Chapter 84
Global Telemedicine and eHealth:
Advances for Future Healthcare–Using a Systems Approach to Integrate Healthcare Functions

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ABSTRACT

This chapter is about the intersections taking place globally in the delivery of healthcare. In today's world, quality health is about access: access to transportation to the hospital, access to the right people, doctors, nurses, and specialists, and the doctor's access to the latest lab tests and equipment. But in our future, all of this goes away. You do not need transportation, as medical ecosystems are becoming ubiquitous. Access to the best medical care available means access to the hospital system living in the cloud. The best labs are built into our phones whereby today's array of sensors can be focused on prevention and delivery systems designed for keeping people healthy. Behind this is the driving vision that medicine will be transformed from reactive and generic to predictive and personalized, reaching patients from the cloud through their telephones in their own homes, making up for a coming shortage in doctors and nurses. Where this brings us is that there is an abundance of confusion as to what Telehealth and eHealth is or what it will be. This chapter addresses an eHealth definition for review, thoughts on eHealth systems, resistance to change issues to be considered, the CVS Minute Clinic's introduction of innovation and disruptive eHealth care models and systems, a Systems Engineering Management proof of concept project with the Kansas Department of Corrections, and globally oriented conclusions and recommendations. (Diamandis & Kotler, 2012).

INTRODUCTION

For the last 50 years, different to other industries, technological advancements in medicine have increased abundantly, rather than decreased costs in the delivery of healthcare. However, recent developments in mobile health technology, addressed here as Telehealth and eHealth, gives hope that the technology tide is turning and that these trends will cause technology to improve

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care (which it has successfully done for years) and drive costs down. Resistance to change will hopefully be overcome by behaviorally designed mobile application technology user interfaces. So, where does this hope come from? A study by a recent Information Week article has hit the nail on the head. 70% of polled hospitals and/or healthcare organizations plan to deploy the iPad by the end of 2012. This matched with market research indicating that 81% of physicians (In the United States alone) will own a smart phone or tablet by the end of 2012. Of those, more than 50% will use Telehealth and eHealth applications daily in 2012. Globally it is predicted that 500 million people will be using mobile Telehealth and eHealth applications by 2015. The world and Telehealth and eHealth personnel will turn these applications into Trojan Horses. Competition has driven down the overall costs of powerful 'pocket' computers to the point that they are becoming as ubiquitous as cell phones were just five years ago. What this will mean is that developing nations will not have to build the healthcare infrastructure that has been developed over the past fifty to sixty years in the industrialized world. The objective of this chapter is to provide you with a vision and perspective of the future of eHealth and the behavioral and systemic challenges to be overcome.

BACKGROUND: THE GLOBAL EHEALTH DEFINITION FOR THE FUTURE

Telemedicine healthcare delivery systems are currently using advanced communications technology based on connectivity, interactions, transactions, information, and intervention. It started with National Aeronautics and Space Administration, NASA, as human astronauts were flying in space. NASA's advanced communication satellites and the ability to monitor the health of the astronauts was the tipping point for the delivery of healthcare digitally. The revolutionary and potential effect on the digital delivery of healthcare globally provides the capability to: bridge interactions between clinicians and patients, overcome barriers of distance and time, build virtual communities that will interact and share knowledge and expertise, enhance the continuity of care and greatly improve access to healthcare in remote and isolated areas. (Bowonder, Bansal, & Giridhar, 2005)

Our definition for Telemedicine - eHealth is seen as:

e-Health is an emerging field in the intersection of geo-medical informatics, public health and business, referring to health services and information delivered or enhanced through the Internet cloud and related technologies. In a broader sense, the term characterizes not only a technical development, but also a state-of-mind, a way of thinking, an attitude, and a commitment for networked, global thinking, to improve health care locally, regionally, and worldwide by using information and communication technology.(J. M. Eisenberg)

Telemedicine - eHealth (referred to as eHealth in this chapter) will act as the center piece for responsive healthcare delivery by providing: delivery of healthcare where patients and providers are not at the same location at the same time, a new mechanism for providing networked medical knowledge through relational and cloud computing technologies. (Currier & Kshetri, 2011)

Using a different approach to delivering global eHealth care, a 'System of Systems' approach will require looking at traditional medical practices and developing new models to integrate medical, healthcare and communication functionality. This approach will be used to combine the skills of various healthcare and system engineering professionals with emerging and advanced computer and telecommunication technology. The healthcare functionality that exists today in health care delivery environments is obsolete and not integrated therefore the delivery of healthcare is more complicated and cost-ineffective. System of Systems is