Telemedicine: A Review

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Article ID: WMC002847
Article Type: Review articles
Submitted on: 14-Feb-2012, 08:49:06 PM GMT  Published on: 17-Feb-2012, 07:46:27 AM GMT
Article URL: http://www.webmedcentral.com/article_view/2847
Subject Categories: PUBLIC HEALTH
Keywords: Telematry, e-health, Telehealth, Mobile health
How to cite the article: Bajpai M. Telemedicine: A Review. WebmedCentral PUBLIC HEALTH 2012;3(2):WMC002847
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Telemedicine: A Review

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Abstract

Tele is a Greek word meaning distance and mederi is a Latin word meaning to heal. Time magazine called telemedicine healing by wire. Although initially considered futuristic and experimental, telemedicine is today a reality and has come to stay. Telemedicine has a variety of applications in patient care, education, research, administration and public health. This paper is an attempt to enlighten the principles underlying telemedicine and also discuss the objectives and current scenario of telemedicine in India.

Introduction

Telemedicine is the exchange of information at a distance, whether that in formation is voice, an image, elements of a medical record or commands to a surgical robot. It seems reasonable to think a telemedicine as the remote communication of information to facilitate clinical care. Moreover, communication systems have a role in home healthcare, providing patients with access to information about their care (Patient education and guidance) and the ability to interact regularly with healthcare worker to assure themselves that they are managing their own care well. In primary care (General practitioner) and specialist (consultant) services, and between primary care and patients. There are also obvious internal communication needs within single hospitals (Intra – organizational needs) in addition to inter organizational needs. Telemedicine, a term coined in the 1970s, which literally means "healing at a distance" [1], signifies the use of ICT to improve patient outcomes by increasing access to care and medical information. Recognizing that there is no one definitive definition of telemedicine – a 2007 study found 104 peer-reviewed definitions of the word [2] – the World Health Organization has adopted the following broad description. The delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries, research and evaluation, and for the continuing education of health care providers, all in the interests of advancing the health of individuals and their communities" [3].

Primary goals of telemedicine:
1. To provide clinical support.
2. It is intended to overcome geographical barriers, connecting users who are not in the same physical location.
3. It involves the use of various types of ICT.
4. Its goal is to improve health outcomes.

Historical Aspect of telemedicine

Historically, telemedicine can be traced back to the mid to late 19th century [4] with one of the first published accounts occurring in the early 20th century when electrocardiograph data were transmitted over telephone wires [5]. Telemedicine, in its modern form, started in the 1960s in large part driven by the military and space technology sectors, as well as a few individuals using readily available commercial equipment [4,6]. Examples of early technological milestones in telemedicine include the use of television to facilitate consultations between specialists at a psychiatric institute and general practitioners at a state mental hospital [7], and the provision of expert medical advice from a major teaching hospital to an airport medical centre [8]. Recent advancements in, and increasing availability and utilization of, ICTs by the general population have been the biggest drivers of telemedicine over the past decade, rapidly creating new possibilities for health care service and delivery. This has been true for developing countries and underserved areas of industrialized nations [9]. The replacement of analogue forms of communication with digital methods, combined with a rapid drop in the cost of ICTs, have sparked wide interest in the application of telemedicine among health-care providers, and have enabled health care organizations to envision and implement new and more efficient ways of providing care [4,6]. The introduction and popularization of the Internet has further accelerated the pace of ICT advancements, thereby expanding the scope of telemedicine to encompass Web-based applications (e.g. e-mail, teleconsultations and conferences via the Internet) and multimedia approaches (e.g. digital imagery and video). These advancements have led to the creation of a rich tapestry of telemedicine applications that the world is coming to use. Barriers in the line of Telemedicine Telemedicine holds great potential for
reducing the variability of diagnoses as well as improving clinical management and delivery of health care services worldwide by enhancing access, quality, efficiency, and cost-effectiveness [4,10]. In particular, telemedicine can aid communities traditionally underserved – those in remote or rural areas with few health services and staff – because it overcomes distance and time barriers between health-care providers and patients [11]. Further, evidence points to important socioeconomic benefits to patients, families, health practitioners and the health system, including enhanced patient-provider communication and educational opportunities [12].

