

Topic: Information and Communication Technology

Code: S

Recommendations

These recommendations take into consideration testimony originally coded to 21 (DrgStand)¹, 22 (MedPrac)², and 23 (InfoTech).³

- S1. Advocate for the adoption of low-tech as well as high-tech systems to ensure that information critical to patient safety (e.g., health history, medication history, and critical lab values) is available to patients and health-care providers within and across organizational boundaries.
 - o S1a. Explore options for ensuring that critical information moves with the patient through and beyond each health system encounter (e.g., health “passport”).
 - o S1b. Collect and disseminate successful low-tech practices for improving communication of critical information.
 - o S1c. Study and make publicly available information about existing health-care information technology (IT) practices and the costs/benefits or returns on investment of existing practices.
 - o S1d. Convene Michigan stakeholders to develop a strategic plan for improving health-care IT in the state. Consider, in particular, how to move ahead with the electronic medical record.
 - o S1e. Advocate for adoption of comprehensive and improved health-care IT (like internet access) in all settings of care.
 - o S1f. Advocate for the implementation of systems designed to prompt clinicians to consider evidence-based practices and patient safety alerts.
- S2. Ensure that Michigan’s interests, perspectives and concerns regarding health-care IT are represented as national IT standards are developed. Advocate for standards that are applicable and usable by all Michigan providers.

Rationale

Current inconsistent use of and lack of common standards for health-care information technology (IT) impede health-care quality and safety. Health-care IT systems have the potential to reduce harm and promote patient safety by preventing and even detecting health-care errors. Health-care errors occur for a multitude of reasons. Lack of access to legible, complete and accurate data, as well as the difficulty in locating paper medical records, are the cause of many errors.⁴ Additional errors occur as the result of the unreasonable expectation that health professionals be able to remember ever-larger amounts of health-care knowledge while making complicated decisions concerning patient care and safety.⁵

The Institute of Medicine (IOM) acknowledges that quality problems do not generally originate from insufficient training, knowledge, or effort by health-care professionals. The concern lies in the rapid development of technology. Considering the plethora of new medical information and technology emerging daily, the IOM considers it impossible for each clinician to retain the knowledge that is essential for evidence-based practice. Further, the IOM suggests that the problems that have been arising because of advances in technology will only intensify if changes are not made to health-care delivery in the United States.⁶ The fact that health-care technologies have developed more rapidly than the health-care professional’s ability to deliver their use safely and efficiently is indeed a growing dilemma.⁷

As the Institute of Medicine (IOM) concludes, a strong information infrastructure must be created to improve patient safety.⁸ This infrastructure will require consistent use of IT to collect, disseminate, and report patient information and data. Considering that many health-care

organizations are on their way to adopting some sort of IT system, a priority in this process is the creation of a national health information infrastructure. As the IOM states, "A national health information infrastructure is not a centralized government database, but rather 'rules for the road' that offer a way to connect distributed health data in the framework of a secure network."⁹

Evidence for harm reduction

Various types of information technology, whether low-tech or high tech, have the potential to prevent patient harm. Evidence suggests that promoting patient safety through IT systems can reduce drug dosing and prescribing errors.^{10 11 12} Other IT systems (e.g., automated reminder systems) are effective in helping health-care organizations to comply with clinical practice guidelines.¹³ Additionally, computer assisted diagnostic systems have been shown to increase the quality of patient care.^{14 15}

One specific type of system, known commonly as the electronic medical record (EMR), has shown great potential. Much attention has been paid to the EMR's ability to promote patient safety, increase the effectiveness of patient care delivery, and help health-care providers quickly and efficiently process immense amounts of health-care/patient information. Since the human mind cannot process all of the current medical data required to care effectively for every patient, EMRs help alleviate this burden.¹⁶ EMRs offer numerous health-care providers access to patient information simultaneously, seven days a week, 24 hours a day. Through these systems, the information can be accessed anywhere; it can always be found and is legible, which is often not the case with written records.¹⁷ According to the U.S. General Accounting Office, automated medical records (EMRs) provide the potential for increased efficiency, reduced costs, and improved patient care.¹⁸ The GAO recommends, however, that common standards be developed to create uniform recording and transmission all medical information for this technology to achieve its potential.

