

What Lies Ahead for Electronic Health Records and Information Technology?

In the coming decades, the cost of healthcare will continue to rise as a result of increases in chronic diseases and the aging population. Organizations that fund healthcare will face the challenge of streamlining healthcare services, making them more effective and keeping costs down. A major part of this will be achieved through the global introduction and use of electronic healthcare records (EHRs). In the past, most EHR systems were designed to record occasional clinical encounters between patients and healthcare professionals and/or the diagnosis and treatment of diseases. The next generation of EHRs will include a patient's individual genome, proteome, metabolome, and health data, including results of diagnostic tests, imaging, and treatment history, entered automatically from birth into computerized databases. EHRs are intended to eliminate paper records, although opinions vary as to whether this will actually happen.

Although EHRs will be managed by healthcare organizations, patients will be able to access their own personal information online. Authorized healthcare personnel, including emergency paramedics, will also be able to access patients' EHRs directly, but will require authorization from each patient to do so. Ownership of individual data will remain with the patient. Patients will be able to access their own EHRs from different locations at any time. By 2050, everyone may have an implanted electronic chip containing an access code that allows wireless access to their personal data. Patients could also use electronic

devices similar to smart phones to move data from home monitoring devices to their EHRs. EHR databases must be compatible for the generation and exchange of health information and data security worldwide. By 2050, it is anticipated that there will be robust global standards for EHRs based on those currently emerging in the United States and Europe.

The use of the information will drive standards, which is important not only to access information, but for the ability to apply computer-modeled knowledge to it. By 2050, computing power up to 100,000 times greater than exists today will be available to provide the kind of information technology needed for access and security. In order to address concerns about privacy, all the data will be encrypted – by 2050, computing power will be sufficient to achieve this.

The EHR database will also be used as a knowledge engine of best practices by physicians to help them reach diagnoses and prescribe treatment by comparing their own patients with other, similar cases worldwide. The data could also be made available for research – for example, for use in observational follow-up studies of drug treatments. This would afford the opportunity of studying real-life data, as compared with data from clinical trials, to estimate the effectiveness of a specified therapy. Since patients would own their own data, each individual would be able to decide whether or not their personal data would be made available for use in this way.