



Activity Report • 2013-2014

ARAVIND EYE CARE SYSTEM

vision:eliminate needless blindness

"All is not here a blinded Nature's task:
A Word, a Wisdom watches us from on high,
A Witness sanctioning her will and works.
An Eye unseen in the unseeing vast;
There is an Influence from a Light above,
There are thoughts remote and sealed eternities;
A mystic motive drives the stars and suns.
In this passage from a deaf and unknowing Force
To struggling consciousness and transient breath
A mighty Supernature waits on Time."

'Savitri' by Sri Aurobindo

-- Book II, Canto V



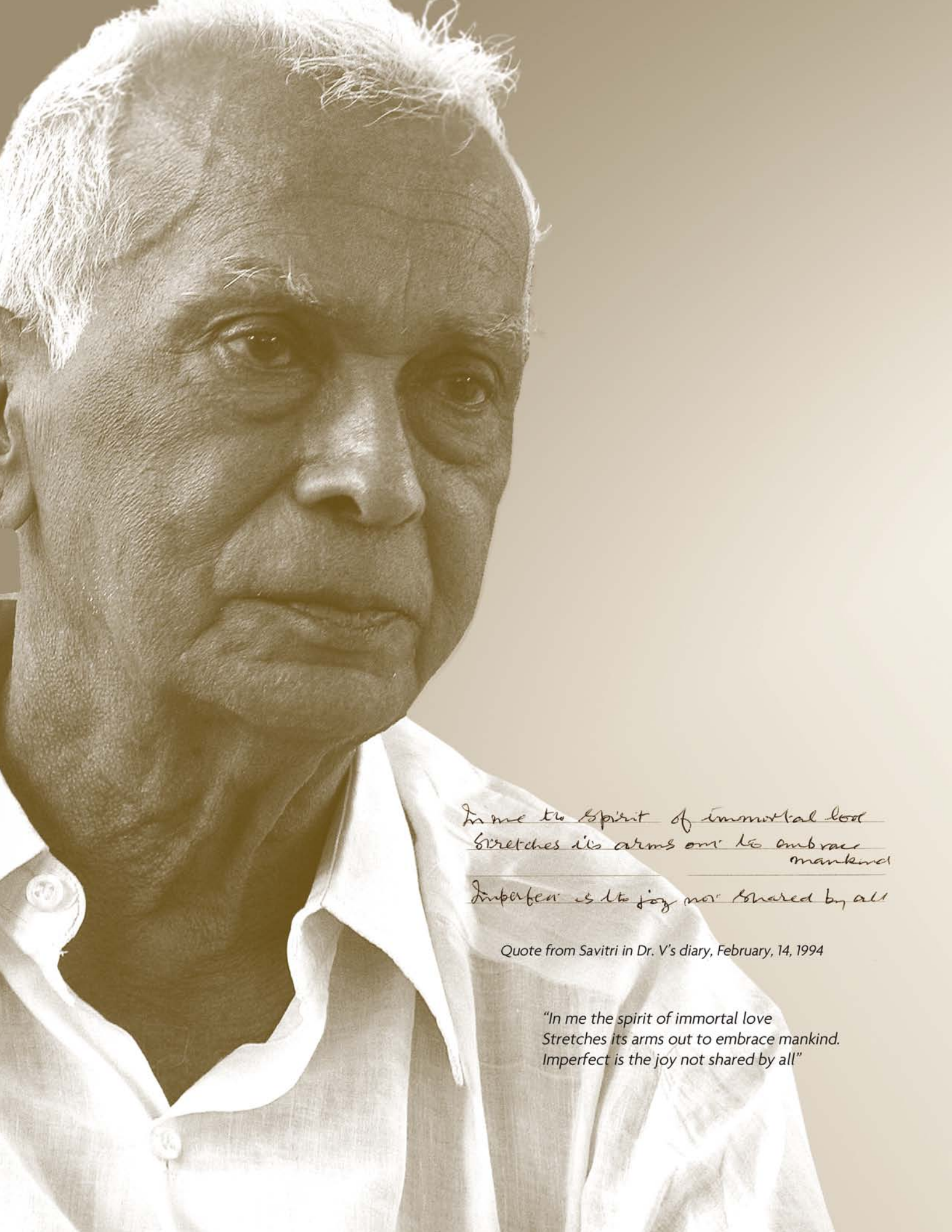
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Photo Credits

*Dr. Vivekanandan, Aravind-Udumalpet
Iruthayaraj, Aravind-Pondicherry
Mike Myers, USA
Mohan, Aravind-Tirunelveli
Oochappan, USA
Rajkumar, Aravind-Madurai
Sasipriya, LAICO-Madurai
Senthil Kumar, Aravind-Coimbatore
Seran I, Aravind-Salem
Thirunavukarasu, Madurai*



*In me the spirit of immortal love
stretches its arms out to embrace
mankind
Imperfect is the joy not shared by all*

Quote from Savitri in Dr. V's diary, February, 14, 1994

*"In me the spirit of immortal love
Stretches its arms out to embrace mankind.
Imperfect is the joy not shared by all"*

ARAVIND EYE CARE SYSTEM

VISION: Eliminate Needless Blindness

EYE CARE SERVICES

Mission:

Provide compassionate and quality eye care affordable to all.

5 TERTIARY EYE CARE CENTRES (Speciality Care, Research & Training)



Madurai 1976



Tirunelveli 1988



Coimbatore 1997



Pondicherry 2003



Salem 2011

5 SECONDARY EYE CARE CENTRES (Cataract Services, Speciality Diagnosis)



Theni 1985



Tirupur 2010



Dindigul 2010



Tuticorin 2012



Udumalpet 2012

6 OUTPATIENT EYE CARE CENTRES (Comprehensive Eye Examination, Treatment of minor ailments)



Madurai
City Centre



Pondicherry
City Centre



Melur



Tirumangalam



Cumbum



Sankarankovil

46 PRIMARY EYE CARE CENTRES (Comprehensive Eye Examination)

EYE SCREENING CAMPS Community Outreach Programmes

In the year ending March 2014, 2,609 camps were conducted through which 558,155 patients were screened and 85,935 surgeries performed.

EDUCATION AND TRAINING

Mission:

Develop ophthalmic human resources through teaching and training



Around 8,000 candidates trained
from 97 countries

1,144 papers published

RESEARCH

Mission:

Provide evidence through research and evolve methods to translate existing evidence and knowledge into effective action



Basic and translational research
Clinical research
Operations research
Product development in eye care

89 research papers published

11 scholars received PhD

CONSULTANCY AND CAPACITY BUILDING

Mission:

Enhance eye care through capacity building, advocacy, research and publications



Sharing best practices at Aravind
Advocacy in eye care
Publications

302 hospitals from 28 countries received consultancy
services in eye care management

OPHTHALMIC SUPPLIES

Mission:

Make quality ophthalmic products affordable and accessible to the vision impaired worldwide



- Intraocular lens
- Equipment
- Pharmaceuticals
- Surgical blades
- Suture needles
- Special products

Products exported to more than 130 countries
worldwide



Loss of sight can
be the greatest tragedy
next to death, yet hundreds
of thousands of people in
the world are suffering
from blindness.

Participation by the
public is the urgent cry in
this mission of restoring
vision.

G. Venkataswamy

Dr. G. Venkataswamy
Founder, Aravind Eye Hospitals



LAICO
LIONS ARAVIND INSTITUTE OF
COMMUNITY OPHTHALMOLOGY



HIGHLIGHTS 2013-14

In 2012, Aravind Eye Care System set stretch goals for where it aspired to be as an organization in 2020. Daring goals such as ramping up to a million surgeries a year were put in place. Aravind believed such audacious targets were necessary in order to make the dream of eliminating needless blindness a reality. Now the clock is ticking and a year has flown by. On reflection, the past twelve months have been about systematically laying the foundation that will take Aravind Eye Care System to the next level and help achieve its strategic goals.

Aspects of this foundation include, a focus on universal coverage, heightened attention to quality and patient safety and developing community oriented models for managing chronic conditions like Glaucoma and Diabetic Retinopathy.



Universal Coverage: A Reachable Reality

The statistics go to demonstrate the true impact of the Vision Centres - they are proof that the elusive goal of “universal coverage” can actually become a reality.

Aravind's mission is to eliminate needless blindness. By definition this means Aravind needs to reach everyone in need of eye care.

By the end of March 2014, Aravind's primary eye care services had grown to a network of 46 Vision Centres covering a total population of three million. During the year, these centres collectively served 194,679 unique outpatients and handled a total of 320,476 outpatient visits.

These numbers indicate that in a given year roughly 8% of the community present themselves for some form of eye care. The centres which have been in existence for three or more years have registered over 20% of their service area population as unique patients. Given the age profile of the Indian population,

it is estimated that about 20% of the population is in need of some form of eye care. Taken together, these twin statistics go to demonstrate the true impact of the vision centres - they are proof that the elusive goal of “universal coverage” can actually become a reality.

This early evidence has strengthened Aravind's resolve to scale up the coverage of the Vision Centres from the current level of three million people to ten million people as swiftly as possible.

In addition to universal coverage, these Vision Centres help ensure higher follow-up compliance for chronic conditions like Diabetic Retinopathy and Glaucoma. They also provide last mile connectivity for special medications that such patients may need.

photo courtesy: @Oochappan



Quality and Patient Safety: A Shift in Mindset

The process of evolving the DNA of the organization in a quest for perfection is an extremely important development for the next phase of growth. And all of this, at the core is driven by the ethos of compassion that the founding team seeded this organization with.

Another important aspect of the foundation for growth has been in the realm of quality, safety and patient centred care. As Aravind aspires to see larger numbers of patients each year and triple volumes by 2020, attention to quality and safety becomes extremely crucial.

The most notable achievement during the year in this realm neither involved new technology nor performance numbers. It involved a transformation in the people's mind-set. Failure or complications are only the tip of the iceberg, typically representing less than 5% of the errors that are 'somehow managed'. Aravind recognized that real change does not come from fire-fighting after a disaster has occurred, it arises from identifying and addressing the root cause of the problem. This recognition helped spark a paradigm shift in our approach to quality.

Through a system-wide campaign, the staff were encouraged to report all errors

regardless of how small they were, how temporary in nature, and even if they were immediately corrected. Reporting errors is made easy by technology - they can be posted (anonymously if preferred) on an intranet portal from anywhere in the system. This approach has been hugely successful. The number of reports of "near misses" and errors being filed has steadily increased. This transparency has enabled a process and culture of continuous improvement while also fostering a very high level of staff engagement. All of this has been achieved in the context of already high quality standards, world-class outcomes and very low complication rates. The process of evolving the DNA of the organization in a quest for perfection is an extremely important development for the next phase of growth. And all of this, at the core is driven by the ethos of compassion that the founding team seeded this organization with.

Walkway into Aravind-Pondicherry



Speciality Care: A Focus on Reaching the Unreached

There is a growing recognition that people with conditions other than cataract or refractive errors are getting neither timely nor appropriate care. Patients with such conditions are diagnosed only if they walk into an eye hospital that routinely does comprehensive eye examinations. Since patients cannot diagnose such conditions themselves, the case finding is largely by chance and thus hugely under-diagnosed. A more proactive, community oriented process is required as has been done for cataract and refractive errors.

Experiments are underway at Aravind to improve the case-finding at Vision Centres, standard eye camps and through novel methods like family-screening for glaucoma and speciality eye camps.

Talks are on with various technology companies to develop appropriate screening equipment for use in eye camps and Vision Centres. As such work is progressing on the “demand” front, the capacity issues at the hospitals are also being addressed. Much progress on this front has been made at Aravind Eye Hospital, Madurai where Retina, Glaucoma and Cornea services have all moved into a much larger and totally renovated facility. This will enable them to see more than twice the number of patients. Early planning on the expansion front is also underway at Aravind Eye Hospitals in Coimbatore and Tirunelveli.

Dr. Krishnadas examining a patient in the renovated Glaucoma facility



Affordable Toric Lenses: Aurolab's Latest Game Changer

Keeping up the tradition of introducing a range of new products each year, Aurolab launched a series of surgical consumables in 2013 to enhance patient care.

Two decades ago when Aurolab came into existence, it literally revolutionized eye care by making quality IOLs available at very affordable price. Aurolab has now come up with another ground-breaking product in the form of affordable Toric IOLs. The Toric lens helps those with significant astigmatism to gain normal vision following cataract surgery without the aid of glasses. Priced at Rs. 16,000/- or more for the lens alone, it was clearly unaffordable for many. Aurolab perfected their own version of Toric IOLs and set the price for these lenses at under Rs.6,000/-.

This affordable price coupled with the high quality of IOL is helping Aurolab make rapid strides in developing the market for Toric IOLs.

Aurolab has recently acquired electro-chemical etching technology and launched Aurosleek blades which are glitter-free sharp precision blades. This will further enhance the quality of cataract surgery.

For the first time, Aurolab has taken on a distribution role for an outside company. It is now a distributor for a hand-held non mydriatic fundus camera made by Optomed, a Finnish company. This step is in perfect alignment with Aurolab's strategic goal of comprehensively aiding in screening and treatment of Diabetic Retinopathy.



Beyond Aravind: The Model Goes Global

It had been a long-time dream of Aravind's founder Dr. Venkataswamy to do sustainable eye care work in Africa and this opportunity will make that dream a reality.

The work of promoting best practices in eye care got a welcome boost this year through a grant from the Hilton Foundation and Bloomberg Philanthropies. This joint initiative with Johns Hopkins University, aims to add 20,000 more surgeries annually in sub-Saharan Africa. This initiative takes an entrepreneurial approach towards supporting five local ophthalmologists who have exhibited a passion to provide better eye care to their own people.

Through this project Aravind will be working with five ophthalmologists, one each in Ethiopia, Zambia, Nigeria, and two in Kenya. The partnership will involve providing guidance for strategic planning, training, on-site support and putting in IT systems. This grant will also provide substantial financial support to each of the five hospitals to bring about the required changes in infrastructure and HR.

Recognizing the impact of systematic organizational capacity building, Lavelle Fund for the Blind, USA has stepped forward to help Aravind mentor another 25 eye hospitals. Some of these will be

from the 300 hospitals that LAICO had worked with earlier while the rest will be newly identified eye hospitals from India and neighboring countries. With this support spread over the next four years, Aravind hopes to add another 50,000 surgeries or more through these 25 hospitals.

During the past year Tulsi Chanrai Foundation of Nigeria held a series of dialogues around jointly establishing a state-of-the-art eye hospital in the country. The Chanrai family have been running businesses in Nigeria for over 100 years and have been equally involved in addressing a number of developmental issues such as access to drinking water, primary health care and eye care.



Aravind senior leaders with the team from Tulsi Chanrai Foundation

Participants of Hilton Cataract Initiative - Vision Building and Strategic Planning workshop



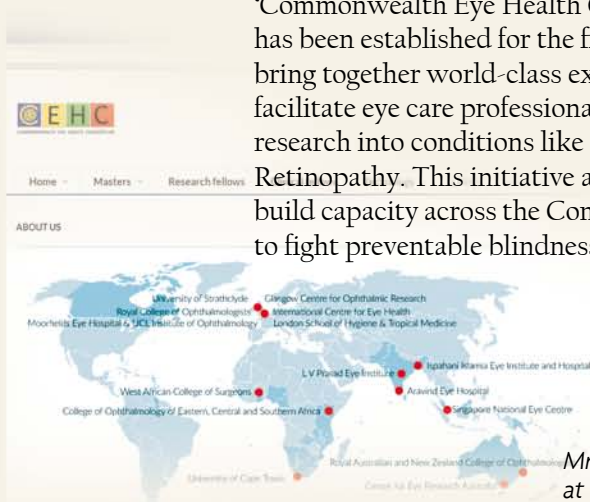
Recognizing the lack of a tertiary eye care facility and training centre, they approached Aravind for collaboratively establishing this. This project is now in advanced stages. The land has been acquired and building plans are being finalized.

Hospital construction will begin shortly and the preparatory work of recruitment, selection and staff training will commence. It had been a long-time dream of Aravind's founder Dr. G. Venkataswamy to do sustainable eye care work in Africa and this opportunity will make that dream a reality.

Aravind Eye Hospital, Madurai was selected one among the eleven expert institutions chosen from across the world to combat preventable blindness in the Commonwealth. A 'Commonwealth Eye Health Consortium' has been established for the first time to bring together world-class expertise and facilitate eye care professionals to pursue research into conditions like Diabetic Retinopathy. This initiative also aims to build capacity across the Commonwealth to fight preventable blindness and

provide quality eye care to those affected or at risk. With a grant of Rs. 71 crore from 'The Queen Elizabeth Diamond Jubilee Trust', the Consortium would be co-ordinated by the International Centre for Eye Health at the London School of Hygiene and Tropical Medicine. The grant would facilitate the Consortium to deliver an integrated programme of fellowships, research and technology. Dr.N. Venkatesh Prajna, Chief, Department of Medical Education, Aravind Eye Care System (AECS) is part of the 12 member steering committee of the Consortium.

With the growing recognition in the field of eye care delivery, Aravind was approached by many eye care organizations seeking hospitality to host their annual conferences. Aravind accorded a warm welcome to this offer. Subsequently, the World Association of Eye Hospitals had its 8th Annual Meet hosted by Aravind - Madurai in the last week of January. Last year also witnessed the organization hosting the Tenth Annual Meeting of the Society for Indian Human and Animal Mycologists (SIHAM), Fourth Annual Meeting of Sight Life as well as the Indo-French Seminar on Fungal Filamentous Pathogens.



Mr. R.D. Thulasiraj, Dr. Sivakumar and Ms. Sashipriya with the team at the Government Eye Hospital at Fayoum Governorate, Egypt



IT: A Powerful Enabler in Patient Care

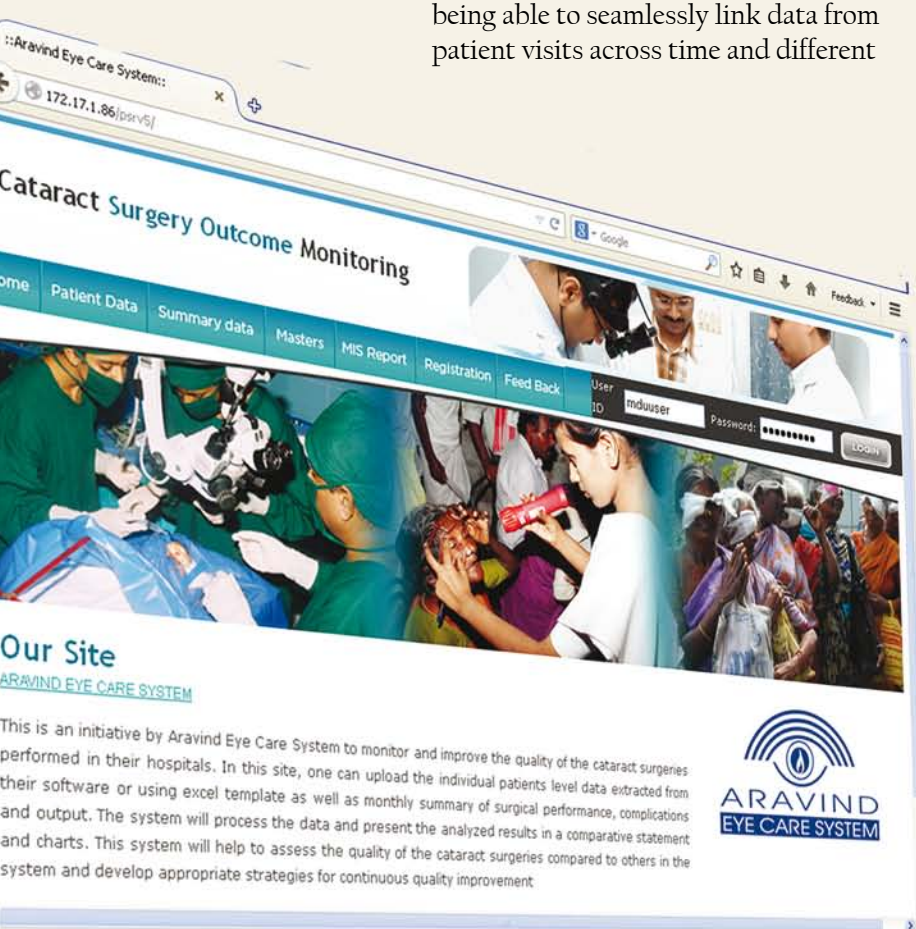
Information Technology is increasingly becoming a critical resource for enabling quality and efficiency in patient care. The Electronic Medical Record (EMR) system at Aravind made its debut over a decade ago in the Vision Centres. Soon all Aravind Eye Hospitals will employ the EMR system developed in-house. This system will not only incorporate the customary charting features including smart drawing tools, but will also seamlessly integrate patient flow management and best practice protocols.

To better manage chronic conditions like Glaucoma and Diabetic Retinopathy, all such patients will become part of a registry being developed for this purpose. This registry, over time will help in continually refining the care management process. Aravind now has a network of sixty fixed locations for patient care. With a lot of cross referrals, being able to seamlessly link data from patient visits across time and different

centres will be of enormous value. This ability will soon come into being with the introduction of an EMR system coupled with the unique patient ID system that was introduced this year.

