Chapter 3
Knowledge in Action:
Fostering Health Education through Technology

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ABSTRACT

This chapter will explore the possibilities and the challenges presented by technology in the area of patient education. Beginning with an overview of the use of the medical record in patient care, the chapter will move on to discuss the evolution of electronic health records (EHR) and the emergence of health information technology in the education of patients. Emerging technologies, the primary care physician's role in creating tailored education plans for their patients, as well as the importance of self-directness in learning both for the physician and the patient will also be discussed. The chapter will conclude with an overview of information and health literacy and how these impact shared-decision making and patient activation (the ability to be engaged in one's own health care). The overall goal of the chapter is to present how physicians and patients can use technology in order to facilitate better patient care and improve patient outcomes.

INTRODUCTION

The rapid growth of technology has had a profound impact on the doctor-patient relationship. Gone are the days when a patient walked passively into a physician's office and waited to be told what was wrong and how their care was going to be managed. Today, patients visit their doctor armed with scores of print-outs from web searches about their disease, or the disease they think they have. They have researched medications or treatment options. They have downloaded an app that monitors

their blood pressure or blood sugar and they bring progress reports to their office visits or have them sent through a secure email system. Physicians search through reams of data to determine what information can be best used to educate the patient, and then wonder if the patient will be willing to work as a member of the health care team in the management of their disease. Information used to educate patients is no more than a mouse click or an app away. Channeling the right information into an education plan tailored to each patient's individual need is one more challenge for today's

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busy primary care physician. Overcoming this challenge is one of the best hopes for improved patient and community health.

FROM INK TO BYTES: THE EMERGENCE OF THE ELECTRONIC HEALTH RECORD

Patient case records have existed since ancient times. One of the earliest known records comes from the Edwin Smith Surgical Papyrus (Wilkins, 1964).[1] When the papyrus manuscript (circa 3000-2500 B.C.) was finally translated in 1930 by James H. Breasted, it was found to be part of a surgical treatise and contained 48 patient case histories systematically arranged by injury and divided into sections: title, examination, diagnosis, and treatment (Wilkins, 1964).

In fifth century Greece, patient case records evolved significantly under the guidance of Hippocrates and his followers (Reiser, 1991a). Case records had two main purposes in the Hippocratic literature: demonstration of the natural cause of the illness and the description of the illness' clinical course through close observation of the patient's symptoms (Reiser, 1991a). Hippocratic cases were recorded chronologically and followed a set format. The record began with the preceding cause of the illness and the presenting symptoms of the patient. Next recorded were the actions taken by the patient and the resulting symptoms that prompted the patient to seek care. This was followed by notes on the progress of the illness. Such progress notes were only included in the patient record when there was an important change in symptoms. Case reports concluded with disclosure of the results of the case, which was often death (Reiser, 1991a). The chronologic order of the case gave the Greek physician insight as to when therapeutic action should be taken and focused attention on the symptoms that would most predict the outcome, as a tenet of Greek medicine

was not to initiate therapy which would have no effect on the course of the illness (Reiser, 1991a).

In the seventeenth century, sickness was thought to be caused by a single mechanism recognized since the time of Hippocrates, namely the disruption of the equilibrium of the four main building blocks of the body (blood, phlegm, black bile, yellow bile) (Reiser, 1991a). Thomas Sydenham, a seventeenth century physician, recognized that there was a pattern to the symptoms his patients presented with and he began to hypothesize that illnesses could be categorized by their characteristic symptoms (Reiser, 1991a). With this premise, Sydenham began to develop a universal classification of disease that has become the basis for the diagnostic process in modern medicine (Reiser, 1991a).

In the nineteenth century physicians in the major teaching hospitals began to maintain permanent medical records as a method of teaching patient cases to medical students (Gillum, 2013; Siegler, 2010). At that time, standards and quality measures had yet to be developed. Cases were prepared retrospectively as an aid to individual memories with the technique of documentation reflective of the individual writing the case (Craig, 1990). Patient case records were free-form with varying levels of quality (Siegler, 2010). Records were bound in leather volumes and kept serially, with different records kept by the surgical, medical, and outpatient services (Gillum, 2013). Data on patients was hard to retrieve, widely scattered, and often incomplete (Gillum, 2013).

The inconsistent quality and sub-standard completion of records prompted medical boards to restructure the medical record in the late 1800s (Siegler, 2010). These changes reflected the need to manage and preserve patient information. As a result of the restructuring, all interventions experienced by the patient while in the hospital were kept in a single history, with a standard method of collecting and ordering the clinical data (Reiser, 1991b).[2] Forms, graphs, and tables dominated the

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