

# **ROADMAP FOR THE ADOPTION OF HEALTH INFORMATION TECHNOLOGY IN RURAL COMMUNITIES**



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by the

NORC Walsh Center for Rural Health Analysis  
7500 Old Georgetown Road, Suite 620  
Bethesda, Maryland 20814  
(301) 951-5070

Report Authors:

Julie A. Schoenman, Ph.D.

Joy Keeler

Adil Moiduddin, M.P.P.

Benjamin N. Hamlin, M.P.H.

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# Chapter 1

## Introduction and Purpose of the Roadmap

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The Federal Office of Rural Health Policy (ORHP), which is a part of the U.S. Department of Health and Human Services' (DHHS') Health Resources and Services Administration, has a mission to support the needs of health care providers operating in rural areas and is committed to increasing the implementation of health information technology (IT) among this group. As part of an ongoing effort to promote awareness and knowledge of health IT, ORHP has commissioned this primer to assist rural providers that are contemplating health IT implementation. While providers at all levels of expertise and all stages of adoption should find useful information in this report, this document focuses on providers who are just beginning their investigation of using health IT.

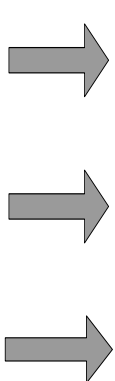
In recent years, policies to promote health IT adoption have played a critical role in the debate over how to improve the safety, quality, efficiency and effectiveness of the health care system. Research has demonstrated the potential for health IT applications such as telehealth, electronic medical records (EMR), computerized provider order entry (CPOE) and e-prescribing to improve the quality of care delivered and, in some cases, health care outcomes.

Potential benefits of health IT as demonstrated by the experience of early adopting health care providers and evidenced in the growing literature surrounding health IT implementation include: improving communications across clinicians and ancillary services providers treating the same patients (e.g., primary care to specialty care, ambulatory care to inpatient care, or clinicians to laboratory or pharmacy communications); increasing access to comprehensive clinical information so information is available to clinicians and patients when they need it; cost effectiveness due to increased efficiencies; and automated clinical decision support reflecting the latest evidence from medical research as it applies to specific patients.

These proximate benefits can lead to overall improvements in health care processes and outcomes, as well as a reduction in duplicate testing and medical errors. While researchers continue to work to understand the relationship between health IT and these benefits, there is a solid logical model for the role of health IT in improving health care delivery overall, and numerous examples of individual providers who have transformed care in their organizations through adoption of health IT. Exhibit 1 summarizes some of the key benefits from health IT as it relates to the basic needs and objectives of rural health care providers.

While progress continues on a national and regional level to promote health IT adoption and health information exchange, rural providers have relatively few resources to support efforts to implement new health IT applications. Lacking technical expertise and surplus

## Exhibit 1: Health IT and Rural Healthcare Delivery

Rural Health Care Objectives	Health IT Applications/Functions
<ul style="list-style-type: none"> <li>• <i>Treat patients across a wide region</i></li> <li>• <i>Provide access to high quality care in the face of provider shortages</i></li> <li>• <i>Communicate effectively with other clinicians and patients</i></li> <li>• <i>Reduce duplication and adverse drug events</i></li> <li>• <i>Reduce unnecessary hospitalizations</i></li> <li>• <i>Maximize 3<sup>rd</sup> party reimbursement</i></li> <li>• <i>Reduce administrative costs</i></li> <li>• <i>Improve patient compliance with prescribed therapies</i></li> </ul>	<div style="text-align: center;">  </div> <ul style="list-style-type: none"> <li>• <i>Distance medicine technologies</i></li> <li>• <i>Access to patient records online</i></li> <li>• <i>Electronic referrals, discharge summaries</i></li> <li>• <i>e Prescribing using built in formularies</i></li> <li>• <i>Automated drug interaction warnings</i></li> <li>• <i>Electronic billing</i></li> <li>• <i>Clinical decision support at point of care</i></li> <li>• <i>Automated patient follow-up</i></li> <li>• <i>Disease, populations specific registries</i></li> </ul>

capital for investment, many providers may find it difficult to sustain any motivation to learn about or pursue health IT. This situation may be especially true for the ‘stand-alone’ providers that are typically found in rural settings.

Despite some important challenges involved in financing, implementing and using health IT, exploring the potential for health IT adoption is a worthwhile activity for nearly every rural health care provider. Any effort to implement new technologies in the delivery of health care should start with the enumeration of objectives and the development of a feasible approach to technology adoption that is geared towards meeting those objectives. In other words, one needs to answer the questions “what problems are we trying to solve?” and “what is a feasible, logical path to address these problems using technology?”

While some rural providers may decide that now is not the right time for them to pursue a major implementation, there are real benefits to learning about the role health IT can play in health care. This is because of both the considerable evidence that health IT can be a useful component of improvements in health care delivery and the ongoing activity on the regional and national level to set the stage for a revamped health care system with robust electronic health information exchange across providers, payers, patients and public health agencies. Without initiating an active program to learn about and incorporate health IT into practice over time, some providers and the patients they serve risk being left behind as the nation moves toward an electronic health care delivery system. Widespread adoption of health IT may or may not be around the corner, however most health care industry experts acknowledge that it will come eventually and rural providers are smart to investigate options at this stage.

The remaining sections of this document will provide information intended to help rural providers begin their investigation of health IT and its applicability to their organization. In an effort to reach the broadest possible audience among the rural health care providers, this document does not restrict discussion to specific technologies or provider types. As such, the information here is meant primarily to be introductory and help point the way to additional resources that readers can pursue on their own. The next chapters will flow as follows:

- *Chapter 2: Approaching Health IT from a Rural Perspective.* This chapter provides an overview of issues and opportunities for rural providers implementing health IT.
- *Chapter 3: Critical First Steps.* This chapter discusses important first steps for rural providers who are beginning to investigate the potential for health IT to improve the way they deliver care, including identifying organizational goals and setting investment priorities, assessing readiness to change, identifying project leads or “champions,” and developing a preliminary feel for the budget to devote to the investment.
- *Chapter 4: Product and Vendor Selection.* Chapter Four provides guidance on viable approaches to procuring and working with software and consulting services vendors that are central to most health IT implementation efforts.
- *Chapter 5: Financing Health IT.* Chapter Five explores issues associated with the most important challenge to health IT adoption as articulated by providers: finding the financial resources. This chapter provides an overview of high-level strategies, then describes specific avenues for securing financial support for a health IT endeavor.
- *Chapter 6: Conclusions.* Chapter Six summarizes key points from across the document and provides some last suggestions for rural providers wishing to move down the path to implementation of health IT.

There is no single “perfect” way to implement health IT. However, there are some useful approaches to thinking about health IT that can help providers to reap benefits from the opportunities and address obstacles encountered along the way. This roadmap seeks to highlight and suggest approaches as they are applicable to rural health care providers.

## Chapter 2

### Approaching Health IT from a Rural Perspective

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#### *Special Features of the Rural Health Environment*

Many of the characteristics inherent to rural America, and to the health care providers who serve this population, present unique challenges and opportunities when thinking about health IT. Geographic isolation and shortages of health care providers – including specialists, mental health professionals, dentists, and pharmacists – mean that patients often need to travel long distances to access their nearest health care provider. Those providers who have chosen a rural practice setting may feel professionally isolated and overburdened. Rural residents, on average, are older and have a higher burden of chronic illnesses. Rural providers also tend to be much more reliant on Medicare and Medicaid payments since private insurance coverage is less prevalent among rural residents.

The configuration of health systems in rural areas also has implications for the adoption of health IT. Almost by definition, rural health systems are less complex: there are fewer providers, and these providers operate on a much smaller scale than their urban counterparts. This smaller scale makes it conceptually easier to engage all community providers in a joint effort to bring technological advances to the area. Fewer competing needs will have to be reconciled, and fewer participants will have to be convinced to be part of the process.

#### *Where Does Health Information Technology Fit into the Rural Picture?*

Advances in information technology hold great promise for helping rural residents and rural providers overcome some of the problems of distance and personnel shortages. Paramount among these advances are a variety of telemedicine applications that enable care to be given without the patient and provider being in the same physical space. These applications include opportunities such as remote monitoring of patients' vital signs, video consultations with off-site providers, Picture Archiving and Communications Systems (PACS) and other teleradiology applications, distribution of prescription drugs and oversight by remote pharmacists, and even performance of surgical procedures using robotic assistance (Exhibit 2).

In addition to the benefits to the patient through improved access to care, these applications can reduce the burden on rural practitioners by providing support from specialists and linkages to the larger health care system. Internet technology also offers the possibility of delivering interactive continuing medical education opportunities directly to rural clinicians' locations, which can help providers to remain current with medical advances without having to travel to distant conferences and training sessions.



**Exhibit 2:**  
**Examples of Health IT Applications Well Suited to Addressing**  
**Rural Distance and Personnel Problems**

<b>PRODUCT OR FUNCTIONALITY</b>	<b>DESCRIPTION</b>
<b>Teleradiology</b>	Teleradiology is a means of electronically transmitting radiographic patient images and consultative text from one location to another. These systems generally consist of an image sending station, a transmission network, and a receiving/image review station. Rural physicians can to send patient images taken locally to a radiologist in a distant location for reading and consultation.
<b>Picture Archiving and Communication System (PACS)</b>	PACS replaces hard-copy based means of managing medical images, such as film archives. These systems consist of a central server that stores medical images and is connected to one or more providers via a LAN or a WAN. PACS expands the possibilities of conventional systems by providing capabilities for off-site viewing and reporting. Additionally, it enables practitioners at various physical locations to peruse the same information simultaneously.
<b>Remote access pharmaceutical distribution networks</b>	Remote access pharmaceutical distribution networks have the potential to improve the quality of healthcare for rural populations without a local pharmacy. Computer tracking and automated dispensing of prescriptions could make medications less expensive and more readily available for rural patients.
<b>Remote psychiatric evaluation/monitoring</b>	Through videoconferencing, remote psychiatric evaluation and treatment can improve access to mental health care for patients without providers nearby.
<b>Remote ICU monitoring</b>	With remote ICU monitoring, critical care specialists can track the conditions of large numbers of patients by computer, overseeing care in order to cut back on complications and alert ICU staff to developing problems.
<b>Remote fetal monitoring of high risk pregnancies</b>	For women with high-risk pregnancies, remote fetal monitoring would allow doctors to more closely track the fetus's condition and respond quickly to any change, without necessarily relying on long hospital stays.
<b>Remote home health care assistance</b>	Remote home health care assistance will improve the quality of care patients are able to receive in their own homes with the help of telemedicine and remote monitoring technology.
<b>Remote chronic disease monitoring and management</b>	Remote chronic disease monitoring and management can help patients follow treatment regimens and keep doctors updated of changes in their condition so as to better manage chronic illnesses.
<b>Glaucoma testing over the internet (Fink's Grid)</b>	The internet has made it possible for anyone to test themselves for glaucoma on a home computer, and touch-screen technology allows doctors to test patients more accurately for a series of vision disorders.
<b>Remote consultations/procedural assistance (Robot-assisted surgery)</b>	Doctors can use a remotely controlled robot to provide patient consultations and procedural assistance; for example, a surgeon could assist in a procedure taking place in rural hospital miles away.

By reducing professional isolation and facilitating treatment of patients with complex illnesses, these applications can make rural practice more attractive to new clinicians who are selecting a future professional location. It is also worth noting that most new physicians in training today are exposed to a range of health IT applications, and may come to expect to have these services available in their future practices.

Even apart from the applications that are especially well-suited to dealing with problems of geographic isolation and provider shortages, many other types of health IT can play a quality improvement role in rural practices. Indeed, in its 2004 report entitled “Quality through Collaboration: The Future of Rural Health,” the Institute of Medicine assigned a pivotal role to health IT as part of a strategy to ensure quality of care in rural areas. Specific prominent examples of these types of applications include electronic medical/health records (EMRs/EHRs) – often complete with clinical decision support software, electronic prescribing and drug interaction monitoring, and electronic ordering and review of tests; bar coding systems for managing medications and other supplies (e.g., Pyxis systems); bedside patient charting and point-of-care monitoring systems; and automated patient tracking and reminder systems. Likewise, rural providers are expected to be important partners in Federal and state efforts to foster the exchange of patient health information across providers as part of the National Health Information Network (NHIN).

### ***Obstacles to Implementation of Health IT in Rural Areas***

Despite its promise, adoption of health IT beyond the traditional telemedicine applications has been relatively slow in rural areas. Observers have cited numerous reasons why this might be the case. Financing constraints are typically cited as the top obstacle to adoption of health IT. While financing concerns affect both urban and rural providers in all health care settings, rural providers may find it especially difficult to secure the needed financing. Smaller, stand-alone providers often found in rural areas do not have access to the capital that might otherwise come from system partners or parent organizations. Rural providers also traditionally operate on low margins, making them less likely to have significant savings with which to fund a large investment. Similarly, heavy reliance on Medicare and Medicaid payments can put rural providers at a disadvantage relative to urban counterparts with more diverse financing streams, and may render them less attractive to commercial lenders as an investment prospect. Finally, the lower volume of most rural providers means that the fixed costs of an investment will be spread over fewer cases, making it more difficult to recover costs and generate a positive return on the investment.

Limited availability of in-house staff with the requisite IT expertise is also believed to be an additional challenge faced by rural providers. Small physician practices and clinics, as well as many rural hospitals and other types of institutional providers, are unlikely to have IT staff with expertise to articulate needs, research product options, select and work with vendors, configure the facility’s infrastructure to implement the new system, and maintain and upgrade the system over the long run. After implementation of a system,

## **Look to External Partnerships as a Way of Strengthening Your IT Capabilities**

Not having the necessary in-house IT expertise can be a real stumbling block to implementation of health IT for many providers. In this case, joining forces with other providers to share a common set of resources can enable all participating providers to move forward rather than stagnating by trying to go it alone.

One example of successful collaboration and sharing of IT resources comes from SISU Medical Systems, a non-profit consortium of approximately 15 rural hospitals in northern Minnesota (<http://www.sisunet.org>). The consortium contracts with Medical Information Technology (Meditech) to provide core software services to its members. SISU employs a wide range of IT personnel who are available to help member hospitals with network management, provide 24-hour technical support and training for member hospitals' staff, and consult on IT investment decisions. The consortium also maintains a central data center as well as a video conferencing network.

