

# Chapter 4

## Risks and Benefits of Technology in Health Care

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### ABSTRACT

*The integration of technology into health care has created both advantages and disadvantages for patients, providers, and health care systems alike. This chapter examines the risks and benefits of technology in health care, with particular focus on electronic health records (EHRs), the availability of health information online, and how technology affects relationships within the health care setting. Overall, it seems the benefits of technology in health care outweigh the risks; however, it is imperative that proper measures are taken to ensure successful implementation and integration. Accuracy, validity, confidentiality, and privacy of health data and health information are key issues that must be addressed for successful implementation of technology.*

### ELECTRONIC HEALTH RECORDS

Technological advances in information and communication technologies (ICT) and computing have made way for the implementation of electronic health records (EHRs), the comprehensive compilation of health care provided to an individual over their lifetime—an exciting and impressive accomplishment. Despite the vast possibilities and efficiencies that EHRs can potentially offer, their implementation into existing healthcare systems

poses some potentially deterring and serious risks, such as confidentiality breaches, identity theft, and technological breakdowns and incompatibilities. Therefore, electronic records should be not hastily integrated into healthcare systems without proper precautions.

#### Advantages

Electronic records offer many advantages over conventional paper-based methods of recording patient data. The comprehensiveness of EHRs can help to bridge the geographic and temporal gaps

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that exist when several clinicians who are geographically dispersed treat the same patient. It is extremely important that all clinicians are aware of past and current medical histories when one patient is treated by several healthcare providers (Mandl, Szolovits, & Kohane, 2001). Since paper-based records are location specific, information contained in one record may differ substantially from records kept in another area or by another provider. When various specialists treat the same patient, patient communication is often hindered, as it can be extremely difficult and time consuming to share patient records between providers using conventional methods (for example, by phone, fax or mail, or physically transporting the record from location to location). Electronic health records, however, enable comprehensive databases of information to be viewed and used by authorized users when they need it and where they need it.

Greater efficiency in accessibility of patient information is thus made possible by the use of electronic records. Accessibility allows for a faster transfer of medical history in a medical emergency or when visiting a new doctor, and also allows researchers and public health authorities—with the permission and consent of the patient—to efficiently collect and analyze updated patient data. Such access is imperative in emergency situations, and also allows public health officials to easily conduct outbreak and incident investigations that may help control epidemics and pandemics, such as SARS, Listeriosis, or new strains of influenza. Accessibility also enables health care providers to reduce costs associated with duplicating tests, since providers have access to already performed test results (Myers, Frieden, Bherwani, & Henning, 2008). Additionally, clerical activities such as appointment reminders and notification of laboratory results can be handled electronically, resulting in greater efficiency and reduced human error.

EHRs can also be equipped with authentication systems, a major guard against security breaches. Patients may be especially wary of having their per-

sonal health information part of a comprehensive database because they are unsure as to who will have access to their medical records. Authentication systems allow for the imposition of various security levels, providing greater control over access to personal information such as immunization records and diagnostic test results. Conversely, paper-based medical records allow healthcare staff to access any part of a patient's medical records. By applying authentication and role-based access to EHRs, personnel such as secretaries and clerical staff will only have access to necessary information (such as that needed for scheduling appointments or providing reminders of scheduled visits) (Myers et al., 2008). In case of an emergency, however, it is possible to develop policies that allow medical professionals to override the protection barriers and gain immediate access to all medical information (Mandl et al., 2001). An additional security feature is accountability, which enables the system to track input sources and record changes. Accountability systems provide an audit trail that can help to eliminate security breaches and, at the very least, track user activities to ensure their appropriateness, authorization, and ethicality (Myers et al., 2008).

Despite the impressive advantages EHRs offer, one must recognize the trade off that exists between accessibility and confidentiality. As noted by Rind et al. (1997, p. 138) "It is not always possible to achieve both perfect confidentiality as well as perfect access to patient information, whether information is computerized or handwritten." Confidentiality, among other issues, must be considered in order to utilize the EHR system to its fullest potential.

### **Disadvantages**

One potential deterrent to full implementation of the electronic health record is compatibility and interoperability across different health information systems. Electronic health records require a standardized system and technology to promote

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