Electronic Health Records:

A Global Perspective

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Overview of Country Healthcare System

The U.S. has a population of more than 300 million people distributed over a land mass so large that the country ranks 179th in the world for population density. As a result of migration into large cities, the population has grown considerably in the 10 largest metropolitan cities including New York City, Los Angeles, Chicago, Houston, Philadelphia, Phoenix, San Antonio, San Diego, Dallas and San Jose.

The U.S. spends a higher portion of its gross domestic product on healthcare than any other country in the world, but ranks only 37th in its performance according to the World Health Organization. In contrast, the U.K. spends just six percent of gross domestic product (GDP) on health services yet ranks 18th in its performance. Several small countries, including San Marino, Andorra, Malta and Singapore, are ranked close behind second- placed Italy.

The U.S. healthcare system is comprised predominantly up of private for-profit insurance companies, non-profit and for-profit hospitals and other health provider delivery centers. The largest payor of healthcare costs, however, is the U.S. government with programs such as Veteran's Health Affairs, the Center for Medicare and Medicaid Services (CMS), TRICARE for the military, SCHIPS and other government backed programs.

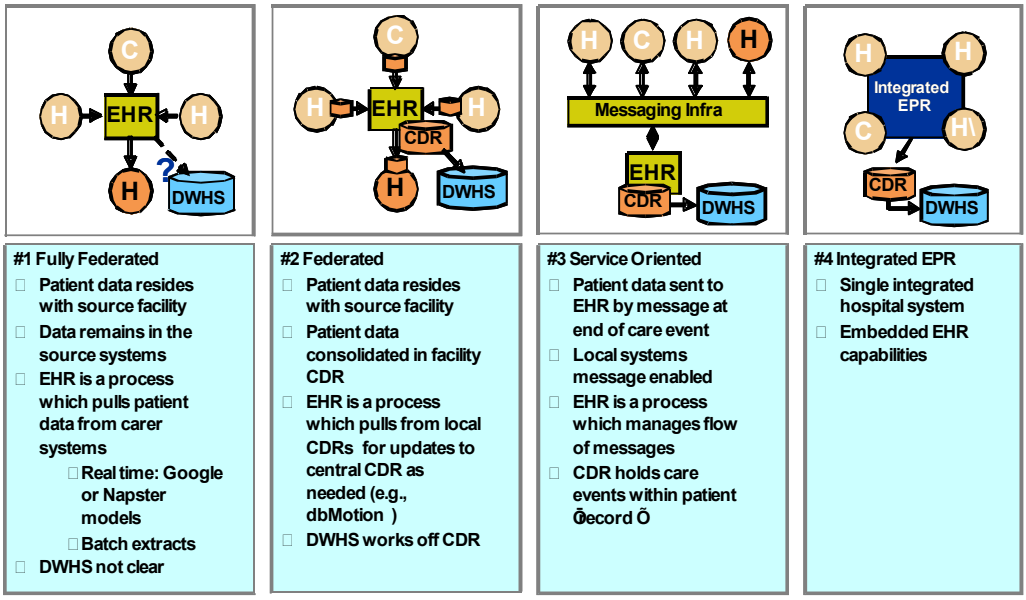
This distributed model consisting of multiple payors has created a very complex and diverse mechanism for funding and delivering healthcare services. There are also approximately 47 million uninsured patients in the U.S. who use services on an as-needed basis and generally receive their care at emergency rooms, urgent care centers or "walk-in" clinics. Not all of these individuals, however, are poor or unemployed. They include children, those employed by small businesses that cannot afford to provide health insurance and those who have opted out of their insurance programs due to inability to pay for increasing premium cost.

The employer-based private insurance in the U.S. has failed to provide adequate and consistent coverage for the entire population. Employers can negotiate insurance premiums with multiple "tiers" of coverage, based on risk, past history of medical expenses, utilization and population mix. This system is flawed, however, because of the inconsistency in how employees provide coverage choices to their employees.