The well-known Rural Wisconsin Health Cooperative (RWHC) provides a second example of the potential to further health IT initiatives through collaboration (<http://www.rwhc.com/>). Formed in 1979, RWHC now represents approximately 30 rural hospitals in Wisconsin and provides a diverse range of professional, educational, consulting, and advocacy services to its members. In the area of information technology, RWHC has developed a wide area network (WAN) that allows them to provide members with low cost shared IT services, such as Internet, web filtering, e-mail encryption, and remote data storage. In addition, RWHC has formed a joint venture with a variety of IT service providers to help members plan for, implement, and maintain their internal IT infrastructures. Intended as a supplement to IT staffs of member hospitals, this initiative provides complete data center services, on-site and telephone technical support, assistance with IT purchasing decisions and implementation, and application development services. The group also negotiates volume discounts for its members through combined purchasing agreements. Through a separate "Technology Management Program," RWHC helps members to manage their large capital equipment investments, including help in selecting the technology, negotiating best prices and coordinating joint purchases, and long-term maintenance.

Looking forward, RWHC and its members are currently engaged in a vendor selection process for a shared hospital information system (HIS) that, when implemented, would be delivered to participants over the RWHC WAN. Work on this project has been supported through a planning grant from the Agency for Healthcare Research and Quality. By pooling facility volumes, sharing a datacenter and datacenter staff, and collaborating on HIS education and best practice standards, RWHC and its members are planning to establish an affordable shared HIS model that provides advanced clinical and patient safety systems and tools to even the smallest rural hospitals in the collaborative.

these providers will often have to rely on outside technical support, which adds to the ongoing maintenance of the operating cost of the system.

In this era of rapid proliferation of products, with little objective vetting of the options, many rural providers may have remained on the sidelines because they fear making a

costly mistake by selecting the wrong product, or because they feel that the industry has not yet reached the developmental stage to merit their investment. Worries about being able to interface efficiently with legacy systems, being able to exchange data with other systems in the absence of national interoperability standards and common data formats, and being able to ensure data security and continuity of operations in the event of system outages may all contribute to this hesitancy to make a big investment in health IT at this time. The lack of a convincing business case for many investments – coupled with the fact that providers bear the cost of the investment while the largest benefits accrue to patients and payers – has also slowed the pace of adoption. Although most of these concerns are equally relevant to urban providers, they may cause greater hesitancy among rural providers, who feel that their limited finances afford them only one chance to make the right investment.

Historically, lack of high-speed access to the Internet has been an obstacle in the adoption of health IT in rural areas. Results from two recent surveys of rural hospitals suggest that this situation has improved in recent years,<sup>1,2</sup> but some rural areas still find themselves without reliable high-speed connections or have other types of communications dead spots due to the topography of the area.

Finally, despite the potential relative ease of developing community-wide health IT projects in rural areas, laws against physician self-referral and other anti-kickback statutes may have had the unintended consequence of thwarting initiatives that are spearheaded and largely funded by the local hospital, then shared with local physicians. The August 2006 expansion of safe harbors by the Centers for Medicare and Medicaid Services and the DHHS Office of the Inspector General should alleviate these concerns for initiatives related to electronic prescribing and electronic health records.<sup>3</sup>

This document is designed to provide guidance to rural providers of all types who are thinking about making an investment in health IT. In light of the major obstacles described above, this document focuses on some of the most critical issues rural providers are likely to face as they investigate options and move down the road to adoption – namely, laying the groundwork through initial assessments and planning (Chapter 3), dealing with vendors (Chapter 4), and finding creative mechanisms to finance health IT initiatives (Chapter 5).

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<sup>1</sup> Flex Monitoring Team. “The Current Status of Health Information Technology Use in CAHs.” May 2006.

<sup>2</sup> NORC Walsh Center for Rural Health Analysis. “Survey of Health Information Technology in Rural Hospitals.” Spring 2006.

<sup>3</sup> <http://oig.hhs.gov/authorities/docs/06/OIG%20E-Prescribing%20Final%20Rule%20080806.pdf>

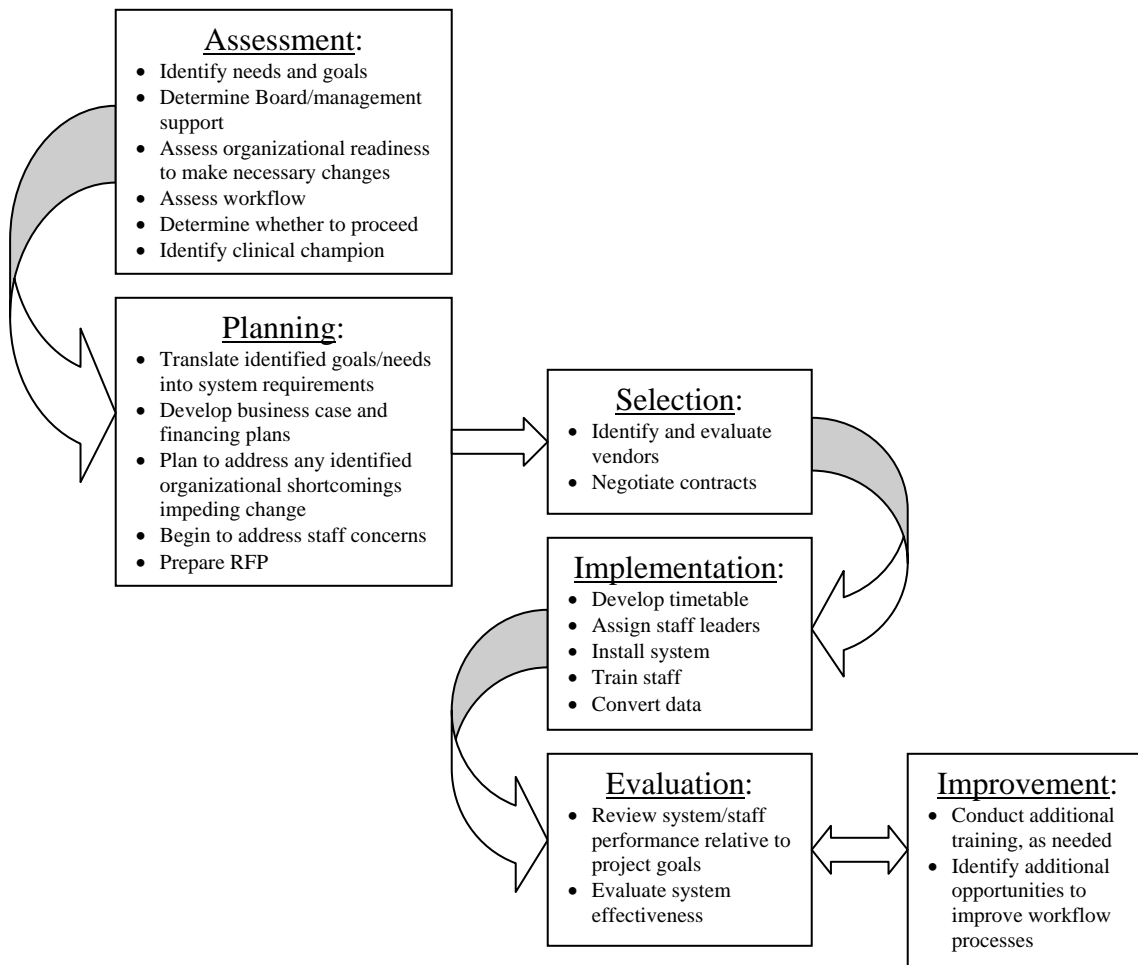
## Chapter 3

### Critical First Steps

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Implementation of any health IT project will be a journey involving many steps, and failure to lay a good foundation at the outset can mean failure. The Doctor’s Office Quality – Information Technology (DOQ-IT) project sponsored by the Centers for Medicare and Medicaid Services (CMS), for example, defines six stages along the journey to implementation of an ambulatory EHR: (1) assessment; (2) planning; (3) selection; (4) implementation; (5) evaluation; and (6) improvement (Exhibit 3).<sup>4</sup> While specifically developed to guide EHR implementation, this same conceptual framework applies to virtually all types of IT initiatives. A critical point to note is that selection and

**Exhibit 3: Six Stages to Adoption of Ambulatory Electronic Health Record**



Adapted from the DOQ-IT EHR Implementation Roadmap.

<sup>4</sup> <http://www.healthinsight.org/doqit/assets/doc/Implementation%20Road%20Map%204-12-06.doc>

#### **Exhibit 4: Common Causes of Failed or Faltering Health IT Implementations**

- Leadership team not engaged.
- No integration of adoption plan with business strategy and long-term goals.
- Unrealistic expectations of what health IT could accomplish.
- Importance of analyzing workflow was misunderstood or incorrectly approached.
- Inappropriate system was purchased.
- Organization lacked an understanding of what was necessary to implement the system successfully.
- Lack of consistent commitment to the implementation across the organization.
- Inadequate training for users.
- Unclear goals and objectives defined to measure progress or success.

implementation occur only after much initial groundwork has been completed through assessments and planning. Furthermore, a good project will not end with implementation; to derive the maximum benefit from the investment, providers should follow the implementation with an evaluation of how the system is working, then make any system improvements called for by this evaluation. System evaluation and improvement will be an ongoing task following the initial implementation.

When first setting out on the transformation journey, it is important to understand the details and nuances of a successful health IT implementation. While not yet a science, there are critical components that are common to successful implementations and conversely, some factors repeatedly associated with failed adoption attempts (Exhibit 4). Understanding these components and realistically assessing where your organization is in relation to each factor, and planning appropriately to deal with the results of these assessments, can help to avoid common problems and ensure that you are prepared to proceed with implementation.

This chapter describes some of the early first steps in the health IT implementation journey, including clearly articulating project goals and aligning them with the organization's larger strategic plan, assessing your organization's readiness to make necessary changes, identifying a clinical champion for the initiative, and developing a preliminary budget and business plan. As such, the information is designed as a guide for critical first steps that will underpin subsequent success with implementation.

#### ***Aligning Health IT with Strategic Planning***

Choosing to implement health IT is not an end in itself, but rather a strategic initiative that can support broader organizational strategies and objectives. Every organization considering such an investment, therefore, needs to begin by carefully thinking through and documenting its vision for health IT and how the investment will support broader corporate goals. The articulation and prioritization of organizational strategic goals, first and foremost, followed by an honest assessment of how health IT can contribute to

achieving these goals, will move the organization well down the path to identifying its highest priority IT investments.

As part of an overall strategic plan, information technology can be the driver of change as new approaches to strategic initiatives are carried out. Examples of strategic initiatives where health IT can play a critical role include:

- patient safety,
- patient satisfaction,
- retention of talented staff,
- sound financial performance, and
- best possible care and outcomes for patients.

Whether implementing an EHR to eliminate or minimize paper in the health care process or deploying standalone systems in specific departments, clearly stating project and strategic goals is essential in order to properly position the organization to maximize short- and long-term benefits of health IT. Most implementations require significant financial and human resource commitments, which can affect other initiatives underway at the organization. If properly planned and managed, health IT will become part of other institution-wide initiatives and will move in tandem with these initiatives to achieve larger organizational objectives.

### *Assessing your Organization's Readiness to Change*

Once the examination of organizational goals and priorities has been completed and you have determined that a particular type of health IT initiative appears to hold promise for achieving these larger goals, a next step is to make a frank assessment of whether your organization is prepared to make all of the changes necessary to succeed with the implementation. Any shortcomings or concerns uncovered during this assessment will need to be addressed as you move forward with implementation.

#### **Factors to Consider in the Readiness Assessment**

Experience of earlier adopters has demonstrated that successful deployments of any type of health IT project require full leadership engagement, financial commitment, and a clear understanding of the cultural and work process changes required along the way. Thus, it is very important to assess the organization's readiness to change across the following dimensions:

- **Leadership Engagement** – objectively define whether the organization and its leadership are prepared to adopt the new culture necessary to fully realize the benefits of health IT;
- **Project Governance and Staffing** – assure that the organization has human resources properly allocated to support the change;
- **Planning and Change Management** – support changing workflow and well trained staff to maximize the IT investment; and

- **Technical Capacity and Readiness** – assess the IT infrastructure, internal resources, and budgetary considerations for advanced clinical information systems support.

**Leadership Engagement.** Understanding the readiness and ability of your organization’s key administrative and clinical leadership to accept and drive change should be one of the first steps in any adoption process. A leadership team that is totally committed to the vision of adoption requires well-defined roles and responsibilities in order to succeed. It is incumbent on the leadership team to align the vision for health IT adoption and clinical transformation with the organization’s overall strategic plan, as described above. Creating a “culture of change” at the leadership level proactively addresses one of the common causes of failed health IT implementations.

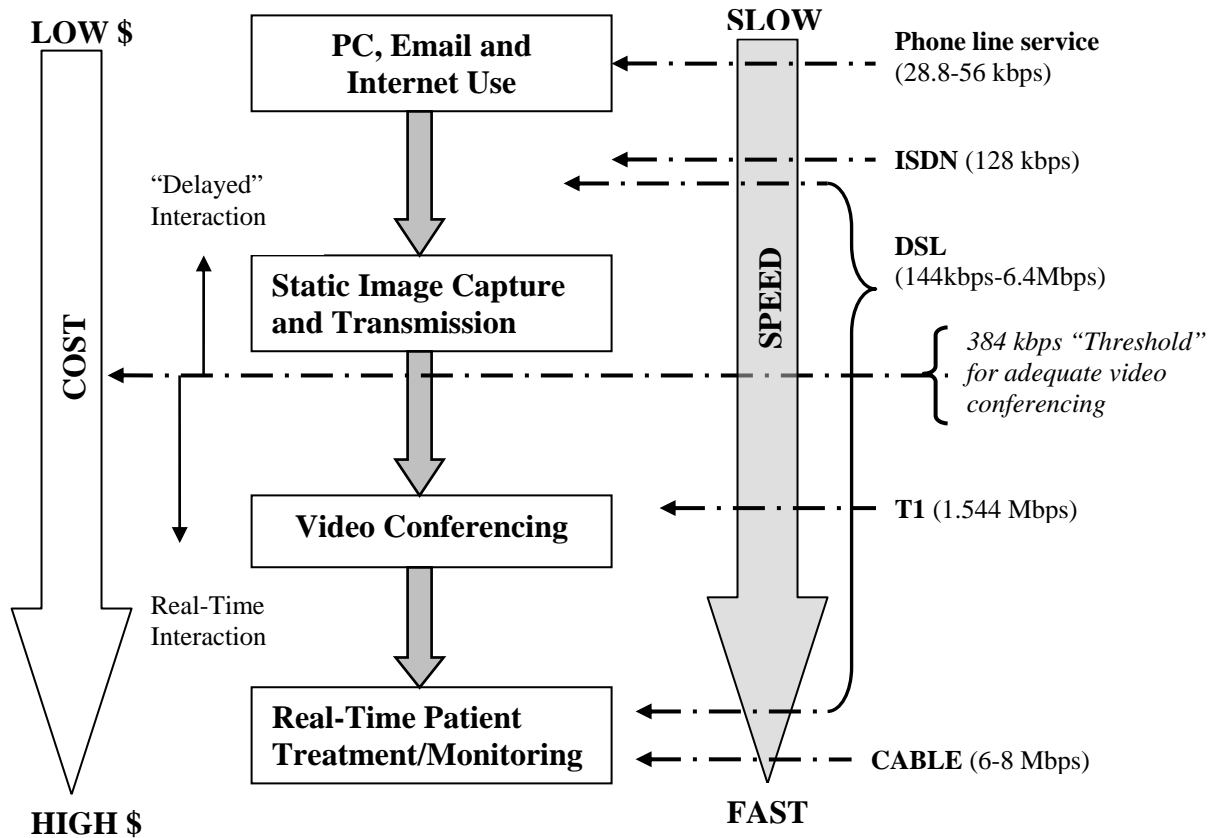
A critical element of the team is a strong clinical leader who is able to serve as the champion for the health IT initiative, melding an understanding of the clinical importance of the application with the technical aspects and rallying other staff members to the cause. Beyond this clinical leadership, it is also important to see that all clinical participants in the organization are part of the change process.

