

TELEMEDICINE: IMPACT AND LIMITATION IN MODERN MEDICAL PRACTICE

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ABSTRACT

The paper briefly reviews the current trends and impact of telemedicine in health care delivery, its challenges and obstacles to be overcome and concludes on its future prospects

Keywords: Telemedicine, teleradiology, telepathology, telesurgery

INTRODUCTION

Telemedicine is one of the most vibrant emerging techniques in medical practice in modern times. Telemedicine is defined as "the use of medical information exchanged from one site to another via electronic communications, for the health and education of the patient or healthcare provider, and for the purpose of improving patient care"[Omar, 2002]. The United Kingdom Telemedicine Association defines Telemedicine as: "The delivery of healthcare services, where distance is a critical factor, by all healthcare 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 providers, all in the interest of advancing the health of individuals and their communities"[HESI, 2001]. Its primary aim is to provide skilled medical care to patients who are in some way isolated from the specialist care that they need.

The first use of Telemedicine was in 1959 where in the University of Nebraska College of Medicine, a group therapy was conducted by Telemedicine [Omar, 2002]. Since then individual health institutions particularly in the United States have employed the techniques in healthcare delivery [Ricci et al., 1997; Bashur et al., 1975]. Examples of telemedicine include teleradiology and telepathology, where, for the most part, images (x-rays, lab slides) are electronically sent to a distant site for viewing and interpretation by others.

In Africa, Kenya and Uganda had benefited from Telemedicine through the Project SHARE in which both of these countries established cross-continental medical links with Canada [Marescaux et al., 2001].

Telemedicine recently made a headline news when a gall bladder operation was successfully performed by surgeons in New York on a patient more than 4,000 miles away in Strasbourg [Marescaux et al., 2001]. In the United Kingdom, video communications technology is being pioneered to save the lives of critically ill new babies at Special Baby Units [Wootton, 2001].

Application of Telemedicine

Telemedicine has enormous and diverse uses in medical practice. A growing number of medical specialties, which employ Telemedicine, includes, radiology, oncology, cardiology etc. Tele-interaction that often involves live audio and video "virtual visits" between patients and medical professionals has been very popular in America in recent time [Marescaux et al., 2001]. In this approach such vital and confidential patient details such as blood pressure, laboratory results e.g. FBS(fasting blood sugar) etc. could be obtained from the patient's home to a clinic.

Teleradiology involve the transmission of medical images(x-rays, CT scans, MRIs, etc.) to expertise radiologists for interpretation. It is interesting to note that Teleradiology is one of the few specialties in the United States that Medicare actually pays for without having to jump through a complicated consultation loop [Reid et al., 1997].

In Psychiatry, Telemedicine has been used to facilitate doctor-patient consultation over long distances. For example, in the United Kingdom, doctors in Lewisham Hospital, South London, through a pilot study have successfully managed psychiatric patients in their General Practitioner's surgeries. The study showed that the patients were very tolerant of the technology [HESI, 2001].

In Dermatology, the approach has also been employed successfully. By employing such specialized equipments such as dermatoscopes or high resolution digital examination cameras, colour pictures of skin lesions or possible malignant melanoma could be obtained. Such pictures can provide the basis for a diagnosis and treatment. The consultant can differentiate between patients whose treatment can be handled by the physician, with appropriate device, and those who need to travel to hospital to be seen in person [HESI, 2001]. Periodically, the consultant calls up the workload awaiting attention. The process thus eliminates waste by ensuring patients who genuinely need help use it.

Cardiologists have utilized telemedicine to perform remote auscultation as well as to transmit and view patient data, such as Electrocardiogram (EKG) and ultrasound information [Bashur, 1975; HESI, 2001].

Telesurgery applications are useful in both pre-operative and operative situations. In pre-operative situations, candidates can be effectively screened and prepared for surgery. *Telemedicine* recently made a headline news when a gall bladder operation was successfully performed by surgeons in New York on a patient more than 4,000 miles away in Strasbourg [Marescaux et al., 2001]. Post-operative follow-up, wound care, and other tasks could also be carried out over distances without the patient having to travel for review.

Emergency medical care can be delivered via *Telemedicine*. The new Tempus 2000 remote monitoring device developed by Remote Diagnostic Technologies in the United Kingdom [HESI, 2001] for example is used aboard certain airlines. When illness strikes, the system automatically relays the passenger's vital signs to emergency room physicians at a facility operated by MedAir, a Phoenix company. This device is able to send real-time electrocardiogram information, temperature (via an ear probe), blood pressure and other vital signs on the patient via a built-in modem connected to a seat-back satellite phone. This allows physicians on the ground to remotely monitor the situation and prescribe treatment [HESI, 2001]. Such is the awesome application of *Telemedicine*.

Recently in Japan, *Telemedicine* has been applied to monitor the health needs of the elderly in remote

forested slopes of the Ushitake mountains in Yamada [HESI, 2001; Callas et al., 1997].

Other uses currently being developed include the training of medical students, sometimes hundreds of miles away on a virtual patient or whole body mannequin, which responds electronically to their drug prescriptions or other therapies [Omar, 2002]. If they get it wrong it is a virtual death rather than the death of a real patient. It is medicine's equivalent of flight simulators to train pilots. Elsewhere, medical stimulated scenarios have been employed in antenatal care via a virtual clinic. In addition to saving time, there is an educational aspect for both specialists and general practitioners who increase their knowledge as a result of being party to decisions and discussions during the teleconferencing [Ricci et al., 1997].

Obstacles facing Telemedicine

The major obstacles to widespread use of telemedicine include some of the administrative structures of medical care. Changing laws and regulations, as well as the attitudes of some physicians involved in the traditional delivery of medicine, present challenges to newer modes of health care delivery. The center for Law Ethics and Risk in *Telemedicine* was established almost a decade and half ago in Wales, United Kingdom to look at the legal aspect of commissioning and management of *Telemedicine* [Omar, 2002; HESI, 2001]. Financial cost has also been a great limitation. In the United States of America for example, apart from *Medicare* reimbursing for other aspects of *Telemedicine*, broader reimbursement is still unavailable [Omar, 2002]. Throughout Europe, there is a high level of inconsistency regarding legality, reimbursement, confidentiality, liability and ethics of *Telemedicine*. Another hurdle is the lack of physician familiarity with high technology. This can equate to reluctance to invest in equipment, or even participate in consults which do not allow face-to-face interaction. All these must be overcome for *Telemedicine* to operate successfully.

Conclusion

Despite these challenges, *Telemedicine* is steadily making a gradual but positive stride in medical practice. Trials and pilot schemes abound. A clinical review in the British Medical Journal points out that much of the growth in *Telemedicine* has been in the form of feasibility studies and pilot trials [Wootton, 2001], nevertheless *Telemedicine* remains a promising mode of health care delivery, not to replace but to supplement quality health care being provided already.

The challenges facing widespread implementation of *Telemedicine* are real, and they are guiding the development of solutions. Certainly, the potential of *Telemedicine* cannot be over emphasized that is, to transform the delivery of quality health care and to improve the health of many people across the world.

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