In other developments, Aravind has migrated its cataract quality assurance system to a cloud based application developed in-house. For every cataract surgery all details relating to pre-op condition, surgery, complications, visual outcome and follow up are posted. The data is uploaded continuously from all ten Aravind Eye Hospitals.

Cataract is the most commonly performed surgical procedure not only in eye care but across all fields of medicine. Today, Aravind Eye Hospitals log over 250,000 cataract surgeries annually into this application. It then generates in real time benchmarks and comparisons at a very granular level, highlighting very specific areas for improvement. Each surgeon can know at any instant how well he or she has performed and where improvement is needed. This benchmarking process has been instrumental to bettering Aravind's outcomes in cataract surgery. Having recognized this benefit Aravind is now making this platform available for other hospitals to post their data and has set itself a goal of having at least one million cataract surgeries logged into the system annually.



Transcending Boundaries: Working Beyond Eye Care

As an expression of its commitment to sustainable development, Aurolab invested in green initiatives by installing a 100KW solar power generation plant, and also installing DEWATS (Decentralized Wastewater Treatment Systems) for treatment of waste water which is then used for agriculture.

Aravind continues to attract visitors from different backgrounds who come to learn the best practices and get inspired by its unique operational model. Earlier this year, Shri Sanjay Kothari, Secretary, Department of Administrative Reforms and Public Grievances (DARPG), Government of India made a visit to Aravind Eye Care System, Madurai. Deeply impressed by the organization's operational model and its dedicated

compassionate service towards restoring sight, DARPG proposed to organize a 3 - 5 day visit in order to expose officers of centre and states to examples of the best practices. Accordingly a delegation consisting of thirteen senior government officials as well as ophthalmologists from Regional Institutes of Ophthalmology and Government Hospitals visited the organization from March 10 - 14.

For the fifth consecutive year Aravind has found place in the itinerary of Jagriti Yatris, a group of highly spirited youths who set out on a national odyssey exploring ideas behind the various business models.

Around 800 visitors had been to Aravind last year, majority of whom were from the field of eye care and a few from general health care sectors.

Dr. R.D. Ravindran and Mr. Thulasiraj with the team from RIO and Government Hospitals



Dr. S. Aravind with the Jagriti Yatris



Deploying Research Discoveries at Patient Level

Aravind Medical Research Foundation with its focus on eye diseases is directly interfacing with clinician scientists, who participate in all aspects of the discovery process. Regular interactions happen between the basic researchers, clinical researchers as well as the manufacturing arm of the Aravind Eye Care System, so that relevant ideas can be further incubated to result in a meaningful conclusion.

Deployment of discoveries at patient level needs the close collaboration of researchers and clinicians and Dr. G. Venkataswamy Eye Research Institute is fostering this in a major way.

Basic science is the driving force behind any application and hence the institute tries to explore the mechanistic aspect of diseases as well.



Dr. R.D. Ravindran addressing the participants at the Research Methodology workshop

Research at Aravind is influencing preferred practice patterns in developed countries also. Aravind's research in fungal keratitis has been widely acknowledged worldwide. The results of the randomized clinical trial in fungal keratitis have been cited as a firm evidence for institutions like Moorfields Eye Hospital to formulate a therapeutic strategy for fungal keratitis.

IOP lowering property of newer anti-glaucoma drugs being tested at the newly established Human Organ Culture Anterior Segment (HOCAS) facility



Developing Eye Care Personnel Worldwide

Lack of adequate training still plagues effective eye care delivery in many parts of the world. Education and training programmes that Aravind offers are much sought-after in the field of eye care and every year the organization receives candidates from across the world for its various clinical, paramedical as well as eye care management courses. In addition to ophthalmology residency programmes, every year Aravind offers over 30 structured courses for various cadres of eye care professionals – both clinical and management. Over 500 eye care professionals across the world have received some form of training through Aravind's structured training programmes in the year ending March 2014. In addition, Aravind also offers learning opportunities to meet with specific needs of individuals

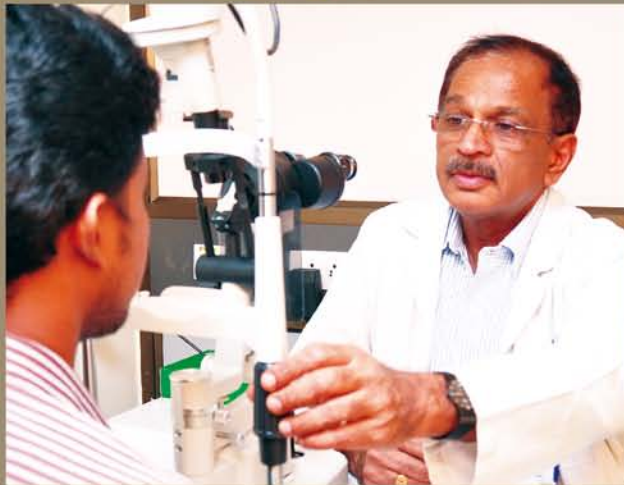


Training session for paramedics at Aravind - Tirunelveli

and organizations. Such training is offered throughout the year and the actual scheduling is based on mutual convenience. These requests often take the form of observation in specific clinical or administrative areas or some hands-on training.

Trainees at the Aravind wetlab





PATIENT CARE

Aravind is committed to provide high quality patient care – going beyond clinical excellence and efficiency, the organization strives to achieve a high degree of patient satisfaction. Quality of care is ensured by state-of-the-art infrastructure, continuous focus on developing the competence of staff and by putting in efficient systems. Beyond these tangibles, is a strong patient-centered culture that ensures staff deliver compassionate care to each patient.

All the speciality clinics actively involve in organizing programmes and exhibitions for creating awareness about various eye diseases in the community.

Last year too, a series of new measures and techniques were introduced, systems updated to provide a unique patient-centred care. Facilities in the speciality clinics across the Aravind satellite hospitals were upgraded, in terms of both infrastructure and manpower.

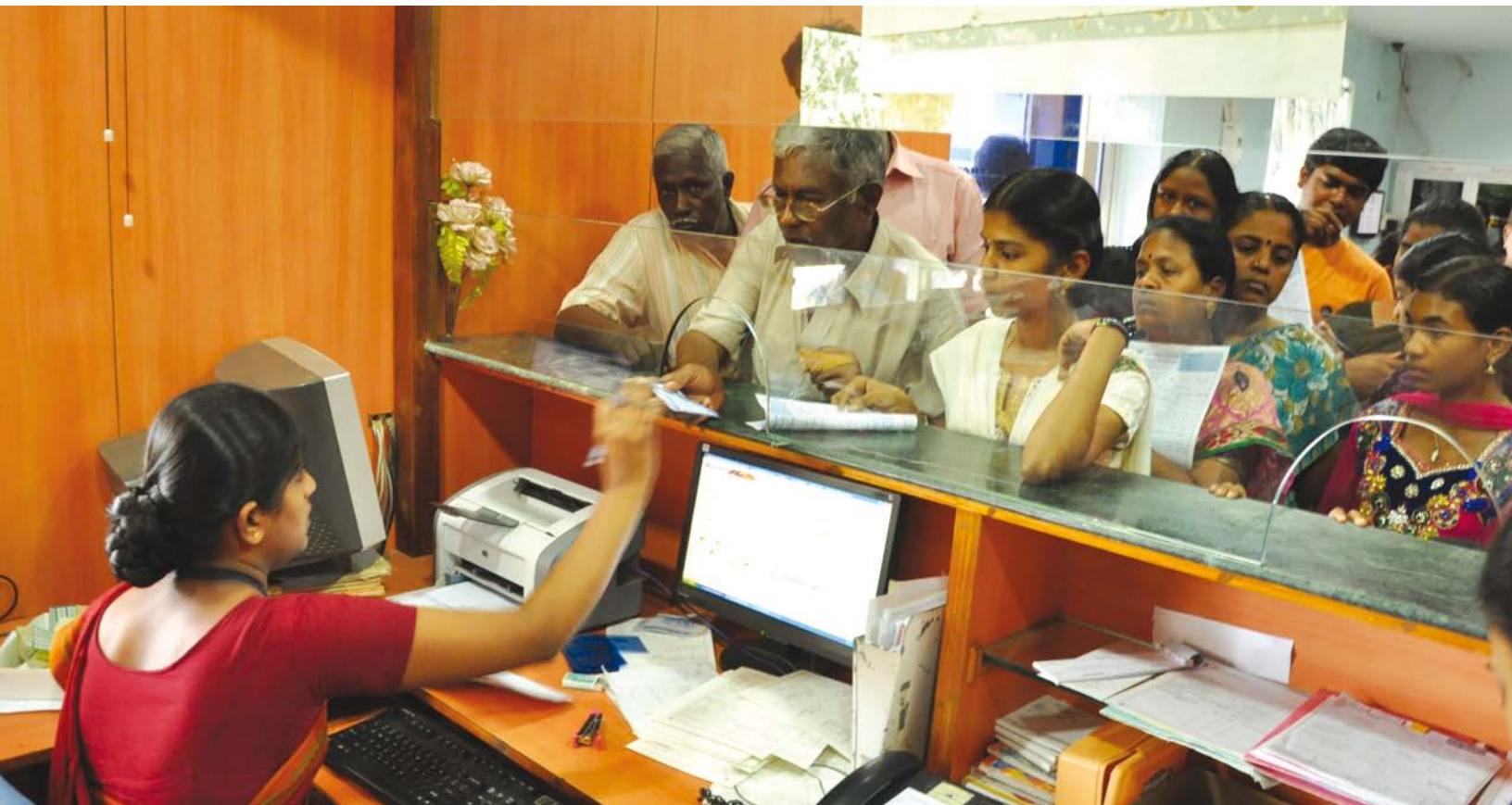
Busy clinics at Aravind - Madurai such as Retina, Cornea and Glaucoma moved to spacious premises in the renovated outpatient building. Separate areas are now assigned for patients according to their type of visit - New, Review and Follow up. This segregation helps the staff cater to the needs of the patients accordingly and reduce the waiting time.

Aravind Eye Hospital, Coimbatore launched “Visioffice”, the first and only universal measuring system that allows obtaining every possible parameter needed for today’s individualized lenses. This is the first of its kind in South India.

Cataract Services

Cataract surgeries constitute more than half of the surgeries performed at Aravind. To enhance the efficiency and quality as well as output of this high-volume surgery, Aravind has acquired newer phaco machines that allows for safer and fast surgery with advanced fluidics technology system enabling

Patient registration at Aravind - Theni



Performance : April 2013 - March 2014

	Total	Madurai	Theni	Tirunelveli
OUTPATIENT VISITS				
HOSPITALS				
Paying (New+Review)	1,781,062	549,683	79,777	265,663
Free (New+Review)	468,268	162,663	21,154	71,904
OUTREACH				
At Free Eye camps				
Comprehensive camps	339,416	109,145	18,930	45,604
Diabetic Retinopathy screening camps	63,635	3,388	3,379	2,245
Refraction camps	50,023	14,648	4,497	11,192
School children examined*	71,824	5,965	1,381	19,350
Paediatric eye screening	31,186	874	3,068	1,952
Mobile van refraction camps	2,071	-	1,946	-
Total patients examined in camps*	558,155	134,020	33,201	80,343
At Vision Centres	320,476	127,046	52,108	66,986
At Community Eye Clinics / City Centres	147,218	85,335	18,894	22,948
TOTAL OUTPATIENT VISITS	3,275,179	1,058,747	205,134	507,844
SURGERIES				
Paying	190,192	71,945	6,411	28,447
Subsidized (walk-ins to free hospital)	101,908	41,171	3,153	13,840
Free (through screening camps)	85,935	32,205	2,701	11,570
TOTAL SURGERIES	378,035	145,321	12,265	53,857

*Note: Does not include 357,610 children screened by school teachers and found to be normal

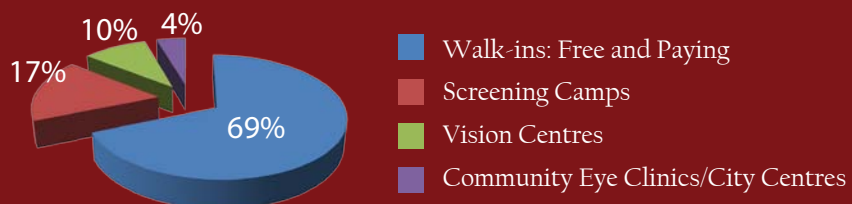
In the year ending March 2014, around 3.3 million outpatient visits were handled and around 380,000 surgeries were performed across all Aravind Eye Hospitals.

Of this, 50% of the surgeries were either free or deeply subsidized.



Coimbatore	Pondicherry	Tirupur	Dindigul	Salem	Tuticorin	Udumalpet
352,343	255,015	41,221	62,909	100,926	47,308	26,217
114,711	80,371	3,314	-	-	3,866	10,285
90,649	69,956	-	-	4,359	773	-
50,699	3,730	-	-	194	-	-
10,384	7,894	-	-	1,234	-	174
19,795	23,343	118	-	1,872	-	-
1,793	23,499	-	-	-	-	-
-	-	-	-	125	-	-
173,320	128,422	118	-	7,784	773	174
33,232	33,181	7,923	-	-	-	-
-	20,041	-	-	-	-	-
673,606	517,030	52,576	62,909	108,710	51,947	36,676
40,597	26,051	1,835	3,368	8,224	1,913	1,401
27,403	13,947	702	-	-	610	1,082
17,767	18,482	257	-	2,340	199	414
85,767	58,480	2,794	3,368	10,564	2,722	2,897

Aravind's Outreach Programme - screening camps, Vision Centres and Community Eye Clinics help take the services to one third of the total patients.



early postoperative rehabilitation of patients. The newly acquired Hoya iTrace surgical work station is a complete diagnostic device based on advanced ray tracing technology that isolates and quantifies cornea versus lens aberration. It provides precise preoperative metrics, which allows surgeons to more accurately predict post surgical outcomes with greater confidence and improve the same by selecting the best IOL for each patient. It has also helped in better measurement and placement of Toric IOL.

Cornea and Refractive Surgery Services

Lasik is increasingly becoming popular among patients with refractive errors. Considering this, all the Aravind tertiary centres have been offering the service for years on. As a promising step, the relatively new centre at Salem started offering this service from February 2014.

The clinics at Aravind – Madurai, Pondicherry, Coimbatore and Tirunelveli have acquired the Femtosecond laser machine to improve the safety and precision of creating corneal flaps in lasik surgery. Descemet Stripping Endothelial Keratoplasty (DSEK), a procedure being widely performed at various Aravind centres, was introduced at Aravind – Tirunelveli in August. This procedure is safer than the conventional penetrating keratoplasty as well as assures faster recovery in patients with healthy anterior corneas.



Installation of a new Phaco machine at Aravind - Tirunelveli

Paediatric Ophthalmology Services

The Ocular Genetics service, yet to be officially inaugurated, already provides its services once a week during summer holidays and twice a week at other times. In the last one year, more than 1000 families recieved genetic consultations and counselling services. Aravind was one of the institutes involved in a collaborative initiative “Genetic Educators Project” with University of Pittsburgh, Pennsylvania, United States to study the possibility of the role of paramedical personnel as basic genetic educators with the results being very encouraging. Though ocular genetics and

Surgeries Performance : April 2013 - March 2014

	Total	Madurai	Theni	Tirunelveli
Cataract surgeries	241,440	95,437	9,662	32,813
Trab and combined procedures	6,312	2,104	281	1,186
Retina and vitreous surgery	12,403	5,200	11	1,301
Squint correction	2,168	966	-	328
Keratoplasty	1,975	760	11	312
Pterygium	4,337	1,820	223	179
Ocular injuries	1,567	525	3	122
Lacrimal surgeries	6,525	3,214	67	921
Laser procedures	77,367	24,918	1,784	13,447
Other orbit and oculoplasty surgeries	8,100	3,531	175	1,198
Others	10,396	4,361	48	1,201
Refractive surgery	5,445	2,485	-	849
TOTAL SURGERIES	378,035	145,321	12,265	53,857



Nurse using the PacScan machine on a paediatric patient at Aravind - Coimbatore

genetic testing is currently in its initial stages in India as in most other countries, it will play a great role in the near future and benefit several families.

The department at Aravind - Coimbatore acquired portable PacScan machine, a combination of both Pachymetry and A-scan. The combination of a high frequency, low noise probe and fast precise algorithm enables scan capture immediately upon application of the probe along the visual axis.

A collaborative effort has been initiated between Aravind - Pondicherry and Department of Health and Family Welfare, Government of Puducherry, at Rajiv Gandhi Women and Children Hospital to address Retinopathy of Prematurity. Memorandum of Understanding was signed on August 8 to conduct

screening for ROP at the hospital. The necessary screening expenditure will be borne entirely by Aravind Eye Hospital and treatment will also be subsidized by Aravind.

Retina and Vitreous Services

Expansion of the clinic facility and introduction of new measures at Aravind - Madurai have proved to be of immense benefit to the patients as well as the staff. A small unit of the biochemistry lab is now set up inside the clinic which makes it easy especially for patients with diabetic retinopathy who otherwise had to go to a separate floor for blood tests. The clinic has always been in collaboration with leading hospitals in and around Madurai for screening of babies for Retinopathy of Prematurity. Last year a children's hospital was added to this network with a view to strengthening screening for the disease.

At Aravind - Coimbatore, the clinic in collaboration with Lions Club International and Dr. Rajendran's Diabetes Centre organized blood sugar screening camps in 150 locations. The camp conducted as part of World Diabetes Day turned out to be a Guinness world record by screening 36, 200 people free of cost in one day.

Aravind - Tirunelveli and Pondicherry acquired Pascal photocoagulator, used to treat a variety of retinal diseases such as diabetic retinopathy, age-related macular degeneration, and retinal vascular occlusive disease in March.

Coimbatore	Pondicherry	Tirupur	Dindigul	Salem	Tuticorin	Udumalpet
49,956	37,896	2,075	2,251	7,040	1,887	2,423
1,729	775	47	45	93	52	-
4,043	1,535	-	-	312	1	-
581	293	-	-	-	-	-
596	291	-	-	5	-	-
1,164	720	41	48	123	16	3
485	382	2	6	42	-	-
982	1,257	33	-	33	18	-
20,817	11,347	531	915	2,566	631	411
1,750	1,099	47	61	119	89	31
2,653	1,787	18	42	229	28	29
1,011	1,098	-	-	2	-	-
85,767	58,480	2,794	3,368	10,564	2,722	2,897



Blood sugar screening camp by Aravind - Coimbatore that set a Guinness World Record



Vision Rehabilitation Centre at Aravind-Madurai

Vision Rehabilitation Services

In collaboration with Sightsavers India, the clinic along with professionals from Sarva Siksha Abhiyan (SSA) initiated a project to provide low vision services to children. In the first phase, the clinic at Aravind - Madurai screened school children with low vision and provided low vision aids along with educational counselling. Three districts - Madurai, Theni and Ramanathapuram with 34 blocks were covered in this project during the year 2013. Special education teachers were involved in prescreening and mobilising children to the camp site. Overall 2,238 prescreened children were screened. Out of them 461 children were found to have refractive errors. 34 children had incurable low vision and were provided with low vision aids through the project. In the second phase Sightsavers worked with Aravind in organizing a training programme to the special educators with a curriculum covering all aspects of low vision. A total of 60 participants from 30 districts in Tamil Nadu participated in this training programme. The participants were given low vision kits at the end. Upon return to their respective centres, these teachers organized low vision training session for special educators, school teachers and parents.

Orbit, Oculoplasty and Ocular Oncology Services

The clinic has been collaborating actively with Indian Council for Medical Research (ICMR) along with other centres in India in establishing the National Retinoblastoma Registry since March 2009 and has enrolled nearly 220 patients till March 2014. These

retinoblastoma patients have been followed up closely over the years and appropriate treatment along with cosmetic rehabilitation has been done.

A new initiative to enhance Retinoblastoma awareness were the activities conducted during Retinoblastoma Awareness Week from May 13 - 18. Posters about Retinoblastoma and its treatment options were displayed in various departments. Dr. Usha Kim spoke to various patients and their attendants to increase awareness about this life and vision threatening childhood cancer.

A new beginning in the field of ocular genetics was the clinic's efforts towards establishing a "Centre for Excellence in Retinoblastoma Genetics". Samples are being collected and genetic analysis of the entire family of retinoblastoma patients is being performed as part of standard management protocol. During the last year, significant genetic mutations accounting for sporadic or heritable disease in nearly 12 retinoblastoma patients were identified. This data is being utilized for genetic counselling in these families.

The prosthetic eye unit in the clinic has been rendering excellent service to patients who have had their eyes removed, either partially or totally. Initiatives were taken in the last year to upgrade its services to include silicone prosthesis. A two member team was sent to Smile in Dental Clinic, Pune for a formal training in silicon prosthesis in April 2013 following which the clinic introduced the service in August. This is the first of its kind in entire Tamil Nadu. The clinic, during the last year, has dispensed nine highly affordable customized silicon prostheses that provide superior cosmetic appearance.