**Project Governance and Staffing.** Preparing your management team to oversee the tactical aspects of your health IT implementation requires a clear understanding of their ability and willingness to support the investment in technology. This includes assessing their ability to properly manage the staffing and financial resources that must be allocated to facilitate acceptance of the new environment. Change is not easy, especially in an environment that may have well established routines. Part of an effective management assessment includes understanding the different workforce roles in the day-to-day interactions and deciding how each will be affected by the implementation of a new system. Physicians and staff who do not adopt the technology will prevent full realization of the benefits of health IT, ultimately reducing its overall value. This is a common characteristic of faltering implementations, so it is important to identify the pockets of resistance within the stakeholders and attempt to address their concerns early on in the process so sticking points do not become roadblocks.

**Planning and Change Management.** This portion of the readiness assessment identifies your team’s understanding of workflow, process change and how to bridge today’s workflow to a new workflow with the implementation of health IT. It is critical to begin the process of organizational transformation before any health IT applications are introduced. The first step is to clearly understand and document the current state so that as new workflow and processes are put into place, nothing is overlooked and unintended consequences are avoided. Managers must focus on process improvement gains to create more effective workflows that improve the level of care provided. Integral to success in this area is the development of staff and clinician training related to this new way of thinking. The goal throughout this phase of the assessment is to understand where your team is in their preparedness so that training can be planned accordingly to bring them up to an ideal level of understanding and ability to manage change across the organization.



### Exhibit 5: Health IT Uses and Minimum Connectivity Requirements



**Technical Capacity and Readiness.** Dependable and fast system access is vital to the success of any health IT application. When evaluating the technical capacity of your organization you will consider the state of your existing internal IT infrastructure, your capital and operating budget for information technology, and the capabilities of your internal IT team. This assessment will prove to be a driving factor in the decision of what type of technology to deploy. Based on your financial resources as well as the level of sophistication of your technology team, you will be faced with decisions on whether to strive for an in-house solution, use an Application Service Provider model (see page 23), or align with existing solutions offered by your QIO or local health information exchange (HIE).

Beyond the capabilities of the practice or institution, it is also critical to consider the capabilities of the local communication network infrastructure. While sophisticated, affordable and fast connections are becoming more common in rural areas, tailoring your health IT needs within the available infrastructure is essential (Exhibit 5).

#### Examples of Available Readiness Assessment Tools

Readiness assessments can be conducted using generally available toolkits or through customized consulting engagements. With either option, the goal is the same: to provide insights on the organization’s preparedness in the general areas described above. In

addition to providing an accurate snapshot of where the organization falls in each category, the act of completing the assessment should also provide an understanding of the ideal or best-case scenario.

Very good readiness assessments have been created by several organizations for different types of providers and technologies. While these tools may differ in their target audience, the requirements for successful change are fundamentally consistent across provider organizations, and consideration of several assessment tools may be helpful regardless of your practice type or the technology you are considering.

**Community Clinics Initiative Tool for EHR Readiness Assessment.** One of the best known tools is the *Readiness Assessment Toolkit* presented by the Community Clinics Initiative (CCI).<sup>5</sup> This management tool is designed to guide ambulatory clinics through the steps of a successful implementation of an EHR by assessing organizational readiness in the areas of: (1) organizational alignment; (2) management capacity; (3) operational capacity; and (4) technical capacity. Each of these broad categories contains a number of subcategories. For example, the Organizational Alignment section includes subsections covering the organization’s culture, its leadership, and its strategy, while the Operational Capacity section covers workflow process, patient involvement, and training. Each subsection is also further broken down to address factors that might affect selection and contracting, implementation, and effective use of the system (Exhibit 6). Using an interactive Excel workbook, users assign a readiness score to each item. Summary scores are automatically computed to indicate the overall readiness as well as to clearly identify areas requiring further attention.

**Exhibit 6: Sample Section of the CCI Readiness Assessment Toolkit**

	A	B	C	D	E	F	G
1	<b>1. ORGANIZATIONAL ALIGNMENT</b>						
2	<b>Readiness Areas &amp; Categories</b>	<b>Elements</b>		<b>Not Yet Prepared 1.....2</b>	<b>Moderately Prepared 3.....4</b>	<b>Highly Prepared 5.....6</b>	<b>Rating Column</b>
21	<b>LEADERSHIP: Selection &amp; Contracting</b>	1.19	<i>Leadership...</i>	believes EHRs are necessary, but is divided as to how to communicate why and when to pursue.	has studied the pros and cons of implementing an EHR and can make an argument for why benefits outweigh costs.	understands the benefits of the EHR and risk of failed implementation, and sets a clear and consistent vision for how EHR supports efficiency and quality improvement goals.	
22		1.20	<i>The Executive team...</i>	relies on vendor to provide EHR planning guidance.	delegates EHR planning to managers or a specific team.	devotes substantial time to EHR planning and execution.	
23		1.21	<i>Physician leader(s)...</i>	create clinical EHR requirements without physician input for submission into the decision-making process.	actively engage physician peers to determine EHR requirements for submission into the decision-making process.	are aligned with administrative leaders and incorporate consensus-based needs into EHR requirements.	

<sup>5</sup> <http://www.communityclinics.org/content/general/detail/783>

## Ask Your Medicare Quality Improvement Organization (QIO) for Help

The current Scope of Work for the Medicare QIOs calls for these organizations to provide assistance intended to spur the adoption of health IT. Initial efforts have focused on helping small to medium-sized physician practices adopt EMRs and other forms of health IT. Additional work is targeting hospitals seeking to adopt CPOE systems, bar coding, and telehealth technologies, and home health agencies using telehealth.

Personalized assistance is available free upon request. For physician practices, the QIOs provide help in assessing and redesigning office workflow and care processes; support in selecting a vendor and overcoming implementation barriers; and advice on how to use data generated by an EMR to improve the clinical care given by the practice. This charge to the QIOs is an outgrowth of the initial phase of the DOQ-IT initiative, which developed training materials and other tools such as readiness assessment worksheets and templates for developing a vendor RFP. All QIOs are now supposed to use these components as part of their support to physician practices. Many similar tools are available for hospitals.

You can find contact information for your state's QIO and for the related DOQ-IT program at: [http://www.ahqa.org/pub/connections/162\\_694\\_2450.cfm](http://www.ahqa.org/pub/connections/162_694_2450.cfm).

Information on the resources QIOs are using to assist providers with health IT adoption can be found at:

<http://www.medqic.org/dcs/ContentServer?pagename=Medqic/MQPage/Homepage>.

Use the 'physician office' and 'hospital' tabs at the top of the home page, coupled with the 'adopt HIT' link on the left of the page.

## Readiness Assessment Tools from MedQIC for Hospitals and Physician Practices.

Other readiness assessment tools are available through the Medicare Quality Improvement Community (MedQIC) initiative, sponsored by CMS. This site includes readiness assessment tools that hospitals can use to prepare for bedside bar-coded drug administration<sup>6</sup> and CPOE systems,<sup>7</sup> as well as tools designed to help physician practices and ambulatory clinics determine whether they are ready to adopt their first EHR<sup>8</sup> or upgrade/modify their existing EHR.<sup>9</sup>

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<http://www.medqic.org/dcs/ContentServer?cid=1122904871843&pagename=Medqic%2FMQTools%2FToolTemplate&c=MQTools>

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<http://www.medqic.org/dcs/ContentServer?cid=1122904872189&pagename=Medqic%2FMQTools%2FToolTemplate&c=MQTools>

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<http://www.medqic.org/dcs/ContentServer?cid=1133278332358&pagename=Medqic%2FMQTools%2FToolTemplate&c=MQTools>

9

<http://www.medqic.org/dcs/ContentServer?cid=1133278333025&pagename=Medqic%2FMQTools%2FToolTemplate&c=MQToolsClinic>

The CPOE tool, for example, asks users to rate the degree to which they agree with various statements about the hospital's strategy, culture, technology, management, and IT staff capabilities. Scores are automatically tallied to indicate overall readiness as well as scoring by individual subcategory.

The assessment tool for bar coding readiness considers nine broad categories of factors that might affect system implementation, such as drug storage and distribution, environmental factors, and staff competency and education. Within each broad category, specific items that are either facilitators or prerequisites to successful implementation of a bar coding system are identified, and users indicate whether each is fully, partially, or not implemented in the hospital. As with the other assessment tools, summary scores are calculated that reflect the overall readiness to adopt the technology, as well as point to areas where improvement might be required prior to implementation.

**Readiness Assessment Tool for Critical Access Hospitals.** The Rural Health Resource Center has recently released a readiness assessment survey designed specifically for critical access hospitals.<sup>10</sup> The survey asks users to indicate whether they agree or disagree with a number of statements characterizing the hospital's market and environment, organizational culture, financial resources, technical infrastructure, staff infrastructure, and personal technology skills.

### *The Technology Champion*

The clinical champions will serve in many capacities throughout the life of the project and will ultimately be the "owners" of the system once implementation is complete and the new technology is part of day-to-day operations. From the onset, the champions should be a part of all planning conversations: at the Board or executive level (Medical Director or CMO) to subsequent groups such as the Selection Committee and all other planning committees. A successful model is to have multi-disciplinary groups of clinicians involved in all planning groups. For larger ambulatory practices, hospitals, or other institutional settings, membership should include, but certainly not be limited to: physicians, nurses, pharmacists, ancillary department representatives and business office representation as appropriate.

Initially, technology champions will help to assure that appropriate clinical considerations are included in strategic planning and preliminary requirements decisions. Later, these champions will be asked to lead the clinical aspects of detailed requirements definitions, vendor demonstrations, site visits, and ultimately vendor selection. As team members and system advocates, technology champions will also be positioned to speak on behalf of the project when things get tough (and things will get tough!). Champions will educate others on the system and also serve as a conduit for information from the field to project leadership.

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<sup>10</sup> This tool can be obtained by sending a request to the Technical Assistance and Services Center at [tasc@ruralcenter.org](mailto:tasc@ruralcenter.org) or contacting them at 218-727-9390.

## *Financial Considerations*

### **Defining Your Budget**

As with the technical capacity of the organization, the available budget will define the range of technology solutions that can be achieved to meet strategic and operational goals. In developing the project budget, early decisions at the executive level will determine how funding will be allocated, and approaches to financing will undoubtedly be discussed. (Chapter 5 describes a variety of financing alternatives to supplement capital and operating dollars.) Common approaches for defining the size of the project budget include allocating a percent of revenue for IT spending, selecting a fixed dollar amount, and using funds that remain available after other projects are accounted for. An early decision should be made regarding the approach that is best for your organization. Whichever method is chosen, it is important to factor in all costs of the initial implementation and to budget a fixed, minimum amount to support ongoing software license fees and technical support, maintenance of infrastructure, and planned growth.

Most organizations plan for a three-year replacement cycle for workstations and PDAs in addition to anticipating growth in the total number of devices as transformation uptake increases. Once technology catches on, most organizations experience a growth in the technical appetite of their clinicians. It would be best to plan (and budget) for this to prevent (or at least anticipate) possible future dissatisfaction by your clinicians.

### **Developing a Business Plan**

An important step for project planning and communicating with organizational leadership and project funders is the development of a comprehensive, well thought out business plan. This plan should provide justification and accountability to support the request for a health information system expenditure. It will also inform others of all the resources needed to secure the project's success. Both costs and benefits expected of the system should be documented and include tangible and intangible benefits. Including potential risks and ways to mitigate risks will decrease the chances of failure. While developing a business plan early in the project will add time to the overall project plan, it will be time well spent if it helps all stakeholders, leadership and funding entities to clearly understand all aspects of the project. A cogent business plan can often play a key role in gaining support from the organization's executive leadership.

Key components of a business plan should include:

- project vision, goals and objectives,
- stakeholders and governance,
- anticipated value and project benefits,
- project management and risk management plans, and
- financial and staffing considerations.

### *Draw on Lessons Learned from Others*

While the journey to implementing health IT may be slightly different for each organization, the industry has learned from earlier adopters and these lessons may be relevant for your particular situation. One excellent resource is the Agency for Healthcare Research and Quality (AHRQ) National Resource Center for Health Information Technology website, which includes a “lessons learned” section for many topic areas.<sup>11</sup>

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<sup>11</sup> [www.healthit.ahrq.gov](http://www.healthit.ahrq.gov)

## Chapter 4

### Product and Vendor Selection

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Once you have completed the critical first steps described in Chapter 3 – and determined that your organization is ready to move forward with a particular type of health IT implementation – your next challenge will be to select the exact product and vendor that best suit your needs and to negotiate a favorable contract with that vendor. Rapid technological and functional advances that change the nature of the products available and the proliferation of vendors can make product and vendor selection a big stumbling block along the road to adoption of health IT. This step may be especially trying for smaller rural providers who are not likely to have large IT staffs with the time and expertise to investigate vendor options in depth, and who may have less direct exposure to the range of product options due to geographic isolation and the lack of opportunities to benefit from local colleagues' experiences.

This chapter offers guidance to help navigate this process, including suggestions for researching products and vendors, soliciting and evaluating bids from vendors, and negotiating a contract with the vendor or vendors selected.

