

EMRs: Are We There Yet?

By Barry P. Chaiken, MD, MPH

Our unfinished journey is more than half a century old. While rock 'n' roll came of age and hippies invaded San Francisco, a small hospital in Mountain View, California, in the heart of what was to become Silicon Valley, teamed up with the Lockheed Corporation and began the development of the first computerized patient record. El Camino Hospital, formed by a group of concerned citizens and physicians and funded by a special tax levy in the late 1950s, worked for two years with Lockheed and deployed the first electronic storage of patient information in 1973. With Apple, Intel, and Microsoft not yet the computer giants they are today, computer hardware, software, and training costs proved very expensive and prevented many other hospitals from following in El Camino's footsteps.

The 1970s brought the introduction of the Department of Veteran Affairs' version of an EHR. Known as the Veterans Health Information Systems and Technology Architecture (VistA), it used federal resources and open-source tools to deliver a relatively robust EHR system to millions of veterans. In later years, the Department of Defense adopted the VistA system for its own use. It is estimated that more than 65% of U.S.-trained physicians utilized the VistA system at a VA hospital during their training, making VistA the most familiar and widely used EHR in the country.

As other industries adopted computers and transformed their processes, hospitals in the 1980s rarely employed computers in clinical care. Most digitization occurred in back-office systems such as finance, human resources, and supply chain. Although the VA declared its system open source and freely available for modification and use, few hospitals embraced the offer, even as personal computers made digitization less costly.

As the era of the personal computer took hold in the 1990s, EMRs began to pop up in ambulatory settings where the application complexity and deployment difficulty were ameliorated by the increasing processing

power and decreasing cost of rapidly evolving computer systems. Although not widely adopted, ambulatory EMRs slowly gained in popularity as tools to facilitate billing, scheduling, and prescribing became available. Hospitals, however, failed to experience similar increases in adoption of EMRs due to the higher cost and increased difficulty in

deploying similar systems amid the much larger and more complex inpatient setting.

Crisis is a terrible thing to waste

Although former President George W. Bush pushed for the digitization of medical records during his first term, real momentum did not build until the financial crisis hit and the federal government put together a 2009 fiscal stimulus package that earmarked billions of dollars to hospitals and physicians for EMR adoption. Now, with almost all the \$35 billion spent, more than 95% of hospitals and over 60% of physicians' offices meet the criteria for meaningful use of certified HIT (Office of the National Coordinator for Health Information Technology, 2017).

As for El Camino Hospital, it replaced its home-grown system in 2015 with a customized version of a popular commercially available EMR.



Despite the evolution and investment in EMRs over the past five decades, little evidence exists that all this digitization is making a difference in quality, safety, or cost. The U.S. ranks at the bottom of OECD countries on many quality metrics. Its costs per capita greatly exceed those of any other country, even though there are millions of uninsured citizens who do not regularly seek services.

Obstacles

Many obstacles that prevented EMRs from impacting quality, safety, and cost remain in place today. These include payment models and failed interoperability efforts.

Current payment models offer conflicting incentives for providers. Some contracts incent value-based care—efforts to offer the highest-quality services at the lowest cost—while others encourage the utilization of services through an essentially fee-for-service model.

Unfortunately, these two models exist in organizations at the same time, confusing caregivers and preventing the redesign of care processes to achieve specified goals. For example, a process redesign that works to restrict unnecessary imaging by applying clinical decision support embedded in an EMR conflicts with a payment model that delivers more revenue with every ordered imaging procedure.

Complete medical records systematically lead to fewer repeat tests, redundant medications, and diagnostic and therapeutic errors. Nevertheless, effective interoperability among EMRs remains a challenge as vendors hold tightly to their proprietary systems, preventing the easy exchange of patient information, and provider organizations engage in data blocking to protect what they perceive as valuable business data, critical in retaining patients and service volume (CMU Open Learning Initiative, n.d.).

What's next?

Rather than facilitating patient care, EMRs frequently become obstacles to care. While physician burnout is often attributed to higher patient volumes and increasing patient acuity, EMRs' administrative burden on both physicians and nurses cannot be ignored.

Commonly, physicians complete their EMR notes from home late at night after their children are put to bed. Nurses, at the completion of busy shifts involving high-acuity patients,

remain 30–60 minutes past the end of their paid time completing documentation. And with caregivers spending so much time looking at the computer screen, patients sometimes wonder whether the physician is treating the CPU rather than them.

Clearly, in the case of EMRs, we are not there yet. Perhaps the infrastructure is in place, but the processes to deliver high-quality, safe, and cost-efficient care are not yet widely deployed. EMRs, originally built to capture documentation to drive revenue codes, do not meet the basic workflows and processes required by clinicians to deliver care.

Organizations must reexamine their existing processes and rework them so they focus on the patient. This redesign must leverage existing technology that automatically completes documentation for billing purposes (e.g., natural language processing or NLP) so the clinician can focus on documentation for patient care purposes.

Continued failure to embrace robust interoperability should no longer be an option for either provider organizations or vendors. The Office of the National Coordinator for Health Information Technology deserves praise for its efforts to push interoperability to the forefront, but many of the other stakeholders can do more.

After more than 50 years of EMRs, our success in using them to improve patient care pales in comparison to the resources invested in the effort. Dangers exist in alienating clinicians and forcing them to leave their profession through the continued

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imposition of crushing documentation burdens. Poorly implemented EMRs that effectively and efficiently deliver expensive, substandard care contrasts with what is possible when EMRs are used to their full potential.

The task to properly utilize EMRs remains undone. Without significant change in payment models, our attitude to interoperability, and acceptance of needed workflow and process, EMRs will never offer the benefits imagined by those pioneers at El Camino Hospital in 1971. *

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