



Health Information Technology Backgrounder

An electronic health record (EHR) is defined by the National Alliance for Health Information Technology as an electronic record of health-related information on an individual that conforms to nationally recognized interoperability standards and that can be created, managed, and consulted by authorized clinicians and staff across more than one health care organization. Although EHR sometimes is used interchangeably with electronic medical record (EMR), EHR is now the preferred term because its definition includes the ability to exchange information interoperably while EMR does not necessarily imply that ability.

Generally, EHRs are computerized versions of patients' clinical, demographic and administrative data. They may include treatment histories, medical test reports and images stored in an electronic format that can be accessed by designated health care professionals on a computer network. Some health care providers are using electronic health records, but many have yet to convert their systems from the traditional paper records. (More about electronic health records can be found in Appendix A.) EHRs are usually controlled to a large extent by health care providers.

Consumers may choose to create a personal health record (PHR), sometimes referred to as a patient-controlled health record (PCHR). A personal health record is an electronic record of health-related information about an individual that conforms to nationally recognized interoperability standards and that can be drawn from multiple sources while being managed, shared, and controlled by the individual.

A personal health record could contain all health information from all of a person's physicians and specialists. It could include records of immunizations and prescriptions, as well as lifestyle improvements, such as smoking cessation, exercise and nutritional improvements. A PHR is controlled by the consumer who may or may not grant other entities access to it.

Ultimately, EHRs and PHR could interact. This means that information from an EHR could be loaded into a PHR, upon permission from the consumer. Also, the reverse could be done, meaning that information from a PHR could be furnished to a health care provider to be attached to the EHR. This type of data interaction could provide complete and timely representation of a patient's medical status.

A 2004 Harris Interactive online poll found that 42 percent of the people surveyed indicated that they keep personal records of their medical care. Of those who kept such records, 86 percent kept paper records.

Health information exchange (HIE) is the electronic movement of health-related information among organizations according to nationally recognized standards. HIE also sometimes is referred to as a health information network (HIN). Health information

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exchange allows clinical information to move electronically between disparate health care information systems while maintaining the meaning of the information being exchanged. (More about health information exchange networks can be found in Appendix B.)

Health information exchange networks are relatively new developments. The most successful ones have been operating for ten years or less. They are being formed as a result of local, regional and national efforts to improve patient care and reap the cost savings of electronic data management

In his 2004 State of the Union Address, President Bush set a goal for most Americans to have electronic health records by 2014. President Obama has sharpened the focus on health information technology as a tool to improve healthcare delivery and reduce costs.

- Despite the advances of 21st century medical technology, doctors and nurses are hindered when they must manage medical treatment by using paper-based records, which are 19th century tools.
- In such an outdated system a patient's vital medical information is scattered across medical records kept by many different caregivers in many different locations, and too often, not all of the patient's medical information is often available at the time of care. For example, patients with medical emergencies are too often seen by doctors with no access to their critical medical information, such as allergies, current treatments or medications, and prior diagnoses.
- Physicians keep information about drugs, drug interactions, managed care formularies, clinical guidelines, and recent research in memory – a difficult task given the high volume of information.
- Medical orders and prescriptions are handwritten and are too often misunderstood or not followed in accordance with the physician's instructions.
- Consumers lack access to useful, credible health information about their own health status, treatment alternatives, or hospitals and physicians that would best meet their needs.
- Physicians do not always have the best information to select the best treatments for their patients, resulting in an unacceptable lag time before new scientific advances are used in patient care. They also do not have ready access to complete information about their patients. Nor do they know how other doctors are treating their patients or how other health care providers around the country treat patients with the same condition. These factors set the stage for preventable medical errors.

The Institute of Medicine has estimated that 44,000 to 98,000 Americans die each year as a result of medical errors, while many more suffer permanent disability. In addition, studies have determined that as much as \$300 billion is spent each year on health care that does not improve patient outcomes because the treatment is unnecessary, inappropriate, inefficient or ineffective.

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Concerns about having medical records stored on paper in files in doctors' offices increased as a result of Hurricane Katrina and other natural disasters. After Katrina hit the Gulf Coast in August 2005, hundreds of thousands of residents who had evacuated to communities across the nation had no access to their medical records. Many of them lacked even the most basic personal health information, such as their medications and dosages. Because of flooding in doctors' offices and hospitals, many of those records had been destroyed and could not be re-created.

Therefore, the federal government has fostered the development of a system of electronic health information exchange using electronic health records to ensure that complete health care information is available for most Americans at the time and place of care, no matter where that is. Those records would be designed to share information privately and securely among and between health care providers when authorized by the patient.

The federal government's vision of the new system, as expressed by The White House in "Transforming Health Care: The President's Health Information Technology Plan", released in 2004, is this:

- When arriving at a physician's office, new patients do not have to enter their personal information, allergies, medications, or medical history, since it is already available.
- A parent, who previously had to carry the child's medical records and x-rays in a large box when seeing a new physician, can now keep the most important medical history on a keychain, or simply authorize the new physician to retrieve the information electronically from previous health care providers.
- Arriving at an emergency room, a senior with a chronic illness and memory difficulties authorizes her physicians to access her medical information from a recent hospitalization at another facility - thus avoiding a potentially fatal drug interaction between the planned treatment and the patient's current medications.
- Three patients with unusual sudden-onset fever and cough, which would not individually be reported, show up at separate emergency rooms, and the trend is instantly reported to public health officials, who alert authorities of a possible disease outbreak or bio-terror attack.