Dr. Usha Kim with a Retinoblastoma patient in the chemotherapy ward, Aravind - Madurai

Glaucoma Services

Aurolab Aqueous Drainage Implant (AADI) is a potential solution to the cost barrier of glaucoma drainage devices in the developing countries. The safety, efficacy of AADI was established by analyzing the IOP control, number of glaucoma medications, visual acuity of 30 patients with refractory glaucoma who underwent the AADI implantation and followed up for a minimum of 18 months postoperatively. Video film on this affordable aqueous drainage implant won major recognitions at the World Glaucoma Congress at Vancouver, Canada in July and at the Annual Conference of Glaucoma Society of India (GSI) at Indore in September.

Automated image analysis for glaucoma detection – an Aravind – Indian Institute of Information Technology, Hyderabad collaboration was awarded the best free paper at the Glaucoma Society of India annual meeting at Indore. In the South Indian population screened at glaucoma services across AECS, (the Indian Family Angle Closure Study), the siblings of individuals with angle closure disease had 10-30% higher risk of angle closure when compared to control subjects. Screening of siblings of angle closure disease is likely to increase detection of angle closure disease in the population early so that glaucoma can be prevented by a simple laser intervention.

Patient recruitment was completed for a large, multicentre, randomized trial at AECS comparing the safety, efficacy of starting treatment with Selective Laser Trabeculoplasty in POAG to starting treatment with Latanoprost eye drops.

To commemorate the World Glaucoma Week, awareness activities including family screening camps, press meets and rallies were organized at all Aravind Eye Hospitals in March 2014.

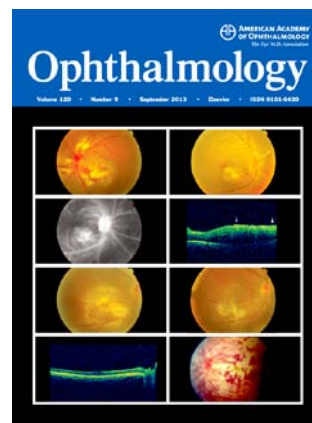
Uvea Services

Uvea clinic at Madurai completed its twenty years of service.

Comprehensive approach to diagnosis and treatment is achieved with the help of rheumatologists, pulmonologists, infectious disease specialists, dermatologists and radiologists. The clinic

encountered two epidemic outbreaks of infectious uveitis and one endemic idiopathic infectious uveitis and was very fortunate to be able to resolve the etiology. Those three novel etiologies include Leptospiral uveitis, West Nile virus retinitis and Trematode granulomas in children. It was a proud moment for the clinic when its study on west Nile Virus retinitis was published in the journal *Ophthalmology* (2013; 120(9):1820-6.) with the images on the cover page of the issue.

Uvea clinic at Aravind - Pondicherry moved to new premises offering better ambience for the patients and the new facility was inaugurated on October 9.



Quality Assurance Systems in Place

Prime importance has been attributed to patient safety. Online incident reporting has been mandated in all the hospitals and the staff were encouraged to report all errors regardless of how small they were, how temporary in nature, and even if they were immediately corrected. In the year 2013 - 14, 598 incidents were reported related to patient safety, non clinical services, efficiency and timeliness. The analyses of the reported events were used to develop patient safety goals specific to Aravind Eye Hospitals. Protocols have been developed for ensuring patient safety in all clinical departments. This has resulted in minimizing incidents and improving clinical quality, productivity, patient services and better patient and staff satisfaction.

ARAVIND EYE BANKS

Every year, in India the need for cornea for sight - restoring surgeries is around one lakh. Statistics reveals that of the total corneas collected each year, only 20,000 can be used for surgeries. 80% of the bilateral corneal blind people are still living in dark. Thus there is a wide gap between demand and supply. To address this gap and to clear the backlog, Aravind Eye Banks resorted to two types of strategies to procure eye balls:

Community Cornea Retrieval Programme

This programme mainly focuses on volunteers and eye donation centres (developed by group of volunteers or service clubs like Lions, Rotary as well as NGOs) for retrieval of cornea. Training programme was arranged for the personnel at eye donation centres for maintaining the standard and quality of corneas with special focus on improving the utilization rate. The eye bank is currently in the process of creating a supportive environment for the eye donation centres in terms of arranging doctors / technicians for performing enucleation. Eye donation centres collected a total of 2,432 eyes during 2013 - 2014.

Hospital Cornea Retrieval Programme

This programme mainly focuses on hospital -based cornea collection. Eye banks across the Aravind centres have entered into tie up with surrounding hospitals for procuring corneas. Grief counsellors are posted in the collaborating hospitals whose main job is to counsel the family of the deceased and make them give consent for donating eyes of their beloved ones. In the year-ending March 2014, 658 corneas were collected through HCRP.

Awareness Programme

Lectures and awareness seminars on eye donation were arranged on a regular basis targeting various educational institutions, industries, NGOs and community groups.

Eye Donation Fortnight was held from August 24 to September 8. Different stake holders were involved in the various programmes organized then for effectively taking the eye donation message to the community.



Eye donation awareness programme organized at a school in Nellikkuppam, Pondicherry



Eye donation awareness rally by Aravind - Salem in collaboration with Salem Saurashtra Cultural Trust

Training

Eight candidates including 6 technicians, one eye donation counselor and one eye bank manager underwent structured training at Rotary Aravind International Eye Bank. Various practical and theoretical sessions were arranged as a part of the programme.

	Eyes Procured	Eyes Utilized for Surgery
Madurai	1,606	911
Coimbatore	1,687	690
Pondicherry	921	290
Tirunelveli	575	327
Total	4,789	2,218

REACHING OUT

Aravind has always been conscious of the significance of being proactive about attracting patients instead of simply waiting for patients to arrive on their own. Over the years, Aravind's outreach programmes evolved from the traditional cataract-only screening to that of a comprehensive screening for all age groups. Permanent centres (vision centres) were set up in rural places over the years to provide primary eye care to the community.

Continuing its journey of expansion of primary eye care facilities, Aravind opened 4 new vision centres - Patthamadai (August 1), Oddanchatram (December 30), Auroville (February 21) and Kadayam (March 26). Now steps are underway to develop a sustainable service delivery model by providing sub-specialty services through these vision centres in linkage with the base hospital (tertiary care).

In the year ending March 2014, 320,476 patients were seen through Vision centres alone, and 147,218 through the Community Eye Clinics and City Centres. And a total of 2609 camps were conducted through which 558,155 were screened.

Annual Outreach Planning Meeting

In order to review performance of the previous year and also to develop new strategies for future, outreach staff across the Aravind centres were called in for a two day planning meeting at Aravind - Madurai in the first week of January. Discussions revolved on setting new targets



Dr. S.R. Krishnadas inaugurating the Vision Centre at Oddanchatram

for the year 2014, analyzing the community participation and evolving ways to reach out to many more.

SightFirst Seminar

SightFirst seminar is organized annually in association with SightFirst committee of the Lions Cabinet to create eye care awareness amongst the new office bearers of Lions Clubs. Seminars were held at Aravind- Madurai and Tirunelveli on October 19 and December 19 respectively. Members from various Lions Clubs of Districts 324 B3 and 324 B4 attended the seminar.

Dr. R. Venkatesh with His Excellency the Lieutenant Governor Hon. Virendra Kataria flagging off the rally as part of World Glaucoma Week celebrations at Aravind - Pondicherry



Outreach Performance April 2013 - March 2014

	Total	Madurai	Theni	Tirunelveli	Coimbatore	Pondicherry	Tirupur	Salem	Tuticorin	Udumalpet
Regular Comprehensive Eye Camps										
Camps	1,507	394	105	270	420	285	-	28	5	-
Patients examined	339,416	109,145	18,930	45,604	90,649	69,956	-	4359	773	-
Glasses advised	73,698	18,657	4,669	12,143	19,007	18,348	-	874	-	-
Glasses ordered	61,540	15,263	3,952	9,738	16,166	15,735	-	686	-	-
On the spot deliveries	46,562	11,838	2,494	7,153	12,832	11,913	-	332	-	-
%	76%	78%	63%	73%	79%	76%	-	48%	-	-
Diabetic Retinopathy Screening Camps										
Camps	446	26	60	18	315	26	-	1	-	-
Patients screened	63,635	3,388	3,379	2,245	50,699	3,730	-	194	-	-
Diabetics identified	21,875	1,709	2,124	1,238	14,969	1,757	-	78	-	-
DR patients identified	1,667	197	202	211	817	232	-	8	-	-
Refraction Error Camps										
Camps	234	59	23	57	47	39	-	7	-	2
Patients examined	50,023	14,648	4,497	11,192	10,384	7,894	-	1,234	-	174
Glasses prescribed	15,242	4,691	1,960	3,788	2,365	2,187	-	212	-	39
Glasses ordered	13,068	4,242	1,777	3,040	2,099	1,730	-	165	-	15
On the spot deliveries	7,597	2,893	857	1,674	1,077	1,023	-	73	-	-
Eye Screening of School Children- Base Hospital										
Schools	102	18	10	8	36	20	1	9	-	-
Teachers trained	1,283	190	165	35	236	644	-	13	-	-
Total strength	165,139	44,698	23,372	9,339	47,131	24,837	495	15,267	-	-
Children screened by ophthalmologist	36,094	5,130	1,381	2,375	19,750	5,468	118	1,872	-	-
Children with eye defects	9,747	2,479	1,164	717	2,310	1,830	34	1,213	-	-
Eye Screening of School Children - Vision Centres										
Schools	9	3		3	1	2	-	-	-	-
Teachers trained	89	13		32	-	44	-	-	-	-
Total strength	11,942	6,325		2,847	650	2,120	-	-	-	-
Children screened by ophthalmologist	2,168	835		725	45	563	-	-	-	-
Children with eye defects	905	307		403	31	164	-	-	-	-
School Children Screening Camps by Lavelle Project (Aravind - Tirunelveli and Pondicherry) :										
Schools	158	-	-	104	-	54	-	-	-	-
Teachers trained	4,571	-	-	-	-	4,571	-	-	-	-
Total strength	252,353	-	-	139,511	-	112,842	-	-	-	-
Children screened by ophthalmologist	33,562	-	-	16,250	-	17,312	-	-	-	-
Children with eye defects	9,427	-	-	6,926	-	2,501	-	-	-	-
Children's Eye Camp										
Camps	121	7	11	8	11	84	-	-	-	-
Children examined	31,186	874	3,068	1,952	1,793	23,499	-	-	-	-
Refractive error	754	131	120	152	166	185	-	-	-	-
Glasses prescribed	319	62	42	2	67	146	-	-	-	-
Glasses ordered	304	59	39	2	63	141	-	-	-	-
Other defects identified	891	67	54	145	81	544	-	-	-	-
Mobile Van Refraction Camps										
Camps	32	-	30	-	-	-	-	2	-	-
Patients screened	2,071	-	1,946	-	-	-	-	125	-	-
Glasses prescribed	567	-	542	-	-	-	-	25	-	-
Glasses ordered	429	-	408	-	-	-	-	21	-	-
Vision Centres										
Centres	46	18	7	8	5	6	2	-	-	-
New + Review	320,476	127,046	52,108	66,986	33,232	33,181	7,923	-	-	-
Ave. outpatients per day	24	24	24	32	21	21	13	-	-	-
Community Eye Clinics										
Centres	4	2	1	1	-	-	-	-	-	-
New + Review	84,133	42,291	18,894	22,948	-	-	-	-	-	-
Ave. outpatients per day	68	68	61	74	-	-	-	-	-	-
City Centre										
Centres	2	1	-	-	-	1	-	-	-	-
New + Review	63,085	43,044	-	-	-	20,041	-	-	-	-
Ave. outpatients per day	102	139	-	-	-	65	-	-	-	-

EDUCATION AND TRAINING

Aravind has developed and refined a system of structured training programmes and every year the organization receives candidates from across the world for its various clinical, paramedical as well as eye care management courses. In addition to ophthalmology residency programmes, every year Aravind conducts over 30 structured courses for various cadres of eye care professionals- both clinical and management. In addition, Aravind also offers learning opportunities to meet with specific needs of individuals and organizations. Such training is offered throughout the year and the actual scheduling is based on mutual convenience. These requests often take the form of observation in specific clinical or administrative areas or some hands-on training.

CMEs held at Aravind

CME on Intraocular Inflammation and Uveitis

Aravind - Salem, April 28

Uveitis Society of India and Aravind Eye Hospital - Salem jointly organized the CME at Hotel Cenneys Gateway, Salem. The CME discussed various issues in the diagnosis and management of uveitis and ocular inflammatory diseases. Around 70 participants including ophthalmologists, and PG students attended the conference. Notable speakers included Dr. Jyotirmay Biswas, Chief, Uvea Clinic, Sankara Nethralaya, Dr. Sudha K Ganesh, President, Uveitis Society of India, Dr. S.R. Rathinam, Chief, Uvea Services, Aravind - Madurai, Dr. ManoharBabu, Vice President, Uveitis Society of India, Uvea specialists Dr. Anuradha and Dr. Balamurugan from Aravind - Coimbatore and Pondicherry respectively. A quiz programme was also conducted, as part of the CME.

II Workshop on Maintenance and Care of Ophthalmic Instruments and Equipment

Aravind - Salem, May 8 - 10

Aravind's Instruments Maintenance team consisting of Mr. S. Poornachandran and Ms. Kasthuri conducted the workshop. A total of 12 technicians from in and around Salem participated.

Dr. S. Mahesh Kumar addressing the participants at the Seventh Triennial Conference of the Ocular Trauma Society of India



CANDIDATES TRAINED 2013-14

TOTAL CANDIDATES : 523

POST GRADUATE COURSES

Diploma in Ophthalmology (2 years)	8
Master of Surgery in Ophthalmology (3 years)	12
Diplomate of the National Board (3 years)	13
Post DO DNB (2 years)	13

LONG TERM - OPHTHALMOLOGY FELLOWSHIP

Ant. Segment / Intraocular Lens Microsurgery (2 years)	11
Orbit & Oculoplasty (18 months)	5
Paediatric Ophthalmology & Strabismus (18 months)	13
Glaucoma (2 years)	11
Retina Vitreous (2 years)	16
Cornea (18 months)	21
Comprehensive Ophthalmology (2 years)	1

SHORT TERM - FELLOWSHIP (FOR INTERNATIONAL CANDIDATES)

Orbit & Oculoplasty (6 months)	1
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SHORT TERM - CLINICAL COURSES

ECCE - IOL Microsurgery (1 month)	12
Small Incision Cataract Surgery (1 month)	31
Phacoemulsification (1 month)	46
Diagnosis and Management of Glaucoma (1 month)	28
Lasers in Diabetic Retinopathy Management (2 months)	29
Vitrectomy (Virtual) (2 weeks)	6
Management of Retinopathy of Prematurity & Paediatric Retinal Disorders (1 month)	12
Orientation to Paediatric Ocular Anesthesia for Anaesthetist (1 month)	1
Neuro-Ophthalmology (3 months)	3

SHORT TERM - PARAMEDICAL COURSES

Optical Dispensing (3 months)	5
OT Techniques (2 months)	3
Refraction Techniques (2 months)	7
Orthoptist (6 months)	4
Ocularist (3 weeks)	7
Fundus Fluorescein Angiography and Ultrasonography (2 months)	4

MANAGEMENT COURSES

Priorities in Eye Care Delivery (1 week)	26
Training for Eye Care Programme Managers (2 weeks)	37
Training and Systems Development for Hospital Administrators / Managers (4 weeks)	14
Project Management for Eye Care (4 weeks)	5
Eyexcel – Expanding Global Eye Care Workforce through Excellence in Training (4 Days)	34
Research Methodology (5 Days)	43
Community Outreach and Social Marketing of Eye Care Services (4 weeks)	15
Instrument Maintenance - For Technicians (6 weeks)	26



Dr. S.R. Rathinam at the CME on Intraocular Inflammation of Uveitis, Aravind - Salem



Ms. Kasthuri demonstrating maintenance of ophthalmic equipment to the participants at Aravind - Salem



Participants to the Glaucoma Retreat at Pondicherry

Glaucoma Retreat

Aravind - Pondicherry, June 29

Glaucoma specialists across all Aravind Eye hospitals were called in for a special retreat at Pondicherry.



Demonstration of manual and automated DSEK as part of Cornea Rencontre at Aravind - Pondicherry

The retreat held at Ousteri Lake near Poonthurai was mainly organized to come up with a concrete developmental plan for the entire Glaucoma services to attain the Aravind 2020 goals. Thirty participants comprising glaucoma specialists, fellows, and mid level ophthalmic personnel (MLOP) attended the retreat.

Cornea Rencontre 2013

Aravind – Pondicherry, July 20 - 21

This international conference had eminent speakers' presentations on various topics and discussed emerging trends in the treatment of corneal disorders. Along with Aravind team, guest faculty from India were Dr. Samar K. Basak, Dr. Pravin K. Vaddavalli, Dr. Sathish Srinivasan, Dr. Tushar Agarwal, Dr. Maghizh Anandan and Dr. Mathew Kurian. Dr. Anthony J. Aldave from

USA made excellent presentations on Descemet's Stripping Endothelial Keratoplasty (DSEK) through videoconferencing. Around 210 delegates attended the conference.

Prior to the conference, the department also arranged a DSEK workshop where Dr. Samar K. Basak and Dr. Sathish Srinivasan demonstrated manual and automated DSEK respectively to the audience and imparted wetlab and live surgical training to the participants.

Symposium on Understanding and Managing Patient Outcome

Aravind - Madurai, August 24

Aravind's Cataract and IOL Department conducted this symposium in collaboration with Hoya Medical India Pvt., Ltd. A total of 66 cataract and cornea surgeons across India participated in the symposium. The focus of the meeting was to understand the role of new technology such as iTrace machine in improving patient outcomes. A live surgery on premium IOLs was also arranged as part of the symposium.

Cataract CME

Aravind - Pondicherry, January 5

Aravind - Pondicherry organized a cataract Symposium with live surgery session for ophthalmologists in and around Pondicherry. Around 75 ophthalmologists including Aravind staff benefited from the CME.

Neuro-ophthalmology CME

Aravind - Salem, March 30

Aravind - Salem organized the CME which comprised two sessions handling 11 different topics. Speakers included Dr. Mahesh Kumar, Aravind-Madurai,

Participants of the Symposium on Understanding and Managing Patient Outcome





Dr. Lalitha Prajna addressing the audience at the SIHAM 2014 meet. At the far right are Dr. P. Manikandan, Organizing Secretary and Dr. V. Narendran from Aravind - Coimbatore

Dr. Kiruba, Aravind - Coimbatore, Dr. Padmavathy, Aravind-Tirunelveli, Dr. Venkatesan, Mithra Scans - Salem, Dr. Natarajan - Neurosurgeon, Neuro Foundation Hospital Salem, Dr. Prem Prakash - Neurosurgeon, Manipal Hospital Salem, Dr. B. Manohar Babu and Dr. Anuj Ponnappa from Aravind-Salem. Seventy two delegates participated in this CME.

held at Aravind - Madurai from September 28 - 29. This meeting helped in enhancing the knowledge and skills of the ophthalmologists as well as promoting better patient care. Close to 120 participants from across the states in India and China attended the conference.

Tenth Annual Meeting of the Society for Indian Human and Animal Mycologists (SIHAM)

The SIHAM meeting is conducted biennially and the tenth meeting was co-hosted by Aravind Eye Hospital, Coimbatore and PSG Institute of Medical Sciences and Research, Coimbatore from January 10 - 12.

Fungi are gaining more and more importance in human, plant and animal infections. There are enormous advances in the field of clinical mycology including diagnostic techniques, treatment modalities and in the understanding of pathogenic mechanisms. This conference provided an excellent opportunity for

Major Conferences Conducted

Seventh Triennial Conference of Ocular Trauma Society of India

There are several exciting developments taking place rapidly in the diagnosis and management of ocular trauma. The eminent faculty and the experts in this field across the country shared their views on current developments and future trends during the conference

Mr. R.D. Thulasiraj welcoming the audience to the 8th Annual Meet of the World Association of Eye Hospitals



clinicians, microbiologists, scientists and students to discuss these trends as well as to learn and interact with eminent persons in the field of mycology, from within India and around the world.

Eighth Annual Meet of the World Association of Eye Hospitals

Aravind Eye Care System hosted the eighth annual meeting of the World Association of Eye Hospitals, the global association of eye hospitals and ophthalmology departments of university hospitals from all over the world. During the meeting held from January 21 - 25, members had the opportunity to get connected to each other and exchange information and knowledge about all kinds of topics, like improving the efficiency in the service given to patients or how to continuously develop patient pathways. Around 100 delegates from eye hospitals from 15 countries attended the meet.

