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Tele-healthcare and Distance Medical Education – SGPGIMS Experience

Sanjay Gandhi Postgraduate Institute of Medical Sciences (SGPGIMS), is situated in Lucknow, the capital of the state of Uttar Pradesh in northern part of India. It is a tertiary level referral medical institution with objective to create a center of excellence for providing state-of-the-art patient care, high quality medical education, training and conduct research in the relevant disciplines of medicine and other allied sciences. At present this super specialty hospital has 695 beds and 30 academic departments (www.sgpgi.ac.in).

SGPGIMS was the first public sector medical institution to adopt Information and Communication Technology in the year 1998 in the form of Hospital Information System (HIS).

Telemedicine activities at SGPGIMS were initiated in the year 1999 in the form of testing the concept of ICT in the field of medicine. All the telemedicine activities are in project mode and are being financially supported by government agencies such as Indian Space Research Organisation (ISRO) and Department of Information Technology. Various telemedicine activities carried out are – Tele-health Care, Distance Medical Education, Participation and Organization of National and International Telemedicine conferences, Creating Public Awareness, Research & Development related to telemedicine.

1. **Tele-healthcare** : Over the years the following modules have been standardized and been integrated into routine practice of tele-healthcare delivery.

1.1 **Tele-consultation** : In September 2000 the first experiment in tele-healthcare was carried out using store and forward technology on Public Switched Telephone Network (PSTN) to exchange electrocardiogram (ECG) between District Hospital, Pithoragarh, Uttarakhand and SGPGIMS, Lucknow, Uttar Pradesh located 275 km apart. The exchange of video clippings of 30 patients, ultrasound and radiographic images, typed and hand written notes and audio clippings provided images of satisfactory quality. Later in the same year similar experiment was carried out with Balrampur and Civil Hospitals located in Lucknow city. In August 2001, SGPGIMS initiated a project by linking one of the medical colleges of Orissa – SCB Medical College, Cuttack situated 1500 km away from Lucknow, through 128 kbps ISDN, to study the impact of telemedicine technology in providing remote super-specialist medical consultation to physicians. Based on the successful outcome of this experiment and the interest shown by the Orissa government, the network was extended to the remaining two government medical colleges in the state: the VSS Medical College, Burla and MKCG Medical College, Berhampur. SGPGIMS designed and implemented another statewide telemedicine network project for the state of Uttarakhand in April 2004. In the first phase, doctors of two district hospitals at Almora and Srinagar have been receiving tele-consultation. The Second phase of network is under process with two new nodes. Similar activity performed with District Hospital Raibareli under SGPGI-Raibareli Telemedicine Network Project. So far we have provided tele-consultation to 1385 patients till October 2009.

1.2 **Tele-follow up** : Tele-follow-up clinics in the Departments of Rheumatology, Endocrine Surgery & nuclear medicine were established in 2004 for the patients of Orissa. So far till October 2009, 562 patients of department of Endocrine Surgery, Rheumatology and Nuclear Medicine received tele-follow up through our center.
1.3 **Pre-referral Screening**: Doctors of SCB Medical College, Orissa who refer patients to SGPGIMS, discuss the patients with the consultants of SGPGIMS before referring the patients to SGPGIMS. Department of Endocrine Surgery has started this activity from October 2004, so far 22 patients have availed this service.

1.4 **Treatment Planning**: Thyroid cancer Patients from Orissa state who have been operated there and need radio-iodine scan and therapy are discussed with Nuclear Physicians at SGPGI to plan post-operative adjuvant therapy. Schedule of appointment is fixed depending on the availability of isotope. Also, such patients from Orissa who have been operated here also schedule their appointment for adjuvant therapy. This program started in April 2004, till October 2009, 113 patients have been benefited from this program.

2. **Distance Medical Education**: SGPGIMS has developed various modules of Distance Medical Education to educate and share knowledge using ICT aiming at patient care and skill development of remote care physicians. The various distance medical education modules adopted are tele-education, tele-CME, tele-conference, tele-consultation, surgical treatment planning, tele-pathology, tele-radiology, tele-follow up and tele-mentoring, lectures, case discussions etc.