One organization that has made good use of electronic health records and a health information exchange network is the U.S. Department of Veterans Affairs through its Veterans Health Administration (VHA). The VA operates the largest single health care system in the nation with about 1,400 hospitals and other health facilities. They participate in a network that allows clinicians to have access to patient's electronic health records, including X-rays, photos and other documents, from other VA facilities.

Those familiar with the VA's system remark about how the system is efficient and easy to use. Simply by presenting an identification card, a veteran can have his or her health records immediately available to physicians and other medical professionals at any VA facility. Some people have credited the adoption of health information technology for transforming the VA from a substandard health care provider in the early 1990s to a

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provider that outperforms many private hospitals in technology, quality of care and efficiency.

The VHA's system, My HealtheVet, allows patients to refill prescriptions online and provides access to health information, and includes links to each patient's Personal Health Journal, as well as to information about benefits and medical resources.

A national survey conducted for the Markle Foundation in November 2006 found that most Americans want access to their personal health information electronically, because they believe it would probably improve the quality of their care. In addition, they see having records available through health information exchange networks as a means to improve the efficiency of the health care system by reducing unnecessary and repeated tests and procedures. But they also want the government to ensure the security of electronic personal health information.

Kentucky's landmark legislation, Senate Bill 2 of the 2005 Regular Session of the Kentucky General Assembly, set Kentucky ahead of all states with the creation of the first statewide governing infrastructure that ensures confidence among stakeholders, including physicians, payors, purchasers, and consumers of health care.

This legislation, made possible through the bipartisan work of both chambers of the Kentucky General Assembly, created two structures—the Kentucky e-Health Network Board and the Kentucky Healthcare Infrastructure Authority. The board is co-chaired by the Presidents of the University of Kentucky and the University of Louisville. The Healthcare Infrastructure Authority is co-chaired by faculty from the two universities. The state will look to the universities and to help build a comprehensive business plan and architecture for the network.

With a governing infrastructure in place, the Commonwealth has the full complement of assets needed to implement an innovative model and to conduct the evidence based research that will drive changes in healthcare. Kentucky has a very manageable number of healthcare stakeholders with only two major insurance companies in addition to the State Medicaid program.

The promise of improving the lives and health of Kentuckians is the driving force behind developing a statewide health information network. Kentucky has one of the sickest populations in the nation, ranking 45th nationally on health outcomes. Kentucky's poor health status makes it a perfect laboratory to study the impact on health status and the ROI related to health information exchange.

Providers would exchange data electronically and patients would have access to their own health information anywhere in the world. The network would include decision support tools, disease management tools, biosurveillance capabilities, and population health features and would support the building of personal health records. Ultimately, predictive modeling could be used for preventive health based on the patient's genetic information as the human genome markers for specific diseases become available.

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The end result will allow a patient and a physician to be in an exam room with that patient's complete medical information along with medical decision support tools, alerts, and research from the nation's best universities on how to treat that specific individual patient. A physician in Hyden, Kentucky will be able to provide the same care as a physician with the Mayo Clinic. This approach will eliminate redundancy, prevent medical errors, and allow providers to treat each patient appropriately and efficiently while providing a biosurveillance, bioterrorism defense, and prevention/wellness system.

Appendix A

An electronic health records system is a means of storing medical information more rapidly and efficiently than paper-based systems. Paper records have several disadvantages:

- They are bulky, cumbersome and require costly space for storage.
- Retrieving and re-filing paper records requires additional labor.
- Paper records can be misfiled easily.
- When one person or department checks out a record, it is unavailable for anyone else, which can have serious consequences in emergency situations.
- Paper records cannot be searched easily.
- Tracking, analyzing and charting medical information is difficult with paper records.
- Paper records cannot be backed up or stored off-site easily.
- Handwriting on paper records can sometimes be illegible.

Electronic health records can overcome these disadvantages and provide a system in which information is much more easily stored, retrieved, updated and secured.

Appendix B

Electronic health records become even more useful when they are combined with a secure health information exchange network, which allows those records to be accessed at many locations throughout a community, a region or even a nation. Advantages of such a network include:

- Patient information can be shared in any location where assessment, diagnosis and treatment decisions occur.
- Privacy and security requirements can be met and even enhanced in a health information exchange network, compared with paper record storage, retrieval and exchange.
- Quality of documentation is improved by having every health care professional involved with a patient enter data into the same system.
- Problems with incorrect or conflicting prescription drugs can be noticed more readily and avoided.

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- Clinicians can gather key information about patients more quickly, which expedites treatment – especially important in emergency situations.
- Patient records are more complete, which helps physicians and staff avoid mistakes.
- Medical information can be tracked, analyzed and charted to identify trends over time or among many patients.
- Records can be backed up and secured, avoiding loss in accidents and disasters.
- Costly tasks of creating and managing paper records are reduced or eliminated, which might hold down inflation in medical costs.

Although the types of data that may be routed through a health information network vary with the maturity of the network, the following principles are important elements:

- Individuals should be able to access their personally identifiable health information as conveniently and affordably as a network can accommodate in its service menu.
- Individuals should know how their personally identifiable health information may be used and who has access to it.
- Individuals should have control over whether and how their personally identifiable health information is shared.
- Systems for electronic health data exchange must protect the integrity, security, privacy and confidentiality of an individual's information.
- The governance and administration of electronic health information networks should be transparent.

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