#### *Researching Vendor Products and Services*

One way to gain quick exposure to a wide variety of products and vendors is to attend conferences of organizations that offer health IT fairs or vendor exhibits at their annual meetings. Through exhibits, presentations, and networking events, these conferences offer an excellent opportunity to learn what is available and to begin an initial assessment of how these products could be useful to you. The annual meetings of both the Healthcare Information and Management Systems Society (HIMSS)<sup>12</sup> and the American Health Information Management Association (AHIMA),<sup>13</sup> for example, include large exhibit halls showcasing a multitude of vendors and products, as does the annual conference of the Medical Group Management Association (MGMA).<sup>14</sup> Your state or local medical or hospital association also may have vendor representation at its meetings. Likewise, the National Rural Health Association (NRHA) sponsors several conferences each year that include representation from technology vendors who are specifically interested in reaching rural providers.

For those investigating EMRs, the Medical Records Institute (MRI)<sup>15</sup> annually sponsors a conference called “Towards the Electronic Patient Record” (TEPR) that features numerous vendors, as well as another industry conference that is attended by hundreds of

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<sup>12</sup> [http://www.himss.org/conference\\_2006/exhibition/product\\_pavillions.asp](http://www.himss.org/conference_2006/exhibition/product_pavillions.asp)

<sup>13</sup> <http://www.ahima.org/convention/2006/index.asp>

<sup>14</sup> <http://www.mgma.com/education/annconf/index.cfm>

<sup>15</sup> <http://www.medrecinst.com>

vendors. Perhaps more accessible is the MRI's "EMR Roadshow," a one-day seminar being held at some 70 locations across the country in 2006 that offers the opportunity to learn about the latest EMR developments and implementation strategies via a vendor exhibit hall, a panel discussion among EMR users, and overview presentations.<sup>16</sup>

There are also numerous online resources available for those who are not able to attend these meetings but who still wish to investigate what products are available and how they compare to one other. For example, the Medicare Quality Improvement Community (MedQIC),<sup>17</sup> sponsored by CMS to assist its Quality Improvement Organizations (QIOs) in improving the quality of care provided to Medicare beneficiaries, offers vendor guides for hospitals wishing to implement CPOE or medication bar coding systems and for physician practices interested in EMRs.

Both of the hospital guides on the MedQIC site rely on vendor evaluations developed by KLAS Enterprises, LLC, a firm that tracks vendor performance based on systematic evaluations completed by vendors' clients.<sup>18</sup> KLAS maintains an extensive database that can be accessed on-line by subscribers, and sells comprehensive reports with vendor ratings for specific types of technologies. Additionally, the KLAS website has a searchable on-line vendor directory. For example, one can identify all vendors currently providing EMRs to physician practices with 1 to 5 physicians.

Other resources that might be helpful to those considering implementation of an ambulatory EMR, include the following:

- The Certification Commission for Healthcare Information Technology (CCHIT)<sup>19</sup> is an independent, voluntary, private-sector initiative acting as the certification authority for electronic health records and the networks through which they share data. In July 2006, CCHIT released the first list of ambulatory EHRs certified as satisfying over 300 criteria related to system functionality, interoperability, and data security. A companion "Physicians Guide" is also available to provide additional information on the certification process. Similar certification assessments are underway for inpatient EHRs, with results expected by 2007. CCHIT also publishes a regular newsletter that is distributed electronically to people who have registered (via the CCHIT web site) to receive it.
- In 2003, the California HealthCare Foundation worked with Forrester Research, Inc., to develop an EMR evaluation tool targeted to small physician practices, and provided ratings for 8 of the larger systems that were available at that time.<sup>20</sup> The evaluation tool considers numerous aspects of system functionality, usability, support, and cost, as well as of the vendor's business strategy and market presence. Weights are assigned to these factors to develop a final score for each

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<sup>16</sup> <http://www.medrecinst.com/conference/emr/index.asp>

<sup>17</sup> <http://www.medqic.org/dcs/ContentServer?pagename=Medqic/MQPage/Homepage>

<sup>18</sup> <http://www.healthcomputing.com/>

<sup>19</sup> <http://www.cchit.org/>

<sup>20</sup> <http://www.chcf.org/topics/view.cfm?itemID=21520>



product. Users wishing to employ this method could use the existing framework and weights to evaluate a different set of vendors, or could easily adapt the tool to modify the criteria considered and the relative weights given to each.

Furthermore, even users that do not wish to go through the rigorous process of assigning scores to a set of evaluation criteria may find this general framework helpful in providing a list of factors to consider when evaluating vendors. An accompanying report that describes the results in more detail, “The EMR Buyer’s Guide for Small Practices,” is also available.

- The California HealthCare Foundation has also collaborated with the Community Clinic Initiative to produce an EHR product guide for community health clinics.<sup>21</sup> Based on self-reported data from vendors, the resulting 2005 report compares 11 EHRs along dimensions such as functionality, scalability, user interface, training, technical support, and experience in the community clinic setting.
- AC Group, Inc.,<sup>22</sup> a private healthcare technology advisory company, releases semi-annual evaluations of practice management systems and EMR/EHRs designed for use in physician offices. A brief summary report is available for free on the web, and the full report can be purchased for a relatively modest price. Caveats related to this source are that some of the more prominent vendors do not participate in this survey, and that data are as reported by the vendors (data are validated for only a small portion of the vendors for each survey). Nonetheless, this source covers a large number of vendors, and provides comprehensive data related to product functionality, end user satisfaction, vendor financial viability and client base, technologies used, and cost. Importantly for rural providers, separate evaluations are provided to assess which systems perform best for practices of 1-5 physicians and small group practices of 6 to 19 physicians.
- In 2005, the American Academy of Family Physicians (AAFP) conducted an informal survey of its members to assess their satisfaction with electronic health record systems adopted by their practices. Although responses were received from only about 400 family practitioners, results for 11 EHR systems for which sufficient data were obtained are reported in the October 2005 issue of Family Practice Management,<sup>23</sup> and may be helpful to practices considering one of these systems.
- Through its Center for Health Information Technology, the AAFP also offers numerous background papers, tutorials, and tools designed to assist physicians who are seeking to implement EHRs in their practices.<sup>24</sup> The available tools include a Physician Product Reviewer/EHR User Directory consisting of reviews written by Academy members who are currently using an EHR in their office. Reviewers rate products on quality, price, support, ease of use, and impact on

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<sup>21</sup> [http://www.communityclinics.org/files/791\\_file\\_EHR\\_Product\\_Guide\\_051105.pdf](http://www.communityclinics.org/files/791_file_EHR_Product_Guide_051105.pdf)

<sup>22</sup> <http://www.acgroup.org/pages/396843/index.htm>

<sup>23</sup> <http://www.aafp.org/fpm/20051000/29aneh.html>

<sup>24</sup> <http://www.centerforhit.org>

### **The Medicare QIOs Can Help with Vendor Selection**

Riverton Family Health Center (RFHC) is a small physician-owned practice in a semi-rural area in Utah. After one costly mistake several years ago trying to implement an EMR system that had been selected with little in-depth planning or investigation, the practice was ready to try again. Instead of going it alone on this second attempt, however, RFHC turned to its local QIO for assistance as part of the Doctor's Office Quality - Information Technology (DOQ-IT) initiative. Working closely with QIO representatives, RFHC began by carefully analyzing all of its workflow processes to identify places that needed improvement and where health IT could help. Armed with the workflow assessment results, RFHC then turned to the vendor selection process. The QIO again helped the practice to narrow the vendor list and develop a method for evaluating the different systems under consideration. RFHC has now implemented its selected system, and gives significant credit to the DOQ-IT program for providing essential guidance throughout the process.

<http://www.medqic.org/dcs/ContentServer?cid=1147808147360&pagename=Medqic%2FMQNews%2FNewsFeatureTemplate&c=MQNews>

productivity and the results are posted for all members to view. Some reviewers have even agreed to be available by e-mail to answer questions about their ratings. Unfortunately, while some of the other tools found at this site are available to the general public, these reviews are available only to AAFP members.

- HIMSS offers an on-line “Ambulatory EHR Selector” that compares EHR products and vendors along a detailed set of characteristics covering topics such as system functionality, training, regulatory compliance, pricing and contracting, and the size and specialty of the physician practices that would find the product of interest.<sup>25</sup>
- The MGMA supports a “Buyer’s Guide” section on its website that describes vendors providing electronic data interchange services and information systems and software, among others.<sup>26</sup>

Speaking with other providers who are similar to you and who have adopted a product of possible interest to you can be yet another excellent source of information. If these colleagues are not available to you locally, you may be able to find appropriate contacts by working with your local medical society, the state hospital association, the State Office of Rural Health, or other similar organizations.

Based on these investigations, you should begin narrowing the field to only those vendors who seem to offer a product that would be well-suited to your needs and who can provide the support to address the findings from your readiness assessment. Many experts recommend narrowing the field to approximately five vendors at this point; regardless of

<sup>25</sup> <http://www.ehrselector.com/EMRToolkit/ASP/Default.asp>

<sup>26</sup> <http://www.mgma.com/marketplace/index.cfm>

### **ASP Vendors as a Possible Solution for Smaller Providers**

Application Service Providers (ASPs) are companies that provide software and software-related services over the Internet. In contrast to the traditional arrangements where the data user also hosts the software and stores the data on its own internal hardware (i.e., “client-server” solutions), ASPs own the software and the servers that run the application, and are completely responsible for maintaining the system. These responsibilities include employing the necessary IT experts, upgrading the software, providing redundant capacity and performing data backups, and instituting procedures for dealing with outages and ensuring data security. Clients access the software via the Internet, and are billed on either a per-use or a subscription basis.

Recent years have witnessed rapid growth in the number of ASPs offering EMRs, CPOE, and practice management systems, among other types of health IT applications. Moreover, some larger physician practices and hospitals have begun offering smaller providers – even those who are not affiliated with them – access to their commercial systems (and the accompanying technical support services) via an ASP-type model. The recent expansion of safe harbors for physician self-referral and anti-kickback laws seems certain to encourage additional development in this area.

Because the ASP bears all of the cost of developing and maintaining the application and supporting the back-end infrastructure, this option offers low entry costs to clients, predictable monthly expenditures, and the possibility of very quick system implementation. These advantages make the ASP option very attractive to small physician practices, in particular, and something that should be investigated by all types of small providers who are interested in adopting health IT systems.

Several things to keep in mind when considering this option include whether you have reliable access to high-speed Internet connections (if your connection goes down you lose access to the system); whether you believe the ASP provides adequate data security; whether the software offered by the ASP will meet your needs without significant customization; the customer base and likely stability of the ASP vendor; and how you would retrieve your data if the ASP goes out of business or you decide to change arrangements.

the exact number, it is important to keep the selection process manageable by imposing some limit on the number of firms you are considering. You are then ready to approach these vendors to gauge their interest in, and price for, implementing their product in your practice or facility.

### ***Defining Requirements and Developing a Request for Proposals***

Bids for most health IT projects would typically be solicited from vendors through a Request for Proposals (RFP). Smaller projects (under \$10,000) that are quite straightforward might be handled through a Request for Information (RFI) or Request for Quote (RFQ).<sup>27</sup> While vendors certainly can and will respond to RFPs that are vague and

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<sup>27</sup>

<http://www.techsoup.org/learningcenter/techplan/page4492.cfm?CFID=18725202&CFTOKEN=89330915>

open ended, it is in your best interest to take the time upfront to develop a rigorous and specific RFP. Describing your current practice environment and your goals and priorities for a new technology application – and being very explicit about the requirements for the product and vendor you seek – will help to ensure that bidders respond with a proposal tailored to your specific situation. It is also very important to present clear instructions about the points that must be addressed in the bid and how that information should be organized in the response. This step will greatly facilitate your evaluation of competing bids by helping to ensure that you are comparing similar products and highlighting major differences between bids in side-by-side comparisons. Asking for references (or, better yet, a list of all installations in practices/facilities similar to yours) is also critical so that you can conduct your own independent assessment of each vendor’s real-world performance.

In its guideline for writing an effective RFP for technology purchases,<sup>28</sup> AHIMA lists the following sections that should be included:

- A cover letter explaining the purpose of the solicitation;
- Relevant background information about the soliciting organization and its goals for the health IT implementation;
- Instructions regarding the response date, number of copies, desired timeline for project implementation, and an organizational contact in case the vendor has questions;
- Statements of the soliciting organization’s expectations regarding vendor presentations, warranties, and product maintenance;
- Delineation of the software requirements, including the “must haves” and the “would like to haves”;
- Specifications for hardware, including providing sufficient information to the vendor about the organization’s current infrastructure to permit the vendor to include provision (and pricing) for all additional hardware needs;
- Description of the training and other support desired by the soliciting organization;
- Request for references;
- Any requirements for presentation of pricing information, such as asking for a software-only quote vs. a quote for hardware and software combined; and
- Criteria that will be used to evaluate the proposals and the target timeline for the selection process.

In developing your RFP, you do not need to start from scratch. Several organizations have sample templates and RFP tools available that can be adapted for your own purposes. For example:

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[http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1\\_000065.hcsp?dDocName=bok1\\_000065](http://library.ahima.org/xpedio/groups/public/documents/ahima/bok1_000065.hcsp?dDocName=bok1_000065)

- The DOQ-IT initiative developed a sample RFP that physician offices might use to seek bids for EHRs and practice management systems.<sup>29</sup> This document contains sections where the practice would describe itself to the vendor, collect information about the vendor, and gather contact information for similar practices who can serve as references for the vendor's performance. This is followed by a comprehensive list of features of EHRs and patient management systems. The practice can indicate the priority it assigns to having each feature as part of the system, and there is space for the vendor to indicate whether the feature is offered in its product or not. Detailed questions then follow that the vendor must address, covering areas such as system support, implementation and training, technical design and operational requirements, report generation, access to source code, security and privacy issues, and pricing and contracting.
- A sample RFP that a community health center/FQHC might use to solicit bids for an automated clinical practice management system contains many of the essential items advocated by AHIMA, including a description of the soliciting organization and its goals for the new system; very detailed descriptions of the system's functional and technical requirements; requirements regarding source code, documentation, technical support and implementation schedule; pricing instructions; a request for references; a statement of the evaluation criteria; and copious instructions to the vendors regarding presentation of information in the proposal.<sup>30</sup>
- The North Carolina Healthcare Information and Communications Alliance, Inc., has prepared a template that practices could incorporate into their larger RFP in order to assess vendors' compliance with HIPAA security requirements.<sup>31</sup> Specific requirements related to password controls, security administration, activity logging, and networking and compatibility are enumerated, and the vendor is asked to describe its compliance with each requirement.

Another option when developing your RFP and soliciting vendor bids is to purchase an automated RFP software tool. One example of such software is the system maintained by On-Line Consultant,<sup>32</sup> which uses question sets to specify your needs and priorities, requests electronic bids from vendors, and generates reports comparing the bids along common dimensions. Versions are available for physician practices, hospitals, and other practice settings, for both financial and administrative information systems as well as for systems affecting patient care activities.

