Chapter 8
Improving Patient Care With Telemedicine Technology

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ABSTRACT

With the spread of telecommunications infrastructure, telemedicine has attracted attention from both healthcare and IT industries. Telemedicine has shown a potential to improve health maintenance, enhancement, as well as healthcare cost reduction. Many governments are boosting telemedicine applications through regulations. The purpose of this chapter is to review the major telemedicine technologies—telemedicine, wearable devices, and emerging innovative health equipment—and current issues of the impact on the patient care in the healthcare industry, the business opportunities, and threats from telemedicine.

INTRODUCTION

With the spread of telecommunications infrastructure, digital health has attracted the attention of the healthcare and IT industries. According to the U.S. Food and Drug Administration (FDA), digital health includes various technologies such as mobile health, telemedicine, wearable devices, and personalized medicine. The use of digital health technologies would provide us with innovative ways to treat our diseases, monitor our health, and give us greater access to healthcare information. Patients are expected to receive innovative medical treatment and preventive medical care, and track health and wellness related activities (Kimball, 2018). Healthcare providers could increase the quality of services, reduce costs, improve access to healthcare information, and make medicine more personalized for patients through the progress of digital health. Digital health has the potential to break conventional healthcare: Therefore, a variety of companies are entering this space including primary healthcare related organizations such as pharmaceutical companies, medical equipment manufacturers, hospitals, etc., and electronics device manufacturers, communication companies, and IT companies. According to Thilo Kaltenbach (2016), the digital health market was 79 billion USD in 2015, but it is expected to grow to 206 billion USD in 2020 with an annual growth rate of 21%.

This chapter reviews a component of digital health: telemedicine technologies - telemedicine, wearable devices, and emerging innovative health equipment, and discusses related impact on patient care, business opportunities, and threats.

TELEMEDICINE

Telemedicine is changing the lives of patients by making healthcare more accessible than ever before. The Internet is completely changing the way people look at managing their health. As technology advances, individuals can integrate telemedicine more seamlessly. For example, the Apple Watch has the capability to track heart rates and feed it to smart phones. This information can be sent to primary care physicians to give them real time data on how their patient's body is performing. Patients with chronic illnesses like diabetes and heart disease now can be monitored more closely with the help of wearable health devices and interactive patient portals.

Scheduling and completing appointments is now easier than ever before. Patients can log on and send an email rather than call and speak with someone directly. They can schedule an appointment from an automated calendar rather than do so with a medical secretary. Patients can complete a follow up health survey with questions related to their in-office visit a few weeks after the fact rather than return to the office for a follow up visit. Conversely, a physician can answer a handful of emails much faster than they can see the same number of patients since each would need to come in, check in, confirm their information, make their payment, get their vitals taken, speak with the physician, debrief with an assistant, pay for their visit, and schedule the next one. A virtual visit is as easy as answering a few questions or reading a message. The process is much easier than in-person visits. This encourages patients to check in with their doctors more frequently. Therefore, patients should be able to sustain a better level of health (Rupp, 2017; Sanyal, 2018).

How Telemedicine Works

The first positive effects of telemedicine were seen in the late 1800s when appointments began to be completed via telephone. Hugo Gernsback predicted that in the future, doctors would utilize not only the telephone but also TV and radio to treat and reach patients. Flash forward to Pennsylvania in the 1940's when radiology images were sent via telephone wire over 24 miles. It was not until the 1950's that telemedicine was used to send out neurological exams at the University of Nebraska. Also, in the 1950's in Nebraska, closed circuit TVs began being used by psychiatric practitioners to complete patient consultations. Because video conferencing with physicians is just now hitting the mainstream, these doctors were ahead of their time. Telemedicine remained largely stagnant until the age of the Internet. Since the inception of Web 2.0 and legislation in the Affordable Care Act of 2010, telemedicine options are now nearly endless (Rupp, 2017).

Alexa, Amazon's voice assistant, will probably soon be able to refill prescriptions at the pharmacy down the street. Telemedicine allows health care professionals to use telecommunications to meet with, evaluate, diagnose, and treat patients remotely through technology. Telemedicine may be utilized on many different applications like smartphones, video conferencing, mobile applications, and high definition televisions to conduct virtual appointments. This technology was originally created to address medical professional shortages, and to reach patients that live far from traditional medical facilities.

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