

TELEMEDICINE IN INDIA

Professor K. Ganapathy, an eminent neurosurgeon (President of the Neurological Society of India and Secretary-General of the Asian-Australasian Society of Neurological Surgery), is one of the pioneers in introducing telemedicine in India. An adjunct professor at the renowned Indian Institute of Technology (IIT) and Anna University in Madras, Dr Ganapathy also heads the Division of Stereotactic Radio surgery (the first in South Asia) in Apollo Hospitals, Chennai, as well as the Apollo Telemedicine Networking Foundation (the single largest multi-specialty telemedicine network in South Asia). He has given more than a hundred lectures on various aspects of telemedicine in India and overseas. A prolific writer, Dr Ganapathy is a member of the Indian National Task Force on Telemedicine and a founding member of the Telemedicine Society of India.

The commonly held notion that India is a third-world developing country is in some respects a paradox. There has been unprecedented growth and development in information and communication technology (ICT) in India. Satellite transmission, high-speed broadband connectivity, and mobile and wireless telephony are now making inroads into suburban and rural India. India no longer has to follow or even piggy back the west, we can leap frog! Today, there are 175 telemedicine units in suburban and rural India and 15 in tertiary care hospitals. Preliminary information is being gathered regarding the feasibility of launching a HealthSat — a satellite exclusively for providing healthcare.

The Indian healthcare industry is obviously one of the biggest industries in the world, with every sixth individual on the planet being a consumer. To expect a fledgling, different method of healthcare delivery (i.e. telemedicine) to have a significant

effective impact on the health care scenario so soon is to turn a Nelson's eye to the stark realities. In the last six years, thanks to the relentless work done by several groups of committed champions of telemedicine spearheaded by Apollo Hospitals, a beginning has been made. The Indian Space Research Organization (ISRO), SGPGI in Lucknow, SRMC in Chennai, AIMS in Kochi, and Narayana Hrudayalaya among others have all contributed to this. The first international Conference on Telemedicine organized by ISRO on behalf of the Government of India was held in Bangalore in March 2005, and proved that Indian telemedicine had come of age.

Telemedicine in India was formally launched on March 30th, 2000, when Bill Clinton— the then president of the United states— commissioned the first telemedicine unit in the village of Aragonda in Southern India, about 200 km from the tertiary care center in Chennai. Witnessing a live cardiac teleconsultation, Clinton remarked to Dr Prathap Reddy, founder of the Apollo group, "I wish the rest of the world will follow your footsteps and make available this technology." Starting as a pilot project (a fully equipped secondary-level hospital with CT, ultrasound, Echocardiography, and 6 MBBS doctors, 1 general surgeon and 1 pediatrician) for a proof of concept validation, Aragonda today is proof that telemedicine for a village is indeed possible. From simple web cameras and ISDN telephone lines, the hospital has progressed to state-of-the-art video conferencing systems and a VSAT. More than 2500 teleconsultations have been given to this center.

Apollo Telemedicine Networking Foundation (ATNF) is part of Asia's largest health care provider, the Apollo Hospital Group. The pioneer in introducing telemedicine in South Asia, ATNF is the largest multi-specialty comprehensive telemedicine provider in South Asia, having facilitated over 15 000 teleconsults in six years. It has installed 92 centers including 17 for the Indian Army and 5 overseas. ATNF has been selected by the Government of India as a partner to provide tele-education and telemedicine for the 53 member states of the African union (Pan African E Network Project) and has been invited by the Ministry of Health, Government of Mauritius to submit proposals for establishing telemedicine in Mauritius. A proposal to help Nigeria set up telemedicine is also being considered. ATNF is the only multi specialty telemedicine unit testing mobile VSAT telehealth delivery.

Detailed "teleneurological examination" is done routinely. A paramedical worker at the remote end elicits the reflexes and the response is seen by the specialist. All teleneurological examinations are recorded live. Replaying of the video enables one to study clinical signs in great detail. A movement disorder specialist, for example, will be able to give an accurate diagnosis even if he has not seen the patient live. Video clippings of pseudo-seizures, involuntary movements, Parkinsonism, myopathy etc. is available. In all cases, the teleconsultant has been able to carry out a sufficient examination to guide the local doctor on how to proceed.

Using ISDN lines, broadband high-speed connectivity, and VSAT satellites, the author has helped family physicians in distant parts of India to manage simple and not so simple neurological and neurosurgical problems. Many head injuries have been managed remotely. Telemedicine is also an excellent continuing medical education (CME) medium educating the non-specialist. The knowledge that a specialist is only a mouse click away does wonders for a rural physician's morale. Some cases have required management in a tertiary care hospital. Details of the treatment were discussed in detail with the patient and the family, so that they were well informed and fully prepared; these telediscussions were of considerable help. Teleconsultation has been particularly useful in the follow up of already-treated patients. The acceptance of teleconsultation by the rural patient, the suburban doctor, the suburban community, and the teleconsultant has been much better than expected. Interestingly, there has been a drop in some telereferrals from rural centers which have access to telemedicine facilities, as the doctor at the remote center has now acquired the confidence to manage many cases.

Clinical applications include the use of telemedicine in cardiology, general medicine, general surgery, sexual medicine, dermatology etc. On one Sunday, 17 teleconsults in neurology were given to 11 different centers in India from Chennai. The pediatric cardiologist in Chennai has seen, more than 150 echo-cardiograms done in the village of Aragonda.