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<sup>29</sup>

<http://www.medqic.org/dcs/ContentServer?cid=1110810526171&pagename=Medqic%2FMQTools%2FToolTemplate&c=MQTools>

<sup>30</sup> <http://ehr.medigent.com/assets/collaborate/2004/04/04/SampleRFP.pdf>

<sup>31</sup> <http://www.nchica.org/hipaaresources/Samples/Portal.asp#security>

<sup>32</sup> [http://www.health-infosys-dir.com/olc\\_hc.htm](http://www.health-infosys-dir.com/olc_hc.htm)

## *Evaluating Bids from Vendors*

Once the bids come in, they will need to be evaluated in a systematic way, using the evaluation criteria you developed and included in the RFP. Depending on the size of the practice/institution and the scope of the project for which bids were solicited, you may have only a couple of reviewers, or may involve members of a larger Selection Committee. If you are using a committee and have received lengthy complex proposals from numerous vendors, you may want to use a review process that assigns one or two proposals each to primary reviewers who are responsible for completing an in-depth assessment of the proposal and reporting results to the group. After this initial triage, or in the case of questions about the initial reviewer's report, additional reviewers would examine the proposals of vendors who were judged to be the top candidates.

Unless a proposal is quickly determined to be non-responsive to your needs or out of your price range, your next step will probably be to contact references of all vendors still in contention. Start with references representing organizations most like yours. If responsibility for making these calls is going to be divided among several people, agree ahead of time on a list of questions that each person should cover with each reference. Some possible questions for references are listed in Exhibit 7.

Based on your conversations with the vendors' references, you should be able to further narrow the field to a small set of vendors from whom you would like an on-site presentation. Before the first visit, you should develop a number of case scenarios that reflect the types of patients and situations typically encountered in your practice or facility. Make sure all vendors demonstrate how these cases would be handled by their system. Also make sure that as many of the key people who will be using the new system as possible have a chance to see the demonstration and offer their feedback.

Following the vendor demonstrations, it is important to visit at least one site where the leading vendor's product is up and running. If you are still considering several vendors, site visits to see each of their products in action are warranted. As was the case when you were initially checking references, the best sites to visit will be those that are most similar to you. For rural providers, these visits are likely to involve travel outside of the immediate area, but information gained during the visits can be invaluable as you make your final selection. All people who will have a voice in your final selection should go on these site visits. If there will be multiple visits, and especially if you are still considering multiple products, going into the visits armed with a standard set of questions and case scenarios will facilitate later comparison of the visit findings. During the visit, make every attempt to speak with people who actually worked with the vendor during system implementation, and who are actively using the system on a daily basis.

Other factors about the vendor that should be ascertained during this evaluation phase include assessments of the vendor's market presence and economic stability. You don't want to sign up with a vendor who is not likely to be around to meet your needs over the long run. If you did not already ask for this information in the proposal, now is the time

## Exhibit 7: Questions to Ask the Vendor's References

- What were your goals for this product, and has it met those goals?
- Was the vendor responsible for staff training, and if so, how did this go?
- How much training did the staff require to become fully operational with the technology? How long did this take?
- What was the real length of the implementation/transition period?
- How did the vendor deal with implementation issues that arose? Was the response timely? Effective?
- What was the most frustrating point of implementation?
- What was the highlight of the implementation process?
- How have actual project costs compared with the prices quoted to you by the vendor?
- How would you rate system performance? Is the system meeting your needs? If not, where is it falling short? How much downtime have you experienced with the system in the past year/since it was installed?
- What kind of technical support system is in place? If the vendor is providing support, how is this working? How much is this costing?
- How does the vendor handle requests for software updates or other enhancements?
- What areas should I push this vendor on if my organization decides to choose this product?
- Would you purchase the same system again?
- What would you do differently?

to find out about the company's installed base (number of licenses sold), its revenues from the last three years, the size of its current sales force, and any business partnerships that the company may have.

Among other resources designed to guide purchasers through the vendor selection process, the DOQ-IT initiative offers a "Vendor Evaluation Matrix" to help you organize your assessments of the vendor demonstrations and site visits.<sup>33</sup> Specifically designed to evaluate EHR vendors, there are separate sections for different functionalities (e.g., charting the visit, decision support, lab and results management), as well as for vendor support, pricing considerations, and company characteristics. The user is to flag the high priority items/questions prior to the visit, and make sure that all of these topics are adequately covered during the demonstration. This same general approach could be adapted for other types of health IT applications.

### *Negotiating the Contract*

Once the top vendor has been identified, the contract negotiations begin. If a second vendor was a close runner up, you might want to delay notifying this vendor of your decision in case negotiations with the top vendor fail.

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<sup>33</sup> <http://www.healthinsight.org/doqit/assets/doc/Vendor%20Evaluation%20Matrix%204.26.06.doc>

## Exhibit 8: Key Items to Include in the Contract

- Brief description of the project and services needed
- Detailed enumeration of the services to be provided by the vendor, including:
  - specification of all hardware and software being purchased or leased,
  - system documentation
  - system testing
  - staff training
  - transfer of existing data to the new system
  - software upgrades
  - on-going technical support and system maintenance
  - provisions for backup systems and data security
- Specifications regarding ownership of the work products and source code and source code escrow accounts
- Warranties: equipment, authorized repair persons, on-going maintenance, loss of revenue liability coverage, performance specs
- Any expectations of actions that will be taken by the client, such as modifying the facility to accommodate the new technology
- Timeline with projected delivery dates for key milestones
- Specific responsibilities of key personnel (both vendor and client)
- Expectations about communications between the vendor and the client
- Payment schedule and amounts
- Clarification of cost and pricing methodology (hourly rates, fixed price, etc.)
- Methods for resolving conflicts
- Provisions for contract termination (by client or vendor)

The contract language must be comprehensive and extremely detailed (Exhibit 8). Contracts can be written for long or short-term relationships, however in longer term agreements, vendors might be willing to give more concessions if they are not forced to renegotiate every year. The contract needs to lay out the costs of the project broken down into implementation costs, maintenance costs, supports and/or subscriber fees (if any). These costs need to be firm for the entire length of the contract and not just for the first segment in order to most accurately calculate the financial projections for the life of the contract.

A payment plan that extends throughout the length of the contract should include a detailed outline of the payment due at each milestone. Ideally, payment will be based on satisfactory performance by the vendor for specific deliverables, rather than being time based. If contract terms are not met as detailed, you can withhold further payment until the issues are satisfactorily resolved. Structuring payments so that larger amounts are due toward the end of the implementation also gives you more leverage and provides an incentive to the vendor to complete the implementation on schedule. For example, you might want to provide small payments at project initiation, when hardware is ordered, and when software is successfully loaded, but reserve the larger payments until the system is fully implemented.



Work with the vendor to determine what hardware will be needed to fully support the product and whether any major structural adjustments to your physical facility are necessary to accommodate the required hardware. Also detailed in the contract should be the integration of both the hardware and software contract components to ensure that all compatibility issues are addressed. The vendor's commitment to the implementation process (i.e., will they have a person in the office during the implementation phase to ensure a smooth transition and how long will that time period be) must be agreed upon so there are no surprises as the "go live" date approaches.

The ownership of the records (and any source code) being created under the contract needs to be very clear, and there must be language in the contract that details the vendor's duties should they go out of business or merge with another company. Issues such as who holds the license to software created to address particular needs of the organization and who has rights to modify the code should the need arise must be clearly detailed in the contract. Data storage and back-up systems, as well as technical support and emergency issues, need to be clearly detailed in the contract to prevent any catastrophic loss of patient or practice information. Escrow accounts for the source code can be created and maintained by a third party to ensure that the patient and practice information is protected and secure in the event of a failure or disagreement between the parties. The contract should also outline whose responsibility it is to convert any electronic data currently used by the practice to conform to the new system.

Implementation of health IT creates significant economic impact, therefore it is critical to ensure that a failure of any part of the system does not create irreversible economic harm to the organization. Comprehensive warranty protection provided by the vendor can alleviate many of the financial worries resulting from a system failure. Warranty protection should have provisions for both hardware and software failure and provide for an immediate backup system should the need arise. Some warranties can even cover loss of revenue should billing systems become nonfunctional and prevent the collection of patient revenue. Each of these provisions must be negotiated on a point-by-point basis, and the amount of protection desired should be determined by the amount of risk the practice is able to bear compared with the additional costs associated with a higher level of warranty protection. Finally, it is advisable to have any contract reviewed by an attorney experienced in contract law, prior to signing the contract.

## Chapter 5

### Strategies for Financing Health IT Investments

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Far and away, the most important obstacle to health IT adoption among health care providers and rural providers in particular is the lack of available resources to fund health IT. This is an important concern and one that should be considered at length as a part of any planning exercise. Although there is a natural tendency to focus on the immediate costs of upgrading hardware and purchasing software licenses, experience shows that the cost of these basic investments is small compared to the cost of refining clinical workflow, training and acclimating users, using the system to improve operations or health care delivery, maintaining the system and making improvements over time.

Although the financing environment poses challenges, many rural providers have been able to secure financing and move forward with health IT adoption. This chapter elaborates several general strategies that have worked for rural providers implementing health IT and offers some more specific options to consider. It is unlikely that any information provided here will be the silver bullet that will allow a rural provider to instantaneously secure funding to revamp their IT system; instead, these general strategies and specific options are intended to serve as food for thought for providers who are committed to implementing health IT, but who currently lack the funds.

In reviewing this information it is important to note that implementations are rarely funded through a single source, be it savings accrued by a provider, loans, dedicated grants or adjustments in reimbursement. Rather, providers should be thinking about combination approaches where investments are made incrementally as funding becomes available.

#### ***General Strategies: Thinking Out of the Box***

One theme to keep in mind when considering funding options for health IT is that finding opportunities will require a dedicated effort on the part of the provider's staff. There is no easy way to incorporate pursuit of additional financing into the already busy schedule of a clinicians or executives working in rural health care. The cost of finding new funding sources is high and, in most cases, requires key staff to put in significant time in the form of proposal writing, online searching, pulling together loan applications and networking. Provider organizations that are successful in procuring funds from various sources have leaders that are always on the look-out for new funding and, in the course of their daily schedule, are able to identify and pursue a steady stream of potential sources. Some high-level strategies used by providers who have been successful in securing health IT resources are outlined below.

**Look beyond Traditional Sources.** Traditionally, infrastructure or technology improvements among health care providers are funded either through savings accumulated by the organization through third-party reimbursement or non-operating revenues or through loan programs associated with service or scope expansions. While these traditional sources should be explored and tapped for health IT, it is clear that many providers will likely need to look well beyond these sources for funding opportunities. Few rural providers will have savings anywhere close to the cost of implementing a major system, and institutions that traditionally lend to health care providers may be reluctant to do so without a convincing business case that the investment will lead to greater revenue or generate savings through operating efficiencies.

Many policymakers point to “pay-for-performance” or “pay-for-use” reimbursement from payers as a means to recoup the costs of health IT implementation retrospectively (through enhanced reimbursement after the investment is made). Discussions and demonstration projects involving adjustments to third party reimbursement policies are underway and hold important promise for helping subsidize the cost of health IT adoption. However, without a specific timeline for such changes from Medicare and Medicaid – the key third-party payers in rural areas, traditional lenders may not be very motivated to help rural providers invest substantially.

**Collaborate with Others.** More than other forms of health care investments, health IT offers enormous potential to reap benefits from economies of scale. In addition, from a policy perspective, the greatest opportunities to improve the health care delivery system via health IT arise from the potential for all types of providers, payers, public health agencies and patients to securely exchange electronic health data so that information is available to the right person or institution at the right time. As such, successful health IT funding strategies often arise through collaboration across institutions. In particular, several grant programs sponsored by state and Federal agencies as well as private foundations require evidence of collaboration and the commitment of a range of organizations as a criterion for funding.

One type of opportunity available to some rural providers is participation in emerging health information exchange (HIE) organizations sometimes called “RHIOs” (for regional health information organizations). These organizations offer a forum for health care providers and other stakeholders to come together to discuss and move forward with policies that will shape the electronic exchange of information. Often HIE organizations provide members with options to procure subsidized health IT applications. One example of a regional HIE-model for health IT adoption is the Taconic Health Information Network and Community, representing about 500 physicians in New York’s Hudson Valley. This organization has established a central database that each provider can access over the internet for a monthly subscription fee. Participating providers can access test results and submit prescriptions to pharmacies, and will soon have access to a full, on-line EMR. Another example of this type of collaboration can be found in Rhode Island where five physician organizations have joined forces to form a for-profit corporation, Electronic Health Records of Rhode Island (EHRRI). While the initial goal was to open discussions about reducing the variation in the EHRs being used in the state,

EHRRI members have now agreed to one system and negotiated a deal with the vendor that will bring the system into the practices of all 1,200 affiliated physicians at a significant discount.

The collaborative model most often involves working with other organizations within a single community, state or region; however, cross-region collaborations are also possible due to the nature of telecommunication technologies. For example, the Health Choice Network is a network of community health centers operating out of Florida that offers access to its EMR and practice management software to partnering community health centers in rural New Mexico and Utah. Other examples of larger practices and hospitals offering subscription (hosted) access to their EMR system for smaller independent providers located in other geographic areas are also beginning to surface. Such initiatives offer an additional revenue stream for the host provider, and permit relatively inexpensive and easy system access for subscribers.

**Do Not Be Afraid to Ask.** As evidence regarding the ability of health IT to improve health care quality, efficiency, safety and access to care mounts, an increasing number of organizations will find that they have an incentive to contribute to its adoption. Research shows several examples of health care providers that have been able to tap programs made available by charitable foundations or large employers in their area for direct assistance with health IT implementation, as employers and payers will have an interest in containing costs and maintaining health care quality within a region over a longer period of time.

Because some important benefits of health IT use (e.g., reduction in the number of avoidable trips to acute care hospital emergency facilities) will accrue to parties other than the health care provider, there is a strong case that support for initiation and maintenance of health IT investment should come from the broader community. Support from non-providers may come in a variety of forms, from direct one-time donations, to partnerships on grant submissions, to in-kind provision of goods, services and expertise. While there is likely a strong case to be made for why other organizations in the community should contribute to health IT adoption, providers interested in taking this approach must work within their associations and with patient advocacy groups to bring that case to the forefront and leverage available resources and funds.