Fourth Annual Meeting of SightLife

Aravind Eye Hospital at Madurai hosted the fourth Annual Conference of SightLife, the largest eye bank in North America from February 28 - March 2. Its main focus is developing countries where the need is and currently works with 15 eye bank partners. The conference brought together close to 100 experts in the field to evolve ways to build capacities of partner eye banks thereby eliminating corneal blindness globally. Fifteen eye banks from India and six from abroad participated. Rotary Aravind International Eye Bank (RAIEB) won the poster competition organized as part of the conference.

Internal Capacity Building

Dr. Sandra Ganesh, Consultant, Department of Paediatric Ophthalmology and Adult Strabismus Aravind Eye Hospital, Coimbatore.

Dr. Sandra Ganesh was at Jules Stein Eye Institute, Los Angeles, California for a period of two weeks with Dr. Joseph Demer, pioneer in imaging studies of the extraocular muscles. Attending clinics with him introduced her to the concept of 'Sagging Eye Syndrome', cause of acquired strabismus in older people due to rupture of the muscle pulleys. She could observe advanced surgical techniques like strabismus surgery under topical anaesthesia including partial adjustable tenotomy of inferior rectus muscle for small vertical deviations, rectus muscle plications etc. In Boston, she spent time in the Low Vision Clinic of the Mass Eye and Ear Infirmary under the guidance of Dr. Mary Lou Jackson. She also visited the Carroll Centre for Low Vision and the Perkins School for the Blind. She also spent three days at Ophthalmic Consultants of Boston observing cataract surgeries performed by Dr. Shingleton and Dr. Reissman. She visited the prestigious Children's Hospital, Boston where she underwent observership under Dr. David Hunter and his team. She also got to work with Dr. Vanderveen who specialises in paediatric cataract and Dr. Fulton who is a paediatric neuro-ophthalmologist. At the end of the two weeks she could also attend the Strabismus Fall festival in which management strategies for complex strabismus cases were discussed. At Wilmer Eye Hospital, Baltimore, she spent time in the operating room observing small incision sutureless strabismus surgery and adjustable techniques.

Participants to the Fourth Annual Meeting of SightLife





Dr. Fathima and Dr. Sandra with Dr. David Guyton at Wilmer Eye Institute, Baltimore, USA



Dr. Fathima receiving observership certificate from Dr. David Hunter at Boston Children's Hospital, Massachusetts, USA



Dr. Kavitha and Dr. Kasthuri with Dr. Harry A Quigley at Wilmer Eye Institute, Baltimore, USA

Dr. S. Kavitha, Consultant, Glaucoma Services, Aravind - Pondicherry.

Dr. S. Kavitha visited Wilmer Eye Institute and Johns Hopkins's University at Baltimore where she observed Dr. Harry A Quigley. Apart from the routine glaucoma surgeries, she observed Trab revision, Baerveldt tubes and CD drainage. She also had the opportunity to observe Dr. Pradeep Ramulu, Dr. Henry Jampel, Associate Professors at Wilmer Eye Institute. She learnt the newer techniques of delivery of mitomycin and conjunctival suturing techniques. She also attended the annual meeting of AAO at Orleans where she could listen to experts like Dr. Aung Tin, Dr. George Speath, Dr. Wallace Alward. She also attended glaucoma symposia organized as part of the meet. At the University of California, San Francisco, she attended grand rounds as well as gained exposure to a procedure called "Endo Cyclo Photocoagulation", which is very useful in managing intractable glaucomas. She also observed Dr. David Chang's surgeries on complicated

cataracts. She also had the opportunity to observe iStent procedure combined with Phaco/Foldables.

Dr. Fathima, Consultant, Paediatric Ophthalmology and Adult Strabismus Services, Aravind - Tirunelveli.

Dr. Fathima visited Vision Rehabilitation Clinic at the Massachusetts Eye and Ear Infirmary headed by Dr. Mary Lou Jackson and got a firsthand knowledge about the comprehensive model of vision rehabilitation. At the Ophthalmic Consultants - Boston (OCB), she had the opportunity to observe the high volume cataract surgeries by Dr. Bradford Shingleton and Dr. Michael Raizman. She visited the Department of Paediatric Ophthalmology at Boston Children's Hospital headed by Dr. David Hunter. She attended clinics with senior consultants like Dr. Robert Peterson, Dr. Gena Heidary, Dr. Deborah Vanderveen, Dr. Ankoor Shah and Dr. Bharthi Gangwani and learnt their diverse approaches to handle different kinds of strabismus. She also attended the CME conducted by the department, "Strabismus Fall Festival" where complicated cases of strabismus were discussed. Dr. Fathima visited the Department of Paediatric Ophthalmology at Wilmer Eye Institute, Johns Hopkins University, Baltimore and attended clinics with Dr. Michael Repka, Head of the Department, Dr. David Guyton and Dr. Heejung Park. She learnt the meticulous technique of small incision strabismus surgery and had discussions with Dr. Heejung Park on potential research collaborations.

Dr. Pamona Samson, Consultant, Aravind - Madurai

At Wilmer Eye Institute, Dr. Pamona was introduced to the clinical IT and Systems as well as the development of the Electronic Medical Records. She spent a day with Dr. Alan Robin observing at his clinic in Baltimore. She attended some interesting courses such as -What you need to know about headache - a pain for the

patient and a pain for the doctor, Facial Palsy, Vision and Art, Ergonomics - musculoskeletal disorders in ophthalmologists, Next generation technologies for the diagnosis and treatment of dry eye and Meibomian gland dysfunction, Ergonomics: preventing work related injury in the ophthalmologist and How to evaluate a patient with uveitis.

Dr. Kasthuri Bai, Consultant, Aravind - Madurai

Dr. Kasthuri visited Wilmer Eye Institute, John Hopkins University, Baltimore where she had an opportunity to observe Dr. Henry Jampell who performed Argon Laser Trabeculoplasty as primary therapy in patients with Open Angle Glaucoma. She observed Dr. Harry A Quigley's surgical techniques of bleb revision and Baervaldt valve implantation. She also observed Dr. Pradeep Ramulu's Baervaldt valve implantation in paediatric glaucoma. She spent two days with Dr. Alan Robin, in his clinic and operating room. Apart from routine Trabeculectomy surgeries, she could also observe drainage of choroidal detachment. At the University of California, San Francisco, she attended Grand Rounds and interacted with Dr. Shan Lin and had exposure to a newer technique, Endo Cyclo Photocoagulation in managing intractable glaucomas. She got an opportunity to observe Dr. David Chang's surgeries.

Dr. Prathmesh Mehta, Consultant, Aravind Eye Hospital, Pondicherry during his visit to Proctor Foundation, University of California San Francisco got an opportunity to interact with Dr. Tom Leitman. He also visited Dr. David Chang's operating room and Jules Stein Eye Institute, University of California, Los Angeles and observed under Dr. Anthony Aldave from April 29 - May 3.



Dr. Prathmesh Mehta, Dr. HariPriya Aravind, Dr. K. Veena and Dr. R. Venkatesh at the ASCRS conference

Major Conferences Attended

Aravind doctors and staff are always encouraged to attend and present papers at various national and international conferences. These visits pave way for better exchange of ideas with their peer groups and also to learn the best practices from experts in the field.

Annual Conference of American Society of Cataract and Refractive Surgeons (ASCRS)

San Francisco, California, USA, April 19 - 23

DR. R. VENKATESH

Instruction course

- Manual small incision cataract surgery for high volume, high quality and cost effective cataract surgery
- Introduction and need for MSICS in the era of micro incision surgery
- Posterior capsule rupture and zonular dialysis management
- Ten commandments - recognize regain and react
- Symposium angle closure A to Z

Aravind's research team with Dr. P. Namperumalsamy at the US-ARVO conference



- Techniques for removing the dense lens in angle closure patients
- Video presentation titled new techniques - nightmare due to posterior polar cataracts: Can anterior segment OCT help us?

DR. K. VEENA

Instruction Course

- Manual small incision cataract surgery for high volume, high quality and cost effective cataract surgery
- Quick photo assessment - An innovative way of school screening

DR. PRATHMESH MEHTA

Instruction Course

- Manual small incision cataract surgery for high volume, high quality and cost effective cataract surgery
- Teething troubles
- Converting, controlling and capsule fixation
- Manual small incision cataract surgery for dancing cataract (video)
- Waterbed of liquefied cortical layer causing sudden visual decline (poster)

DR. HARIPRIYA ARAVIND

- Saving the nucleus before it sinks (video)
- Aravind pseudoexfoliation study: Intraoperative results of phacoemulsification cataract surgery
- Chief instructor - posterior capsule rupture and zonular dialysis management
- SICS in challenging situations (course)
- Management of soft cataracts and shallow anterior chamber

Dr. Mohideen Abdul Kader also participated in the conference.

Meeting of the World Association of Eye Hospitals (WAEH) 2013

Mexico, April 23 - 26

DR. HARIPRIYA ARAVIND

- Measuring cataract surgical outcomes
- Overview on Aravind Eye Care System

Annual Meeting of Association for Research in Vision and Ophthalmology (ARVO)

Seattle, Washington, May 5 - 9

DR. P. NAMPERUMALSAMY

- Indo-US vision research workshop 2013
- Diabetic Retinopathy: The looming global health crisis

DR. R. VENKATESH

- Indian family angle closure evaluation study - comparison of iridotomy
- Associated anatomic changes in angle closure suspects and patients with either primary angle closure or primary angle closure glaucoma

DR. P. SUNDARESAN

- A variant in the SLC35D1 gene is associated with age-related cataract in India

DR. C. GOWRI PRIYA

- Evaluation of surface free energy of Aurolab Aqueous Drainage Implant (AADI) and its influence on cell adhesion property, in comparison with Baerveldt implant



Dr. R.D. Ravindran during his visit to St. Eriks Eye Hospital, Stockholm, Sweden



Dr. P. Namperumalsamy at the International Symposium on Bending the Cost Curve, Madrid, Spain

SUSHIL KUMAR DUBEY

- Identification of mutations in candidate genes in patients with globe anomalies: A targeted next-generation sequencing approach.

V. NITHYA

- Molecular epidemiology of methicillin resistant staphylococcus aureus (MRSA) causing ocular infections in south India

DR. MOHIDEEN KADER

- Clinical profile of a large family with primary open angle glaucoma (POAG) in south Indian population

DR. MONA KHURANA

- Opportunistic Glaucoma Screening in Rural India - Role of Vision Centres (poster)

Fine-Tuning Health Care - Improved Outcomes and Cost Efficiency Using Quality Registries

Stockholm, Sweden, May 21 - 22

Dr. R.D. Ravindran was the invited speaker at Fine-tuning health care - improved outcomes and cost efficiency using quality registries, a high-level conference hosted by the Swedish Ministry for Health and Social Affairs. The workshop was



Dr. R. Venkatesh at the International Symposium on Intraocular Surgery



Dr. N. Venkatesh Prajna, Dr. Tanpreet Pal Singh at the APACRS conference

organized by the Government of Sweden on the National registries maintained by them for the various diseases and surgical procedures. He also visited St. Eriks Eye Hospital in Stockholm and gave a talk on Aravind model.

International symposium on Bending the Cost Curve: Global best Practices

Madrid, Spain, May 29 - 30

Dr. P. Namperumalsamy was the guest speaker for the international symposium on *Bending the cost curve: Global best practices* organized by Price Waterhouse Coopers (PWC) at Madrid, Spain.

This is an international round table series designed to highlight ground - breaking methods for cutting costs while promoting efficiency and innovation by examining leading - edge case studies from around the world. Dr. Namperumalsamy presented the *Aravind Model - Reducing costs through product innovation* as one of the five best innovative practices in the world.

International Symposium on Intraocular Surgery (ISIS)

Trivandrum, June 22 - 23

DR. R. VENKATESH

- Recognize, regain control and react to PCR
- Early experience and results of AADI

26th Annual Meeting of Asia Pacific Association of Cataract and Refractive Surgeons (APACRS)

Singapore, July 11 - 14

DR. N. VENKATESH PRAJNA

- Update on fungal keratitis-results from the mycotic ulcer treatment trial

DR. TANPREET PAL SINGH

- Tackling hard cataracts in developing world (video)

DR. NEELAM PAWAR

Video presentation at Film Festival

- Challenging cases of paediatric cataract surgery
- Cosmetic visual combo pack - combined phacoemulsification and squint surgery

DR. DEVENDRA MAHESHWARI

- The effect of phacoemulsification with IOL implantation in eyes with cataract and preexisting trabeculectomy

An Intercontinental Perspective of Paediatric Ophthalmology and Strabismus: AAPOS and SNEC Joint Meeting

Singapore, July 14 - 16

DR. RAJESH PRABHU

- Optical Iridectomy - Safe and effective option for central corneal opacity management in very young children (free paper)
- Efficacy of fulltime occlusion therapy in the management of Amblyopia in 8 - 15 years old children (poster)
- The effect of teacher training programme in screening for refractive errors among school children (poster)

DR. SANDRA C GANESH

- Prescribing prisms in strabismus practice - An analysis of indications and outcome (poster)
- Monocular elevation deficiency - Clinical associations and surgical outcomes (poster)

DR. ARUNA RATHAKRISHNA

- Surgical outcomes of consecutive exotropia - Our experience
- Etiology, clinical features and surgical outcomes in superior oblique palsy

2nd National Uveitis Conference

Nepal, July 25 - 27

DR. S.R. RATHINAM

- Basics and terminologies of uveitis
- Assessment and management of intermediate/posterior and panuveitis
- Parasitic uveitis
- Masquerade syndrome
- Spirochete related uveitis



Dr. Rathinam at the Annual meeting of the Uveitis Society of India

World Glaucoma Congress 2013

Vancouver, Canada, July 17 - 20

DR. R. RAMAKRISHNAN

- What is sustainable - medical management or surgery? Who gets what?

DR. GEORGE V PUTHURAN

- Role of G. D. D in Indian scenario

DR. GANESH V RAMAN

- Comparative analysis of Phacotrabeculectomy and SICS Trab in patients with primary glaucoma

Dr. Manju R Pillai attended the consensus meeting on childhood glaucoma held as part of the conference.

International Society of Genetic Eye Diseases and Retinoblastoma

Ghent, Belgium, August 22 - 24

DR. PARAG SHAH

- Outcome of intra and extra ocular retinoblastoma (paper)

13th Annual Conference of Uveitis Society of India

Mussourie, Uttarakhand, September 27 - 29

DR. RATHINAM

- When to do cataract surgery in uveitis

DR. S. BALAMURUGAN

- Cataract surgery in uveitis

DR. SAHIL BANDARI

- Cutaneous trauma-A trigger for Vogt Koyanagi Harada's syndrome (poster)

DR. ANURADHA

- SICS in uveitic Cataracts (poster)

DR. PALMEERA

- Inflammatory CNVM

DR. SARAVANAN

- Management of hypotony in uveitis

DR. NAVEEN

- Intravitreal methotrexate for management for leukemic retinopathy



Dr. P. Namperumalsamy inaugurating the Seventh Triennial Conference of Ocular Trauma Society of India

Annual Conference of Glaucoma Society of India

Indore, Madhya Pradesh, September 20 - 22

DR. GEORGE VARGHESE

- Tackling glaucoma in uveitis

DR. MANJU R PILLAI

- Newer tonometers

DR. R. RAMAKRISHNAN

- Which drugs are safe for medical management of paediatric glaucoma
- Keynote address on the problem of undiagnosed glaucoma in India

DR. ARIJIT MITRA

- Role of AS - OCT in monitoring primary angle closure suspects and patients with plateau iris syndrome pre and post iridoplasty (poster)
- Central corneal thickness (CCT) using ASOCT and ultrasound pachymetry - To find reproducibility of measurement and correlation between the two technologies and determine the accuracy and viability of anterior segment OCT in determining CCT (poster)

- AADI for beginners! (video)

- Results of Iridoplasty at a tertiary eye care centre (poster)

DR. RAVICHANDRA, DR. DEEPAK

- Does variation in CCT affect IOP measured by Goldmann's applanation tonometer, tonopen and noncontact tonometer?

3rd International Nystagmus Research Workshop

Oxford, London, September 5 - 7

Dr. Shashikant Shetty participated in the workshop as an invited faculty.

Annual Conference of Oculoplastic Association of India

Bangalore, September 6 - 8

DR. VIJI RANGARAJAN

- Rare case of pulsating proptosis



Dr. Fathima as the instructor at the AAO conference



Dr. Rodney Morris with Dr. Tiruvengada Krishnan and Dr. Magizh Anandan

Seventh Triennial Conference of Ocular Trauma Society of India

Madurai, September 28 - 29

DR. MANORANJAN DAS

- Spectrum of anterior segment injuries

DR. M. SRINIVASAN

- Agricultural injuries

DR. THIRUVENKATA KRISHNAN

- Classification and overview of Chemical injuries

DR. A.S. KARTHIKEYAN

- Pearls for evaluation of pediatric trauma patient

DR. P. VIJAYALAKSHMI

- Points to ponder in paediatric ocular trauma

DR. R. RAMAKRISHNAN

- Traumatic Glaucoma

DR. R. KIM

- Current concepts in the management of open globe injuries

DR. GEORGE MANAYATH

- Traumatic endophthalmitis - evaluation, management and outcome

DR. ANAND RAJENDRAN

- Sympathetic ophthalmia

DR. NARESH BABU

- IOFB – outcome and management

DR. VIJI RENGARAJAN

- Enucleation with implant

DR. MANEKSHA

- Evisceration with implant

DR. USHA KIM

- Reconstruction and beyond

DR. MAHESH KUMAR

- Traumatic optic neuropathy

Annual Meet of the American Academy of Ophthalmology

New Orleans, USA, November 14 - 23

DR. FATHIMA

- Instructor in the two day skills transfer course - Manual extracapsular cataract extraction surgery

DR. SAURABH ARORA

- Comparison of combined intravitreal bevacizumab and triamcinolone acetonide with bevacizumab for macular edema associated with CRVO

Congress of European Society of Cataract and Refractive Surgeons (ESCRS) and EUCORNEA

Amsterdam, The Netherlands, October 5 - 9

DR. REVATHI, DR. HARDIK

- Comparative analysis of effects of corneal collagen cross linking on keratoconus in paediatric patient and adults (poster)

DR. RODNEY MORRIS

- Comparison between DNA macro chip and routine lab culture for post operative endophthalmitis

Dr. K. Tiruvengada Krishnan attended EUCORNEA and ESCRS at Amsterdam, and participated in the Instruction Course - Manual small incision sutureless cataract surgery in difficult situations.

Annual Conference of Vitreo Retinal Society of India

Pune, December 13 - 15

DR. SARAVANAN

- Management of complications during vitreoretinal surgery
- Macular schisis secondary to normal tension glaucoma- case presentation

DR. GEORGE

- Low fluence PDT Vs graded Subthreshold TTT in the treatment of chronic central serous retinopathy

DR. NARESH BABU

- Resurgery in RRD

DR. ANAND RAJENDRAN

- A comparative analysis of the efficacy of subthreshold micropulse 577 nm yellow laser versus 532 nm green laser for central serous chorioretinopathy

DR. JATINDER SINGH

- Idiopathic juxtafoveal telangiectasia

DR. MANISH TANDON

- Connexin-eye and skin connection!!!

DR. PRAVEEN MURALY

- Combined hemi central retinal artery and vein occlusion associated with rheumatoid arthritis

DR. PUSHPANJALI RAMTEKE

- Intravitreal bevacizumab monotherapy for polypoidal choroidal vasculopathy - long term results!
- Unilateral wipe-out syndrome - Tracking the parasitic invader

DR. SAURABH ARORA

- Pars plana vitrectomy with and without scleral buckle for the management of primary RRD

DR. SANDEEP BACHU

- Microbiological profile and visual outcomes of post traumatic endophthalmitis
- Intravitreal Bevacizumab as an adjuvant treatment in incontinentia pigmentis with macular ischemia (poster)

DR. SAKET ARYA

- Clinical and microbiological profile following scleral buckle removal

DR. ADITYA VIKRAM SHARMA

- Comparison of Anti VEGF Mono therapy Vs combination therapy with Low fluence PDT in cause of polypoidal choroidal vasculopathy

DR. VIJAYALAKSHMI

- Outcome of silicon oil removal in rhegmatogenous retinal detachment (free paper)
- Demographic profile of parafoveal telangiectasia (poster)

DR. PARAG

- Focal chemotherapy for Retinoblastoma

Tenth Annual Meet of the SIHAM

Coimbatore, January 10 - 12

DR. K. DHARMALINGAM

- Understanding fungal pathogenesis through proteomics

DR. P. MANIKANDAN, DR. ANITA RAGHAVAN, DR. V. NARENDHAN

- Molecular identification and antifungal susceptibility of *Aspergillus lentulus* isolates came from keratitis cases from India (poster)

DR. P. MANIKANDAN

- Extra cellular enzymes and mycotoxins as a virulence factors in *Fusarium* and *Aspergillus* ocular infection (poster)
- Azole susceptibility of *Fusarium* spp. from mycotic keratitis (poster)

K.R.P NIRANJANA

- Comparative proteomics of tear film from fungal keratitis patients

R. SIVASAMY

- Exoproteome profile of *Aspergillus fumigatus* isolates from fungal keratitis patients



Dr. Vanniarajan at the Ophthalmic Genetics workshop

S. MOHAMMED RAZEETH

- Understanding the pathogenic mechanisms of *Aspergillus flavus* in human mycotic keratitis using high efficiency gene targeting system

JEYALAKSMI KANDHAVALU

- Proteome profiling in tears of mycotic keratitis patients

R. NITHYA

- Identification of pathogenesis associated proteins of *Aspergillus flavus* causing fungal keratitis

Eighth Annual Meet of WAEH 2014

Aravind - Madurai, January 21 - 25

DR. NAMPERUMALSAMY

- Right place, right care

DR. USHA KIM

- Task shifting to improve efficiency

DR. ARAVIND SRINIVASAN

- Designing for high efficiency

DR. RAVINDRAN

- Efficiency through high quality

DR. R. KIM

- Technology for efficiency

DHIVYA RAMASAMY

- Improving patient compliance with counsellors

R. MEENAKSHI SUNDARAM

- Doorstep service delivery

Ophthalmic Genetics and Genetic Counselling for Clinicians and Basic Scientists-Conference and Workshop

Bengaluru, February 15 - 16

Jointly organized by Narayana Nethralaya and Cardiff University, School of Medicine, UK

DR. P. SUNDARESAN

- Genetics of Albinism

DR. VANNIARAJAN

- Genetic testing of Retinoblastoma using Next Generation Sequencing



Dr. P. Namperumalsamy at the Symposium on AVRIT@4

7th International Congress on Glaucoma Surgery (ICGS) 2014

Singapore, February 20 - 22

Dr. R. Sharmila attended 7th International Congress on Glaucoma Surgery 2014 (ICGS) conference held at Singapore and won award for the best paper presentation.