The U.S. system of healthcare financing and delivery may be the most complicated among all developed nations. It is the only country, for example, that has not adopted a universal healthcare system.

The drive, so far, towards adoption of EHRs in the U.S. has been the result of fear of reported medical errors, legislation without mandates, quality and transparency in pricing and employers' inability to afford the increasingly higher costs of healthcare. Many experts agree that the best way to improve healthcare quality and to reduce medical errors is to fully deploy EHRs. Unfortunately the U.S. lags far behind other countries documented in this paper.

National/Regional EHR Approach



The goal for the U.S. is to have an integrated, national EHR system that fits the first category above, the "Fully Federated" Model. This is demonstrated by the federal government's attempt to help facilitate local, regional and state-sponsored programs for EHR adoption.

EHR Governance

Legal/Regulatory

In most cases in the U.S., there are no financial or other incentives to physicians or to health systems to implement healthcare IT. Although there is general agreement that EHRs would improve the quality and coordination of healthcare, the government has relied on a "bottom-up" approach to its adoption. Although the federal government has issued grants through the Office of the National Coordinator for Health Information Technology (ONC) to organizations to develop a nationwide IT infrastructure, little money is directed toward paying for those systems. As the largest single payor of health benefits in the U.S., the federal government has issued little in the way of punitive mandates for lack of adoption. In addition, paltry offerings of financial incentives, such as through Medicare, has made little difference in physician adoption rates. Research has shown that many U.S. physicians see no benefit to themselves or their practices by moving from paper to electronic systems and the costs involved are too exorbitant for most small practices.

Many state and local governments have issued grants for the development of RHIOs in an attempt to promote exchange of health data. Most of these efforts have either not advanced beyond their formative stages or have failed. A recent Harvard study reported by Healthaffairs.org (http://www.healthaffairs.org/press/novdec0708.html) found that, of the 145 RHIOs reviewed in 2007, almost 25 percent were already defunct and only 20 modest-sized organizations were successfully exchanging data. Five of them only

exchanged data in a targeted arena such as Medicaid enrollees or patients with a specific disease such as diabetes. The other 15 were exchanging clinical data across a broader range of patient populations.

Most RHIOs rely on small start-up grants and hope that stakeholders will pay for the exchange of health information. They often find that not all stakeholders are on board with the project from its inception. They struggle with interoperability issues when attempting to get different systems to communicate with each other; privacy and security concerns regarding where the data is stored and how it is exchanged; a lack of provider trust due to peer competition; and the high cost for a physician's office to implement a system. Without data to exchange, the system cannot thrive; without physician adoption, there cannot be a complete set of data entered. Therefore, physician acceptance is critical to the success of any RHIO. RHIOs that focus on the technology and its integration alone cannot expect to succeed. If most of the grant money is spent on hardware and infrastructure and little on lowering the cost barriers to small hospitals and physicians, the result will be a regional system devoid of data.

The limitation under Stark II Law is another barrier to EHR adoption, even though there was a "relaxation" of the law in December of 2007. In an attempt by HHS to give federally qualified community health centers and others a financial incentive, it loosened its anti-kickback rules. The "safe harbor" now permits hospitals and payors to provide EHR systems with e-prescribing to physicians as long as the benefits are made available to all patients and the physicians purchase their own hardware and contribute 15 percent to the retail value of the software system.

Despite the implementation of the Stark II safe harbor, many U.S. physicians are still not willing to pay for the high cost of hardware, the direct and indirect costs of moving from paper to paperless offices, or the 15 percent of the cost of high-priced software. An unanticipated result is that it may actually delay adoption. Physicians who were considering the purchase of an EHR system are now waiting for one to be offered to them by a third party. In a system where most U.S. hospitals are community based, have fewer than 300 beds and are financially constrained, this is not likely to happen without government incentives.