Improved health-care IT also opens the door to additional quality avenues. The creation or implementation of supportive information systems such as patient registries would be effective in providing the tools for preventive care reminders, necessary follow-up information, and provide feedback to the provider about patient compliance.^{19 20 21 22 23}

Assessment

Advantages

- Even if technology is low-tech, like a one-page paper tool with pertinent patient information that can be faxed from one health-care organization to the next, it can be beneficial to the patient and provider in the short run.
- The importance placed on reminder systems²⁴ and online prescribing²⁵ will have a large impact in the health-care delivery system. Additionally, the Internet will play a large role in the transmission of scientific publications, practice guidelines, and other evidence-based practice tools.²⁶ The explosion of Internet use will also allow consumers to search health-care information, seek out providers, and find health-care support groups.²⁷
- Information systems will prove to be beneficial in improving administrative and financial transactions. The two most important factors that will be addressed through IT systems are service improvements and efficiency.²⁸
- As the IOM proposed, IT systems will be able to improve public health through incident reporting, disease surveillance, patient registries and answering public health concerns between providers.²⁹
- The use of the Internet is and will be a strong force in health education for the future. Virtual classrooms, teleconferences, and simulations are available for educational

purposes that are accessible through the Internet.³⁰ Multiple facets of research will be improved by the use of the Internet. From accessing the most recent literature on health-care issues to sharing databases, advancement in research will be more readily available to not only colleagues, but the public as well.³¹

Barriers

- IT is at the heart of many patient safety proposals.³² Despite its importance in improving patient safety, some concerns arise with the implementation of IT systems. For example, more demands may be placed on the health-care worker, causing a higher workload and calling for an increase in cognitive understanding of the new systems, which may lead to additional failures.³³
- A substantial barrier may occur if health-care organizations do not commit to information technology. Organizational cultures may not embrace IT systems making the creation of informatics infrastructures across and within health-care organizations difficult.³⁴
- A significant amount of technical assistance will be needed to support those implementing the clinical systems and EMRs associated with building the infrastructure. Many privately owned companies have made significant progress in this respect. It is important that the forerunners in this endeavor, national or local, be forthcoming to share their knowledge and experience on implementation feasibilities to the entire care delivery system.

Implementation

Further research

Considering that many health-care organizations are on their way to adopting some sort of IT system, a priority in this process is the creation of a national health information infrastructure. Efforts should be made to investigate the most systematic and efficient method to create this structure. National standards to protect data privacy and a national consensus on how to collect, code, and exchange clinical data must be a part of that investigation.³⁵

Legislation and/or administrative rules

None required, except as might be needed to develop incentives.

Resources

- Technical expertise and senior leadership will be required if Michigan is to improve its health-care IT systems.^{36 37}
- The ongoing cost of implementing IT systems will remain throughout the entire process. Start up, system construction, continued operation, and improvement costs will be incurred over time. However, cost savings are also expected. The Wisconsin Health Information Network, which allows access to direct clinical and administrative data, was able to realize an average annual cost saving of \$17,000 to \$68,000 for physician practices and \$398,000 to \$1,061,000 for hospitals.³⁸

Incentives

Given that the most often cited barriers to IT implementation are financial, financial incentives may be most effective. One way of stimulating private-sector stakeholder investment is to offer tax breaks to potential investors. The federal government should provide the financial support and leadership needed for the establishment and ongoing maintenance of national data standards.

Specific steps and target dates

Following adoption of these recommendations, the following steps will take place.

- Within 12 months the Michigan Partnership for Safe Health Care will convene the first of a series of summits of health-care stakeholders to assess current use of health-care information technology in the state (particularly with regard to electronic medical records) and identify a core set of activities designed to accomplish the recommendations set forth above. Such activities are expected to include coordinated advocacy for Michigan's health-care stakeholders as national IT standards are developed.
- Within 15 months, the Partnership will conduct an inventory of low-tech strategies, focusing in particular on those that have proven successful.
- Within 21 months, the Partnership will develop and promote a Web site containing information about and links to these successful strategies.

Testimony overview

Summary

Twenty-six informants representing hospitals (9), practitioners (4), educators (2), employers (4), professional societies (5), and others (2) submitted a total of 42 recommendations related to information technology. An additional 2 informants provided recommendations related to implementation of safety systems in health-care organizations.

Key findings

- Technology need not always be high-tech; message is to establish communication between the provider and consumer.
- Critical information has to move with the patient through several encounters in the form of 'moving medical records'. These would enable evidence-based practices and patient safety alerts.
- Study the significance of electronic medical records (EMRs), computerized prescriber order entry (CPOE), e-prescribing and other mechanisms of speedy communication. These can assure safe and prompt care needed for favorable outcomes in the long run.
- Do not re-invent the wheel by experimenting with new processes that might turn out to be ineffective and expensive. Instead, follow national guidelines and practices and adhere to national standards for IT implementation.
- Comprehensive health-care information technology (IT) should be adopted in all settings of care including home health and nursing facilities.

Research overview

Medication errors are a grave threat to patient safety and one of the greatest opportunities for reducing medical errors. Among all the facets of patient safety, it is imperative that health-care providers administer the appropriate medication. In the United States, 7,000 deaths occur annually from medication errors that take place either within or outside of the hospital setting.³⁹ Research has shown that medication errors can be reduced by the use of computerized drug prescribing.^{40 41} More specifically, medication order entry systems, which offer data on known drug allergies, drug interactions, current medications and the patient's diagnosis, have shown to reduce the number of errors made when prescribing medications.⁴² These types of systems also reduce errors made because of drug dosing.⁴³ Safety monitoring through such processes as service reminders and drug dosing systems have been linked to improved clinical decisions.⁴⁴

AHRQ reported that e-prescribing with decision support using personal digital assistants (PDAs) reduce illegibility, omissions, and the overall incidence of prescribing errors.⁴⁵

Confidentiality of medical information is a primary concern when addressing issues of transfer and exchange between providers as well as patients. The IOM proposed that health-care systems in the 21st century should provide patients with access to both scientific and personal information. This information should be available to the patient without restriction or permission by another entity.⁴⁶ In most health-care organizations today, the data is seen as retrospective or a record of the clinical care, designed in part to protect against lawsuits.⁴⁷ Under the new approach of technological exchange, the health-care information would be treated as a tool to build the patient-provider relationship. The information should be seen as interactive and prospective.⁴⁸

The IOM recommends that new systems include an audit log that lists all who have accesses the patient's identifiable information.⁴⁹

State executive information systems offer health-care providers the ability to gain access to health-care data that has been traditionally housed in a number of separate data sets. Georgia's Division of Public Health created their Executive Health Information System that meets this goal. The need for healthy information infrastructures that allows the private and public stakeholders access to health-care data has been a vision since enactment of the Health Insurance Portability and Accountability Act of 1996 (HIPAA). States such as Wisconsin, Utah and Minnesota have helped to create these systems in the private sector. Telemedicine communicates health-care information, such as medical images, consultation, and education to various health-care providers. These systems have been effective in rural settings where resources are limited. Georgia, California, Colorado, Kansas, and Nebraska have implemented some type of telemedicine system. AHRQ created a National Resource Center for Health IT, "the largest single commitment to technical assistance in AHRQ's history".⁵⁰

Review Panel Round One

Scoring summary

In Round One, the Review Panel was asked to score each recommendation area on a scale of 1 to 5, where 5=extremely viable, 4=very viable, 3=somewhat viable, 2=potentially viable with changes, and 1=not viable for this project. Average scores for relevant recommendations considered in Round One:

- Medication Practices/Drug Standards: 3.2
- Information and Communication Technology: 3.8

Notes

- Consider leveraging influence to establish national standards for EHRs as a platform to improve patient safety.
- Focus on a 'high' level; on 'what' and not the 'how' of IT implementation.
- Do not concentrate on detailed system bases; recommendation should be applicable to all settings of care.
- 'Passport' to health-care information was readily accepted as a viable recommendation.

Endnotes

- ¹ Code 21 (DrgStand) was used to identify testimony recommending development of standards to guide the design of processes and procedures related to the safe use of drugs.
- ² Code 22 (MedPrac) was used to identify testimony recommending adoption and implementation of medication safety practices.
- ³ Code 23 (InfoTech) was used to identify testimony recommending use of information technology to improve the safety of patient care.
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