Mobile Telemedicine

There are about ten active mobile telemedicine units in India today that go to different villages every day. A villager gets into an air-conditioned mobile truck with ultrasound, X-ray, echocardiogram, ECG, biochemistry laboratory, ophthalmic equipment etc. A paramedical technician focuses the ophthalmoscope into the eyes of the patient, and the image of the fundus is evaluated by the teleophthalmologist in the tertiary care center. A VSAT on the truck transmits the images through satellite technology. Though many of the existing vans are dedicated to ophthalmology, multi purpose vans are also available now.

Educational Video Conferencing

Video conferencing is an inexpensive way of interacting with doctors worldwide. In August 2001, the author organized a two-hour teleconference with Fujitha Health University, Nagoya, Japan. This international grand round went off without a hitch. A similar meeting followed with the Department of Neurosurgery, UDMNJ, New Jersey, in December 2001. In 2002, a multipoint intercontinental neurosurgery/trauma emergency medicine and disaster management conference was simultaneously conducted with Tunisia Chennai Geneva and Paris. Subsequently, 15 teleconferences have taken place periodically with neurosurgery centers worldwide. Need-based neurology educational teleconferencing, is being conducted on a regular basis between SGPGI, Lucknow, and SCB Medical College, Cuttack (which are 1500 km apart) using a desktop

video conferencing system with a PTZ camera and 126 KBPS ISD telephone lines. To date, more than 45 sessions have been conducted. International exposure changes one's perspectives and helps us think globally. Geography is indeed becoming history. For the last five years, the pediatrics department of the Apollo hospitals has been conducting weekly tele-CME programs, which have immensely benefited the doctors in and around Aragonda.

Academic Activities

Telemedicine in India truly came of age when the first International Telemedicine Conference (INTELMED 2005) took place in March 2005. Organized by ISRO, Government of India, at Bangalore, India, the conference integrated the efforts of the various organizations involved in telemedicine. In total, 750 delegates from India and 50 from overseas attended the conference. Issues regarding the need for a low-cost telemedicine system to extend the outreach of modern healthcare to rural India, socioeconomic factors involved in putting up such systems, the interoperability of hardware and software in telemedicine, financial and business models of telemedicine, etc. were emphasized upon. In August 2006, the 8th International Conference on e-Health Networking, Application and Services sponsored by IEEE will be held in New Delhi, followed by a global convention and expo on telemedicine and e-health and the second national conference of the Telemedicine Society of India. Membership to the Telemedicine Society of India will be open shortly.

The National Task Force on telemedicine, constituted by the Ministry of Information Technology, Government of India, is on its way to formulating a comprehensive telehealth road map for the whole country. The several subcommittees that make up the task force are indeed a veritable think tank comprising the "who's who" of every conceivable area of telehealth. Their recommendations are likely to be implemented by the National Telemedicine Advisory Council, a body which will ensure that telehealth eventually becomes integrated into mainstream healthcare.

Issues and challenges in implementing telemedicine include:

- Acceptance of this modality by society, patients, family physicians, specialists, administrators and the government;
- Designing cost-effective appropriate hardware and software connectivity;
- Standardizing, certifying, authenticating, and registering telemedicine units so that minimum safe standards are uniformly adopted;
- Running short-term courses to train the trainers and the users;
- Drafting and passing a telehealth act for India;
- Payment to teleconsultants to make the scheme attractive and viable;
- Getting grants, subsidies, and waivers to introduce telemedicine

- to suburban and rural areas;
- Getting Indian telemedicine units recognized by other countries so that we can provide overseas teleconsults for revenue generation which can be used to subsidize rural telemedicine; and
- Introducing telemedicine in the medical/IT curriculum.

Conclusion

It is the author's dream that, within the next few years, there will be telemedicine units in most parts of suburban and rural India. The Indian Space Research Organization has announced that it will initially provide 100 VSATs exclusively for telemedicine purposes. ISRO hopes that, one day, there will be almost a million teleconsultations a day in India; eventually, no Indian will be deprived of a specialist consultation wherever he/she is. This is not impossible. What is required is not implementing better technology and getting funds, but changing the mindset of the people involved. For this to happen, a critical mass must be reached. Awareness should permeate throughout society. Real growth will take place only when society realizes that distance is meaningless today, and that telemedicine can bridge the gap between the "haves" and the "have nots," at least in so far as access to healthcare is concerned.

Telemedicine will soon be an integral part of mainstream medical practice in India.

India has already joined the small band of nations that have held international conferences on telemedicine. The Telemedicine Society of India is in the making, as is a National Institute of Medical Informatics located at Lucknow. The courses on telehealth technology jointly conducted by ATNF and Anna University are becoming increasingly sought after. Articles on telehealth from India are now being published in national and international medical journals. Telemedicine is no longer a dirty word!! Departments of telemedicine, HealthSat (a satellite exclusively for telehealth like the Edusat), a journal of telemedicine, and a diploma in telemedicine—these are all in the making.

President Kalam used the word "telemedicine" five times in his Republic day address — obviously; this is a major thrust area in India's race to become a developed nation. Telemedicine can bridge the gap between the "haves" and the "have nots" in healthcare only when tediagnosis is followed up by appropriate referrals for investigations and subsequent management. To achieve this, universal insurance is an absolute necessity.

Telemedicine is not yet a part of healthcare, even in advanced countries where it was introduced two decades ago. It takes time to create a revolution. The exponential growth in ICT, as well as the plummeting costs and increasing awareness of telemedicine leave no doubt that telemedicine will certainly revolutionize healthcare delivery in India sooner rather than later.

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Websites for additional information on “Telemedicine in India”

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- www.mit.gov.in
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