**Do Your Homework.** The key in developing a strategy to fund health IT on a provider level is making sure that all opportunities are investigated. It is important to look regularly for community, state and Federal funding opportunities online and to sign up for email alerts for announcements of grant programs offered by major foundations. On a national level, several agencies, associations and foundations including the eHealth Initiative, the Health Information Management Systems Society, the Agency for Healthcare Research and Quality and, of course, HRSA provide excellent coverage of upcoming grant and loan opportunities. It is important to note, however, that state and local initiatives can also play a big role in financing solutions, but may not appear on these national sites. It is also important to attend meetings of your professional association, relevant county and state agencies, and chamber of commerce in order to

obtain information on direct funding or new loan opportunities and to make the case regarding the need for support for health IT implementation among these potential stakeholders.

**Find Ways to Work with What You Have.** Even after all strategies are exhausted, at the end of the day providers should recognize that there are very few health IT implementation efforts that are able to achieve all objectives in the first round of new implementation. It is important for providers not to be discouraged if funding for the optimal solution is not available and to work hard to understand options for improvements that can be achieved with the resources they have. Some cost-saving options that may be considered are leasing rather than buying hardware and working with vendors to achieve discounts based on a willingness to serve as a test bed for new products. Additionally, some small and rural providers have found that vendors that work on the ASP model described in Chapter 4 are a good way to avoid having to make expensive hardware upgrades often attendant to installing new applications. While providers should always explore creative options for moving forward, it should be noted that each of these options come with downsides and that ample care must be taken to assure that the path taken will not end up costing more than it saves across a particular time horizon.

### *Options for Investigation*

Having laid out important general strategies to pursue while trying to raise capital to fund health IT investments, we now move to some specific options that rural providers have found to be useful for funding health IT. The ability to tap any one of these sources will depend on the particular circumstances of the individual provider. Therefore, providers should think about these options as examples of where they can look, rather than as a definitive source of all avenues of funding that may be available to them.

**Traditional Sources.** While it seems very likely that rural providers will have to look beyond traditional financing sources to fund health IT investments, these traditional avenues will still have to play a role. Many rural providers are able to set aside some funds for investing in infrastructure and process improvements. The criteria for allocating these funds to any given effort may rest on the ability to establish a clear return on investment (ROI). While ROI is difficult to establish for some health IT interventions, there are certain applications, e.g., telehealth, practice management or e-prescribing, that permit the provider to bill for additional services provided remotely, improve the efficiency of administrative and billing systems, and reduce costs associated with paper or telephone communication with pharmacies, respectively. Even when ROI is not clear cut for the institution, many grant programs will still require a cost-sharing component where the providers are required to demonstrate an internal commitment to health IT by making part of the investment for a funded project on their own.

Beyond using reserve funds, other traditional avenues for financing improvements, such as private loans, should be explored. Communities and states typically have development programs designed to help provider organizations develop infrastructure to enhance the

delivery of health care. Providers that are not-for-profit or have some Federal designation for serving underserved areas or populations are more likely to be eligible for these types of loans, which are very often provided on favorable terms. For community health centers and other providers funded under Section 330 of the Federal Public Health Service Act, for example, HRSA's Bureau of Primary Health Care (BPHC) has a subsidized loan program, as do many state-based primary care associations.

**Accessing State Resources.** Several states have set aside funds to foster infrastructure or health system development. State involvement in this arena has grown rapidly in the past few years as a result of the national push to establish a National Health Information Network (NHIN), comprised of health information exchange organizations. Much, but not all, of the available state support requires collaboration and data exchange between at least two partner entities. Several examples of state programs are listed below. Providers located in states other than those highlighted below should be in close communication with state officials to monitor new opportunities that the state may be interested in funding. In particular, some states have recently begun using savings arising from their Medicaid managed care programs to support health IT adoption.

- Florida has a matching grant program that provides up to \$150,000 for planning activities, and up to \$500,000 for implementation and evaluation projects for interoperable health information exchange between health care providers.<sup>34</sup>
- Massachusetts has committed \$50 million through the Massachusetts eHealth Collaborative to fund community-level implementation of EHRs in selected communities.<sup>35</sup>
- In North Dakota, Blue Cross Blue Shield is in the fifth year of funding grants of up to \$65,000 for projects that will use health IT to improve care for rural citizens.<sup>36</sup>
- In New York, the Health Care Efficiency and Affordability Law for New Yorkers (HEAL-NY) Capital Grant Program expects to have up to \$1 billion available over four years to support the capital costs of regional health IT projects (involving at least two distinct health care stakeholders) and restructuring of regional health care systems. In 2005, phase 1 of this program awarded nearly \$53 million in matching grants for health IT projects. (The current phase 2 is focusing on restructuring initiatives.)
- In Pennsylvania, the Highmark eHealth Collaborative, funded by the state's Blue Cross Blue Shield plan, is making grants available of up to \$7,000 per physician to help physician practices acquire and use technology needed for e-prescribing and EHR systems.<sup>37</sup>

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<sup>34</sup> [http://ahca.myflorida.com/dhit/FHIN\\_grants\\_program.shtml](http://ahca.myflorida.com/dhit/FHIN_grants_program.shtml)

<sup>35</sup> <http://www.maehc.org>

<sup>36</sup> [http://www.med.und.nodak.edu/depts/rural/pdf/bcbs\\_year05.pdf](http://www.med.und.nodak.edu/depts/rural/pdf/bcbs_year05.pdf)

<sup>37</sup> <https://www.highmarkehealth.org/index.php>

### **The Nebraska Statewide Telehealth Network**

One of the most comprehensive statewide health IT efforts to date is the Nebraska Statewide Telehealth Network, which currently links more than 70 hospitals, 17 public health departments, six bioterrorism laboratories, and other state organizations through an interactive, high-speed video and data network. The network is used to provide remote consultations with medical specialists, teleradiology, Spanish language interpretation services, continuing medical education, and other training. It can also be used to quickly transmit information about a terrorism act or threat or other natural disaster.

Development of this network has relied on commitments from a broad base of supporting organizations, and creativity in obtaining the necessary funding. The state Public Service Commission is contributing up to \$900,000 annually from its Universal Services Fund, while the state Health and Human Services System has provided nearly \$600,000 for equipment and other support. Additional financial support has come from Federal grants from the Rural Utility Service and the Office for the Advancement of Telehealth as well as from two of the state's Area Health Education Centers. Rural hospitals will contribute \$100 per month to help cover transmission costs.

- Rhode Island established a state fund in 2004 (SB 2651) to support health IT development and adoption.
- The Minnesota e-Health Initiative, a public-private collaborative effort to accelerate the adoption of health IT, obtained \$1.3 million in state funding in 2006 for matching grants to providers serving rural areas or underserved urban areas. Grantees must represent a consortium of more than one provider type. Planning grants of up to \$50,000 and implementation grants of up to \$250,000 are available.
- In Washington, First Choice Health and the Washington State Health Care Authority have joined forces for the second year in a row to make \$1 million in grants of up to \$20,000 available to help smaller physician practices and critical access hospitals invest in health IT systems.
- During the 2005 legislative session, the Iowa General Assembly adopted HF841, allowing the legislative authority for the adoption of a Medicaid waiver. Under the IowaCare Act and the waiver, DHS is required to expand use of electronic medical recordkeeping by Medicaid providers, focusing initially on Medicaid recipients whose quality of care would be significantly enhanced by the availability of EMR.

In addition to these specific examples, there is increasing evidence that state-based health IT funding opportunities are growing. A recent survey initiated by the eHealth Initiative

showed that over half of all states either had initiatives in place or had plans to enact state health IT legislation. In addition, the survey found that 17 states had grant or contract funding in place to support health IT adoption.<sup>38</sup>

As states increase their funding for these efforts, becoming an active participant and catalyst in regional information exchange projects opens the door to obtaining financial support for adoption of health IT systems.

**Federal Grant Resources.** In addition to state initiatives, several Federal agencies also provide grants specifically dedicated to health IT, and many have a particular focus on rural providers. Key Federal agencies sponsoring health IT implementation are described below; Appendix A provides a summary of principal funding programs specific to rural providers.

- The Health Resources and Services Administration (HRSA). HRSA has a long history of providing grant opportunities for rural health care providers with an interest in enhancing their infrastructure and building capacity. Key offices include the Office of Rural Health Policy (ORHP), which funds a variety of grant programs related to increasing access to care and quality of care for rural residents, and the Bureau of Primary Health Care (BPHC), which has funded grants specific to health IT implementation for Federally-funded ambulatory health centers. HRSA's commitment to health IT promotion was recently solidified around the establishment of an Office of Health Information Technology (OHIT) whose function it will be to coordinate health IT efforts across the Agency and provide targeted technical assistance and other resources to rural providers as well as others. While current opportunities for rural providers are described at <http://ruralhealth.hrsa.gov>, other HRSA health IT initiatives planned for FY 2006 have yet to be publicly announced.
- The Agency for Healthcare Research and Quality (AHRQ). AHRQ currently funds well over 100 health IT projects, over half of which affect providers and patients living in rural areas. AHRQ's health IT grant portfolio includes a series of planning and implementation grants aimed at rural community providers, as well as six state and regional demonstration projects in Utah, Colorado, Tennessee, Indiana, Upstate New York and Delaware. Although there are currently no announcements of future funding, there is some indication that additional health IT funding will be available beginning in FY 2007. Information on AHRQ's health IT portfolio can be accessed at <http://healthit.ahrq.gov>.
- Centers for Medicaid and Medicare Services (CMS). CMS also sponsors a number of programs that can assist providers in the implementation of health IT. In recent years, CMS has worked with the Veterans' Administration (VA) to provide an office-based version of the VA's VISTA electronic medical record software to providers in conjunction with the Doctor's Office Quality -

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<sup>38</sup> <http://www.ehealthinitiative.org/assets/documents/eHI2006ReportonStateActivities.pdf>



Information Technology (DOQ-IT) initiative. While the software itself is provided to physicians free of charge, providers have to work with vendors to implement and customize the software. CMS is also striving to foster health IT adoption via direct support given to providers through its Quality Improvement Organizations (QIOs).

- Other Federal Agencies. Other Federal agencies to consider when learning about funding opportunities associated with health IT include the Office of the National Coordinator for Health IT and the National Institutes of Health. While programs sponsored by these offices are not generally targeted to rural health care providers, these Agencies are important to watch as health IT and health information exchange gain more currency within the health care system.

In addition to these established Federal grant programs, the U.S. Congress is currently considering legislation that would establish a matching grant program to facilitate investments in clinically-related health IT systems by integrated health care systems with a demonstrated commitment to serving the uninsured, underinsured, and medically underserved populations. H.R. 4157 was passed by the House in late July 2006, and introduced in the Senate on August 3. The appropriations target is \$15 million for each of fiscal years 2007 and 2008.

**Private-Sector Grant Opportunities.** Finally, there are a number of opportunities to access funds for health IT through private grants, donations or in-kind contributions. Foundations that typically fund health IT projects include the Foundation for eHealth Initiative, which operates the Connecting Communities for Better Health (CCBH) program in conjunction with HRSA, the Markle Foundation, the Robert Wood Johnson Foundation, and the Tides Foundation. Because foundation grants are often geared toward specific objectives and types of grantees, such as increasing public health involvement in health information exchange or encouraging take up of EMR among Federally-qualified health centers in California, not all opportunities will be available to all rural providers.

Nonetheless, it is important to connect with local and national foundations on a regular basis to review funding opportunities. You might also want to consider proposing health IT projects under general community development grants issued by foundations that are meant to cover social services generally, not only health care or health IT. Grants aside, rural providers might even think about approaching large employers in their area for help with IT investments intended to improve the quality of health care delivery, and the health of the workforce, in their community over a period of time.

## Chapter 6

### Summary

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Investments in health IT have tremendous potential to improve the quality and effectiveness of patient care and the efficiency of the health care system. Other than telemedicine applications, however, most rural providers have been slow to embrace these newer innovations. Reasons for this situation are many, and include very real financing and human resource obstacles as well as a general “paralysis” due to not knowing where to start and uncertainty about whether the time is right to make an investment.

Given the growing momentum toward the adoption of health IT, however, it seems unrealistic to expect that providers can remain on the sidelines forever. For one thing, very rapid technological advances are bringing increasingly sophisticated and valuable applications to the health sector. Additionally, Federal, state, and private-sector support for health IT are both beginning to address obstacles to adoption (such as through standards development and certification of vendors) and pilot testing incentives to adopt new technologies (such as through pay-for-performance initiatives). Thus, while not every provider will determine that a health IT investment is wise at this time, all providers should be learning more about the industry and continually reassessing options. By being up to speed, it will be much easier to make an investment once you determine that the opportune moment has arrived.

As you are thinking about the possibility of adopting some form of health IT, it is essential to begin with a critical, honest assessment of your expectations and readiness for change, and to develop a plan for overcoming any obstacles that this examination suggests may hinder your progress. Key questions to ask at the outset include:

- What, very specifically, are the goals of adopting the health IT solution you have in mind? Is it realistic to expect to accomplish these goals through the new technology?
- Are all of the leaders of the organization fully supportive of health IT initiatives, or are they skeptical? What additional evidence, if any, could be presented to them to bolster their knowledge and support?
- Do you have an IT champion who understands both the clinical and technical issues and who can provide leadership throughout all phases of the adoption process?
- Do you have a good understanding of your current workflow processes and of how these processes will have to be changed in order to adopt the new technology?
- What changes will be needed to your technology infrastructure?

- Do you appreciate the depth of any resistance to change among members of your organization? What is behind this resistance? What steps could you take to alleviate fears and overcome reluctance?
- Is there full commitment at all levels of the organization, both culturally and financially, to making the change?
- Do you have the requisite IT expertise in house, or a plan to address your current and future needs with outside resources?
- Do you have the necessary funding for the investment and long-run operating costs, or have leads for how to get this funding?

Only after completing this type of examination will it be possible to come to a rational decision about whether a health IT investment makes sense for your organization at this time. If you determine that continued action is warranted, a thorough investigation of product and vendor options is your next step. We have offered numerous suggestions for ways to learn more about these options and to evaluate the products and vendors along dimensions that are most important to your organization. Taking advantage of several of these options – and, especially, learning from the experience of organizations similar to yours – will begin to give you a good feel for the different products and how they might be helpful in your situation.

As your search begins to narrow the options to vendors who appear to best meet your needs, you will develop a very explicit enumeration of your requirements and translate this into an RFP. Developing a strong RFP can save you many headaches further down the road and will also serve as a guide during your implementation. When bids come in, take the time to evaluate them in depth, following systematic criteria that you have developed in advance. Be sure to check references carefully, visit similar sites where the system is in use, and have the vendor come to your site to conduct a demonstration using real-world scenarios that you have designed.