Fourth Annual Meet of SightLife

Aravind - Madurai, February 28 - March 2

MR. R.D THULASIRAJ

- Innovation in developing leadership (keynote address)

DR. SRINIVASAN

- Developing a culture of quality

DR. ARAVIND

- Moving forward: Successful implementation of strategic planning

DR. SARAVANAN

- Adopting new practices and converting them into habits

Eye Health Innovation Consortium

London, UK, March 5

Dr. N. Venkatesh Prajna attended the consortium which has been set up at the request of and funded by Queen Elizabeth Diamond Jubilee Trust to provide a lasting tribute to HM the Queen. This is a five year programme which will provide specialist training and technology advancements in the field of eye health in many countries across the Commonwealth. The Consortium was held at London School of Hygiene and Tropical Medicine, London.

Symposium on AVRIT@4, Advanced Vitreoretinal Techniques and Technology

Ahmedabad, March 23 - 24

Dr. P. Namperumalsamy was felicitated during this symposium along with Dr. S.S. Badrinath and he gave a lecture on Diabetic Retinopathy.

ARTICLES PUBLISHED IN PEER-REVIEWED JOURNALS

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Effect of phacoemulsification with intraocular lens implantation in eyes with cataract and functioning filtering blebs

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Das T, Ravindran RD, Sriram RD, Venkatesh K.

The endophthalmitis kit.

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Srinivasan M, Jeena M, Revathy R, Meenakshi R, Lalitha P, O'Brien KS, Glidden DV, Ray KJ, Oldenburg CE, Zegans ME, Whitcher JP, McLeod SD, Porco TC, Lietman TM, Acharya NR, for the Steroids for Corneal Ulcers Trial Group.

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Jeena M, Lalitha P, Prajna NV, Srinivasan M, Das M, D'Silva SS, Oldenburg CE, Borkar DS, Esterberg EJ, Lietman TM, Keenan JD.

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CONSULTANCY AND CAPACITY BUILDING

The year had been one of great significance as LAICO ventured into three significant initiatives – with Hilton Foundation to increase cataract surgical rate in sub Saharan Africa, with Lavelle Fund for the Blind for capacity building of 25 eye hospitals across Indian sub-continent and finally with SightSavers for achieving comprehensive universal coverage in eye care – all of which are likely to profoundly impact the way eye care is being delivered.

An Entrepreneurial Approach to Increasing Access to Cataract Surgical Services in Sub-Saharan Africa

Hilton Foundation awarded LAICO, a three year project with a grant of US\$ 1.5 Million to work with five ophthalmologists with a goal of enhancing cataract surgical rates significantly in the areas of Sub-Saharan Africa (SSA) served by them, with a focus on efficiency, quality and reaching the poor. This is a joint project involving LAICO, Prof. Al Sommer, Dana Centre and the five ophthalmologists from SSA - Dr. Dan Kiage: Innovation Eye Centre, Kisii, Kenya; Dr. Kibata: UHEAL Foundation, Nairobi, Kenya; Dr. Asiwome Seneadza, Kitwe Central Hospital, Zambia; Dr. Fitsum, Bekele, Fitsum Berhan Speciality Eye Centre, Ethiopia and Dr. Kunle Hassan, Eye Foundation, Nigeria.

The key objectives of this project are

1. to develop high volume, high quality sustainable eye hospitals by adapting effective practices in service delivery, quality assurance, efficiency and training and
2. from the experience gained, develop a scalable and sustainable service delivery model, built on local solutions - relevant to SSA to the local challenges.

An October Summit Workshop on Patient Compliance





Mr. R.D. Thulasiraj with the team from Fitsum Berhan Speciality Eye Centre, Ethiopia as part of signing the MoU for Hilton Cataract Initiative at LAICO

Bringing together the hospital teams for a vision building and strategic planning workshop at LAICO was the first step. Each hospital team consisting of four members spent eight days from October 18 - 25 to gain a deeper understanding of effective systems by studying the Aravind operations and developed an action plan towards achieving the targets set by them. Dr. David Friedman, Director, Dana Centre, Wilmer Eye Institute and Mr. R.D. Thulasiraj, Executive Director - LAICO were with the participating hospitals during the entire workshop period sharing their perspectives and insights. The hospitals set themselves various annual targets to be reached by the end of three years. All the hospitals entered into a Memorandum of Understanding (MoU) with LAICO that clearly outlined project goals and objectives, roles of stakeholders and their expectations. LAICO team also made onsite visits to Kitwe Eye Hospital, Zambia (November 28 - 30). Innovation Eye Centre, Kisii, Kenya (December 3 - 5); Eye Foundation, Nigeria (Community Vision Institute, Ijebu, OGUN, Nigeria) (December 2 - 5) and Fitsum Berhan Speciality Eye Centre, Mekelle, Ethiopia (December 14 - 20).

Lavelle Fund for the Blind Grant for capacity-building of Eye Hospitals in Indian Sub-Continent

According to some estimates, typically less than 25% of eye care resources are utilized. Various eye hospitals in the developing world who actually have the potential to do well are grossly under performing due to lack of training in efficient organizational processes. To find a long-term solution to this chronic situation,



Dr. Thiruvengada Krishnan and Mr. Mohammed Gowth on a needs assessment visit to Innovation Eye Centre, Kisii, Kenya as part of HCI



Dr. R.D. Ravindran and Ms. Dhivya Ramasamy at Kitwe Central Hospital, Zambia

Lavelle Fund for the Blind awarded a four-year grant of nearly \$1 Million to LAICO for capacity building of 25 hospitals across India and neighbouring countries. This grant will support training, IT development, outreach and a seed grant to the individual hospitals.

October Summit 2013

Enhancing Cataract Outcomes through Continuous Monitoring and Bench-marking

The workshop aimed to highlight the necessity and benefit of tracking and monitoring the key parameters of Cataract services by introducing the Cat-QA software and through that improving the quality and outcomes of a hospital or a particular surgeon. A total

of 50 participants from 12 hospitals (7 external and 5 Aravind centres) participated in the workshop held from September 26 - 27. Dr. R. Pararajasegaram; Former WHO Consultant; Dr. Col. Deshpande, President, Vision 2020 and Dr. G.V. Rao, Executive Director, Vision 2020 participated. The workshop involved presentations, group work by the participating hospitals and demo on the software.

Universal Coverage through Primary Eye Care

The consultation held from September 30 - October 2, helped develop a deeper understanding of the current models in primary eye care and clarity on the roles of primary eye care centres. Key challenges and probable solutions were identified and a roadmap was developed for scaling up primary eye care to achieve the goal of universal coverage. A total of 48 participants from eye hospitals, INGOs and government organisation from countries such as Australia, Bangladesh, Canada, Ethiopia, Ghana, India, Nepal, Switzerland, Tanzania, UK and USA participated. During the consultation, the participants worked in groups on current initiatives, outcomes and challenges as well as best practices in primary eye care services.

Towards Better Patient Compliance – A workshop to learn from best practices

This workshop was held to address the challenges of low patient compliance to the advice given, be it medication, glasses, surgery or follow-up. The objective was to understand the magnitude of the problem, explore best practices to improve the situation. Close to 50 participants from 4 countries attended the workshop held from September 28 - 29. The workshop featured



Inaugural ceremony of the Workshop on Universal Coverage through Primary Eye Care

several practical ways of improving compliance. Participants contributed actively to this workshop through group work which encouraged them to identify barriers to compliance and develop strategies to overcome them through awareness creation, improving service design and patient empowerment.

Rejuvenation through Innovation

This was an internal workshop organised for the members of Aravind Eye Care System. Teams from six hospitals of Aravind (Madurai, Coimbatore, Pondicherry, Salem, Tirunelveli, and Theni), LAICO and Aurolab attended this workshop held from October 5 - 6. The participants were a mix of doctors, administrators, engineers and Mid-level Ophthalmic Personnel. This workshop was the first step towards institutionalizing innovation at Aravind and creating a platform that would encourage innovation. The

Dr. R. Pararajasegaram addressing the participants at the Cataract Quality Assurance workshop





Mentoring Programme for Global Sight Network Initiative

platform aspires to generate productive exploration of new possibilities beyond what was considered feasible and rational. The workshop was facilitated by Prof. Christian Seelos from Stanford University with sessions led by Mr. L Natarajan from Titan and Mr. Dheeraj Batra from the Indian School of Business. Mr. David Green and Mr. Vijayarajan also helped with the workshop. Clear next steps and follow-up mechanisms were established to take this forward.

Dr. R. Pararajasegaram Honoured with Dr. G. Venkataswamy Endowment Award

Dr. G. Venkataswamy Endowment Award is given annually to professionals in ophthalmology and vision sciences who work in eye care towards elimination of blindness. The award for the year 2013 was presented

to Dr. R. Pararajasegaram, a long term friend and well-wisher of Aravind, on October 1 in recognition of his enduring contribution towards the prevention of global blindness. Dr. Pararajasegaram gave oration titled *A Saga for Sight - My Experiences in International Eye Health* during the ceremony.

Mentoring Programme for Global Sight Network Initiative - So One Million Eyes See Again

Global Sight Network initiative of SEVA Foundation envisages helping 100 eye hospitals perform 1 million additional surgeries a year by 2020. By working through a network of 8 mentor institutions (LAICO, Kilimanjaro Centre for Community Ophthalmology, Tanzania; Lumbini Eye Institute, Nepal; L.V. Prasad Eye Institute, Hyderabad; Sadguru Netra Chikitsalaya, Chitrakoot; VMA-Netra Niramay Niketan, Chaitanyapur; Visualiza, Guatemala and Al Noor, Egypt), Seva plans to reach out to these 100 eye hospitals and build their capability to serve significantly more people with enhanced quality and in a sustainable manner. In connection with this, LAICO hosted Seva's review meeting on October 3 - 4. This had participants from all the mentor organisations except Visualiza and Al Noor. Apart from the Seva team, Mr. Colin Williams from Wescott Williams, UK facilitated the programme and under his stewardship the group came up with recommendations for taking this work forward and achieving the ambitious but a much needed goal.

Mr. G. Srinivasan along with the senior members of Aravind presenting the Dr. G. Venkataswamy Endowment Award to Dr. R. Pararajasegaram



Developing Strategic Plan for LAICO-2020

As a follow up to the retreat held in January 2013, a session was organized from June 11-13 where each of LAICO's strategic divisions presented its goals and road map for 2020. This was critically reviewed based on the assumptions made and relevance. Resource requirements and potential partnerships were explored. The whole discussion was facilitated by Prof. DVR Seshadri from IIM Bangalore.

Eye Care Consultancy and Capacity Building

As of date, 302 eye hospitals from 28 countries across the world have benefitted from LAICO's consultancy programmes. In the year-ending March 2014, Needs Assessment visits were made to eye hospitals such as Netra Niramay Niketan Hospital, Chandni, Sitapur Eye Hospital, Uttar Pradesh; Lions Eye Hospital, Patran, Punjab; Guru Nanak Eye Centre, New Delhi and P Satyanarayana Lions Eye Hospital Bellampalli, Andhra Pradesh. A team from LAICO visited Sadguru Netra Chikitsalaya (SNC), Chitrakoot as well as Netra Niramay Niketan, West Bengal along with the Seva team as part of the review process and for providing support as needed.

A total of four vision building workshops were conducted during the year through which eye hospitals from countries such as India, Tanzania, Egypt and Indonesia were mentored.

Dr. Tiruvengkatakrishnan, Medical Consultant, Cornea Clinic, Aravind - Pondicherry and Ms. Sashipriya, Senior Faculty, LAICO made follow-up visit to Kham



Ms. Sashipriya and Dr. K. Tiruvengada Krishnan during the eye care planning meeting at Kham Eye Centre, China

Eye Hospital, China from June 2 - 7 and discussed the development process. They also participated in the first eye care planning meeting for the region.

Building Capacity at Al Noor Foundation

LAICO has been engaged with the Magrabi Eye Foundation, Cairo, Egypt to build it into a regional resource centre for eye care. LAICO's role is to facilitate this entire process. In April 2013, Mr. R.D. Thulasiraj, Dr. Sivakumar, Senior Medical Officer, Aravind - Tirunelveli and Ms. Sasipriya, visited the Government Eye Hospital at Fayoum Governorate which the team from Magrabi Eye Foundation is mentoring. This was to train the Magrabi team on the ground by working side-by-side with them.

Mr. R.D. Thulasiraj, Dr. Sivakumar, and Ms. Sasipriya with the team at Al Noor Foundation and Kilimanjaro Centre for Community Ophthalmology



Onsite Support to Sitapur Eye Hospital

In its heyday 30 years ago, Sitapur Eye Hospital in Sitapur, Uttar Pradesh was an inspiration to Dr. G. Venkataswamy and many eye hospitals in India, but has later on experienced significant decline. Team from LAICO/Aravind made a Needs Assessment visit to this hospital from April 14 - 18 for an in-depth study of the systems and processes. Dr. G. Natchiar made a follow-up visit and subsequently a team from Aravind consisting of senior mid-level ophthalmic personnel and an ophthalmologist spent significant time at Sitapur going through every aspect of the hospital and recommending changes that were necessary. The hospital management IT system developed by Aravind was installed. LAICO faculty and Mr. Nagarajan from Seva made another visit in November to improve efficiency by strengthening the operations and set best practices. This whole initiative is being supported through a grant from So-Hum Foundation made through Seva.

Parameter Evaluation Visit to Grameen Hospitals

LAICO has been associated with Grameen Hospitals in Bangladesh since 2006 through a structured capacity building process, mentoring them and providing support whenever needed. In March 2014, a five-member team consisting of Dr. Usha Kim, Chief-Orbit Clinic, Aravind-Madurai, Mr. Gnanasekhar, Manager-HRD, Mr. R. Suresh, Faculty, LAICO, Ms. Sundari and Ms. Renuka joined a Seva team to Grameen Eye Hospitals at Bogra and Barisal. The main purpose

was to do a thorough process audit and review their performance to suggest necessary changes and improvements that would help.

Collaborative for Achieving Excellence

LAICO had partnered with Access Health in adapting the process developed by IHI (Boston, USA) to bring about improvements in the delivery of health care in a systematic manner. Access Health based in Hyderabad ran the first collaborative in India involving five eye hospitals all of whom were serving a significant number of poor patients. The focus of this collaborative was to improve the financial health of these hospitals by enhancing the paying clientele. This collaborative learning is year-long, with the hospital teams coming in person for four learning sessions and structured reviews in between over phone or video. LAICO hosted some of these learning sessions and were involved in the review process. Later LAICO also ran its own collaborative on a similar theme for a group of hospitals mentored by it.

Teaching and Training

Community Eye Health Workshop

Mr. Sanil Joseph had been to Paraguay to lead and teach in the Community Eye Health workshop organised by Fundacion Vision, Asuncion, Paraguay from 22nd to 29th November with support from IAPB. The course was attended by 8 hospital teams from 4 countries such as Bolivia, Mexico, Peru and Paraguay.

Aravind team with Prof. Mohammed Yunus and Dr. Suzanne Gilbert at Grameen Eye Hospital



ORBIS Flying Eye Hospital Training Programme

Aravind's Instruments Maintenance team was invited as faculty to the biomedical training programme organized by ORBIS Flying Eye Hospital which was attended by twelve trainees and held from September 16 - 21 at Disha Eye Hospital, Kolkata. The team gave an introduction to general ophthalmic equipment, its maintenance and handled sessions on in-house troubleshooting techniques and equipment calibration.

Patient Compliance Workshop

Ms. Dhivya Ramasamy was invited as faculty for the patient compliance workshop organized by Dr. Shroff Charity and Eye Hospital along with V2020 for eye hospitals in north India. Ophthalmologists, hospital directors and administrators from various hospitals participated in the workshop held at New-Delhi from March 8 - 9.

Outreach Management Workshop

Mr. R. Meenakshi Sundaram facilitated outreach management workshop for the outreach coordinators at Jaypee Hospital, Noida, Uttar Pradesh on March 25.

Online Learning Resource for Eye Care Personnel

Recognising the need for a comprehensive training programme for Mid Level Ophthalmic Personnel, LAICO has been involved in the development of an online training resource and a delivery platform, 'Aurosiksha'. This has been designed with the intention of equipping trainers across the world to



Ms. D. Ganga explaining about the maintenance of ophthalmoscope to the participants at the ORBIS training programme



Ms. Dhivya Ramasamy with the participants of Patient Compliance Workshop in New-Delhi

Mr. Sanil Joseph with the participants of Community Eye Health workshop at Fundacion Vision, Asuncion, Paraguay



deliver standardised quality content for their eye care paramedic training programmes. Besides content, this portal has the capability to monitor student and faculty performance as well. There are over 1560 users currently enrolled across the globe.

The Aurosiksha platform was used by the Tripura Vision Technician Assistants (VTA) team for conducting an online examination for its trainees; as requested by AVP-Health Initiatives, IL&FS-Education and Technology Services Ltd.

Towards Developing Internal Competence

Workshop on Visioning for Comprehensive Care

A one day retreat facilitated by Prof. DVR Seshadri from IIM Bangalore was held on April 11 to help Aravind the teams think through the process that would help in operationalize the Aravind 2020 goals. The discussions were limited to four big specialities, Retina, Glaucoma, Paediatric and Cornea. In order to help facilitate this process, the MAP project team from the Ross Business School, University of Michigan met with several of the senior leaders to study the strategies and key challenges in the road ahead. The project culminated in this Visioning Workshop for all the senior leaders of Aravind. Around thirty of the senior members from different Aravind centres participated in this meeting.

Short course on Biostatistics

Ms. Dhivya Ramasamy attended the course held at Christian Medical College (CMC), Vellore from May 20-24 and got oriented into the basics of biostatistics.

Workshop on Clinical Trials

Dr. Manju Pillai, Consultant, Glaucoma Services, Aravind Madurai, biostatisticians Mr. K. Jeyaram Illaiyaraja, and Mr. V. Vijaya Kumar attended the workshop at CMC, Vellore, between June 24 -28. The workshop covered fundamentals of clinical trials, consort guidelines, ethics in clinical research of FDA, GCP guidelines, types of study designs, randomization etc.,

Clinical Data Management Workshop

Mr. Ganesh Babu, Senior Manager, IT and Systems and Mr. Jeyaram Illaiyaraja attended Clinical Data Management Workshop at CMC, Vellore from September 2 - 6.

Short Course on Fundamentals of Biostatistics, Principles of Epidemiology and SPSS

Mr. R. Suresh Kumar attended the course held at CMC, Vellore from November 25 - 29.

Exposure to Project Management

Mr. V. Vijayakumar, attended the Project Management course offered at the University of California, Berkeley from March 2 - 30. The course is accredited by the Project Management Institute,

Mr. R. Meenakshi Sundaram handling the Outreach Management Workshop at Jaypee Hospital, Noida, Uttar Pradesh





Mr. V. Vijayakumar with Jane Aguirre, Vice President, Global Alliances, AAO; Mr. Edson Eliah, KCCO; Mr. Chundak Tenzing, Dr. Suzanne and Heidi Chase, Seva during his visit to AAO

the accrediting body for certification in project management. He attended a few sessions on proposal writing, budgeting and programme monitoring and evaluation at Foundation Center, San Francisco and UC, Berkeley. He also got an opportunity to visit the American Academy of Ophthalmology.

