Electronic Medical Records (EMR) – The Train Has Left the Station

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A secured web based, user friendly, intuitive, affordable EMR is available 24/7

People in general do not like change; we doctors are no different. After all, we have been practicing medicine / surgery since the days of Hippocrates without EMR. However, we need to move with the times and take advantage of technological advances; for example, echocardiogram instead of relying solely on the stethoscope, and faxes and emails in addition to the regular mail. However, technology for technology's sake can be disruptive and counterproductive. More technology does not necessarily improve efficiency, quality and cost effectiveness. In fact, more of the wrong technology causes frustration, impedes workflow and drains the bank account. Like fire, it can keep us warm and cook our food; it can also burn down the house and kill us.

What is the ultimate electronic medical record technology for this decade? If physicians and surgeons do not participate in the development of the correct model (called an application in the 'techie world'), we and the whole trillion dollar health care industry will be burdened with an awfully expensive monster that will cost the industry billions of pounds, euros or dollars and cost patients and health care providers their sanity.

What are the necessary components of this inevitable technology to facilitate care for our patients, to increase the quality of such care and to decrease costs for the public?

1 Both President Bush and the Democratic Party leadership in the United States believe that in order for real time accessibility of a patient's medical records, an electronic medical record has to be interoperable and available 24/7. If a patient has 20 doctors, using the current paper system or using the current electronic medical record system, the 20 medical records are scattered in 20 different offices in filing cabinets or on local servers. We need encrypted, secured, web-based application database technology for real time recording, data warehousing and instantaneous retrieval; SSL and VPN for security; and XL-7, XML, commercial technology (could be referred to as 'closed source') and 'open source' technology for interoperability and maintaining privacy. As a result, all of the 20 medical records from the 20 doc-

tors will be catalogued and stored in one repository on the web and hosted in 'cyberspace' with backup and 'redundancy'. With the appropriate password and screen name, an emergency room doctor located anywhere in the world at 3:00 in the morning will be able to access all of the records in real time provided there is internet service, hardwire or wireless. Having this interoperable system will not only improve quality of care, and decrease drug interaction and medical errors, but will also decrease costs by eliminating the repeat of unnecessary tests that is so common in the medical industry today and is estimated to be in the billions in the United States alone. Electronic prescriptions can be done safely and efficiently with this system. There is a method of tracking all tests that are ordered until the results are given to the patient and a disposition is made. Patients' messages can be monitored and answered promptly and efficiently through many methods including secured internet lines, and we can link this to preventive health literature, patient instructions. Such literature can be automatically printed and given to patients.

2 The user interface has to be intuitive and extremely user friendly, allowing doctors of varying computer literacy to use the EMR. It has to follow the flow of how doctors take care of patients in the consultation room, hospital, operating theatre, emergency department, for example. It has to follow the sequence of (a) identifying the patient by name, age and the necessary demographics (as an option the patient's photo of the patient can be displayed), (b) a quick review of the pertinent past medical history, such as allergy to medication, current medications and significant illnesses, (c) ability to view the last entries – called 'progress notes' in North America. The user interface must allow the operator to record the patient's current symptoms and physical findings utilising (i) sophisticated 'live' real-time ink technology transmitted into 'cyberspace' for secure data warehousing and not stored as a scanned-in 'photograph' or (ii) typing and transmitted similarly or (iii) digital templates to input onto electronically sensitive check boxes cus-

Figure 1

Figure 2

tomised by the clinicians or (iv) handwriting recognition technology or (v) voice recognition. This data is automatically stored and can be retrieved instantaneously via secured wireless technology. Diagnostic test results are filed in the labelled 'electronic' drawers in the electronic filing cabinets and are retrievable instantaneously by a quick tap on the labelled 'drawer'. Such tests can be viewed and printed out for the patient. Figure 1 shows one version of an otolaryngologist's 'filing cabinet'. This can be customised for any doctor in any specialty. Figure 2 shows the doctors of other specialties using this EMR to care for the same patient. With the patient's permission, a quick tap of the correct drawer in Figure 2 can give the treating doctor instantaneous 'read only' access to the records of the other doctors taking care of the patient.

By tapping on the prescription icon, the patient's name, address and age are automatically printed on the prescription. The doctor can write / type the chosen medication, dosage and quantity. Alternatively, the doctor can select from a preprogrammed list of medications complete with dosages and side effects, and the prescription can be printed, faxed or e-mailed to the pharmacist (chemist). Prior to prescribing the medication, the EMR shows the doctor the patient's allergies to medications and the patient's current medications, to avoid drug interactions.

In the United States, the EMR can assist the doctor to select the appropriate billing codes ('CPT') and link to the proper diagnosis codes ('ICD'). It is also ready to incorporate algorithms, 'pay for performance' protocols and clinical guidelines. As an additional feature, patients whose doctors are not utilising this EMR can request their records from those doctors and submit the records to this EMR for cataloguing, storage and instantaneous retrieval subsequently.

In summary, the technology is available today to create an Electronic Medical Record that is affordable and user friendly, a system into which we put technology to enhance medical practice and not to avoid inefficient technological steps. We want to be doctors and the patients demand our full attention. The patient-doctor encounter should not be a cumbersome data-entry session making the doctor a data-entry clerk.

Such a system is available, in use clinically and on the way to further enhancement and wider production. In the future we shall discuss the 'honeycomb', a universal method of recording all anatomical parts, subparts and the symptoms and pathological findings for each. ∎