

Telemedicine: The Present and the Future

Marion BJ^{1*}, Tyler BJ² and David W¹

¹Mercy College, USA

²Avalon University School of Medicine, USA

***Corresponding author:** Marion Ben-Jacob, Ph.D., Department of Mathematics and Computer Sciences Mercy College GMH-111, 555 Broadway, Dobbs Ferry, NY 10522, USA, Tel: 914-674-7524; Email: MBenJacob@mercy.edu

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Abstract

Telemedicine is the remote diagnosis and delivery of healthcare using telecommunications technology. This article presents an overview of different components of a telemedicine system incorporated into the present state of the field. A projection of the future of this exciting venue is then discussed.

Keywords: Telemedicine; Technology; Academics

Introduction

This paper presents an overview of the perspectives of telemedicine, reflecting the present state of the field. It concludes with a projection of the status of telemedicine in the future. Telemedicine is the remote delivery of healthcare using telecommunications technology. It is an approach to medicine that can lower the overall costs of healthcare. It affords care to some who may not be in a position to see a doctor or a medical caregiver because of geographical distance. The technology involved supports consultations between medical experts. It is also used for recording and storing patient history and the transmission of scans such as x-rays and MRIs [1].

Discussion

Telemedicine is an alternative venue for in-person, doctor-patient interactions. As such, it should not be compared to the latter milieu. What the two do have as a common goal is the promotion of healthcare. The underlying ethics of both settings are the same. They strive for sound doctor-patient relationships, protection of privacy, and treatment of diverse populations in an equitable manner, and practice of good healthcare.

Future societal integration of telemedicine depends on four broad characteristics: convenience; value;

quality; and confidence. The first two features are present in healthcare society already. It is more convenient to contact a healthcare professional via the Internet and have an appointment very quickly, if not almost immediately, than travel a distance after scheduling appointment days in advance. The cost of telemedicine is significantly less than face-to-face medicine, reflecting its value, if for no other reason there is no overhead for the doctor or medical professional. We contend the quality is good now and will only improve with time as the use of telemedicine expands and people at both ends become more comfortable with the platform. The level of confidence will grow as telemedicine is integrated and accepted by society. This is true with every new undertaking.

Caregivers involved in telemedicine need to take courses to become proficient. Presently, there are onsite and online courses available [2,3]. Our opinion is that in general they are too short in length because their impact involves the healthcare of individuals and the participants need ultimate practice with the teleconferencing and the technology in general [4].

Technology is a critical component of telemedicine. Standard telemedicine systems need three basic components; an interface for patients, an interface for professional caregivers, and a network for connection. At the beginning of the treatment or healthcare interaction, authentication of the user is required. Then

data must be input in an encrypted form to insure privacy. After transmission, the data needs to be decrypted. This is to insure security [5].

After security, another important factor is network speed or bandwidth, which is the number of bytes/second that can be sent over the network. A slow network speed will hinder the success and acceptability of telemedicine [6].

Reliability of the transmission is critical as well. Hardware and software must meet industry standards. Maintainability of the system from the perspectives of cost and technical level is also necessary [7].

With regard to the technology, we are confident that the future will see faster and more secure systems with easier access for professionals and non-professionals alike. We are of this opinion based on recent technology. This is exemplified by the fact that over the past 20 years society has accepted online finance, over the past 15 years, ecommerce has been integrated into our lives, over the past 10 years we have been comfortable with social media, and online learning has been accepted and advocated as part of the academic world.

Conclusion

Telemedicine is here to stay and advance for numerous reasons; it provides medical care to people who live in remote areas, reduces the overall costs of healthcare, allows for faster access to medical opinions, diagnoses, and treatments, and better access to medical information. As more people support this innovative environment for healthcare and the associated technology improves, telemedicine will grow in popularity and acceptance. Ultimately, this acceptance will trickle down to the academic world.

Our contention is that in the very near future colleges and universities will offer a major in telemedicine. There are several reasons for this view. More and more professional opportunities in the field will be available, and as such, colleges and universities will offer this major field of study and compete for students. Support of innovative fields that are advancing in the United States is ongoing. This is evidenced by the recent major of cyber security at many institutions of higher learning and the promotion of the STEM (science, technology, engineering, and mathematics). Cyber security is a relatively new major, which evolved from the fast-paced growth of technology and the need to insure the security of computer systems from the interference with or damage to the hardware, software, provided data and services [8]. There is significant need for

professionals in the STEM disciplines as demonstrated by statistics, literature, and support of the U.S. government for programs and projects in the fields [9-11].

Our perspective for the future academic major of telemedicine would include a substantial number of science courses, e.g. biology, chemistry, nursing courses, and technology courses. The individual college or university would tailor the specific major. With the completion of an undergraduate major in telemedicine a successful graduate could further their studies in medical school, nursing school, or graduate school in computer science or human resources.

Telemedicine is the future of medicine because of all its positive characteristics, but most importantly because it provides care for many who would otherwise not have access to it. Telemedicine is relatively new and as such, it will take time for its total integration into society.

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