Healthcare Policy

As indicated earlier, the U.S. has taken an indirect approach to the development of a national EHR system. Legislation is focused on facilitating the development of EHR systems within the private sector but federal funding sources have been limited and the government has not enforced its own legislation.

For example, in 2005 U.S. Department of Health and Human Services (HHS) issued legislation known as the Patient Safety and Quality Improvement Act. The purpose of this legislation is to create patient-safety organizations that would collect and analyze healthcare facility data. To date, despite the combined efforts of U.S. senators, The Joint Commission and the American Medical Association (AMA), HHS has failed to enforce this legislation.

Technology

The infrastructure for a national EHR system in the U.S. has yet to be determined. However, attempts to define such an infrastructure through certification of accepted

functionalities, standardizations of data exchange and collaboration between stakeholders are sponsored by the federal government. Organizations such as the CCHIT, HITSP and the American Health Information Community (AHIC) have been funded by ONC to provide consensus for a national IT system.

At the local level, the capitalist-driven healthcare market combined with a lack of federal funding for EHRs and few federal mandates for its adoption have allowed an explosion of clinical electronic ambulatory records systems. The large number of disparate systems in the ambulatory sector has hampered interoperability and exchange of data. Although other countries suffer from the same problems with standards and interoperability, there are fewer vendors involved.

Adoption Rates and Challenges

Although a recent study suggested that 75 percent of medical students strongly support the use of EHR in clinical medicine, the U.S. lags behind most other developed countries of the world in its adoption.

Many countries, including Canada, England, New Zealand, Australia, Denmark and the Netherlands, had "top-down" government mandates for implementation of healthcare IT a decade before the U.S. began to introduce EHR-adoption bills into Congress. Others countries, including India and Israel, have developed a "grass roots" approach that has been driven by competition in the private sector, but fueled at local and national government levels. Canada's approach has been a collaborative effort between the government and private sectors but has been financed extensively through public funds.

In the U.S., the federal government has more recently become involved in HIT adoption with the establishment of ONC. This office reports directly to the HHS Secretary and it has taken an indirect approach to the development of a national EHR system. ONC has chosen to encourage, rather than to fund or to mandate, a nationwide, interoperable, IT program for the healthcare industry.

Despite attempts by the federal government through CMS to foster HIT adoption, incentives have been slow in coming and of little substance. Medicare's Pay-for-Performance program has not yet been finalized and its early attempts at promoting electronic data exchange is less of a boat and more of a life raft, trying to stay afloat in an ever-deepening ocean.

Through the Department of Defense and the Veterans Affairs Administration, the military branch of the government has been more successful in adopting IT into healthcare. Early attempts such as the VA's "VISTA" software was widely used at VA hospitals and clinics across the country.

Local, state and national governments have encouraged the growth of RHIOs to promote a network of interconnected EHRs. Of the 145 RHIOs established, 25 percent have failed and only 20 have successfully exchanged data.

Despite wider acceptance and adoption of healthcare IT systems outside of the U.S., there is still a world-wide lag in adoption of fully integrated EHR systems. Defined as an end-to-end system consisting of clinical patient records, personal health records, e-

prescribing, interoperability with lab and radiology systems and others, EHR adoption rates among hospitals and physicians in most countries is not that far ahead of the U.S.

EMR and e-prescribing systems, as subsets of EHRs, are sometimes used by varying numbers of PCPs around the world. The U.S. rate for "sometimes use" of EMR is reported to be 17 percent compared to 14 percent in Canada, 25 percent in Australia, 52 percent in New Zealand and 59 percent in the U.K. The numbers of PCPs who are using e-prescribing "often" is reported to be nine percent in the U.S., eight percent in Canada, 44 percent in Australia, 52 percent in New Zealand and 87 percent in the U.K.

In the U.K., PCPs have received many years of policy mandates and financial incentives from the NHS Greece. This has resulted in the majority of hospital-based physicians using EMRs.