Projects

Lavelle Paediatric Eye Care Extension Project (August'13 to July'14)

The goal is to build sustainable capacity and processes by establishing a "School Eye Screening Model" to effectively address the problem of visual impairment and blindness among school children in the age group of 3 - 17 years in the service areas of Aravind Eye Hospital at Tirunelveli on a regular basis. The process involves training teachers for screening students of 1st, 3rd, 5th, 7th, 9th and 11th Standards and children who were prescribed glasses in previous camp as well as those with visible eye defects or diseases such as squint, white pupil, nystagmus, abnormal head or face turn, red eyes, inability to copy from black board, complaint of chronic head ache or lack of concentration. The project aims to provide intervention as indicated - preventive, curative (medical and surgical) and rehabilitative in nature.

Till date 2,207 teachers from 145 schools in Tirunelveli and Tuticorin districts have been trained. A total of 127,649 school children studying in 103 schools in Tirunelveli and Tuticorin were screened. 15,694 students were identified by the teachers as having eye

problems and the Aravind medical team who examined 15,491 of them, confirmed that 6,456 had eye problems. Of these, 4,657 students had refractive errors while the rest had other eye defects. 1,781 students were referred to the base hospital for further eye examination. A total of 3,238 spectacles were provided to children with refractive error.

XOVA Project at Aravind Eye Hospital, Pondicherry

Aravind Eye Hospital, Pondicherry was awarded Excellence in Ophthalmology Vision Award (XOVA) 2012 for improving teacher training model in India to identify ocular defects among school children. Subsequently this project was initiated to reduce the number of school children with undetected ocular defects by training teachers to screen students for refractive errors and ocular diseases, as well as improving follow-up and adherence to hospital recommendations and treatment. The duration of the project is for 2 years from July 2013 - June 2015. The objective is to reach 400,000 children in the age group of 6 - 17 years through comprehensive eye screening and providing intervention as indicated- preventive, curative (medical and surgical) and rehabilitative in nature in the six adjoining districts of Aravind - Pondicherry service area.

During last academic year, 3,738 teachers were trained for preliminary vision screening and creating eye care awareness among children. From the 139,273 children screened by the teachers from 81 schools, 5,615 children were confirmed by the Aravind team as having eye problems. 3,305 children who had refractive errors were provided with spectacles free of cost from Lavelle Fund and Essilor. 1,500 patients were referred to the base hospital for further examinations; among them 478 children came to the hospital. One child was operated for cataract and other two were operated for squint.

So-Hum Project

The project supported by Jerry Jones is a multi-organizational effort of LAICO and Seva. The purpose of the project is to help more people see but to do it through existing and new eye hospitals that are being built. Under this approach, such partnering hospitals will be mentored on achieving operational excellence, reaching the community effectively and becoming sustainable, financially and otherwise. The project will support the hospitals to put in place best practices, IT systems for operations and quality management, LAICO

in addition to mentoring its own cohort of eye hospitals will also work with Seva and the network of mentor institutions to accelerate the additional number of people served.

Data monitoring system: As part of the project LAICO has designed a new, user-friendly interface for the Global Sight Initiative (GSI) database. The new interface went live in March 2014. LAICO and Seva staff have already received a lot of positive feedback from mentors and mentee staff who are entering data. Several mentor institutions have begun installing and providing training to the staff to use computer-based management systems at mentee hospitals that do not already have a system in place. The utilization of these systems can improve performance by providing instant feedback for decision making.

Universal Eye Care and Comprehensive Eye Care for a Million People: Using Technology and Vision Centres as the Foundation – Building a Scalable Model in Tamilnadu, India

The project supported by Sightsavers aims to develop a sustainable service delivery model by providing relevant level of sub-speciality services through vision centres in linkage with base hospital (tertiary care). The project commenced in October 2013. Fourteen eye health field workers were selected to work with 15 vision centres in the service area of Aravind Eye Hospital, Madurai covering a population of a little over a million. They were oriented and trained over a 3 week period in eye care, eye donation and common eye diseases. These field workers are now placed in vision centres areas to implement community based activities like awareness creation, organizing outreach camps for providing

sub-speciality services, identification of low vision cases and referral. Sub-speciality services are provided through outreach mode by specialists and by ensuring timely follow-up. The project also aims to work with government health workers to identify persons with eye problems in the community and refer them to vision centre as well as to identify low vision cases through key informant method. The IT team is working on the development of a registry and tracking mechanism for known diabetics and glaucoma patients.

Health Services Research

One of LAICO's goals is to strengthen health services research in order to contribute to eye care service delivery globally. Towards this end, a workshop to build LAICO's research capacity was organised on March 27 - 28. Dr. Ken Bassett, Professor and Division Head, British Columbia Centre for Epidemiology and International Ophthalmology (BCEIO), University of British Columbia, Vancouver, Canada along with Pro. L. Jayaseelan, Head, Department of Biostatistics, CMC, Vellore facilitated the workshop. This helped the LAICO faculty members to develop meaningful research questions and concept notes in their areas of interests.

Faculty Capacity Building

Mr. Sanil Joseph successfully completed the one year MSc in Public Health (2012 - 13) from London School of Hygiene and Tropical Medicine (LSHTM). He has been on a scholarship from The Wellcome Trust, UK which also supports him to do an 18 month research project to study the impact of telemedicine in diabetic retinopathy screening. This project is being carried out since October 2013.

Dr. Manoranjan Das, Ms. Deepa and the rest of Aravind team at Sitapur Eye Hospital as part of capacity building under So-Hum project





Dr. R.D Ravindran and Mr. Sanil Joseph with Mr. John Pelly, Chief Executive, Moorfields Eye Hospital, London



Mr. Sanil Joseph at the Reform Roundtable Seminar

On-going Research Projects

1. Effectiveness of Telemedicine in identifying cases of diabetic retinopathy among patients visiting diabetologist's clinics compared to the conventional referral system. Principal Investigator: Sanil Joseph; Funded by The Wellcome Trust, UK
2. Assessment of factors influencing decision making on eye donation among potential donors. Principal Investigator: B.S. Ganesh Babu; Internally funded

Other Major Events Hosted /Attended

Ninth Annual Conference of VISION 2020: The Right to Sight: INDIA

Dr. R.D. Ravindran and Ms. Sasipriya were invited as guest speakers at the 9th annual conference of VISION 2020: The Right to Sight: INDIA held in Bhopal from April 6 - 7.

Reform Roundtable Seminar on "High volume, low cost Healthcare: The case of the Aravind Eye Care System"

London, UK, April 11

Mr. Sanil Joseph participated and led the seminar organised by The Reform Research Trust, UK in London. The seminar explored the principles behind the Aravind model and their relevance in enhancing UK's National Health Services (NHS).

Visit to Moorfields Eye Hospital

London, UK, April 16

Dr. R.D. Ravindran and Mr. Sanil Joseph visited Moorfields Eye Hospital to understand their quality assurance systems, electronic medical records and

performance appraisal process. Dr. R.D. Ravindran was also the keynote speaker at the International Forum on Quality and Safety in Health Care organized by the British Medical Journal (BMJ) in London on April 15.

Sharing the Aravind Model

London, April 23

Mr. Sanil Joseph presented the Aravind model in a seminar titled *Driving down the cost of high-quality health care* at the London School of Hygiene and Tropical Medicine, London on 23rd April, 2013. The seminar was attended by faculty and students from various departments of the School.

Acumen Fund CEO Summit

Madurai, May 20 - 21

LAICO hosted the annual meeting of the CEOs of Acumen Fund. The team had a productive time at Aravind visiting the different facilities and interacting with the senior leaders of Aravind.

CIPS Workshop on Innovations in Health Sector Raipur, Chhattisgarh, August 5

Centre for Innovation in Public Systems (CIPS), Hyderabad in association with Chhattisgarh Academy of Administration conducted this three day workshop. The participants for this workshop were officials from Health Department of Government of Chhattisgarh. Mr. R.D. Thulasiraj delivered a talk on the Aravind model at this workshop. Following this, Aravind team consisting of Mr. Thulasiraj and Ms. Sashipriya participated in another meeting organized by CIPS, "Enhancing eye care service delivery by strengthening tertiary, secondary and primary level systems". This meeting had participation of high profile government officers - Dr. Kamal Preet Singh from Directorate of

Health Services, Government of Chhattisgarh, Ms. Sujatha Rao, Former Secretary, Ministry of Health, Govt. of India - and ophthalmologists from the district hospitals, and eye hospitals from Raipur.

Clinical Health Informatics Leadership Seminar

Birmingham, UK, September 12

Mr. R.D. Thulasiraj attended the seminar organised by The Royal College of Ophthalmologists at Aberystwyth University and gave a talk on telemedicine approach in eye care. He also attended the IAPB Annual meeting at London School of Hygiene and Tropical Medicine, London from September 15 - 16.

Seva Board Meeting

Mr. R.D. Thulasiraj attended Seva board meeting held at San Francisco, USA in the month of November.

Mr. R.D. Thulasiraj attended the Seva Board Meeting in the months of May and November. He gave a talk on A Systems Approach to Cataract Blindness at the American Ophthalmological Society on May 17. He also took part in the Aravind Eye Foundation (AEF) retreat and projected Aravind's growth plans.

WHO Global Forum

Kobe, Japan, December 10 - 12

Mr. R.D. Thulasiraj attended the WHO Global Forum on Innovation for Ageing Populations.



Mr. R.D. Thulasiraj with Dr. Suzanne Gilbert, Dr. Christine Melton and Dr. Bruce Spivey during the AEF retreat

Lusophone Congress

Panaji, Goa, January 14

Mr. R.D. Thulasiraj attended the congress which focused on entrepreneurs of Portuguese-speaking countries and of India, to understand the real possibilities of exchange of goods and services. It was jointly organised by the Lusophone Society of Goa in collaboration with Confederation of Indian Industry, Institute of Asian Studies and Friendship Association Portugal - India.

Mr. R.D. Thulasiraj at the CIPS Workshop on Innovations in Health Sector



RESEARCH

Good research needs excellent team and adequate infrastructure. Aravind Medical Research Foundation (AMRF) has both these essential requirements. Research at the institute focuses on both the host and pathogen components in the case infectious disease of the eye caused by fungus and bacteria. Disease mechanisms of other eye diseases such as Primary Open Angle Glaucoma (POAG), Primary Angle Closure Glaucoma (PACG), Leber's Hereditary Optic Neuropathy (LHON), Diabetic Retinopathy and Retinoblastoma are also being studied. The stem cell group tries to develop new approaches to generate and use stem cells that could be of use in selected therapies. As a new avenue of research, animal models of some diseases are also being explored.

Molecular Genetics

The department primarily studies the molecular genetics of inherited eye diseases especially POAG, PACG, LHON and Diabetic Retinopathy adopting high throughput techniques for genetic analysis.

POAG is one of the most prevalent types of glaucoma. Until date, three candidate genes (Myocilin, Optineurin and WDR36) were identified from the 25 loci linked with POAG. Family history is one of the risk factors for glaucoma. Therefore, 240 participants have been recruited for this study from a single large four generation family, among them 22 are POAG cases and 20 members are POAG suspect cases. Screening of all the study participants identified the absence of disease-causing mutations in Myocilin and Optineurin genes. The absence of mutations in these two genes, strongly suggests that the disease in this pedigree may be caused by a novel glaucoma gene. The department is in the process of investigating the new candidate gene using Exome sequencing.

PACG, subtype of glaucoma is a genetically complex neurodegenerative disorder characterized by optic disc cupping and loss of visual field, more common among people of Asian descent than Europe. No specific candidate gene for PACG has yet been identified. The department evaluated the genetic association in a south Indian population for three Single Nucleotide Polymorphisms (SNPs) - rs11024102 in PLEKHA7, rs3753841 in COL11A1 and rs1015213 between

Research scholars at the Molecular Genetics lab



PCMTD1 and ST18 genes, using the Taqman allelic discrimination assay. This study reported significant association of SNP rs1015213 with PAC/PACG but not rs11024102 and rs3753841 in a south Indian cohort.

LHON is a maternally inherited, neuro degenerative disorder of Retinal Ganglion Cells (RGC) leading to vision loss. LHON patients most commonly carry one of the three primary point mutations: m.3460G>A, m.11778G>A and m.14484T>C in *ND1*, *ND4*, *ND6* genes respectively. 75 LHON cases and 75 age matched controls have been recruited and entire mitochondrial genome has been sequenced. Low prevalence of primary mutation was identified and there is no influence of haplotype in the clinical expression of LHON.

Diabetic Retinopathy (DR) is a progressive disease affecting the structure and cellular composition of the microvasculature. The department extensively screened the nuclear genes associated with diabetic retinopathy in Indian population. It established retinal transcriptome gene expression signature using tissue microarray for DR in human cadaver eyes for identification biomarkers.

A comprehensive research programme was developed on retinoblastoma that includes (1) Studying gene expression pattern to understand the effect of RBI mutations (2) Developing a rapid, cost effective and reliable strategy to detect spectrum of RBI mutations including nonsense, missense, insertions, deletions and splice site mutations using methods such as Next Generation Sequencing, Multiplex Ligation dependent Probe Amplification and Sanger sequencing (3) Screening of patient and family members using blood and tumor samples to assess the risk of retinoblastoma in future siblings and offsprings of the patients.

Ocular Microbiology

The prime focus of the ocular microbiology lab is to identify and characterize the virulence mechanisms and antibiotic resistance mechanisms of common ocular pathogens. Host innate response to ocular pathogens like *Pseudomonas aeruginosa*, Methicillin Resistant *Staphylococcus Aureus* (MRSA), and trematodes is being studied using ocular specimens and corneal epithelial cell lines. Cytokine analysis by multiplex bead array revealed high levels of pro inflammatory cytokines (IL-1 β , IL-6, IL-8, TNF- α , & IL-12) and chemokines (MIP-1 α , MIP-1 β , IP-10 & RANTES) in the aqueous humour of trematode uveitis patients when compared to endogenous uveitis and cataract control groups. Whole genome sequencing of ocular MRSA and *P. aeruginosa* isolates was done to identify novel virulence determinants and drug resistance proteins. Comparative



Research scholar setting up a quantitative Real time polymerase chain reaction

genome analysis between two MRSA strains, AMRF1 (ST22) and AMRF2 (ST672) revealed unique transposons (Tn554), proteins and phages mediating drug resistance in both the strains. Whole genome sequencing of an invasive, multi drug resistant *P. aeruginosa* strain, BK1 indicated a 0.4Mb region with no homology to the reference strain PA01, carrying the *P. aeruginosa* genomic islands, PAGI- 1, 4, 5 and 10. The genome sequences have been submitted in GenBank and a detailed analysis of the sequencing data is in progress. Deep sequencing was done with *Aspergillus flavus* infected and control corneal buttons to identify any novel and differentially expressed microRNAs in fungal keratitis. Further studies on animal models / human corneal epithelial cell lines will be done to understand the mechanisms of disease pathogenesis in infectious keratitis.

Ocular Pharmacology

The department focuses on Diabetic Retinopathy to understand the interplay between polyol pathway and angiogenic factor and its regulation in retinal pigment epithelium (RPE) using in vitro model system. High Aldose Reductase gene mRNA expression and VEGF expression by real time PCR were observed in retinal pigment epithelial (ARPE-19) cells challenged with pathological glucose concentration (25mM Glucose) as compared to normal glucose (5mM Glucose). The presence of epalrestat (Aldose reductase Inhibitor) significantly reduced the expression and secretion of ALR and VEGF. This finding further confirms the involvement of ALR in mediating diabetic complications in retina. This study will give insight into the factors that perturb the balance between angiogenic and anti-angiogenic factor in the susceptible eye tissues.

In glaucoma, the organ culture anterior segment (HOCAS) system has been established to study the effect of actin monomer-binding cytoskeletal drug Latrunculin B (Lat B) to the Rho kinase inhibitor Y27632 (Y27), both known to increase outflow facility in live monkeys and humans. In HOCAS, 2 μ M Lat B caused 46%, 72% and 70% increase in outflow facility as compared with baseline at 3hrs, 12hrs and 24hrs post exchange (n=3; p<0.01) respectively. There was a slight increase in the outflow facility in control eyes which was not statistically significant at 12hrs and 24hrs. Studies are underway to investigate the involvement of Rho Kinase signalling in maintaining the homeostasis of IOP regulation and TM outflow using HOCAS and TM cell culture system.

Stem Cell Biology

The focus of the research is on adult stem cells - specifically limbal epithelial stem cells, which play an important role in corneal epithelial homeostasis and hence corneal transparency. The department has earlier established a two parameter concept for identifying and quantifying limbal/buccal epithelial stem cells, and developed a simple method for *ex-vivo* expansion of these epithelial stem cells for corneal surface reconstruction in limbal stem cell deficient patients in compliance with good manufacturing practice. Transplantation of such bio-engineered stem cell rich autologous limbal/buccal epithelium for corneal surface reconstruction in unilateral/bilateral limbal stem cell deficient patients respectively is being carried out since 2007.

With the objective of improving stem cell expansion and transplantation outcome, the current focus is to understand the mechanism involved in the maintenance of stemness at (i) molecular level - the role of specific

genes, regulatory elements and associated signaling pathways and (ii) cellular level - the microenvironment or niche in the limbal stroma. Recently, the department has established a novel method for live imaging of limbal niche in healthy individuals using *in vivo* confocal microscope. Further studies are now being carried out to evaluate the nature of limbal stroma in limbal stem cell deficient patients for better diagnosis and management of limbal stem cell deficiencies.

Proteomics of Ocular Diseases

Proteome analysis is emerging as an important approach to understand eye diseases and also to develop suitable markers for early diagnosis. Ultimately, this technology will allow to find ways and means to treat complex disorders. At the Proteomics Department, Aravind team works on three important eye diseases - Fungal Keratitis, Diabetic Retinopathy and Primary Open Angle glaucoma. All these diseases are amenable to proteome analysis.

Mycotic keratitis is more prevalent compared to bacterial keratitis in tropical countries including India. The team analyses factors responsible for fungal pathogenesis. Mass spectrometry facility funded by the Department of Biotechnology, Government of India has been established at the centre. Using this high throughput mass spectrometer (OrbitrapVelos Pro), changes in the host as well as the pathogen to understand the pathogenesis of fungal keratitis are studied. Using this approach, several novel secretory proteins of *Aspergillus* have been identified, many of which show significant differences between the clinical isolates and saprophytes of *A. flavus*. These and other related studies allow to understand the lifestyle of the fungus as a human pathogen compared to its

Using state-of-the-art-technologies, proteomics strategies are applied to understand the pathogenesis underlying ocular diseases



saprophytic life. Recently, the department has initiated whole transcriptome analysis of the saprophytic and pathogenic states of the fungus. This data is being used along with proteome data to understand the pathogenic state more accurately. On the host side, investigations are being carried out at the proteome of tear and cornea to understand the pathogen induced changes in the protein profile. Results showed some of the tear protein expression levels is variable depending upon the causative fungus. Zinc alpha 2 glycoprotein is one such protein showing differential expression in *Aspergillus* and *Fusarium* infection.

Proteomics approaches are underway to study the progression of disease and the associated proteome wide changes for Diabetic Retinopathy as well as Primary Open Angle Glaucoma. The outcome of these studies will enable to identify potential biomarkers for diagnostic and prognostic purposes.

Bioinformatics

Bioinformatics is an emerging field between biological and computational sciences, which has become an essential part in vision research today. The necessity of Bioinformatics in medical research is to understand the biological processes at the molecular level. Currently Bioinformatics research activities at AMRF are directed towards two major areas,

Structural Bioinformatics: A structure-based bioinformatics method is being developed to understand the molecular mechanism by which mutations lead to genetic eye diseases. For instance, this approach showed the molecular causes of Retinitis Pigmentosa (RP) and Congenital-Stationary Night Blindness (CSNB) caused by mutations in the RHO gene. This analytical approach will help to create a platform to understand the pathogenesis of all other genetic eye diseases that are common in India.

Next-Generating Sequencing (NGS) Data Analysis: The tremendous sequence capacity and recent advantages of NGS technologies have opened up new possibilities in clinical laboratories to sequence genomes of many individuals in shorter amounts of time and with less financial investments. The department at AMRF develops and applies tools for the analysis for NGS



Computational facility for Bioinformatics applications includes mutational analysis, comparative genome analysis and Next generation sequence data analysis

sequencing data, from processing of raw data and mapping of reads to downstream statistical and bioinformatics analysis of the data. Listed below are the ongoing projects:

- **Exome Sequencing:** Sequencing of only exonic regions of the genes reduces the costs of sequencing. This Exome sequencing method has been widely used to elucidate the genetic causes of many eye diseases, starting from single gene disorders and moving on to more complex genetic eye disorders, including complex traits and cancer. The department developed clinical exome analysis software pipeline by integrating and writing new tools.
- **Comparative Genomics:** The department provides various bioinformatics tools and pipelines to study the bacterial genome and compares genomes using next generation sequencing data. The team worked primarily on bacterial genomes to find genome wide differences in ocular isolates and to find new virulence factors.
- **Clinical Variant Analysis of Retinoblastoma (RB):** The department provides in-house streamlined pipeline to analyse data obtained using Illumina platform. The pipeline can handle both blood and tumor samples of RB patients to analyse the variants in RB1 gene.

