

# The Evolution of the Electronic Health Record

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Medical records have changed dramatically because of the development of the electronic health record. The federal government has promoted the electronic health record through incentives programs. However, obstacles remain with regard to standardization, interoperability, time-consuming data entry, and security issues.

## At a Glance

- The electronic health record (EHR) has undergone transformational change since its introduction and the transition from written medical records.
- Data-sharing challenges across settings still exist, and healthcare providers cite this as an issue.
- A need exists to increase standardization and security of the EHR.

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Medical record documentation of patient data has evolved during the past several years. Early patient medical records included brief, written case history reports maintained for teaching purposes. One such document obtained is a text from Egypt of 48 case reports that includes injuries, fractures, wounds, dislocations, and tumors that date back to 1600 BC. This document was written on papyrus text and acquired by Edwin Smith, an Egyptologist, in 1862 (Atta, 1999; Gillum, 2013). Case reports served as the patient record for many years, used only intermittently by physicians. By the 1880s, concerns regarding medical records as legal documents for insurance and malpractice cases encouraged administrators of hospitals to supervise record content (Gillum, 2013). By 1898, the patient record came to the bedside, moving from retrospective documentation to cases reported in actual time. Medical records resembled more of the present-day record with family history, patient habits, previous illnesses,

present illness, physical examination, admission urine, blood analysis, progress notes, discharge diagnosis, and instructions (Gillum, 2013).

## Transformation of the Electronic Health Record

Electronic health records (EHRs) were introduced in the 1960s in the United States, with multiple systems developed by different groups during the same time period. In the 1960s, Larry Weed, MD, introduced the Problem-Oriented Medical Record (POMR), which focused on a patient problem list and consisted of history, physical examination, laboratory data, complete problem list, initial plans, daily progress notes, and discharge summary (Gillum, 2013; Siegler, 2010). Weed led an effort to develop an electronic version of the POMR. He stated,

I realized that medicine must transition from an era where knowledge

and information processing capacity resides inside a physician's head, to a new day where information technology would provide knowledge and the processing capacity to apply it to detailed patient data. (Jacobs, 2009, p. 85)

In 1971, Lockheed Corporation created a company that eventually became known as Eclipsys Corporation (now part of Allscripts Healthcare Solutions, Inc.), featuring computerized physician order entry. At the same time, the Veterans Administration became one of the first large healthcare systems to fully implement a computerized patient record system, which was eventually fully integrated as an inpatient and outpatient EHR, allowing for the ordering of medications, procedures, x-rays, patient care nursing orders, special diets, and laboratory tests. This EHR is now known as the Veterans Health Information System and Technology Architecture (U.S. Department of Veterans Affairs, 2014). In 1972, the Regenstrief Institute in Indianapolis, Indiana, had developed the Regenstrief Medical Record System. Although it has not been widely used throughout the United States, it has been implemented in three hospitals at the Indiana University Medical Center campus (Tripathi, 2012). McDonald et al. (1999) described the purpose of the EHR in a quote that is still applicable.

Our goal was to solve three problems: (a) to eliminate the logistical problems of the paper records by making clinical data immediately available to authorized users wherever they are, (b) to reduce the work of clinical book keeping required to manage patients, and (c) to make the informational "gold" in the medical record accessible to clinical, epidemiological, outcomes, and management research. (p. 226)