Telemedicine in India: Initiatives and Perspective

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What is Telemedicine?

- Telemedicine is the use of electronic information and communications technologies to provide and support health care when distance separates the participants ...

Institute of Medicine, 1996
Introduction

• Telemedicine primarily refers to use of Telecommunication for diagnosis and treatment of disease
• Emergent mode of delivery of health care at distance
• Telemedicine provides healthcare where there is none and improves the health care where there is some
• One way to bring / provide access to quality health care to under-served rural & urban masses
Telemedicine: India’s Option or Necessity

- India characterized by low penetration of healthcare services
- 90% of secondary & tertiary healthcare facilities in cities and towns away from rural India where 68% of population lives
- Primary health care facilities for rural population highly inadequate
- Despite several initiatives by Government & private sector the rural and remote areas continue to suffer from absence of quality healthcare
- Significant proportion of patients in remote locations could be successfully managed locally with advice/ guidance from specialists/ super-specialists in cities, without having to travel to the specialists.
- Key driver of public:private partnership for health care delivery to the people of India
Telemedicine: The Promise

• Taking modern healthcare to remote areas using IT as specialists are city based
• Majority of diseases not requiring surgery conducive to telemedicine
• Can also play a significant role in training of medical personnel across the country
• Decrease in price and complexity of this technology over last five years makes it economically viable
A Typical Telemedicine System

Patient end
Mercury console

Specialist End
Mercury Console

384 kbps

Router

384 kbps

Router
Current Efforts

• Many programs worldwide using variety of telemedicine technologies
• In India telemedicine programs actively supported by:
  • Dept. of Information Technology
  • Indian Space Research Organization
  • NEC Telemedicine program for North-Eastern states
  • Apollo Hospitals
  • Asia Heart Foundation
  • State governments
  • Telemedicine technology also supported by some other private organizations.
DIT Initiatives

• As a Facilitator, with long term objective of effective utilization/incorporation of IT in all major sectors, DIT has taken following leads in Telemedicine:
  – Development of Technology
  – Initiation of pilot schemes
    – Selected Specialty e.g. Oncology, Tropical Diseases
    – General telemedicine system covering all specialties
  – Standardization
  – Framework for building IT Infrastructure in health
Development of Telemedicine Technology

- Telemedicine software system has been developed
  - Mercury by Centre for Development of Advanced Computing, C-DAC
  - Supports Tele-Cardiology, Tele-Radiology & Tele-Pathology, etc.
- Uses ISDN, VSAT, POTS
- Used to connect the three premier Medical Institutes of the country (viz. AIIMS New Delhi, SGPGIMS, Lucknow, and PGIMER Chandigarh).
- Now being connected to include Medical centres in Rohtak, Shimla & Cuttack.
Telemedicine in Kerala

• Setting up of Telemedicine & Telehealth Education facilities in Kerala using the Technology developed under DIT
  – The project will link three specialty medical hospitals at MCH, SCTIMST & the RCC, with 4 District/ Rural Hospitals.
  – Continuing Medical Education (CME)

• CancerNet: Telemedicine system for Cancer Patients in Kerala
  – Establishment of an Oncology Network for providing Telemedicine services
    • Cancer detection, treatment, pain relief, patient follow-up and continuity of care in peripheral hospitals (nodal centres) of Regional Cancer Centre (RCC).
    • Implemented by C-DAC, Trivandrum and RCC
  – Connects RCC, Trivandrum and five nodal outreach centres
  – More than 3000 patients treated/consulted at these nodal centres
  – Major financial benefit to patients
Telemedicine System in West Bengal

- Telemedicine for Tropical Diseases
  - Utilizes Technology developed by WEBEL & IIT Kharagpur
    - Tele-medicine for diagnosis & Monitoring of tropical diseases in West Bengal
    - Uses low speed POTS connectivity
    - Diagnosis and monitoring of skin and blood related tropical diseases
    - The system has been installed in School of Tropical Medicine, Kolkata and two District Hospitals
    - More than 800 patients undergone consultations
  - Being upgraded & extended to cover two referral hospitals and four District hospitals
    - Will use 512 KBPS leased line and the West Bengal State Wide Area Network optical link of 2 Mbps
Telemedicine in North East States in India

- **Need**: the area is very remote and lacks Specialty Healthcare
- **Kohima – Turnkey Project**
  - Implementation of Telemedicine Solution at Kohima Hospital in Nagaland
  - Partnership between Govt. of Nagaland, Marubeni India Ltd, Apollo and Ministry of Communications and Information Technology
- **Setting up of two telemedicine centres connecting hospitals in capitals of the North-eastern states of Sikkim & Tripura with Super-specialty hospital under Community Information Centre scheme of DIT**
- **Major scheme is planned by North Eastern Council of India to cover all 75 districts in seven states through Telemedicine**
Telemedicine during Mela Festivals/Disaster

- **Maha Kumbhamela**
  - Attended by about 10 million people in about a month
- **Implemented by SGPGIMS, OTRI & State Govt. of Uttar Pradesh**
  - TeleConsultation
  - Tele-monitoring of Public Health activities
- **115 referrals**
Telemedicine Initiative of Dept of Space

- Towards improving rural health care in India under *Space for Health* Programme
- Uses primarily Satellite connectivity
- Currently 32 Telemedicine nodes
  - 11 Super specialty
  - 21 District / Rural Hospitals
- Plans
  - 50 nodes by end of 2003
  - 100 nodes by 2004
Other related Initiatives
Telemedicine Standardisation

• Need:
  – Large number of Telemedicine networks being installed in the country
  – Lack of uniform, multipurpose telemedicine standards meeting needs of diverse user groups at different hierarchical levels hamper effective use of telemedicine

• Adherence/adoption to standards ensures
  – Telemedicine Systems are interoperable
  – Compatibility with new version of technology
  – Scalability of systems without total replacement while expanding capability

• Recommended Guidelines and standards for Telemedicine Technology & Practice in India evolved under a high level committee.
  – Document released on Sept 9, 2003
Framework – an Overview

• Telemedicine Consultation Protocols
• Minimum Data Sets
• Identifiers

• Information Exchange Stds
• Security
• Medical Equipment

• Primary
• Secondary
• Tertiary

• Hardware
• Software
• Connectivity

Telemedicine Service Providers

Process Guidelines

Guidelines & Standards for Telemedicine Practice in India

Technology

Video Conferencing

Technology Providers

System Requirements
Vision: Defining a National Telemedicine Network

- Vision for National Telemedicine Network to cover large population. A three tier hierarchical connectivity structure can be contemplated for implementation in phases to include:
  - A Primary Heath Centre (PHC)/Community Health Centre connected to District level hospital
  - A District level Hospital connected to a State Level Hospital/Selected Specialty Hospital
  - State Hospitals and selective District hospitals being connected to a super specialty hospital at the National level
National Telemedicine Network: Major Challenges

- Resource requirement evaluation
  - Connectivity/ Bandwidth (B/W) provision & reliability
  - Telemedicine cost consideration /affordability
  - Adherence to open platforms and open architecture standards
  - Sustainability
  - Sourcing Specialist availability
  - Trained manpower

- Phased roadmap for implementation e.g. District Hospital to Referral/Specialty hospital in 1st phase

- Crucial role for DoS: Provision of B/W through VSAT

- Private and Public Health Provider partnership crucial
Thank you

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