On-going projects

- Mitoscriptome analysis to understand the pathogenesis of diabetic retinopathy using tissue microarray
- Mitochondrial genes involvement in Leber's Hereditary Optic Neuropathy (LHON)
- Establishing the genetic testing centre for retinoblastoma
- Genetic and transcript analysis of RBL gene in retinoblastoma patients
- Etiology and immunopathogenesis of sub conjunctival and anterior chamber granulomatous uveitis in children of south India
- Genotypic characterization and analysis of virulence factors in Methicillin resistant *Staphylococcus aureus* causing ocular infections
- Microbiological clearance time and sensitivity assay for acanthamoeba keratitis
- Elucidating the role of MicroRNAs in infectious keratitis
- Evaluation of the anti-microbial and anti-inflammatory functions of vitamin-D in infectious keratitis
- *Aspergillus flavus* study group of India (AFSGI) epidemiology, pathogenomics, and system biology of *A. flavus* infections in India - an integrative approach
- Enrichment of human limbal epithelial stem cells to understand the stem cell related properties by whole genome analysis and p63 isoform expression profile
- To analyse the limbal epithelial stem cell niche in limbal stem cell deficient patients.
- Effect of VEGF levels in Tenon's fibroblast on the outcome of glaucoma surgery.
- CoE - Programme support on human mycotic keratitis
 - a. Core Project: Functional genomics and proteomics of fungal pathogenome and host immune response to fungal infection in human mycotic keratitis
 - b. Project 1: Quantitative proteomics and analysis of disease specific post translational modifications of tear, cornea and sera of keratitis patients
 - c. Project 2: Biology of human ocular fungal pathogens: comparative proteomics of virulent and avirulent *Aspergillus* and *Fusarium*.
 - d. Project 3: Functional genomics of a fungal pathogen *Aspergillus fumigatus*.
- Role of Aldose Reductase in Retinal Pigment Epithelium - An understanding towards the Pathogenesis of Diabetic Retinopathy.
- Evaluating the role of macular carotenoids in the accumulation of A2E, a fluorophore in the pathogenesis of Age-related macular degeneration.
- Structure based bioinformatics approach for the analysis of SNV's and its associations with eye related disease
- Comprehensive *exome* analysis pipeline using clinical next-generation sequencing data
- De Nova assembly pipeline for whole bacterial genome sequencing data

Major Training Programmes / Workshops Conducted

Training Programme for Members of Institutional Review Board

June 14

A special training programme was arranged for the members of the Institutional Review Board of Aravind Eye Care System, heads of speciality clinics, LAICO faculty and Aurolab senior staff. Ethics of clinical research, ICMR guidelines and Good Clinical Practice were discussed during the programme.

Workshop on Clinical Proteomics

June 24 - 26

This workshop was funded by DBT, Government of India and the objective was to train young research scholars in proteomic techniques. The workshop brought together clinician scientists as well basic science experts working on specific areas of proteomics, to share the various approaches that could be explored to address the clinical issues which includes: early detection/diagnosis of disease; prediction of how a disease will behave over time and how a specific patient will respond to a given treatment; and identification of novel targets for therapeutic intervention. Hands-on demonstration of the proteomics techniques such as 2D-DIGE labeling for performing comparative and quantitative proteomics was arranged.

Lecture Series on Proteomics and Applications

August 3

The objective of this programme supported by Department of Biotechnology, Government of India, was to expose young researchers in various Proteomics approaches that could be used in clinical research. The lectures covered functional genomics, Proteomics, SRM and MRM based mass spectrometry methods for protein quantification in clinical samples and statistical approaches to be followed in experimental design and data analysis.

Workshop on Biomedical Informatics for Ophthalmologists

October 11 - 13

This workshop was conducted as part of October Summit to promote the newly emerging multidisciplinary field Biomedical Informatics (BMI) and identify synergies between the Bioinformatics/ Omics communities and the Medical Informatics handling health care and clinical research in Ophthalmology. This workshop provided an opportunity to understand importance of biomedical

informatics research and how it can add value to the clinical work. This programme was supported by Department of Biotechnology and Indian Council of Medical Research, Government of India.

Indo-French Seminar on Filamentous Fungal Pathogens: Current Trends and Future Perspectives

January 20 - 22

An Indo-French seminar was organized by Aravind Medical Research Foundation at Hotel Taj Gateway in Madurai. This event was sponsored by Indo-French Centre for the Promotion of Advanced Research (IFCPAR) which receives financial support from the Department of Science and Technology, Government of India and the Ministry of Foreign Affairs, Government of France. The mandate of IFCPAR is the promotion of cooperation in fundamental and applied scientific research between India and France. This seminar was also held in keeping with this mandate which was to develop co-operation through identification of scientists and scientific institutions of the two countries likely to co-operate in a profitable way.

Scientists from both France and India working in this field were invited to participate. There were about 25 participants, with 12 scientists from France and 13 from India. The main theme of this seminar was fungal diseases and its impact on human health and the current research in understanding the pathogenesis of fungal infections with special emphasis on filamentous fungal organisms like *Aspergillus fumigatus* and *flavus*.

Participants of the workshop on Biomedical informatics for ophthalmologists



Dr. K. Dharmalingam showing the Proteomics lab to the senior team from Cognizant Foundation, Mr. S. Madhavan and Mr. Lakshmi Narayanan

Dr. K. Dharmalingam Assumes Office as Director - Research

Dr. K. Dharmalingam who had been serving Aravind Medical Research Foundation in the capacity of Adjunct Professor assumed office as Director - Research in the month of July. Dr. VR Muthukkaruppan will continue as advisor to Aravind Medical Research Foundation.

A DBT Distinguished Biotechnology Research Professor, Dr. Dharmalingam was instrumental in promoting Biotechnology research and teaching in India. His area of current research interest is mainly Proteomics of eye diseases. His previous research includes DNA restriction and repair in *E-coli* and regulation of antibiotic biosynthesis in *Streptomyces*. He is a member of Indian Academy of Sciences and Indian National Science Academy and has more than 200 papers in peer reviewed journals in the area of Molecular Biology and Biotechnology to his credit. He has authored two books and holds two patents.

On-going Clinical Research

Aravind Eye Hospitals

Retina

- AMD Phenotype and Genotype Study
- A 12 month, phase III, randomised, double-masked, multicentre, active-controlled study to evaluate the efficacy and safety of two individualized regimens of 0.5mg ranibizumab Vs. verteporfin PDT in patients with visual impairment due to choroidal neovascularization secondary to pathologic myopia (Brilliance)
- Luminous: Study to observe the effectiveness and safety of Lucentis through individualised patient treatment and associated outcomes
- A 12 month, open label, multicentre trial study to evaluate the efficacy and safety of intravitreal injections of ranibizumab 0.5mg on Cystoid, spongy and mixed OCT patterns secondary to diabetic macular edema
- A prospective, comparative, open label, randomised, multicentric phase III study to compare the safety and efficacy of Ranibizumab of Intas Biopharmaceuticals LTD in comparison with Lucentis of Novartis in patients of Wet AMD (Age Related Macular Degeneration)
- The visual and anatomical outcome in Diabetic Tractional Retinal Detachment (TRD) involving Papillo-Macular Bundle (PMB) following vitrectomy- a randomised comparative study
- Intravitreal Triamcinolone Vs. PST Triamcinolone Vs standard care in refractory pseudophakic (postoperative) cystoid macular edema

IOL and Cataract

- The natural history of IOL in eyes with exfoliation syndrome (APEX IOL Study)
- Aravind pseudoexfoliation IOL study-genetic analysis
- The role of homocysteine in Aravind Pseudoexfoliation IOL (APEX) Study
- Barriers to acceptance of cataract surgery
- A prospective open labelled study to evaluate the safety and surgical performance of surgical blade (Aurosleek) in cataract patients
- A randomized controlled trial comparing intraocular pressure changes after Phacoemulsification and manual small incision cataract surgery
- A prospective, non-randomized, single arm, open label study to evaluate the safety and efficacy of Toric IOL in patients having cataract associated with astigmatism

- Retrospective study of visual outcomes and complications after sutureless, flapless and glueless intrascleral fixation of posterior chamber IOL in cases with Inadequate capsule support
- Comparison of induced coma due to decentration of two aspheric IOL'S
- A novel technique of iris fixation of sulcus lenses in cases of inadequate capsular support

Cornea

- MUTT 2
- Acanthamoeba clearance study (Longitudinal study)
- Acanthamoeba clearance study (Diagnostic Study)
- Clinical assessment of AURO KPRO
- Pentagan OCT
- Asia Cornea Society - Infectious Keratitis Study (ACSIKS)
- Parasitic Ulcer Treatment Trial
- Evaluation of the efficacy of 2% cyclosporine in preventing graft rejection in primary grafts w/o high risk characteristics study 1 (PKP study)
- Evaluation of the efficacy of 2% cyclosporine in preventing graft rejection in therapeutic keratoplasty-study 2 (TKP study)
- Comparing methods of specimen collection in deep Keratitis cases
- Corneal collagen cross-linking with Riboflavin and Ultraviolet for Keratoconus

Paediatric Ophthalmology

- The prevalence of long term sequelae in preterm children diagnosed with ROP

Glaucoma

- A prospective non-randomized efficacy and safety clinical trial, to evaluate the efficacy and safety of AADI in controlling IOP in refractory glaucomas thereby preventing further damage to optic nerve and visual field loss
- A prospective, randomised, controlled clinical trial comparing topical medical therapy with Selective Laser Trabeculoplasty (SLT) as initial treatment for Open Angle Glaucoma in south Indian population
- Indian Family Angle Closure Evaluation (IFACE) Study - Part II
- International paediatric glaucoma registry
- Comparative efficacy of Trabeculectomy with Ologen in primary developmental glaucomas Vs developmental glaucomas with secondary ocular abnormalities
- Central macular thickness and its relation to axial length and intraocular pressure after phacotrabeculectomy

- Determination of contrast sensitivity and modulation transfer function with different intraocular lenses in glaucoma patients undergoing combined surgery
- To determine the relation of obstructive sleep apnoea syndrome with glaucoma. To determine the association between the preferred sleeping position and asymmetric visual field loss in glaucoma patients
- A prospective, randomized, controlled clinical trial comparing topical medical therapy with Selective Laser Trabeculoplasty (SLT) as initial treatment for Open Angle Glaucoma and ocular hypertension in south Indian population.
- A randomized controlled trial comparing intraocular pressure changes after phacoemulsification and manual small incision cataract surgery
- International pilot survey of childhood glaucoma
- Investigation of genetics, cytokines and gene expression profiles in the pathogenesis of Primary Angle Closure Glaucoma.
- A comparative study on external dacryocystorhinostomy following acute dacryocystitis, with and without mitomycin C
- A study on amblyopia in congenital ptosis and effect of surgical correction

Neuro-Ophthalmology

- Association of sleep apnoea syndrome and non arteritic anterior ischemic optic neuropathy

Operations Research

LAICO

- Effectiveness of telemedicine in identifying cases of diabetic retinopathy among patients visiting diabetologist's clinics compared to the conventional referral system.
- Assessment of factors influencing decision making on eye donation among potential donors.

Uvea

- A phase III, multinational, multicenter, randomized, double - masked study assessing the safety and efficacy of Intravitreal injections of DE-109 (three doses) for the treatment of active, non-infectious uveitis of the posterior segment of the eye
- Etiology and immunopathogenesis of sub-conjunctival and anterior chamber granulomatous uveitis in children
- Molecular diagnosis and ocular imaging of West Nile Virus Retinitis and Neuroretinitis

Orbit, Oculoplasty and Ocular Oncology

- National Retinoblastoma Registry
- Establishing the genetic testing centre for childhood ocular cancer (retinoblastoma) in Aravind Medical Research Foundation
- Genetic and transcript analysis of RBI gene in south Indian Retinoblastoma patients
- Clinical evaluation of silicone implant for primary or secondary volume rehabilitation of anophthalmic sockets
- An open label, prospective clinical evaluation of safety and efficacy study of Aurostent (Silicone mono canalicular lacrimal stent manufactured by Aurolab, Madurai, India) in the treatment of canalicular injuries and anomalies

Clinical Trials

Aurolab

- Aurolab clinical evaluation of Toric intraocular lens
- Clinical assessment of AuroKpro
- A prospective non-randomized efficacy and safety clinical trial, one year study with a one year extension to evaluate the efficacy and safety of AADI in controlling IOP in refractory glaucoma thereby preventing further damage to optic nerve and visual field loss
- Clinical evaluation of silicone implant for primary or secondary volume rehabilitation of anophthalmic sockets
- An open label, prospective clinical evaluation of safety and efficacy study of Aurostent (Silicone mono canalicular lacrimal stent manufactured by Aurolab) in the treatment of canalicular injuries and anomalies
- A prospective, non-randomized, single arm, open label study to evaluate the safety and efficacy of Polymethyl Methacrylate intraocular lens for treating the patients having cataract.
- A prospective, open label, observational study to evaluate the safety and surgical performance of surgical blade (aurosleek) in cataract patients

MANUFACTURING OPHTHALMIC SUPPLIES

In its journey to meet ophthalmologists' need to serve patients better, Aurolab has launched new products such as pre-loaded aspheric hydrophobic IOL, high viscosity sodium hyaluronate, ophthalmic blades crafted with high end technology, and a few other products. Aurolab products have been registered under various Ministries of Health such as Egypt, Turkey, Myanmar, Indonesia, Thailand, Mexico, Nepal, Nigeria, Uganda and Ethiopia paving way for the customers there to benefit from its quality and affordable range. Aurolab is also investing in software deployment at its distributor locations in India to improve the last mile service connectivity to its customers.

New Products

Aurogel Plus

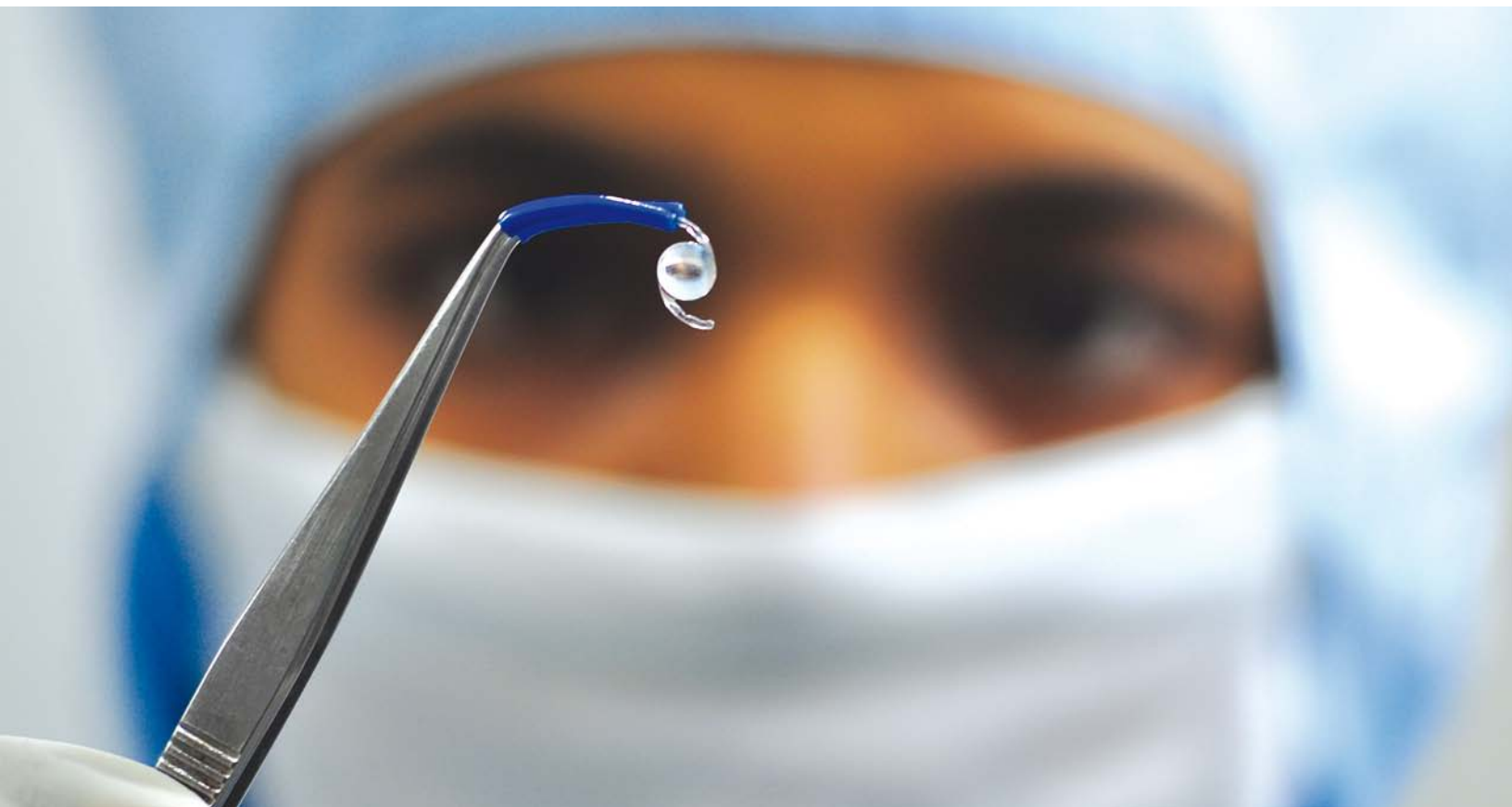
Sodium Hyaluronate 1.6% - 1ml

Aurogel plus suits well for patients with weak capsular bag and in paediatric cases. Aurolab developed this product to meet the customer's expectation of having a high viscosity product.

Promox

Moxifloxacin 0.5% - 1ml (Box of 5 vials)

Endophthalmitis is an uncommon, but serious complication after intraocular surgery and can lead to severe visual loss. Recent studies have suggested that its incidence after cataract extraction has increased over the last decade. Fluoroquinolones are a class of broad-spectrum, bactericidal antibiotics that cover many gram-positive, gram-negative, and anaerobic organisms. They are commonly used to treat ocular infections and are widely used as prophylactic agents before and after intraocular surgery to prevent endophthalmitis.





Aurovue EV

Disposable preloaded delivery with 2.8mm incisions: Aurovue EV is designed to integrate surgeons' requirements in terms of negative aspheric lens, perfect and stable axial positioning, low PCO rate and ease of handling and injection through disposable preloaded system with 2.8mm small incision.

Aurosleek

Aurosleek blades are manufactured with electro polishing technology and processed on CNC grinding machine from a thinner profile stainless steel material. It comes with the unique tip guard design and validated blister pack. Thin profile material of the blade aids in superior wound reconstruction. Electro polishing technology gives uniformly well-polished and glare free matt finished blades. CNC grinding machine ensures high accuracy and consistent sharpness in each blade. Unique tip guard eliminates the blade's tip. Blades are packed in validated blister pack in clean room environment, which gives assured sterility and safety to the patients.

Smartscope

Aurolab introduced Optomed Smartscope, a non mydriatic fundus camera, a breakthrough in digital hand-held retinal imaging. The camera handset is extremely light-weight. This makes it an easily portable tool. It is very easy to use and offers unprecedented versatility with two interchangeable lens modules. This is a perfect screening tool for various clinical applications enabling remote consultation and reducing unnecessary referrals. The targeted customers are non retinal doctors, optometrists, diabetes clinics and diagnostic centres.

Aurochart

Digital Vision Chart: Aurolab introduced a multi distance digital vision chart which can be used in 2.4m, 3m, 4m, 5m, 6m, 4m-mirror, 5m-mirror and 6m-mirror distances. Charts are incorporated in an 18.5 inch wide LG monitor with high resolution and contrast. The digital vision chart is also equipped with multimedia connectivity through USB and MMC provisions which help the user run videos and clinic advertisements. A smart power saving option aids in automatic switch off of the unit when not in use. Wall mountable and compact enough for the examination room, this is targeted for ophthalmologists, optometrists and optical shops.

Regulatory Activities

The ISO and CE surveillance audits were carried out successfully. New products such as Truedge AS, Aurovue EV, I-Vision, Aurogel Plus and Aurosill500 are awaiting CE certification. The registration certificate for Kenya has been revamped which is valid for the next 3 years and the GMP audit has been successfully done by Pharmacy Poisons Board, Kenya. Products such as Aurolens, Auroflex, Auroflex EV, Aurovue, Aurovue EV have been registered in Uruguay and Aurofot, Aurosil, Aurochrome, Aurovisc have been registered in Uganda.

100KW solar power system was installed at Aurolab in May 2013. The system consists of 408 panels which can produce 500 units of electricity per day. Currently, energy generated by this system is used for the entire lighting purpose in Aurolab. This has considerably reduced the Genset usage and thereby the carbon footprint of Aurolab. In simple terms, it has helped Aurolab reduce its impact on environment. Sales planning meeting for the year 2014 - 15 was organized by Aurolab in which sales managers from across the country participated. Product managers and domestic marketing team members were also invited to the programme which was held during the first week of January.

