Electronic health record:
the impact on public health

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Below, servers at Panhandle Health District in Idaho today.

N ew electronic technologies have transformed the way health information is being recorded, stored, retrieved, and analyzed. Health care professionals can now access information more easily than ever before, making the management of patient information more effective. These changes have created an information management infrastructure that is suitable for monitoring community health. Today, public health agencies at state and local levels are integrating information systems to monitor selected community health outcomes. This paper reviews the developments in electronic health record systems during the past 20 years and shows how these changes have affected the ability to better assess community health at the local and regional levels.

History

Advances in health record systems during the past 20 years have changed the way information is being collected, interpreted, and shared by professionals locally, regionally, and nationally. These electronic records support access to data directly relevant to patient care, but they can do much more. The collection of health information in the past was primarily concerned with collecting patient health data in a hard copy form. This data was stored at the point of service, at the local or state level. Recent electronic developments in record systems have revolutionized the way in which health information can be stored, retrieved, and analyzed. This has created many

Panhandle Health District, Idaho

opportunities to use and network health-related data among health professionals globally.

Early data collection efforts involved basic computer applications such as punch-card data processing, minicomputers, and mainframe computers. Although this technology facilitated data exchange within organizations, the information collected was relegated to designated sites only, which made it difficult to analyze other data not obtained onsite. Public health applications for performing statistical analysis of incidence, distribution, and causes of disease within selected communities were still difficult to perform without the availability of a regional, state, or national exchange system.

During the 1990s, new tools emerged that allowed better access to the various networks and better networking between sites. Discussions between staff at the National Institutes of Health (NIH) and the Institute of Medicine (IOM) led to creation of a committee to advance the role of electronic records in health care, originally called the Committee on Improving the Medical Record in Response to Increasing Functional Requirements and Technological Advances. This committee called for a rigorous examination of existing health record systems, development of a plan to improve existing systems, and identification of impediments to the wide-scale adoption of electronic health records (EHRs), also called electronic medical records (EMRs). The committee outlined specific policies that would be needed for a wide-scale adoption.

Also during the 1990s the World Wide Web (www) emerged. Reliable servers and advanced software soon followed and free Internet browsers became available. These developments improved access and connectivity among health care sites locally, regionally, and nationally, increasing the speed and efficiency of gathering and analyzing data.

Current Developments

In 2009, the American Recovery and Reinvestment Act (ARRA) continued the work initiated by the Institute of Medicine. The 2009 Act authorized the

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Centers for Medicare & Medicaid Services (CMS) to provide reimbursement incentives for eligible professionals and hospitals who demonstrate having become "meaningful users" of certified EHR technology. Starting in 2015, providers will be expected to have adopted and be actively utilizing certified EHRs in compliance with the "meaningful use" definition. According to a recent study in the New England Journal of Medicine, only 1.5% of US hospitals currently have a comprehensive EHR. CMS outlines a number of criteria to meet this definition, including Computer Provider Order Entry (CPOE), drug/allergy checks, E-prescribing, and electronic claims submission. Specific criteria for each state are available on the CMS Web site listed in the annotated bibliography.

Although technologies do not automatically improve the quality and safety of health care, meaningful use of data obtained through an EHR system can transform health-care delivery and ultimately lead to measurable improvements in community health outcomes. The application of new EHR technologies can offer health care providers real-time access to patient data while providing a useful analysis tool. EHR systems developed and adopted during the past 20 years have improved patient care and increased overall access to health care, suggesting a reduction in health care disparities within our communities.

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Above, computers were introduced to this health department in the early 1990s.

Effect on Public Health

Expanded use of EHRs will allow public health agencies to better track changes in community health. Electronic data transmissions will be needed from health care provider sites to public health agencies using a Web-based interface. Adoption of standardized data formats, vocabularies, and software products that support a public health/electronic health record system are necessary and will bring us closer to achieving interoperability.

The EHR transition during the past several years has offered public health agencies the ability to provide services such as immunization histories and registries during disease outbreaks. Communities now have the ability to receive real-time health alerts from public health agencies, supporting a broad range of health promotion programs including the prevention and management of acute and chronic diseases. Overall, the new health information technologies have demonstrated an increase in the quality of care in healthcare facilities, better medication management and reduction in errors, and improvement in coordination of care. This, in turn, has reduced treatment costs, streamlined community surveillance efforts, and improved research efforts.

An example of the direct public health benefits associated with the use of an EHR system is highlighted in the October 1, 2009, press conference by Kathleen Sebelius, Secretary of the US Department of Health and Human Services (HHS). Secretary Sebelius outlined the direct benefits that have been achieved by new health information technologies in the delivery of health care in rural communities. She cited the successes achieved by using an EHR system to monitor diabetic patients. The Columbia Basin Health Association (CBHA), in central Washington, used the EHR system to track 1,302 diabetic patients.

Both photos, Panhandle Health District, Idaho

At top, computer training after introduction in the early 1990s. Above, typing in the pre-computer age.

By June of 2008, CBHA improved patient compliance, with 86 percent of diabetic patients receiving a foot exam and 63 percent receiving an eye exam in the past year, up from the January report of only 31 percent receiving a foot exam and 37 percent receiving an eye exam. Since the implementation of the EHR, the CBHA has ranked above the 95th percentile nationally in total medical and dental team productivity.

The Concord Hospital Physician Group (CHPG) of Concord, New Hampshire, also used the EHR to improve diabetes metrics. This group focused on embedding diabetes protocols in their EHR, linking these to prompts at the point of care, and establishing a diabetes registry that aided in identifying and contacting patients for follow-up care. This resulted in the improvement of nine of ten metrics of the Diabetes Physician Recognition Program (DPRP).

Concerns and Challenges

Although it is easy to see the benefits of the EHR in public health, there are still concerns and challenges. The Health Insurance Portability and Accountability Act (HIPAA), as well as new provisions in ARRA, have attempted to address many of the privacy concerns, but there are currently no restrictions placed on using de-identified data for research purposes. It is important to remember that in order to use electronic data, it must be de-identified and thus EHR systems must thoroughly wipe the record of identifying data before sharing this for public health use. Unfortunately, EHRs will not be centralized or required to be in a standard format, so regulation of this, as well as compatibility issues, will continue to be challenging.

Summary

Recent electronic developments in health information technology have revolutionized the manner in which health information is stored, retrieved, and analyzed. A monopoly or single access to data no longer exists. The use of the Internet has encouraged the public to take a more active role in participating in community health matters. While many have taken advantage of the new Internet technology to become better informed about health matters, the community will expect healthcare providers and public health officials to ultimately translate technological advances in EHRs and health information exchange into improvements in public health. This will be the challenge for the next 20 years. ∎

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