2.1 **Tele-education of postgraduate students of medical colleges**: From September 2001 SGPGIMS conducted its distance medical education programme for the post-graduate students of SCB, Medical College, Orissa and later from March 2003, it extended this programme to two other medical colleges i.e. VSS Medical College, Burla and MKCG Medical College, Berhampur of this state. In another project the Department of Radiotherapy of SGPGIMS which is also a Regional Cancer Center is also linked with Chhatarpati Shahaji Maharaj Medical University, Lucknow sponsored by Department of Science and Technology to perform similar activity.

2.2 **Tele-education of district hospital doctors**: With an aim to develop and improve the professional career and consultation skill of the rural and remote doctors, SGPGIMS used telemedicine technology in various projects. In these programs, the specialties and topics chosen for these programs were based on the needs and demands of the users at the remote end which they thought would be helpful in their day-to-day clinical work.

Between 2004 -2007 we carried out a telemedicine project with support of Government of Uttarakhand state to facilitate specialty consultation and distant learning for the doctors and paramedical professionals of two district hospitals of Uttarakhand. Base Hospitals Almora and Srinagar in the remote hilly areas were linked to SGPGIMS through ISDN media. In April 2006 under the Corporate Social Responsibility (CSR) program of Gas Authority of India Limited (GAIL), a telemedicine project was started linking SGPGIMS with District Hospital of Raibareli, located at a distance of 80 km, with fiber optic cable network.

2.4 **Tele-education for Paramedical Professionals**: In November 2004, two new modules targeting on paramedical professionals such as nursing skill development and hospital administration were taken up in distance education mode for two district hospitals under Uttarakhand Telemedicine Project. Later on this module is adopted for the paramedical professionals of medical colleges of Orissa and District Hospital, Raibareli and extended to lab technicians, dieticians and physiotherapists.

2.3 **Knowledge Sharing with Peer Institutions**: SGPGIMS telemedicine center established contact with other reputed national and international institutions. In this program, the doctors of both
the institutions share their experiences and knowledge and discuss the complicated and interesting cases. This Knowledge Sharing programs were subsequently introduced for Amrita Institute of Medical Sciences, Kochi in March 2004, multipoint connectivity with AIIMS, New Delhi and PGIMER, Chandigarh (October 2005), CMC, Vellore (September 2006), SRMC, Chennai (April 2008), internationally Ranguil University, Toulouse, France (April 2005) Oregon Health and Science University, Portland, USA (November 2007).

2.4 **Tele-CMEs**: From time to time various departments of SGPGIMS organizes Continuing Medical Education (CME) programs to update knowledge. The entire proceedings of these CMEs were also transmitted to the networked medical colleges or institutions. On an average 15-20 faculties and medical students participated at the remote locations. The video lectures of eminent persons of international fame received at SGPGIMS from abroad were also transmitted to these network partners during these Tele-CMEs. So far we have conducted 40 Tele-CME programmes.

In Year 2007 SGPGIMS started receiving weekly sessions of Clinico-Pathology Conference (CPC) held at PGIMER, Chandigarh. Similarly Clinical Grand Round (CGR), a weekly program conducted by the various department of SGPGIMS is being transmitted to Pandit Bhagwat Dayal Sharma Post Graduate Institute of Medical Sciences, Rohtak (2007), Jigme Dorji Wangchuck National Referral Hospital (JDWNRH), Thimphu, Bhutan, Railway Hospital, Izzat Nagar, Bareli and Indira Gandhi Medical College, Shimla (2009).

2.5 **Tele-mentoring**

In March 2004, a tele-mentoring trial by the department of Endocrine Surgery was carried out through satellite based telemedicine network. Endocrine Surgeons at SGPGIMS assisted surgeons in AIMS, Kochi located at a distance of 2500 km to successfully operate a patient of primary hyperparathyroidism who had two unsuccessful operations in the past. Besides broadband tele-communication, excellent picture of the surgical field was grabbed with high resolution video camera and exchanged in real time through video-conference system along with step by step interactive discussion 8,9,10.

3. **Conclusion**: SGPGIMS has become a hub of telemedicine activities in northern India by establishing network partners with the institutions and hospitals at tertiary/secondary/primary level healthcare. This has enabled specialist at SGPGIMS to share their knowledge and experiences with peers both nationally and internationally. The network has been extensively used to disseminate knowledge, educate doctors and paramedical staff, improve and develop their consultation and surgical skill in virtual classroom environment thus making an attempt to bridge the knowledge gap between tertiary and secondary/primary level in a vast country like India.

**References**: