

Telemedicine - Geography is History

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ABSTRACT

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In contrast to the conventional medical practice where the patient and doctor meet each other in person and interaction & physical examination take place, in telemedicine doctor and patient are at a distance and medical practice is carried out. In telemedicine, medical information is transferred through post, phone, internet or any type of communication network for the purpose of medical consultation or remotely supported medical procedures. Telemedicine generally refers to the use of communication and information technology for the delivery of medical care from a distance.

The technological standards, equipment needed, the legal position, the draw backs are all discussed in detail.

Utilizing this IP connectivity Samad IVF has established a global Telemedicine network for Infertility and ART practice for patients, general practitioners, OBG specialists and third party administrators (TPA). This global network provides Consultation, Investigation, Diagnosis, Prescription, Treatment, Counseling and Telementoring.

Keywords: Telemedicine, Legal position, Equipment's needed, Drawbacks.

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In contrast to the conventional medical practice where the patient and doctor meet each other in person and interaction & physical examination take place, in telemedicine doctor and patient are at a distance and medical practice is carried out. So in this 'in absentia care' or 'care at a distance', the distance between the doctor and patient is meaningless, so as to mention "Geography is History". Smoke signals used by African villagers to denote serious disease and two way radios used in Australia in remote areas in the last century are early examples of 'care at a distance'

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WHO Definition

"The delivery of healthcare services, where distance is a critical factor, by all healthcare professionals using information and communication technologies, for treatment and prevention of diseases and injuries; by transfer of medical data in electronic form from one location to a distant location."

HISTORY OF TELEMEDICINE

The practice of Telemedicine started first at Boston, USA in 1967. In India telemedicine practice was initiated at Lucknow and Chennai at 1997. In Kerala the first unit of telemedicine was established at Medical College Trivandrum in 2003. In India, recognizing the common interest of health and community welfare, telemedicine was promoted for the availability of quality medical services to the needy, irrespective of socio economic and geographic disparities like rural, remote and inaccessible places. Available Health care statistics in India indicate that 75% of qualified doctors practice in the urban areas and 23% in semi-urban areas and 2% in rural areas where as 70% of the population are in the villages. Hence 80% of medical facilities are available only in the urban areas. This disparity in Health care can be controlled using telemedicine.

Technology and Equipment's for Telemedicine

Internationally technology standards are laid down by Technology Development Board (BDT) under the International Telecommunication union (ITU). The basic telecommunication connectivity between the patient and the doctor may be a wired one or a wireless one. The wired connectivity could be telephone line,

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ISDN line, Cable connection or Internet. The wireless connection could be satellite connection (VSAT or otherwise) or wireless internet.

For effective video conferencing the band width and nature of connectivity are important. Synchronous digital subscriber line (SDSL) is preferred over asynchronous digital subscriber line (ADSL) from any Internet service provider (ISP) or satellite service provider. A minimum of 384 kbps bandwidth is necessary for supporting minimum 30 frames per second (FPS) for good quality video pictures.

Once the connectivity is established between the patient and the doctor at a distance, hardware and software equipment's for data, audio and video transmission are needed. Computers, Video cameras and appropriate software are required for distant audio video conferencing for the practice of medicine. For effective and safe practice of telemedicine across countries and continents in the world suitable hardware and safety software are a must. PIR (Personal Information Record), PHR (Personal Health Record), EMR (Electronic Medical Record), DICOM (Digital Imaging and communication in Medicine), PACS (Picture Archival and communication system), HL7 (Health Level 7), AES (Advanced Encryption Standard) and many other software based on international standards are necessary for global practice of Telemedicine.

In computer technology world, telemedicine refers to practice of clinical medicine whereas tele- health, e-health, digital health denote public health care from a distance using computers. Ubiquitous Health (u-Health) means monitoring the health of a person for appropriate early warning and action with simultaneous centralized recording of health parameters of the individual. Multifunction sensors with global positioning system (GPS) integration are attached to the body of the individual so that his health function is tracked by satellites wherever he is on the globe.

METHOD OF TRANSMISSION IN TELEMEDICINE

1. Store & Forward (Asynchronous)

Patient data (History/investigation/pictures) collected at one end & transmitted to other end at a convenient time. Medical opinion from the other end will be sent back at a convenient time.

2. On-line (Synchronous)

Live audio-video conferencing & data transfer from the patient end to the doctor end. Opinion & prescription are given instantly.

Type of Service Delivery

1. *Primary Medical Service* - In areas where it is not available.
2. *Expert Medical Service* - In areas where it is not available.
3. *Service / Business Expansion* - In any area.

Utility of Telemedicine

Apart from consultation and treatment, medical education and health care awareness for public health are two areas utilizing this new technology. This can be done from point to point or point to multipoint. Mobile Telemedicine units are utilized for village level practice and disaster medical practice during tsunami or similar problems. Medical conferences are also conducted utilizing distant connectivity at various points in the country and across the globe for doctors, so that no travel is needed and interaction from your home town to the conference hall is possible.

Guide lines in Telemedicine

A document "Guide lines and standards for telemedicine" by B S Bedi and R L N Murthy was published by department of information technology, New Delhi and Antrix corporation ISRO, Bangalore for ready reference. Among other things, it briefly addresses data standards, data exchange messaging standards, storage and transmission standards, IT Infrastructure technical standards for inter- connectivity, inter-operability, scalability, security and process guidelines. The telemedicine centers can be classified into three classes

- 1) Primary Telemedicine Centre (PTC)
- 2) Secondary telemedicine centre (STC)
- 3) Tertiary telemedicine centre (TTC)

Each class is subdivided into L1, L2 and L3 depending on size and facility. For each class, telemedicine platform, clinical devices, video conferencing units, communication hardware, PIR software, storage and transmission format, exchange of data format, identifier standards for patient and provider and security encryption standards are recommended.

Law for Telemedicine Practice

A draft law was published by Govt. of India as Telemedicine Act 2003. Once it is passed by the parliament it notifies the formation of telemedicine authority for telemedicine licensing and related matters therewith. Duties and liabilities of persons involved in telemedicine are described in the draft bill for institutions and

practicing doctors. Transitional provisions are ensured for the health and safety of patient who is undergoing treatment by way of telemedicine till the bill is passed.

Cyber Law

It deals with crimes related with computer and internet usage, not directly involved with telemedicine practice.

Drawbacks in Telemedicine Practice

Security and privacy of patient data are taken care of by multilevel security software (AES) but the right of the patient as the owner of his medical data and the access to the medical data thereby, may jeopardize the security.

The Law and Guidelines for Accreditation and licensing of telemedicine centers are different in different countries. Medical degrees and qualifications may not be mutually recognized by all the countries in a global scenario of telemedicine practice. Honoring of prescriptions and standards across countries may pose problems. Ethics and law are different in different countries. Accepted local standard in a country may not be a global standard.

Custody of digital medical records (EMR), digital signature and Insurance & reimbursement protocols vary from country to country.

New Trends

In the field of tourism and travel, telemedicine will be a boon for NRI and foreigners when they seek healthcare or get sick in India. In the field of Reproductive Tourism for IVF treatment (medical tourism) pre-travel consultation and post-treatment follow up by video conferencing between distant countries will boost the patient confidence. Travelers and nonresident workers who get sick in India can have home town or family doctor consultation via international telemedicine connectivity.

Future

Home facility can be used for monitoring of personal health and early warning for speedy remedial action.

Tele-mentoring can be utilized for education and training including robotic surgery.

Virtual consultation rooms at distant places can be set up with equipment's for body exam with tactile sensors. Online monitoring and diagnosing equipment's are already in use.

ISRO and Telemedicine

Through national satellite network, ISRO has established a wide network of telemedicine centers throughout the length and breadth of India connecting super specialty government and private hospitals with district hospitals and primary health centers including multi-function village-resource centers (VRC). ISRO also provides medical service to certain African countries utilizing the satellite network

Telemedicine at SAMAD IVF Hospitals

Samad IVF hospital Trivandrum is one among the 150 + telemedicine clinics connected by ISRO. It is the only single specialty hospital providing Infertility and IVF services in the ISRO network. Samad IVF hospitals at Trivandrum and Cochin also have private International IP connectivity for global telemedicine practice. For consultation and reproductive tourism, patients from Gulf, Europe and North America are utilizing this International IP connectivity. Utilizing this IP connectivity Samad IVF has established a global Telemedicine network for Infertility and ART practice for patients, general practitioners, OBG specialists and third party administrators (TPA). This global network provides Consultation, Investigation, Diagnosis, Prescription, Treatment, Counseling and Telementoring.

END NOTE

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