When making your final choice of a vendor, it is important to select a company that is likely to be around over the long term. This consideration is especially critical if you don't have your own technical support personnel and are relying on vendors for technical support. Similarly, vendor reputation for post-market technical support will likely be an important consideration.

Financing your investment will require creativity and cooperation. Look beyond your own walls and beyond your traditional methods of financing. Possibilities include grant support – especially within the context of health information exchange projects, such as those that are developing at many state and regional levels. To access many new funding opportunities you will have to collaborate with other providers and consider adopting technologies jointly. This can be difficult at first, but may open doors to accessing expensive technologies and facilitating electronic exchange of information.

Finally, it is important not to attempt to fix all of your problems with a single health IT implementation. Work with what you have in terms of expertise and financing to make changes in line with your current capacity as opposed to ultimate goals. The success of

health IT adoption policies will rest on the ability of providers to move deliberately and thoughtfully towards using information tools to effect a safer, more effective and more efficient health care system.

**Appendix A.**  
**Overview of Federal Programs Providing Financial Support for Health Information Technology**

<b>Program</b>	<b>Description of Program</b>
<b>Universal Services Fund</b>	<p data-bbox="510 418 1224 448"><a href="http://www.fcc.gov/wcb/tapd/ruralhealth/welcome.html">http://www.fcc.gov/wcb/tapd/ruralhealth/welcome.html</a></p> <p data-bbox="510 492 1860 813">The Federal Communications Commission’s (FCC’s) Universal Services Fund, set up in 1996 to promote access to affordable telecommunications throughout the U.S., has a special funding pool earmarked for rural healthcare providers. The goal of this component of the USF is to encourage the growth of telehealth in rural areas by ensuring that rural providers have access to telecommunications services at rates no higher than those paid by their urban counterparts. The program provides discounts on the installation of new telecommunications technologies, as well as discounts on monthly telecommunications and/or internet charges. A wide range of public and non-profit rural health care providers are eligible for the program (along with some for-profit hospital departments in special circumstances).</p> <p data-bbox="510 857 1850 1105">The Fund is administered by the Universal Service Administration Company (USAC). To apply, rural providers can submit a request for specific services to USAC. Once they verify eligibility, USAC posts the request on its website and opens competitive bidding from companies wishing to serve the applicant. The applicant selects the most cost-effective bid, given its individual needs and requirements. Using the Universal Services Fund to fund gaps, the carrier offers the rural provider discounted services. The level of support is determined by location and type(s) of service and is determined individually for each applicant.</p>
<b>Distance Learning and Telemedicine (DLT) Program</b>	<p data-bbox="510 1153 1083 1182"><a href="http://www.usda.gov/rus/telecom/dlt/dlt.htm">http://www.usda.gov/rus/telecom/dlt/dlt.htm</a></p> <p data-bbox="510 1226 1843 1357">The Distance Learning and Telemedicine (DLT) Program, administered by the U.S. Department of Agriculture, consists of three separate components: (1) a Grant Program, (2) a Grant-Loan Program, and (3) a Loan Program. The overall goal of the DLT program is to provide financial assistance to improve learning and healthcare (specifically telemedicine) opportunities for rural students, teachers, medical</p>

<b>Program</b>	<b>Description of Program</b>
	<p>professionals, and residents. Individual applications are designed based on community-determined needs, but are related to the improvement of telecommunications, computer networks and other advanced technologies in the rural area.</p> <p>The Grant Program provides up to \$500,000 (\$50,000 minimum) in funding for the purchase of end-user technology such as computer hardware and software, digitizing and data terminal equipment, internal wiring, and/or interactive video equipment. In order to be eligible, grantees must provide at least 15 percent in matching funds for the project, but higher percentages improve overall grant scoring. Unlike the Grant Program, the Grant-Loan (which provides the organization with a \$1 grant for every \$10 borrowed) and Loan programs do not require matching contributions and are not limited to end-user equipment. Loan-Grant and Loan funds can be used for purchase of telecommunications equipment or related needs (facility updates, establishing interconnections, purchasing land, training, etc.), but cannot be used to pay salaries or duplicate other services. Loans and combination Grant-Loans can range in size from \$50,000 to \$10,000,000. Individuals are not eligible to apply to either the grant or loan programs. Electric and/or telecommunications borrowers are eligible for loans only.</p> <p>The Grant Program is considered on a once-yearly, competitive basis with applications due in early summer for the next year's funding cycle. The combination Grant-Loan and Loan applications are considered on a rolling basis in a noncompetitive grant process in the order they are received. In FY 2005, approximately \$24.8 million was available for grants, \$44 million for combination grant-loans, and \$9.8 million for loans. In FY2006, \$20 million was available for grant funds (information regarding FY 2006 funds for combination grant-loans and loans had not been announced as of this writing.)</p>
<b>Small Rural Hospital Improvement (SHIP) Grants</b>	<p><a href="http://ruralhealth.hrsa.gov/ship.htm">http://ruralhealth.hrsa.gov/ship.htm</a></p> <p>The Small Rural Hospital Improvement (SHIP) Grant Program (CFDA 93.301) is a Federal program administered by the Health Resources and Services Administration's (HRSA) Office of Rural Health Policy (ORHP). The program provides funds to small rural hospitals to fund the improvement of internal infrastructure that aids the hospital in: (a) implementing the Medicare prospective payment system; (b)</p>

<b>Program</b>	<b>Description of Program</b>
	<p>conforming to HIPAA requirements; and/or (c) reducing medical errors and supporting quality improvement. Typically, a majority of grant funds have been used to purchase technical assistance, services, training and information technology.</p> <p>To be eligible for a SHIP Program Grant, hospitals must be non-Federal, short-term, general acute care facilities with 49 or fewer beds that are located in a rural area (defined as located outside of a Metropolitan Statistical Area [MSA] or in a rural census tract of an MSA or Rural Commuting Area). All critical access hospitals (CAHs) are eligible, regardless of location.</p> <p>Eligible hospitals apply for a SHIP grant through their State Office of Rural Health (SORH), to whom funds are distributed for distribution to individual hospitals. Applications have typically been due in mid-March. Grants are awarded for one year, with the option of yearly renewal, subject to the continuation of Federal funds and satisfactory performance. In FY2006, the SHIP program awarded approximately \$9,000 to each of 1,622 hospitals for a total program award of approximately \$14.5 million. Similar funding is anticipated for FY2007.</p>
<p><b>Medicare Rural Hospital Flexibility Grants</b></p>	<p><a href="http://ruralhealth.hrsa.gov/funding/flex.htm">http://ruralhealth.hrsa.gov/funding/flex.htm</a></p> <p>The Medicare Rural Hospital Flexibility Grants are funded by HRSA's Office of Rural Health Policy through awards made to State Offices of Rural Health, as part of the Medicare Rural Hospital Flexibility – or Critical Access Hospital (CAH) – Program. Most SORHs then administer funding to eligible hospitals (usually CAHs) and other entities within their jurisdiction, according to a plan developed by the state to accomplish certain goals related to rural network development and enhancements to quality of care for rural residents. Investments in health information technology and programs to foster regional exchange of health information would generally be in line with the goals of the Flex Program grants, although the size of the individual grants would not fund large investments. The specifics of the grant solicitations regarding eligibility, program focus, grant size, and timing of application differ by state. Flex Program grant funds totaled approximately \$39 million in FY2006.</p>

<b>Program</b>	<b>Description of Program</b>
<b>Rural Health Network Development Grants</b>	<p data-bbox="514 287 1123 321"><a href="http://ruralhealth.hrsa.gov/funding/network.htm">http://ruralhealth.hrsa.gov/funding/network.htm</a></p> <p data-bbox="514 362 1864 613">The Rural Health Network Development Grants Program (CFDA 93.912) is another HRSA/ORHP program that is aimed at supporting collaborations between health care organizations in a given community. The grant provides up to three years of funding for rural providers who work together in formal collaboratives of at least three separately owned healthcare providers. Grant funds are intended to help the collaborative integrate administrative, clinical, financial and technological functions across members. The overall goal of the program is to improve the health system by reducing fragmentation and achieving economies of scale otherwise unattainable without inter-agency collaboration.</p> <p data-bbox="514 654 1864 906">Applications are due in the fall for funding in the next year's award cycle. Subject to the availability of appropriations, ORHP anticipates that approximately \$1,000,000 will be available to fund five to six new awards in FY2007. Individual grant awards are limited to a maximum of \$180,000 (direct and indirect costs) per year, or \$540,000 over three years. Grantees can propose project periods of up to three years, and, where applicable, can renew their grant over this period. Interested organizations apply through the Federal ORHP, but must inform their State Offices of Rural Health of their intent to apply to the program. The SORHs can provide technical assistance and guidance during the application period.</p>
<b>Rural Health Network Development Planning Grants</b>	<p data-bbox="514 911 1234 945"><a href="http://ruralhealth.hrsa.gov/funding/networkplanning.htm">http://ruralhealth.hrsa.gov/funding/networkplanning.htm</a></p> <p data-bbox="514 985 1854 1310">As a supplement to the Development Grants, Congress also recently initiated a Rural Health Network Development Planning Grant Program. The program provides one year of funding to rural communities that are seeking to develop a formal, integrated health network, but do not have a sufficient history of collaboration or formalized structure to enable them to apply for a Rural Health Network Development Grant. Any rural public or non-profit entity can apply for the grant on behalf of the network partners. The applicant network must work together to identify needs in the community and enumerate problems that the network will address. The overall goal of the program is to develop relationships and formalized structures that will allow participants to work together to solve problems jointly and achieve greater efficiencies and economies of scale in community healthcare.</p>



Program	Description of Program
	As with the Development Grants, applications are due to ORHP in the fall prior to the year of award funding. In FY2006, ORHP anticipated that \$1,000,000 in funds would be available for 10-12 grantees. Funding is limited to between \$25,000 and \$85,000 per grantee for the one-year grant period.
<b>Integrated Clinical and Communications Technology Grants</b>	<p data-bbox="512 436 1644 467"><a href="http://newsroom.hrsa.gov/speeches/2004speeches/williams-oct1-comm-tech-project.htm">http://newsroom.hrsa.gov/speeches/2004speeches/williams-oct1-comm-tech-project.htm</a></p> <p data-bbox="512 508 1864 829">The Integrated Clinical and Communications Technology (ICCT) Grants, funded by HRSA, are one component of the Agency's larger commitment to health center network planning and development. The ICT funds, which are available only to health centers with at least some Section 330 funding support, must be matched by a percentage grantee contribution that depends on project status. The grants are intended to support the development of a technology infrastructure that integrates business, care management and technical information through projects focused on integrated information communication and technology. In October 2003, HRSA funded six three-year ICT projects, totaling \$4.2 million dollars in grant funds. At this writing, it is not yet known whether additional projects will be funded in the future.</p>
<b>Small Health Care Provider Quality Improvement Grants</b>	<p data-bbox="512 880 1125 911"><a href="http://ruralhealth.hrsa.gov/funding/SHCPQL.asp">http://ruralhealth.hrsa.gov/funding/SHCPQL.asp</a></p> <p data-bbox="512 951 1871 1125">The Small Health Care Provider Quality Improvement Grant Program, proposed for implementation in 2006, provides grant funds to rural public or non-profit providers of care or health services to assist in the planning or implementation of quality improvement strategies to improve patient care and/or chronic disease outcomes. The program is administered by HRSA, which anticipated awarding up to 15 two-year grants in 2006. A total of \$750,000 is currently available for this program.</p>
<b>Knowledge Management and Applied Informatics Grants</b>	<p data-bbox="512 1135 1283 1166"><a href="http://grants.nih.gov/grants/guide/pa-files/PAR-05-012.html">http://grants.nih.gov/grants/guide/pa-files/PAR-05-012.html</a></p> <p data-bbox="512 1206 1835 1343">The Knowledge Management and Applied Informatics Grant Program is administered by the National Library of Medicine in the National Institutes of Health (NIH). The Translational Informatics grants available through the program are intended to aid organizations that wish to exploit health IT to bring useable information to end users and/or to translate the findings of biomedical informatics into practice.</p>

Program	Description of Program
	<p>These applications include information retrieval, decision support, knowledge representation, natural language processing, visualization, simulation, human-machine interaction and knowledge management.</p> <p>The program provides non-renewable grants of up to \$150,000 for up to a three-year period. NLM spends about \$4 million annually to support the program and makes between 8 and 10 new funding awards each year. Grant applications are submitted directly to the NIH and grant awards are typically made three times a year in December/January, May/June and August/September.</p>
<p><b>Integrated Advanced Information Management Systems Grants</b></p>	<p><a href="http://grants.nih.gov/grants/guide/pa-files/PAR-05-064.html">http://grants.nih.gov/grants/guide/pa-files/PAR-05-064.html</a></p> <p>Integrated Advanced Information Management Systems (IAIMS) are comprehensive trans-organizational information management structures that link and relate library systems of published biomedical knowledge with individual and institutional database and information files. The goal of the systems is to improve patient care, research, education and administration by providing a more efficient system of information management and access. The IAIMS grants from the National Library of Medicine provide funding to public or non-profit hospitals, medical centers, academic health centers and other health science organizations and institutions to plan and operationalize IAIMS within their institution or several institutions in the community. Programs that benefit rural residents are viewed as highly desirable in the application process.</p> <p>Support is available from NLM for both the planning phase and the operational phase. For planning grants, up to \$150,000 is available for one or two years of IAIMS planning, in which the grantee develops a comprehensive IAIMS plan. Institutions that publish a satisfactory IAIMS plan are eligible to apply for a Operational Phase Grant of up to \$500,000 per year for up to five years. In addition to the large-scale grant award, operational phase applicants can also apply for funds of up to \$50,000 per year to pay for an IAIMS apprentice, whose education plan they would incorporate into their larger program.</p>

## Appendix B

### Glossary of Key Terms

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**Anti-kickback Statute** — A law that makes it a crime for a hospital to pay or offer any remuneration to a physician to induce the physician to make referrals to the hospital. This legislation has often been seen as an obstacle to hospital-driven health IT initiatives that are shared with area physicians. The statute is often referred to as the “Stark Law.”

**Application Service Provider (ASP)** — An application service provider deploys, hosts and manages access to a packaged application for multiple parties from a centrally managed facility. The applications are delivered over networks on a subscription basis. This delivery model can speed implementation, minimize the expenses and risks incurred across the application life cycle, and overcome shortages of qualified technical personnel available in-house.