Common barriers to EHR adoption in the U.S. include:

- Funding
- Employer/member participation
- Provider buy-in
- Access to meaningful data sources
- Complexities of market competition

The end result is a patchwork of different vendor systems at different stages of maturity in the healthcare marketplace. This hampers the attempts by the NHIN and ONC to create a unified promotion of data standards, interoperability and national best practices.

Pricing as a Driver of EHR

Driven by the growth of consumer-driven healthcare plans, U.S. consumers have begun to demand detailed data from healthcare providers. Unfortunately, many providers do not have the adequate systems in place to provide such data. According to a survey conducted by the PNC Financial Services Group, 85 percent of consumers said that they believed hospitals and doctors should be required to disclose their charges. More than half of respondents said that their selection of doctors and hospitals would be influenced by such information. The same survey found that consumers struggle with claims payment issues. Sixty percent of respondents did not know that there was a limit on how long they have to dispute claims denials.

Consumer-Directed Health Plan (CDHP) demand for transparency in pricing is expected to lead to greater competition and the need for greater cost-efficiency on the provider side. One way to achieve this is through the adoption of EHRs.

National EHR Programs in the U.S.

The U.S. healthcare IT strategy has been reinforced by the president's goal of every American having an EHR by the year 2014, but the burden of implementing this strategy has largely been left up to the private sector, including providers, payors and community-based organizations. RHIOs or HIEs have been growing across the nation, but with the poor success rate as indicated above.

The same challenges to EHR adoption exist regardless of population size, geography, member mix and funding sources. These include:

- Acquiring clean data from vendors and providers, payors and other sources;
- Availability and access to data;
- Infrastructure and other financial costs;
- Funding;
- Technical resources to manage and sustain systems once they are implemented;
- Security and privacy concerns;
- Ownership of the data once it is collected;
- Data standards and methodology for collection, aggregation and normalization; and
- Developing quality measures that are meaningful and consistent across the U.S.

Similar to most other counties, regional and local EHR development is considered to be the first step in building a national system. Despite their high failure rate, RHIOs are still considered to be the building blocks of ONC's proposed NHIN initiative. To build a national network of interoperable health records, an attempt has been made to first develop local and state level systems. To be successful, the NHIN concept requires collaboration by stakeholders including insurance companies, hospitals, employers, physicians and pharmacies. Information and interoperable data exchange are critical to the delivery of quality, cost-efficient healthcare.

Data Standards

Like most other nations, the U.S. has a multitude of standards that are still being heavily debated and used across multiple IS. These include HL7, SNOMED and DICOM. Newer versions of XML have world-wide acceptance and are slowly phasing out older programming languages. Like other countries, the U.S. has concentrated on standards within its own borders although it is involved in an international collaboration effort through such organizations as the ISO and the International Electrotechnical Commission (IEC). ISO is a network of the national standards institutes of 157 countries with one member per country and a Central Secretariat in Geneva, Switzerland, that coordinates the system.

ISO is a non-governmental organization; its members, therefore, are not delegates of national governments. ISO does, however, bridge an important gap between the public and private sectors. Many of its member institutes are part of the governmental structure of their countries or are regulated by their government. Other members are from the private sector and have been set up by national partnerships of industry associations.

IEC is also a member network that was founded in 1905 and attempts to bridge the gap between government and private industry. ANSI is the U.S. representative organization to the IEC.

Many U.S. organizations have been involved in trying to set unified "standards" in the healthcare arena. They include the American National Standards Institute (ANSI), HL7, HITSP, and the U.S. National Committee (USNC). ISO and IEC have some input from the U.S. on an international level. Thousands of individuals, companies, government

agencies and other organizations such as labor, industrial and consumer groups have been involved in the development for standardization of EHRs. This has been going on for years and yet we do not have a unified nation standard for healthcare IS in this country. In 2008, however, the ONC-supported HITSP will present its consensus recommendations to the U.S. government.

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