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The Perfect Electronic Medical Record System

To the Editor:

During the past couple decades, the use of the word *perfect* with *electronic medical record (EMR)* has been almost oxymoronic. Some physicians and hospital staff love their EMR systems, others hate their EMR systems to the point where they ignore them and use paper instead, and still others will not even consider trying such systems. To design the “perfect” EMR system, one must take into account the interests of a number of key stakeholders—hospitals and emergency departments, physicians in private practice, insurance companies, pharmacies, and, most importantly, patients.¹

The basic outline for a “perfect” EMR system would include interconnections among all these parties. All hospitals, physicians, insurance companies, and pharmacies would have access to the same patient information. For an EMR system to be all-inclusive, it needs to combine several kinds of information into a single integrated system. Based on our experience, such information would include a full patient history, a list of medications used by the patient, and a list of the patient’s hypersensitivities on the front page of the EMR—followed by specially tailored sections for each medical specialty. For example, gastrointestinal medicine, orthopedics, and primary care would each have their own pages in an ideal EMR system, including fields for the kind of work flow that a physician needs to properly manage the health of each patient within the param-

eters of his or her specialty.

This type of EMR system would allow for very little miscommunication between healthcare providers and serve as an all-inclusive medical record that would improve efficiency. Such improvement is especially important nowadays, when many patients see a dozen or more specialists. Through broad acceptance and adoption of well-designed EMRs, there will be large savings in healthcare costs, greater efficiency, fewer errors, and overall improvement in healthcare.²

For patients, there are some notable barriers to receiving the full benefits of EMRs. From a patient’s perspective, several nonintegrated parts of healthcare—such as different providers, clinics, and practices—dispersed over a large geographic area all need to have access to the patient’s up-to-date medical history. Any incompatibilities between the electronic systems used by these different parts need to be overcome. Furthermore, some patients might not feel secure with their information being available on a Web-based server, and they may not want every healthcare provider to have full access to their entire medical records. Patient concerns over online access to their medical data need to be addressed, though such access is a necessity for continuity of care.

In regard to technological capabilities, an advanced EMR system should have the ability to send patients electronic reminders on their phones and computers to take medications, to visit physicians, and to take other preventative measures—should the patient so choose. Medical reminders can be a lifesaver. For cervical cancer screening alone, medical reminders to patients have the potential to help save 13,000 life-years at a cost of \$152 million to \$456 million per year.³

Evaluating EMRs from a purely economic point of view, the main downside for practitioners occurs during the learning curve, when physicians and other healthcare providers need to spend extra time writing reports and learning

how to use the EMR system. Each provider will need to spend time not only learning how to use an EMR system and how to implement the system to his or her specifications (because systems are not generally usable out of the box), but the provider will also need to schedule fewer patients for the first week or two of system implementation. This learning and implementation process and the reduction in patient volume, along with the cost of purchasing an EMR system, will temporarily affect a physician’s bottom line. Many healthcare networks reduce costs by purchasing EMR licenses in bulk or sharing costs of EMR implementation to ensure consistency of EMR systems within their networks.

There is an added complexity for providers who practice at multiple hospitals in which different EMR systems are used. The provider would not only need to ensure that the different EMR systems are cross-compatible, but he or she would also need to take the time to learn two or more distinct systems.

Insurance companies prefer that their policyholders stay healthy so that the companies spend less money on covering adverse conditions. A comprehensive EMR system could warn physicians if a contraindication exists with a prescription medication that a patient is using—and it may even prevent a contraindicated medication from being ordered. This ability to avoid prescribing harmful medications could result in a decrease in adverse effects—thereby reducing insurance costs for healthier patients.

A comprehensive EMR system will also reduce the length of hospital stays and administrative time and the use of drug and radiologic examinations both in and out of the hospital.² However, one must remember that these savings will not occur immediately. Rather, the savings will accrue as more and more facilities and physicians adopt EMRs.

It will be difficult to sell EMRs to some hospitals and clinics. Many healthcare facilities have been evaluating EMRs for years, though these facilities have not

yet finalized guidelines or parameters for EMR use. For hospitals, there remain three main barriers to EMR use—a high initial cost with uncertain return; a varying learning curve with lack of initial efficiency for all providers; and the time and expense in converting paper records to EMRs.^{4,5} During a 10-year deployment of an EMR system, the overall estimated annual cost for an average hospital will be \$28 billion—and \$16 billion per year thereafter.^{4,5} Another cost associated with EMR implementation is an estimated \$2.5 billion to obtain widespread connectivity of the EMR system.² These costs are negated by estimated net savings of \$21.6 billion to \$77.4 billion per year for the average hospital.^{4,5} Over a 15-year period, the estimated net savings from implementing an EMR system is more than \$370 billion.

We urge insurance companies and the government to cover some costs of deploying EMRs and of training healthcare providers in their use, because the use of EMRs will likely result in improved public health and cost savings. Even without the incentive of shared costs, implementation of an EMR system should be worth the expense. Bigelow et al⁶ estimated that for asthma, chronic obstructive pulmonary disease, congestive heart failure, and diabetes mellitus combined, EMR use would result in annual decreases of 4 million inpatient stays, 5 million outpatient visits, and \$30.1 billion spent by hospitals, as well as annual prevention of 28 million days of lost work, 13 million days of lost school, and 245 million days spent by ill patients in bed.

Most pharmacies already use some form of EMR system. Thus, adaptation of these current systems to a more advanced EMR system should not be problematic. The inclusion of pharmacies is a necessity in a comprehensive EMR system, so that healthcare providers can know if their patients have been properly filling their prescriptions. The main incentive for pharmacies to upgrade their EMR systems is increased efficiency and decreased mistakes as a result of

prescriptions being sent electronically from physicians' offices or hospitals directly to pharmacies. To help pharmacies transition to a comprehensive EMR system, the government, as well as insurance companies, should offer financial incentives to them.

In summary, an all-inclusive, interconnected EMR system has the potential to change healthcare as it is known today. Comprehensive EMRs will help lower the cost of healthcare and assist healthcare providers in offering the best treatment available. The use of comprehensive EMRs may also result in decreased lawsuits because of fewer mistakes by physicians. With an EMR system such as the "perfect" system described in this letter, there should be no reason for any healthcare provider or facility to continue to use paper for record keeping.

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Atypical Presentation of Herpes Simplex Encephalitis in an Infant

To the Editor:

Most childhood cases of herpes simplex virus type 1 (HSV-1) infection are caused by oral transmission. In children, neurologic infections induced by HSV-1 represent either primary or reactivated viral states. A more serious sequela of HSV-1 infection is herpes simplex encephalitis (HSE). The most common symptoms in clinical presentations of HSE in children are altered mental status, dysphasia, fever, headache, irritability, seizure, and visual field defects.¹

Examination of cerebral spinal fluid (CSF) is the gold-standard laboratory test for diagnosing HSE. This serum analysis typically yields lymphocytic pleocytosis, normal to slightly elevated total protein concentration, normal glucose concentration, and normal to mildly elevated CSF opening pressure.² Arguably even more important in diagnosis is magnetic resonance imaging (MRI) of the brain. In patients with HSE, MRI will often demonstrate an abnormal appearance in the temporal lobes resulting from edema, in addition to the so-called *transylvian sign*, which represents edema across the sylvian fissure.³

In the present letter, we discuss the case of an infant with HSE who had unremarkable CSF test and neuroimaging results. To our knowledge, this case report is the first to describe clinical HSE in an individual with a normal CSF profile and no diagnostic imaging support.

Report of Case

An infant girl aged 17 months presented