Despite its promise, telemedicine applications have achieved varying levels of success. In both industrialized and developing countries, telemedicine has yet to be consistently employed in the health care system to deliver routine services, and few pilot projects have been able to sustain themselves once initial seed funding has ended [11]. Asian scenario. In 21st Pacific Science congress held in Japan in 2007 was attributed to Asia pacific telemedicine interactive. The meeting was attended by more than 80 participants from the following 16 countries: Bhutan, Fiji, Germany, India, Indonesia, Japan, Korea, Nauru, Nepal, Pakistan, Philippines, Russian Federation, Thailand, Vietnam, Sri Lanka, Ukraine, and United States of America. The International and Regional Organizations have to promote and supported the introduction courses on telemedicine and e-Health in all training and educational programs of health-care professionals including doctors, nurses and technical staff, as for example ITU Telemedicine Expert Training Course hosted at Tokai University, School of Telemedicine & Biomedical Informatics at SGPGIMS, Lucknow, India, Telemedicine Course at Holy Family Hospital in Pakistan. The meeting recommended that the awareness of new information/telecommunication technologies and in particular IP based solutions for e-health applications have to be one of the main subjects of national/regional telemedicine projects and workshops/seminars. [13] Telemedicine in India The Apollo group of hospitals was a pioneer in starting a pilot project at a secondary level hospital in a village called Aragonda 16 km from Chittoor (population 5000, Aragonda project) in Andhra Pradesh. Starting from simple web cameras and ISDN telephone lines today, the village hospital has a state-of-the-art videoconferencing system and a VSAT (Very Small Aperture Terminal) satellite installed by ISRO (Indian Space Research Organisation). Coupled with this was the Sriharikota Space Center project (130 km from Chennai) which formed an important launch pad of the Indian Space Research Organisation in this field. [14]

The telemedicine software system has also been developed by the Centre for Development of Advanced Computing, C-DAC which supports Tele-Cardiology, Tele-Radiology and Tele-Pathology etc. It uses ISDN, VSAT, POTS and is used to connect the three premier Medical Institutes of the country (viz. All India Institute of Medical Sciences (AIIMS), New Delhi, Sanjay Gandhi Post Graduate Institute of Medical Sciences (SGPGIMS), Lucknow and Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh). Now it is being connected to include Medical centres in Rohtak, Shimla and Cuttack.

[15]. Challenges in the line of telemedicine [16] Perspective of medical practitioners: Doctors are not fully convinced and familiar with e-medicine. Patients’ fear and unfamiliarity: There is a lack of confidence in patients about the outcome of e-Medicine. Financial unavailability: The technology and communication costs being too high sometimes make telemedicine financially unfeasible. Lack of basic amenities: In India, nearly 40% of population lives below the poverty level. Basic amenities like transportation, electricity, telecommunication, safe drinking water, primary health services, etc. are missing. No technological advancement can change anything when a person has nothing to change. Literacy rate and diversity in languages: Only 65.38% of India’s population is literate with only 2% being well-versed in English. Technical sensitivity: e-medicine supported by various types of software and hardware still needs to mature. For correct diagnosis and pacing of data, we require advanced biological sensors and more bandwidth support. Qualitative approach: Quality is the essence. And every one wants it but this can sometimes create problems. In case of healthcare, there is no proper governing body to form guidelines in this respect and motivate the organizations to follow-it is solely left to organizations on how they take it. Government Support: The government has limitations and so do private enterprises. Any technology in its primary stage needs care and support. Only the government has the resources and the power to help it survive and grow. There is no such initiative taken by the government to develop it. Conclusion Finally, many developed countries reported concerns regarding legal issues such as those associated with ensuring patient confidentiality. For support in establishing legal policies, Member States are encouraged to refer to the legal report (forthcoming), which forms a part of the GOe eHealth series.
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