**Bedside Bar Coding System** — Bedside bar coding is an integral part of using technology to improve patient safety in the medication administration process. With this type of technology, patients receive a bar-coded bracelet at the time of admission. As new medication orders are electronically entered into the system, nurses and pharmacists can immediately view the information on-line. The nurse administering medication can pull up the patient’s electronic medication administration record, which directs them to the correct drawer, bin and medication within a medication cart. They then scan the bar-coded medication to confirm the medication and dose, and the patient’s bar-coded bracelet to ensure that the right patient is receiving the right dose of the right medication at the right time via the right administration route. The medication is administered, and the patient profile is automatically updated and tracked to the patient’s electronic medical record. Information is also tracked by the pharmacy and updated in the hospital’s inventory and patient billing records. Some providers also have bar coded badges for nurses so that the administering clinician is recorded as part of the patient’s record.

**Computer-based Clinical Decision Support (CDS)** — Software that makes relevant information available for clinical decision making. CDS ranges from electronically available clinical data (e.g., information from a clinical laboratory system), to electronic full-text journal and textbook access, to evidence-based clinical guidelines, to systems that provide patient and situation specific advice (e.g., EKG interpretation, and drug-to-drug interaction checking).

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

**Consolidated Health Informatics (CHI) Initiative** — One of the 24 Presidential eGovernment initiatives with the goal of adopting vocabulary and messaging standards to facilitate communication of clinical information across the Federal health enterprise.

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

**Digital Subscriber Line (DSL)** — Connectivity option that increases the digital capacity of ordinary phone lines. Transmission speeds are tied to the distance between the customer and the telecommunications central office, and from 144 kbps (16,000 ft) to 6.4 Mbps (1,000 ft).

**Doctor's Office Quality – Information Technology (DOQ-IT)** — One of the physician-focused quality initiatives sponsored by the Centers for Medicare & Medicaid Services (CMS). The project focuses on the adoption of information technology in the outpatient setting, including the submission of clinical measure data to the Quality Improvement Organization (QIO) Clinical Warehouse. Measures are then calculated and reported back to the practice for quality improvement assessment.

**Electronic Data Interchange (EDI)** — An instance of data being sent electronically between parties, normally according to predefined industry standards.

**Electronic Health Record (EHR)** — Extends the notion of an EMR (see below) to include the concept of cross-institutional data sharing. An EHR contains a subset of data from each participating institution's EMR (that is agreed upon by the institution). An EHR may also reside entirely within one institution and link the various affiliated practice sites together. The EHR is generally patient focused and spans episodes of care rather than a single encounter. An EHR can be present only if all participating sites have an EMR in place that is interoperable.

**Electronic Medical Record (EMR)** — The set of databases (or repositories) that contains the health information for patients within a given institution or organization. Thus, an EMR contains the aggregated datasets gathered from a variety of clinical service delivery processes, including laboratory data, pharmacy data, patient registration data, radiology data, surgical procedures, clinic and inpatient notes, preventive care delivery, emergency department visits, billing information, etc.

**Electronic Prescribing (eRx or ePrescribing)** — A computer technology whereby physicians use handheld or personal computer devices to review drug and formulary coverage information and then transmit prescriptions to a printer, electronic health record

or local pharmacy. E-prescribing software can be integrated into existing clinical information systems to allow physician access to patient-specific information in order to screen for drug interactions.

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

**Enterprise Master Patient Index** — A database that contains a unique identifier for every patient in an enterprise, including affiliated medical centers, outpatient clinics, practice offices, rehabilitation facilities, etc. Registration systems from each of the entities would look to the EMPI to obtain patient information based upon several patient identifiers.

**Enterprise Resource Planning (ERP) System** — System offering the integration of a number of organizational activities into one accounting information system.

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

**Health Information Technology** — The application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision making.

**Integrated Services Digital Network (ISDN)** — A connectivity option that provides digital service from the customer's premises to the dial-up network. It turns one existing wire pair into two channels and four wire pairs into 23-channels for the delivery of voice, data, images, or video. Basic Rate Interface (or basic service) can support speeds up to 128 kbps whereas the Primary Rate interface (high speed service) bonds six channels together for speeds up to 384 kbps.

**Interoperability** — The enabling of communications across software and hardware of multiple vendors.

**Master Patient Index (MPI)** — A software database program that collects a patient's various provider identification numbers and keeps them under a single, community or enterprise-wide identification number.

**National Health Information Network (NHIN)** — A “network of networks” or a “system of systems” permitting the electronic exchange of patient-level clinical health information and other administrative data. The NHIN may also include an infrastructure

to define and support necessary standards, policies, network services, regulations, and business rules.

**Picture Archiving and Communication System (PACS)** — a PACS network consists of a central server that stores a database containing medical images, and is connected to one or more providers via a LAN or a WAN. PACS replaces hard-copy based means of managing medical images, such as film archives. It expands on the possibilities of such conventional systems by providing capabilities of off-site viewing and reporting, and enables practitioners at various physical locations to view the same information simultaneously.

**Personal Health Record (PHR)** — An electronic application through which individuals can maintain and manage their health information (and that of others for whom they are authorized) in a private, secure, and confidential environment.

**Plain Old Telephone Service (POTS)** — The worldwide telephone service with transmission speeds ranging from 28.8 to 56 kbps.

**Practice Management System** — A part of the medical office record that carries the financial, demographic and non-medical information about patients. This information frequently includes: patient's name, patient's identification number, date of birth, telephone numbers, emergency contact person, alternate names for the patient, insurance company or entities financially responsible for payment, subscriber information for an insurance company, employer information, information to verify insurance eligibility, information to qualify for lower fees based on family size and income, and provider numbers to process medical claims.

**Quality Improvement Organization (QIO)** — Under the direction of CMS, the Quality Improvement Organization (QIO) Program consists of a national network of 53 QIOs, responsible for each U.S. state, territory, and the District of Columbia. QIOs work with consumers and physicians, hospitals, and other caregivers to refine care delivery systems to make sure patients get the right care at the right time, particularly patients from underserved populations. The Program also safeguards the integrity of the Medicare Trust Fund by ensuring that payment is made only for medically necessary services, and investigates beneficiary complaints about quality of care.

**Regional Health Information Organization (RHIO)** — RHIOs are multi-stakeholder organizations created to facilitate an exchange of healthcare information. Generally RHIOs are formed to influence the safety, quality, and efficiency of healthcare as well as access to healthcare through the use of health IT.

**Stark Law** — A Federal law designed to prohibit physician referrals to any hospital that compensates that physician, unless the form of compensation is specifically permitted by the Stark Law or associated regulations.

**Systems Development Life Cycle (SDLC)** — A systems approach to problem solving that is made up of several phases: 1) identifying and defining a need for the new system, 2) analyzing the information needs of the end users, 3) creating a blueprint for the design with the necessary specifications for the hardware, software, people and data resources, 4) creating and programming the final system, and 5) evaluating the system's actual functionality in relation to expected or intended functionality.

**T1** — A 1.544 Mbps point-to-point dedicated circuit provided by the telephone companies. T1 lines are used for private networks as well as for connection between a local area network (LAN) and the provider. T2 lines can offer speeds up to 6.312 Mbps and T3 can go as high as 44.735 Mbps.

**Telemedicine** — The use of telecommunications technology to transmit medical information from one location to another to improve health status. Telemedicine enables connections among providers, and between providers and patients, linking potentially distant resources with more convenient sites of care. The patients may be situated in another medical facility or clinical office, may be at home or, increasingly, may be mobile and simply interested in having certain clinical values monitored remotely.

## Appendix C

### Some Helpful Health IT Resources

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#### **Agency for Healthcare Research and Quality (AHRQ)**

540 Gaither Road  
Rockville, MD 20850  
(301) 427-1364  
<http://www.ahrq.gov/>

AHRQ is a Federal agency within the U.S. Department of Health and Human Services, whose mission is to improve the quality, efficiency, effectiveness, and safety of health care. The Agency sponsors extramural research, including well over 100 grants in the area of health information technology. Grants have been awarded for planning, implementing, and evaluating health IT projects, as well as for state and regional health information exchange efforts. AHRQ's National Resource Center for Health Information Technology provides support to these grantees and has compiled a large number of helpful resource documents that are available to the public through the Knowledge Library on its web site ([www.healthit.ahrq.gov](http://www.healthit.ahrq.gov)).

#### **American Academy of Family Physicians (AAFP)**

11400 Tomahawk Creek Parkway  
Leawood, KS 66211-2672  
(800) 274-2237  
<http://www.aafp.org/online/en/home.html>

The AAFP is a membership organization representing family practitioners and FP residents and medical students. Through its Center for Health Information Technology (<http://www.centerforhit.org>), the AAFP provides its members with education, technical expertise, and research regarding technologies related to medical office automation. Although many of the services are available only to members, the web site contains helpful general information and resources.

#### **American Health Information Management Association (AHIMA)**

233 N. Michigan Avenue, 21st Floor  
Chicago, IL 60601-5800  
(312) 233-1100  
<http://www.ahima.org/>

AHIMA is a membership organization for health information management professionals dedicated to effective management of personal health information. The organization provides advocacy, education, and professional development opportunities, including professional conferences and informational material available for purchase through its web site as well as other information available only to members.



**American Telemedicine Association (ATA)**

1100 Connecticut Avenue, NW, Suite 540  
Washington, DC 20036  
(202) 223-3333  
<http://www.atmeda.org>

The ATA is a non-profit association devoted to promoting the use of telecommunications technology for health care. The web site contains a Buyer's Guide to telemedicine vendors and many other resource documents related to telemedicine.

**California Health Care Foundation (CHCF)**

476 Ninth Street  
Oakland, CA 94607  
(510) 238-1040  
<http://www.chcf.org/>

CHCF is a private philanthropic organization devoted to improving the health care of Californians. The foundation sponsors research and one of its key focus areas has been health information technology. Its web site contains numerous helpful reports on a variety of health IT topics.

**Certification Commission for Healthcare Information Technology (CCHIT)**

233 N. Michigan Avenue, Suite 2150  
Chicago, IL 60601  
(312) 233-1582  
<http://www.cchit.org/>

CCHIT is a voluntary, private-sector initiative that is providing certification of IT vendors. The first list of certified vendors for ambulatory EHRs was released in July 2006.

**eHealth Initiative (eHI)**

818 Connecticut Avenue, N.W., Suite 500  
Washington, D.C. 20006  
(202) 624-3270  
<http://www.ehealthinitiative.org/>

eHI is an independent, non-profit organization whose mission is to promote improved health care through the use of health information technology. Through its "Connecting Communities for Better Health" initiative, eHI provides resources and support to over 260 organizations nationwide that are involved in health information exchange projects.

### **Government Health IT**

<http://www.govhealthit.com/>

Government Health IT focuses on the role of government policy in driving the adoption of health IT. The web site contains numerous helpful reference documents and links to other relevant sites. A bi-monthly newsletter and magazine are also available.

### **Healthcare Information and Management Systems Society (HIMSS)**

230 East Ohio Street, Suite 500

Chicago, IL 60611-3270

(312) 664-4467

<http://www.himss.org/ASP/index.asp>

HIMSS is a membership organization devoted to promoting the optimal use of information technology and management systems in health care. The organization provides advocacy, education, and professional development opportunities, including professional conferences and informational material available for purchase through its web site.

### **Health Resources and Services Administration (HRSA)**

5600 Fishers Lane

Rockville, MD 20857

<http://www.hrsa.gov/>

HRSA is a Federal agency within the U.S. Department of Health and Human Services, whose mission is to improve access to health care services for people who are uninsured, isolated or medically vulnerable. Relevant offices within HRSA include the Federal Office of Rural Health Policy (ORHP, see below) and the Office of Health Information Technology.

### **Markle Foundation**

10 Rockefeller Plaza

16th Floor

New York, NY 10020-1903

(212) 713-7600

<http://www.markle.org/>

The Markle Foundation is a private philanthropic foundation whose mission is to foster the adoption of information technology in the fields of health care and national security. The foundation no longer funds unsolicited proposals, but instead seeks out and works with partners on projects of its own choosing. In the area of health IT, the foundation co-sponsors the Connecting Communities for Better Health initiative.

**Medical Group Management Association (MGMA)**

P.O. Box 17603  
Denver, CO 80217-0603  
(877) 275-6462  
<http://www.mgma.com/>

The MGMA is a membership organization representing medical group practices. It provides advocacy, education, and professional development opportunities for its members. Its web site includes a “buyer’s guide” section that provides information on information systems and software vendors.

**Medical Records Institute (MRI)**

425 Boylston Street, 4th Floor  
Boston, MA 02116-3315  
617-964-3923  
<http://www.medrecinst.com/>

MRI is dedicated to advancing the adoption of electronic health records and other related forms of health IT. The organization sponsors numerous conferences, including the “EMR Roadshow” that enables providers to learn about multiple vendors in a single location.

**Medicare Quality Improvement Community (MedQIC)**

<http://www.medqic.org/dcs/ContentServer?pagename=Medqic/MQPage/Homepage>

MedQIC is a web-based workspace developed by the Centers for Medicare and Medicaid Services in conjunction with its Quality Improvement Organizations. The site provides a wealth of information, tools, and other resources devoted to the promotion of high quality health care, including a set of materials designed to assist with the adoption of health information technology by physicians’ offices, hospitals, and home health agencies.

**Office of Rural Health Policy (ORHP)**

Health Resources and Services Administration  
5600 Fishers Lane, 9A-55  
Rockville, MD 20857  
(301) 443-0835  
<http://ruralhealth.hrsa.gov/>

Located within HRSA, ORHP promotes improved health care services for rural America. The Office supports numerous grant programs, including the Rural Health Outreach grants, the Rural Health Network Development grants, the Rural Health Network Development Planning grants, the Small Rural Hospital Improvement Program grants, the State Office of Rural Health grants, the Rural Hospital Flexibility grants, and the Rural Health Research Center grants.

**Quality Improvement Organizations (QIOs)**

<http://www.cms.hhs.gov/QualityImprovementOrgs/>

The Medicare QIO program consists of a nationwide network of organizations under contract to the Centers for Medicare and Medicaid Services to safeguard the quality of care provided to Medicare beneficiaries. Under the current Scope of Work, QIOs are charged with assisting small physician practices, hospitals, and home health agencies with the implementation of health IT initiatives. Many of the tools they are using in this task can be accessed through the MedQIC site (see above).

**Technical Assistance and Services Center (TASC)**

600 E. Superior Street, Suite 404

Duluth, MN 55802

(218) 727-9390

<http://www.ruralresource.org/>

TASC is funded by the Federal Office of Rural Health Policy to provide technical support, tools, and other resources to the State Offices of Rural Health and rural health care organizations.

**Veterans Health Information Systems and Technology Architecture (VistA)**

[http://www.va.gov/vista\\_monograph/](http://www.va.gov/vista_monograph/)

VistA is the computerized patient record system in use at the nation's VA facilities.