PERSPECTIVE

Defining Core Issues in Utilizing Information Technology to Improve Access: Evaluation and Research Agenda

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The Department of Veterans Affairs (VA) has been at the vanguard of information technology (IT) and use of comprehensive electronic health records. Despite the widespread use of health IT in the VA, there are still a variety of key questions that need to be answered in order to maximize the utility of IT to improve patient access to quality services. This paper summarizes the potential of IT to enhance healthcare access, key gaps in current evidence linking IT and access, and methodologic challenges for related research. We also highlight four key issues to be addressed when implementing and evaluating the impact of IT interventions on improving access to quality care: 1) Understanding broader needs/perceptions of the Veteran population and their caregivers regarding use of IT to access healthcare services and related information. 2) Understanding individual provider/clinician needs/perceptions regarding use of IT for patient access to healthcare. 3) System/Organizational issues within the VA and other organizations related to the use of IT to improve access. 4) IT integration and information flow with non-VA entities. While the VA is used as an example, the issues are salient for healthcare systems that are beginning to take advantage of IT solutions.

Information technology (IT), especially a comprehensive electronic health record (EHR), has been central to encouraging access to high quality care within the Department of Veterans Affairs (VA) healthcare system.[1–4] While the EHR is a vital IT solution in healthcare, the VA has also increased its focus on patient-oriented IT solutions such as personal health records,[5,6] home patient monitoring,[5,7] tele-consultation,[8] and non-face-to-face disease management.[9] This mirrors efforts in other large integrated healthcare systems.[10]

This paper summarizes areas where IT can potentially be used to increase access and key issues that should be addressed through evaluation and research. The issues discussed here are salient for healthcare systems that are working to take advantage of IT solutions.

USE OF HEALTH IT IN THE VA

While adoption of comprehensive EHRs in the United States was not widespread in the 2000s,[11,12] the VA has had a system-wide EHR since 1997. The Computerized Patient Record System (CPRS) includes primary features defined under meaningful use criteria for EHRs[13] including: clinical documentation, test results, provider order entry, and clinical decision support.[1]

In 2003, the VA launched both the My HealtheVet (MHV) personal health record system and the Care Coordination/Home Telehealth (CCHT) program. MHV (www.myhealth.va.gov) is a website personal health record portal that provides Veterans with the opportunity to organize their personal health information (e.g. lists of providers) and summarize that information for their healthcare team. The site also includes online VA prescription refill requests and access to trusted health education resources. For VA patients who have upgraded their account, services also

include access to VA wellness reminders, VA medication history, and secure messaging with the healthcare team.[6] The VA Blue Button enables registered users to download an electronic copy of their MHV personal health information.

CCHT links patients with chronic care needs to VA care teams that assist with disease management using home monitoring equipment that transmits information bi-directionally between hospital and patients' homes via telephone and broadband connectivity.[7] Furthermore, many care teams have the opportunity to utilize various tele-consultation programs.[14]

HEALTH IT MAY IMPROVE ACCESS

The VA is currently enhancing healthcare services by moving toward having care delivered by patient-aligned care teams (PACTs) developed using the patient-centered medical home (PCMH) model. A central tenet of the PACT/PCMH model is that patients should have access to in-person and virtual services to meet the variety of needs the individual may encounter.[15] With appropriate planning, IT has the potential to enhance multiple aspects of access as suggested by the PACT/PCMH model,[16,17] including:

- Care Coordination—Information needed to ensure that patients receive evidence-based care can be made available through the EHR. This is done through providing information to patients' entire care teams, enhanced follow-up, and decision support. Current efforts to enhance information exchanges between providers within the VA and across provider organizations such as the Department of Defense (DOD) may further enhance this coordination.[18]

- Quality Measurement—The VA and other systems utilize data from the EHR to monitor the quality of services provided.[19–21] A lack of quality at a population-based level may indicate that individuals do not have access to optimal services. For example, data on low rates of patients receiving follow-up for positive fecal-occult blood tests in the early part of the last decade led to the development of extensive efforts to improve access to follow-up colonoscopies for VA patients.[21]

- Enhanced Communication between Patient and Care Team—MHV currently provides a number of features that offer alternative mechanisms for a patient to communicate with the healthcare team that are also being adopted in the private sector, including secure messaging and prescription refill requests over the Internet.

- Providing Patients with Summaries of Personal Health Information, Including the Plan of Care—Patients have multiple providers in different systems. In addition to information exchange, systems may provide patients with summaries of information for both personal health records (e.g. self-monitored blood sugar logs) and the EHR. MHV has versions of these features.

- Home Monitoring of Health Status—Home monitoring of patients at increased risk of complications and hospitalizations has been shown to be effective when data are made available to care teams.[22] The CCHT program provides equipment, such as home blood pressure monitors and scales that connect via telephone and broadband so that information is automatically sent to care teams. As a result, patients who may not be able to make it to a VA facility for daily monitoring have access to these services.

- Tele-consultations—Patients may face transportation or time barriers that limit their ability to receive specialty services. Tele-consultation services in areas such as dermatology, retinal imaging, mental health, rehabilitation, and pathology have been utilized in the VA to reduce these barriers to services.[14]

- Enhanced Self-Management Support—Numerous technologies have been utilized in the VA to develop effective self-management support programs.[9,23] These have involved one or more features such as one-on-one telephone calls, interactive voice response calls, and the Internet, often in combination with self-monitoring and medication adjustments.

- Peer-to-Peer Interaction—A relatively new area of access is the ability of patients to interact with their peers around health issues.[24] New technology that has the potential to further enhance this interaction is under development.

The remainder of this perspective outlines key current gaps in evidence and methodologic challenges related to evaluating specific aspects of health IT that may enhance access.

