Aravind Tele Ophthalmology Network

Aravind Eye Care System

Aravind Tele-ophthalmology Network (ATN) was launched in the year 2002. Since then, Telemedicine link has been established between all the satellite hospitals of Aravind. Aravind uses this technology to potentially overcome the issues of transportation and inadequate specialist availability. ATN has 2 main functions.

1. Tele-consultation
2. Tele-education

Objectives of ATN

- To make eye care service accessible and affordable to all by reducing travel cost and time for the patients.
- To enable People at remote areas to get top class medical facility from reputed hospitals and Doctors.
- To act as an interface between doctors to share their experiences.
- To spread eye care service to the remote villages and serve people without much investment on the infrastructure.

For Patient consultation there are various activities of ATN

1. Vision center
2. Mobile van
3. Diabetic clinics
4. Reading and grading centre
5. Patient consultations
6. Eyestalk

These have been broadly classified into Primary, Secondary and tertiary based on their application.

Primary care

At the primary level, Aravind has set up many vision centers. This centre offers primary eye care services with the help of trained ophthalmic technician at an affordable cost each centre is covering a population of 50,000 to provide primary eye care services managed by a well trained Ophthalmic Assistant and supported by a Vision Centre coordinator. These centers are connected with the eye hospitals using high bandwidth connectivity, ensuring the service of an ophthalmologist. The ophthalmic assistant who performs slit lamp examination, refraction, treating minor ailments, and dispenses glasses in consultation with the ophthalmologist. All the patients are consulted with the ophthalmologist at the base hospital through videoconference. Patients who require further investigations or interventions like cataract surgery are asked to come to the base hospital. The connectivity is either using high bandwidth (4 mbps) point to point wireless (802.11b - license free spectrum) or the broadband internet connection.

Aravind has implemented this innovation in Madurai, Theni, Coimbatore, Tirunelveli, and Pondicherry under the service area of Aravind Eye Hospitals. As on date, 30 centers have been established using wireless technology or BSNL brand band connectivity. Totally 147,121 patients (New patients: 110,984 &Review patients: 36,137) have visited this primary eye care centers (New patients 75%; Review patients: 25%). Around 7,184 patients were advised for cataract surgery and 4486 (62%) patients had undergone cataract surgery at base hospital. About 48,780 patients were undergone refraction test, of this 24,685 patients were advised for glasses and 90% of them were purchased the glasses. Totally 7,810 patients were referred to base hospitals for specialty eye care and 83% of them have visited the base hospital.

Aravind realizes the need to inculcate better health seeking behavior among the people that would dramatically increase the uptake of eye care services. Increasing the awareness about eye problem, treatment options etc. along with creating permanent access to eye care could help achieving the desired goals by setting up of IT enabled vision centers in the rural areas.

Secondary Care

The main focus at this level is screening for diabetic retinopathy as the number of diabetics in India is highest in the world. This has been done in two ways. One using a mobile van equipped with VSAT satellite connectivity. Mobile vans travel to remote locations where local physicians identify patients with diabetes. Van technicians obtain fundus images of these diabetics and send data to main hospitals for interpretation. Reports are sent back to mobile vans within one hour. The patients are then counseled on further course of action by the technician and a counselor. The second method involves opportunistic screening of all diabetics attending the diabetic center for diabetic retinopathy using telemedicine.

The technology involves the use of a retina imaging camera and a special software to offer remote diagnosis and consultation using store & forward technology.

- Aravind Eye Care System has indigenously developed a Software **ADRES 3.0** (Aravind Diabetic Retinopathy Evaluation Software). This has 2 modules – a Client end and a Provider end.
- At the client end (Mobile van / Diabetologist's office), Diabetic patients' retinal images are taken using a commercially available Fundus camera following a predefined protocol. The images are sent to the central reading center at Aravind Eye Hospital using VSAT / DSL broad band.
- At the grading center, the retinal images are graded using the "Provider" module of the software. The software elicits the severity level of the disease and also suggests

treatment based on the input given by the grader. This report is then sent back over VSAT/DSL to the Mobile Van / Diabetologist who then hands over a printed report to the patient with appropriate counseling. The turnaround time for the whole process is less than an hour.

Aravind collaborates with various diabetes centres(This year we have included three more centres namely Agada , Ganesh and Srividya) in the screening of diabetics through tele-consultation with the help of Aravind Diabetic Retinopathy Evaluation Software (ADRES). In the year ending March 2012, 1214 cases were evaluated using ADRES.

Tertiary Care

General ophthalmologists obtain tertiary care consultations from specialists at main hospitals using live videoconferencing or store-and-forward techniques based on in-house developed software. The live videoconferencing helps in teaching and for live consultations. For the store and forward, Aravind has developed software called EYESTALK. With the help of this software a general ophthalmologist can send all the clinical data pertaining to a patient to specialty department such as Retina, Glaucoma along with the images. The specialist can send his opinion through the same and this act as a teaching tool for the general ophthalmologist.

Through these various processes Aravind is comprehensively trying to cover the inadequacies in treatment that arise from the dispersed population and the nonavailabilty of specialists and at the same time focusing on better utilization of available human resources.

Videoconferencing

Since its inception in 2002, the telemedicine link has been established through videoconferencing between all the satellite hospitals of Aravind which enables the staff at Aravind interact and share their views during CME programmes, research and management meetings and also on special functions. The teleophthalmology network play a major role in different educational interactions which include grand rounds, journal clubs, clinical meetings, post graduate classes and classes for mid-level ophthalmic personnel and paramedics. Around 480 videoconferencing sessions including international conferences were conducted during the last year. A total of 690 hours have been spent for video conferencing and the average time taken per session was around 1 hour 30 minutes.

<u>Images of Videoconferencing Equipment:</u>


AC I/P
Telenet's
NT-B
230V~
LINE
ISDN LINE
S/T
S/T
AC I/P
Telenet's
NT-B
230V~
LINE
ISDN LINE
S/T
S/T
2
AC I/P
Telenet's
NT-B
230V~
LINE
ISDN LINE
S/T
S/T
3


Video in
Audio in
Data
VGA out
Mic
Audio out
ISDN BRI
Ethernet
DC in


TANDBERG 550