HOSPITAL NOTES

# Guidelines and Standards For Setting Up a Telemedicne Centre : The Essentials

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One of the commonly observed problem in health care system is the unavailability of the medical practitioner at each and every place. Secondary and tertiary medical expertise is not available in several areas of the world. Quite often, many patients are sent elsewhere at a considerable expense. In a number of these cases, the treatment could have been carried out by the local doctor with advice from a specialist.

Offering medical advice remotely, using state of the art telecommunication tools is now a regular feature in several parts of the world. Telemedicine is practical, safe and cost effective. Telemedicine hinges on transfer of text, reports, voice, images and video, between geographically separated locations. Success relates to the efficiency and effectiveness of the transfer of information.

Concept

Telemedicine is a confluence of communication technology, information technology, medical engineering and medical science. Tele is a Greek word meaning "distance "and Mederi is a Latin word meaning, "to heal". Time magazine called Telemedicine "healing by wire". Though initially considered "futuristic" and "experimental", Telemedicine is a reality today. Telemedicine project consist of a "Point to Point" System between the patient's end, which is probably a general hospital located in a village or a town and an expert doctor's end which is a specialty hospital Situated in a city .Telemedicine is a method, by which patients can be examined, investigated, monitored and treated by the doctor located in different places.

Space Requirement (1)

For Primary level telemedicine center a minimum of 400 sqft., for Secondary level telemedicine center minimum of 550 sqft. and for Tertiary level telemedicine center minimum of 600 sqft. surface area is required

Indoor requirement

1. The controlled environment is essential for indoor VSAT equipments. The room temperature must be within 27 tolerance of 2 degree centigrade through out the operation of VSAT system. Also space provided for indoor VSAT equipments must be dust free and there should be adequate space around system for better air circulation.
2. Indoor units are small rack mount type .A suitable table & chair arrangement is required for telemedicine centre.
3. # 1, 10 A dual pol MCB on unregulated power line (for 1 KVA UPS input) must be provided in the room where VSAT is to be installed. The voltage between neutral & earth must be less than 3 volts in a raw supply for UPS input.

Outdoor Requirement

1. The location having flat circular area of 4meters in diameter is must for 3.8 Antenna installations.
2. The proposed location must be within 120 feet from VSAT room & must have clear look angle for Insat-3B satellite.
3. RF earth pit (outside & nearer to VSAT room) & same earthing must be extended up to VSAT room with use of appropriate copper strips. The earth resistance must be less then 3 ohms (proper earthing is must).
4. Antenna earth pit (outside and nearer to location for antenna) and same earthing must be extended up to antenna base with use of appropriate copper strip. The earth resistant must be less then 3 Ohms (proper earthing is must )

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Telemedicine system consist of customized Hardware and software at both the ends with some of the diagnostic instruments like ECG,X-ray, scanner and pathological microscope and camera provided at the patient end. They are connected through INSAT 3B Satellite by VSAT system consisting of 3.8 m antenna, SKY-IP Terminals with 2-5 watts radio.

Hardware

–Telemedicine Platform

This will include minimum standards for type of platform to be used processor /minimum speed, memory requirements, interfaces and peripherals.

Clinical Devices

- These include minimum standards for all the clinical devices to be interfaced or integrated with the telemedicine system, including performance specifications for devices measuring diagnostic parameters, imaging devices, compression, and their safety requirements.

Video Conferencing Unit

- Compromises of minimum standards for video conferencing system, including data rate, picture resolution, frame rate, type of camera, audio quality etc.

Communication Hardware

This includes minimum standards for various hardware used for interfacing the telemedicine system with the communication network, including all types of terrestrial and satellite based networks.

Sotware Required

- An operating system

-Licensed telemedicine S/W (with PIR with the mandatory fields) with appropriate User Interface(UI)

-Back-end Data Base with the mandatory tables/ fields (if applicable)

-Connectivity: options for telemedicine services

-VSAT

-PSTN

-ISDN

-Leased Line

-Wireless LAN /WAN

The telemedicine centers could be broadly classified into the following classes. (2)

Primary telemedicine center (PTC)

Secondary telemedicine center (STC)

Tertiary telemedicine center (TTC)

This could be further sub classified as 3 major levels - L1 ,L2 ,L3 .depending on the size and facilities available, the smallest being L1

Tertiary telemedicine center would be broadly classified only as L1 and L2. PTC's would be based in primary health centers, STC's in secondary medical centers and TTC's in tertiary medical center.

How does the System W orks? (3)

A basic telemedicine system consists of a personal computer, a modem, a telephone line, a scanner and a web cam. Telemedicine covers a wide range of activities. In the past it was primarily tele-radiology, transferring high resolution X-rays, ultrasound, CT scans, MRIs and ECGs. Today, the same system can enable a doctor to conduct a detailed clinical examination remotely. What's more, gloves with special sensors are available, which give tactile feedback from a transmitted image.

While a very basic telemedicine system can do with a PC, telephone and scanner, it needs to be scaled up as needs increase. "Electronic stethoscopes can transmit sounds from the lungs and heart, from one continent to another, without any alteration in the quality of the sound. Traditionally, only the physician at the other end of the stethoscope could hear the sound, and interpretation was dependent on what was between the two ear-pieces. Today, the same sounds can be heard through a speaker phone by an unlimited number of doctors in faraway places. The sounds can be compared with those in different diseases from a referral sound laboratory, and the specific problem can then be identified. A wide variety of internal and external examinations can be done with a patient far away. Endoscopic cameras peering into the patient's interior can be manipulated from several thousand miles away. Dermascopes can transmit skin injuries in the natural colour since they offer a choice of several million colours. Detailed diagnosis and monitoring of patients can be done remotely by using sophisticated medical probes and monitors. Access to multimedia patient records, medical databases and treatment algorithms is, therefore, just a click away."

Problem faced by the users

As in any industry, inadequate infrastructure hampers the growth of telemedicine. For instance,

1. Connectivity for telemedicine is not possible when many of the remote villages do not have connectivity in the first place.
2. There's also a shortage of computer-savvy healthcare professionals, almost no exposure to usage of computer applications in the curriculum of medical colleges, and a lack of training facilities with regard to application of information and communication technologies in medicine.
3. People are not aware of telemedicine consultation.
4. Proper maintenance of the equipments.

While telemedicine in India is still in its embryonic stage, the Government has taken a series of steps to make sure that it turns out to be one of the biggest success stories. For instance, recently, the Department of Information Technology framed guidelines for telemedicine in India. These guidelines also take care of legal issues that can arise from using this technology.

Need for Telemedicine

Key reasons why telemedicine is important:

· The heterogeneous geographical set-up like, snow-covered mountains, hilly terrains, forests effectively mean that the population of state is spread out and not everyone has access to healthcare services.

· Huge population of India makes the government's job more difficult in planning healthcare delivery systems and making facilities available for everybody at any place.

· In the case of rural population the risk of death is twice that of urban patients with similar injuries because of discovery time, transport time, inexperienced providers but with the advent of telemedicine, we can expect to solve all the above problems.

The Future of the Telemedicine (4)

In the last six years, the relentless work done by several groups of medical professional has shown results and the holy grail of 'anytime, anywhere, any speed' communication is no longer beyond reach. Today, there are about 300 telemedicine units located in the rural and sub-urban India and about 25 in tertiary care hospitals. The patient can collect laboratory results without making a trip to the hospital. All he needs to do is call into the system and dial his ID number. If his test results are ready, he can have a hard copy of the results faxed to him immediately. Large volumes of information regarding the hospital, various departments, doctors, lab tests, billing, pre-operative and post-operative instructions, follow-up, etc, will be available on automated audio text. Preliminary information is also being gathered to study whether HEALTHSAT - a satellite exclusively providing healthcare can be launched in India.

The importance of telemedicine has been widely acclaimed in India. National Task Force on Telemedicine, Planning Commission working group on Telemedicine, The Telemedicine Society of India and a National Institute of Medical Informatics and Telemedicine, all are striving hard to make medicare facility available to all at their doorsteps. Apollo Telemedicine Networking Foundation and Anna University are also jointly conducting course on Telehealth technology.

While Telemedicine units are being installed in rural and suburbs, the concept of mobile telemedicine units' is also gaining wide spread importance to make healthcare with all modern facilities at the doorsteps of every villager through a mobile truck.

While Telemedicine has revolutionized healthcare, the days of "Home Telecare" do not seem far off so that eventually no one in India is deprived of specialist healthcare.

**Further Reading**


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