KEY ISSUES AND SUGGESTIONS RELATED TO DETERMINING THE IMPACT OF HEALTH IT ON ACCESS

Understanding Broader Needs/Perceptions of Patients and Their Caregivers Regarding Use of IT to Access Healthcare Services and Related Information

VA patients are predominantly men and tend to be of lower socioeconomic status than the general United States population.[25] However, the VA is currently experiencing an increase in younger veterans from the wars in Afghanistan and Iraq as well as an increase in the number of women who are entering the system.[26] Because of the breadth of the system, urban and rural patients have differing needs and patterns of utilization.[27,28]

There is a need to better understand the needs, desires, and available resources for patients and their families about using IT solutions.[29–31] This includes, 1) what services are desired; 2) what current technologies are used and/or available (e.g. Internet); 3) what skills are needed (e.g. ability to use devices); 4) are there technology design issues that may impact use (e.g. issues for patients with disabilities); and 5) do patient needs differ by patient subgroups (e.g. urban vs. rural).

Disparities have been noted in the use of patient oriented activities (e.g. glucose self-monitoring) that are often targets for IT interventions.[32,33] An important aspect of evaluating the impact of IT technology on the use of services includes the reach of these services to different patient subgroups.[34] Further, the effect of IT on the perception of access should be examined.

Understanding Individual Provider/Clinician Needs/Perceptions Regarding Use of IT for Patient Access to Healthcare

IT tools are designed to enhance traditional care, not replace it. Use of IT solutions such as EHRs and secure messaging is

likely to have a significant impact on the workflow and team interaction among clinicians.[35–37] For example, how will expanded use of secure messaging impact work flow in the clinic? Who will read and respond to patient messages? How will such systems change expectations of both clinicians and patients? Are there unanticipated consequences of the new tools?

Because uptake of IT interventions will require the active involvement of clinicians, it is necessary to evaluate 1) needs and desire of clinicians related to IT; 2) perceived readiness for the implementation of interventions; and 3) concerns about the impact on the practice of healthcare. Proactive measurement of readiness for organizational change may be useful in identifying potential barriers to implementation.[38,39]

SYSTEM/ORGANIZATIONAL ISSUES RELATED TO HOW HEALTH IT MAY IMPROVE ACCESS

Closely related to issues involving individual clinicians, are broader questions about how the organization will integrate IT to improve access. For example, organizations need to evaluate how IT impacts communication among specialties. Within the EHR, specialized consult templates are an example of how to ensure that multiple specialty care teams have information needed to provide care. Further, there are opportunities to utilize technology such as high resolution cameras, web portals, and remote monitoring equipment to ensure that critical information is available. A question is whether there are differences in clinical outcomes among patients when specific interventions are utilized. Additionally, organizational impacts such as costs and patient utilization may be considered. Finally, it is important to continuously enhance and evaluate policies on data security and privacy to ensure the protection of patient information.

IT Integration with Non-VA Entities

The VA has a significant number of patients who also access other healthcare systems.[40] Like all organizations seeking to meet the federal meaningful use criteria for implementation of EHRs,[13] the VA is actively working on solutions to integrate healthcare information across provider organizations. A goal of the Virtual Lifetime Electronic Record (VLER) program is to develop a record of all active duty and veteran healthcare provider under the auspices of DOD, VA, and TriCare, as well as the private sector. This initiative has great potential for helping to ensure that patients receive appropriate care when they need it. IT integration has potential to enhance receipt of quality, efficient, and safe care. However, there are important technical, information flow, and privacy issues that need to be evaluated as part of these efforts.

CROSSCUTTING EVALUATION/RESEARCH METHODOLOGICAL ISSUES FOR FURTHER REFINEMENT

The study of the impact of health IT on access faces important methodological challenges. These include:

- Need to refine measurement tools and metrics. Such tools and metrics may include: 1) indicators of significant utilization of technology (e.g. what is substantive patient use of web-based services?); 2) defining a "quality" intervention; 3) measuring patient and staff experience with specific technology and content; and 4) determining the impact of interventions on the organization of care. For example, evaluation of patient-oriented interventions may require a combination of measuring use (e.g. functions of a Web portal), satisfaction with individual functions, and how the intervention changes relationships between the patient and care team.[41,42]

- Unintended consequences. How do you draw a connection between implementing IT solutions and unintended consequences? These consequences may relate not only to the technical aspects of the IT solution but also to how IT may change the workflow and social interactions within organizations.[43] For example, while computerized provider reminders are effective tools for encouraging guideline concordant care,[44] reminder fatigue may cause important processes to be missed.[43]

- Methods to support and teach patients and/or providers to use new technology. This requires not only establishing programs to train patients on how to use devices and services, but also includes incorporating methods from fields such as human factors engineering[45] into health services and implementation science methods. Developing an infrastructure for technology usability testing that allows the needs of patients and staff to be considered during development has potential to aid future adoption.

- Need to incorporate implementation science methods [46,47] (e.g. formative evaluation)[48] into efforts to work with key stakeholders during the development, initial study, and rollout of new technology and content. The VA Quality Enhancement Research Initiative (QUERI)[49] has recently established an eHealth QUERI coordinating center, which seeks to enhance our understanding of what mechanisms enable effective IT interventions that can be broadly used in healthcare. As described by the Glasgow RE-AIM framework, this includes aspects of intervention reach, effectiveness, adoption, implementation, and maintenance.[6,50]

CONCLUSION

Improving access to high quality health services for the Nation's heroes is at the heart of the VA mission. Numerous IT solutions introduced during the last two decades have great potential for helping to meet this objective. Designing both the technology and content of IT interventions with explicit recognition of potential impact on access will aid in successful adoption. At the same time, the needs of different stakeholders, value of the content, and features of the technology will all need to be understood so that effective programs are implemented and utilized.

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