Human Resource Development Activities

Recreational

Auroutsav, the biannual arts - literary - sports competition held in the month of August brought out the latent talents among the staff. The entire staff was divided into four groups named after valiant women

Winners of Auroutsav 2013 celebrating their joy



100KW solar power system being inaugurated at Aurolab

freedom fighters of India. Winners were awarded prizes and the team that won maximum points was felicitated.

22nd Aurolab Day was celebrated in a grand manner on January 25 in the Aurolab premises. The celebrations provided an opportunity to reflect on the past and to think of the future plans and expansion of Aurolab. Service awards were distributed to the staff members.

Festivals are always a special season at Aurolab and the fervor with which it celebrates each festival is simply amazing. Special celebrations were arranged on the occasion of various festivals to entertain the employees and to share the joy of the season.

Educational

As part of ensuring professional development of the employees, production staff was taken on an industrial visit to Srinivasa Fine Arts, Sivakasi on August 17 to observe the 5's concepts and packing methods. The department organized a basic fire safety awareness



Production staff on an industrial visit to Srinivasa Fine Arts, Sivakasi

and training programme in the Aurolab premises on October 12. Special training was imparted to the staff to handle fire emergency with the help of extinguishers. The training programme was conducted by Usha Fire Safety Equipment.

A continuous technical education session was organized for the Production staff on October 20. Staff members were updated on the various new products, marketing and promotion strategies, regulatory affairs and so on. A guest lecture was also organized on the importance of doing work with involvement and without stress. The lecture was handled by Ms. Mallika from Sivananda Ashram.

A training programme on corrugated fibre board was arranged for the staff members on November 23. The objective of the training programme was to bring out the salient features of corrugated fibre board as a packing medium and enable the design and development of the same for a given product.

Aurolab facilitated an Art of Living session for the staff from December 23 - 27. Mr. Chandrasekar from Art of Living conducted breath water sound workshop.

A training programme was organized for the staff of supervisor cadre on December 7. Mr. Chinnamaruthu-CEO, Optima Human Capital Services handled the session which covered topics like communication skill, listening skill, telephone etiquette, team work and attitude.

Guest lectures on various health care topics by eminent doctors were also arranged on various occasions. These include lectures on oral health, gynaec problems, dental care as well as gastrointestinal disorders. Apart from these, motivational talks were also arranged on a regular basis to rejuvenate and refresh the employees.



Mr. Antony Renny, Mr. Vishnu Prasad and Mr. Padmanaban in the Aurolab stall at AAO conference

Prominent Trade Shows Attended

Congress of the American Society of Cataract and Refractive Surgeons

Dr. P. Bala Krishnan, Mr. Vishnu Prasad and Mr. Alexander represented Aurolab at the ASCRS congress and the Conference of the American Society of Ophthalmic Administrators held at San Francisco, USA from April 19 - 23.

Annual Conference of the European Society of Cataract and Refractive Surgeons

Mr. Vishnu Prasad, Mr. Venkatesa Kannan and Mr. Antony Renny represented Aurolab at the 31st European Society of Cataract and Refractive Surgeons conference held at Amsterdam, Netherlands from October 5-9.

Conference of the American Academy of Ophthalmology

Mr. Vishnu Prasad, Mr. Padmanaban and Mr. Antony Renny represented Aurolab at the 117th American Academy of Ophthalmology conference held at New Orleans, USA, from November 16- 19.

Annual Conference of the All India Ophthalmic Society

Aurolab participated in the 72nd All India Ophthalmological Conference held at Agra from February 6 - 9. Products such as Aurovue EV, Auroseek, Promox and Aurogel plus were launched at this conference.

Kera - Con

Mr. Sivanand, Mr. Saravanamoorthy, Mr. Sundar Ganesh and Mr. Saravanan represented Aurolab at the 1st National Corneal conference (Keracon 2013) held at Goa during December 13 -15. Aurolab sponsored Keratoprosthesis user meet at this conference.

CENTRAL FUNCTIONS

With the rapid expansion of the organization, there arose the challenge to ensure proper coordination and standardisation of the various administrative and developmental activities. The central office was thus formed that essentially constitutes departments such as Human Resource, Information Technology, Tele-ophthalmology Network, Library and Finance.

HUMAN RESOURCE

Ensuring employee engagement in its various innovative activities, the department boosts the employee morale and helps build a sense of belonging amongst them which tremendously contributes towards the success of the organization. Apart from the routine HR works, the department actively promotes the unique values and culture, which constitutes the strong foundation of the organization.

Aravind's unique HR practices especially recruiting high school passed girls as ophthalmic technicians have been acclaimed by many. After a period of two year intensive in-house training, these girls are absorbed into the system. A strong network of Mid-Level Ophthalmic Personnel (MLOP) thus constitutes a major portion of Aravind's workforce.

Every year HR teams across the Aravind centres are brought in for a two-day retreat to discuss the future plans and policies as well as to delineate the course of action. At the retreat held at Aravind - Madurai, in

the first week of January, Nursing superintendents, HR representatives and staff of Personnel department joined. HR theme for the year 2014 was designated as "Year for training and development" and several programmes are being carried out towards this end.

Value Survey at Aravind Eye Hospitals

To know the perception of Aravind staff as to how best the value system and work culture defined by Dr. V has been transferred and shaping up amongst the employees, a survey was conducted by Mr. Trichy Krishnan and Mr. Michael Frese, Professors at NUS Business School, Singapore. They conducted the survey across Aravind Eye Hospitals through a structured questionnaire named "Value Survey" which was facilitated through the HR department. Two sets of questionnaires were provided - one to capture perception of the people who manage the organization and the next to capture perception of the MLOPs in the organization. In the first phase, the questionnaire was administered to the management team and senior doctors across Aravind and about 61 responses were collected. In the second phase the questionnaire was administered to MLOPs and administrative staff. About 250 responses were collected. The responses in both these phases were analysed by the NUS team and the findings were presented before the senior management team of Aravind on April 5.

Participants of the HR retreat



"Aravind Eye Care System has created a model which is of the people, by the people and for the people and stands out as an exemplary innovation of human capital, primarily the rural women"

– DOC N DOC, March 2014.



Sanitary staff being felicitated at Aravind - Pondicherry

Employee Opinion Survey

The HR Department of Aravind, Madurai conducted Employee Opinion Survey during January to March 2013. The whole exercise revealed the strengths of the organization as well as some pitfalls that need to be seriously addressed. About 535 respondents participated in this survey which constitutes mid-level ophthalmic personnel, admin staff, managers, doctors and research team. Results of this survey were shared with the heads of the departments.

Employee Welfare Activities

Janakiamma Child Care Centre at Aravind - Madurai organized summer camp for a period of two weeks for staff children aged 5 - 15. The camp was action packed with main focus on teaching the children about the country's rich culture, traditions, spirituality and values.



Graduation ceremony of MLOPs at Aravind - Madurai

As part of welfare initiatives, doctors, managers and senior staff of various clinical departments of Aravind - Pondicherry visited Pegasus outbound learning centre in the last week of October to develop their skills on communication, proper planning, commitment to work, creating good working environment, proper delegation and distribution of the work.

Sanitary staff of Aravind - Pondicherry were facilitated by the senior management for their meritorious service and special gifts were distributed on October 28.

Motivational talks on varied subjects were arranged on different occasions to help staff come out of the mundane and hectic work schedule. Awareness programmes on various topics are also being arranged regularly.

Aravind teams at Madurai, Pondicherry and Aurolab accorded a warm welcome to the special chariot procession organized by Swami Vivekananda Matt in commemoration of the 150th birth anniversary of Swami Vivekananda.

NUS Business School team sharing the findings of value survey with the Aravind senior leadership





Annual Day celebrations at Aravind- Tirunelveli



at Aravind- Coimbatore



Creche children at the Annual day celebrations at Aravind - Madurai



Dr. Natchiar with the summer camp children at Aravind - Madurai

Recreational Activities

Auroutsav, the week-long cultural cum sports events organised biennially across all the Aravind centres was conducted in the first week of September. Staff belonging to different cadres were grouped into four teams - all named after valiant heroines of India such as Thillaiyadi Valliammai, Jhansi Rani, Rani Chennamma and Velu Nachiyar. The festival, in which all employees, from the chairman to the last grade worker took part also helped in firming up team spirit. The teams participated in 30 events that were divided into five categories - literary events, art and craft, fun events, sports and stage events.

Excursions were arranged on a regular basis for staff belonging to various departments. All the festivals and special days were celebrated with elaborate programmes which gave staff the opportunity to mingle with each other and get relieved from the routine schedule. Melody Friday, a musical evening is also arranged every month during which the employees interested in singing are given an opportunity to come on to the stage

and perform. The fourth season of Madhura Geetham, an annual musical event held commemorating the birth week of Dr. M.S. Subbulakshmi was co-hosted by LAICO along with INTACH, Madurai on September 16. Mr. Gomathinayagam from Chennai gave an interesting lecture demonstration on how certain popular cine classics have the shades of certain ragas.

Continuing Professional Education Programmes Organized

Continuing medical education programmes are arranged for the doctors and MLOPs especially during the Diwali and Pongal seasons when the patient crowd is less. The main aim of such programmes is to update the staff of the latest trends and developments in their respective fields.

A Continuing Professional Education (CPE) session was arranged for the Aravind Communications team in the second week of December. Hosted by Aravind - Tirunelveli, this CPE had Dr. Francis Roy, consultant orthopaedician as the external faculty. The entire



Training co-ordinators during the CPE at Aravind - Madurai

session was facilitated by Mike Myers, Seva volunteer and Dr. K. Rajagopal. The CPE was attended by around twenty members.

The fourth session of continuing education programme for training co-ordinators was conducted in the first week of June at LAICO and had participants from Aravind - Madurai, Coimbatore, Tirunelveli and Pondicherry. The objective of the programme was to provide practical exposure on the upgraded Aurovikas software and to standardize communication letters for all the courses.

For the very first time, a workshop was conducted for the technicians of Aravind Optical in the first week of June. A total of 32 participants attended the programme. The programme focused on various aspects related to optical machine maintenance and cost containment. Technicians of Aravind vision centres were also brought together for a 3 month training programme from August - October. The programme aimed to enhance



Dr. R.D. Ravindran with the participants of CSSD workshop

the skills of refraction practitioners, upgrade their knowledge and augment their ability in proper planning and organizing thereby ensuring the smooth running of a vision centre. A total of 10 technicians participated in this programme.

Staff of Central Sterile Supply Department (CSSD) across all the Aravind centres were brought together for a two day workshop in January which aimed to standardise the operations of the department.

A training session was arranged for the instruments maintenance technicians across the Aravind Eye Hospitals at Aravind - Coimbatore on February 11. Special lectures cum practical sessions were organised in collaboration with ophthalmic equipment companies. The session oriented the participants on various aspects of troubleshooting and reducing maintenance cost of instruments and equipment. A total 19 staff members from across the system participated in this programme.

Aravind Communications team with Dr. R. Ramakrishnan and Mr. Mike Myers at Aravind - Tirunelveli



INFORMATION TECHNOLOGY AND SYSTEM

Aravind eye care system has been deploying information technology for over 3 decades. The primary focus has been on developing innovative applications to enhance patient care, quality of the services, operations and overall management of the organization. IT solutions deployed in Aravind and demonstrated its benefits, have been shared with other eye hospitals. During the year 2013 - 2014, the IT division developed several new solutions, improved existing ones and also supported other eye hospitals with IT implementations and training programmes.

Electronic Medical Record (EMR)

The decade-long awaited and most expected application is being implemented in various centres in Aravind. To ensure smooth and successful implementation, the deployment is scheduled accordingly to initially implement it in outpatient clinics, then in surgical centres and finally in tertiary centres. EMR should help to manage the data more clearly and precisely as well as addresses the challenges arising out of illegible handwriting. This solution is named *Insight*. It is currently implemented in the outpatient clinics at Madurai, Tirumangalam and Melur. All the ophthalmologists, residents and mid-level ophthalmic personnel were taken through a structured training program to get hands on experience and become familiar with the system. The department is currently focusing on completing the developments required for implementing this solution in surgical centres.

Unique Identification Number (UIN)

For identification purpose, patients are assigned Medical Record Number (MRN) during their first visit to Aravind. If the same patient visits other Aravind centres for some reason, he/she gets as many MRN and medical records. To avoid confusion, it is important to aggregate all the notes in a single file to get a better understanding of the patient's history. Hence, UIN was introduced to bring all the medical notes pertaining to a particular patient under one ID. With the full-fledged implementation of Electronic Medical Record system, this initiative gains more significance as the entire patient history can be retrieved with the help of UIN irrespective of the site of care within Aravind Eye Care System.

Registries for universal coverage

As part of the universal coverage project, a database is being developed to consolidate the list of patients with key eye problems and the current status of the advice provided. This would be used to track the patients who need continuous care and ensure compliance to treatment prescribed.

Developments in Web Applications

Integrated Human Resource Information System (IHRIS), a web based solution was developed to integrate and manage the human resource data across all Aravind centres. The system encompasses the following modules: Recruitment, payroll, entry time and attendance, employee self service, HR management information and analytics. The system helps in the easy retrieval of relevant information related to a particular employee. It enables the organization to achieve improved efficiency and quality in HR decision making through the various reports and analytics this system generates. The employee self service module works as a communication platform among the employee, organisation and HR system and saves much of the paper use by providing an easily-accessible, centralized location for showcasing organizational policies, announcements.

AuroNews, a web portal was developed to archive all the happenings of Aravind Eye Care System. The system compiles the happenings in a systematic way for easy retrieval. It also helps disseminate information on current happenings through different platforms like intranet and the e-magazine, Thingal Udhayam.

An exclusive website was developed to capture the details of the various events of Aurotsav 2014. The system updated the users about the event schedule and scores. This system was made available on Aravind's Intranet.

A web based system was developed to capture the details of the various Journal Club sessions. The system generates and send appointments as soon as the event is registered in the system. It also archives the presentations and enables the user to upload the resource materials.

A generalised version of Content Management System for Newsletters was developed to enter and archive the newsletters. It also helps to publish the newsletter online or disseminate it through email. At present Aravind's quarterly magazines, Compassion and Illumination are being disseminated through this portal. A windows based system linked with IHRIS was

developed to record the entry time and exit of the library users. The user can be an employee or a trainee or visitor. If the user is an employee, the system assigns the library visiting details with the employee ID in the IHRIS. In the case of visitors, the system assigns the users with a unique id and captures his/her visiting details. This system was implemented in Madurai, Coimbatore, Tirunelveli, Pondicherry. By monitoring how frequently employees / trainees visits the library, the organization is able to get an understanding as to how people make the most effective use of this facility.

Enhancements were made in the following software for better management and easy retrieval of data:

Surgery Counseling for Free Patients

Improvements were made to capture the details of counseling process and print the counseling card. The data captured would be useful to monitor the compliance rate to advice.

Corporate Account Monitoring System

This was designed to monitor the receivables from companies paying for their employees' eye care services. This system tracks the patient details, payment details, and follows up with corporates.

Enhancements in Cataract Surgeries Outcome Monitoring System (CATQA)

New features were included to monitor additional variables. Individual surgeon level reports were made available. The software has been internally used for benchmarking the outcome and comparing the individual doctor's score to identify the gap as well as improving the processes and systems.

Materials Management System (MMS)

This existing system that tracks all inventory purchases and issues was revamped to make it more user-friendly and improve performance and reporting. A sub-store module was implemented to maintain and manage the stocks. A central database was put into place to improve standardisation across all the Aravind Hospitals and enable better benchmarking of consumption patterns.

Vision Centre Management System (VCMS)

Additional variables and features were added to share complete details required for registries and manage universal coverage project. Optical shop purchases and orders can also be now monitored from central station.

Enhancements in Intranet Modules

- Visitors Management Information System was revamped.
- Aravind's weekly e-magazine Thingal Udhayam underwent changes in lay out and now acquired a new look.

Mr. Ganesh Babu with participants of IHMS Users' Meet at BNSB Eye Hospital, Mymensingh, Bangladesh



- Library Image portal was extended to upload and view the images of ocular syndrome and stereoscopic Gonio photographs.

Networking and Technology

Structured cabling work using 10G was done in new outpatient facilities and entire outpatient block. Servers in all the Aravind centres were upgraded with RAM and operating system to improve the performance and meet the increasing load. SQL 2012 was implemented to get full benefits of the server memory and improve the performance of the database. To ensure network security, the department has started implementing SANS critical control as well as putting in place various systems and measures.

Auronutrisoft: A tool for studies in nutrition

It has a database of complete ingredients from ICMR, recipes from several studies across the country, a tool to design the questionnaire to enter and save data and inbuilt process of compiling, analyzing and producing macro-and micro-nutrient information based on the intake data entered.

Providing Support to Eye Hospitals

Integrated Hospital Management System (IHMS) software was implemented in eight hospitals in India, two each in Nepal and Bangladesh and one each in Nigeria and Ethiopia. Vision centre management system was implemented in four hospitals in India.

In addition to these, materials management system, lab system, medical shop and optical shop system were implemented in 5 hospitals.

As part of providing continuing support, IHMS users across Nepal were invited for a workshop from November 22 - 23 at Nepal Netra Jyoti Sangh, Kathmandu, Nepal. The objectives of the workshops were to review the utilization of IHMS system, understand the users' problems and design/discuss appropriate solution, ensure quality of data as well as build a central database.

LIBRARY AND INFORMATION CENTRE

Library is an inevitable component in an organisation like Aravind which is attached with PG training and other paramedical courses. Libraries are set up in several of the Aravind centres and these tremendously help support medical education, including teaching, research and patient care. Centrally co-ordinated by an eminent team based in Aravind - Madurai, the libraries across the Aravind centres deploy latest technologies to collect, store, retrieve and disseminate a great amount of information.

Library Committee meetings are held every six months to review the activities and to suggest improvements to better its services. Conferences and training programmes were also arranged to discuss the changes happening rapidly in the field and to make librarians understand their crucial role in managing and providing access to information.

Change Management in Medical and Healthcare Librarianship: Issues and Challenges

Role of librarians and information specialists today is to increase access to information. Digitization of library information resources has presented a new age librarian with a myriad of fresh challenges which he has to contend with and learn to surmount. This Seva-supported conference was organized to understand the changes medical and health sector libraries are currently experiencing. The conference held on November 23 at Aravind-Coimbatore also analysed the gap between current practices and emerging technology in medical libraries and information management. A total of 72 participants from medical institutions, multi-speciality hospitals, training institutes, academic, public and special libraries, resource centres and medical colleges participated in the conference.

SEVA – Elsevier Practical Training Session for Librarians

Aravind Library and Information Centre at Madurai organized a SEVA-Elsevier workshop in the last week of November to provide practical exposure to eye hospital librarians. Apart from the Aravind team, a total of seven librarians from L V Prasad Eye Institute, Hyderabad; Sadguru Netra Chikitsalaya, Madhya



Aravind library team with the participants of Change Management Workshop

Pradesh; Netra Nirmay Niketan, West Bengal; Lumbini Eye Institute, Nepal; Sankar Foundation Eye Hospital (2 librarians), Vishakhapatnam and Dr. Om Prakash Eye Institute, Amritsar participated in this training programme. Discussions revolved on strengthening the existing collection (print and electronic resources), indexing system (retrieval and search technique), as well as making use of technological applications.

BIOSTATISTICS

The department provides vital support to various clinical, epidemiological and health services research projects at Aravind by their active involvement in study design, data entry, data management, statistical analysis and report writing. The department also involves in statistical consultation for postgraduates, fellows and research scholars. Additionally, statistical inputs are provided for planning research studies and for reviewing articles by various reviewers within Aravind and to research projects elsewhere on request. The biostatisticians handle classes in statistics for the students of Diploma in Medical Record Science.

TELE-OPHTHALMOLOGY NETWORK

Aravind has been deploying telemedicine to help facilitate the delivery of eye care services to rural areas. This low-cost telemedicine approach in all the Aravind vision centres enables the patients to have real-time consultation with the ophthalmologist in the base hospitals. Telemedicine facility also helps the organization to collaborate with various diabetes clinics for screening of patients with diabetic retinopathy. A total of 1,344 cases were evaluated during the year-ending March 2014. In addition to this, telemedicine is also used for the delivery of education and teaching programmes and the facilitation of administrative meetings involving satellite centres. Around 297 video-conferencing sessions consisting of a total of 385 hours were conducted during the year and the average time taken per session was around 1 hour 30mins.

AWARDS AND ACCOLADES

Aravind Eye Care System, the organization and several of its staff were recognized for their various achievements. These awards won at various conferences bore testimony to the competence of the staff and also came as a recognition to their whole-hearted dedication as well as hard work in their profession.

Listed below are the awards won during 2013 - 2014:

Global Innovation Summit Award

Aravind Eye Care System was declared winner of the 2014 Rainforest Recognitions: Innovation Ecosystem Award instituted by the Global Innovation Summit. Mr. David Green, a long time friend of Aravind, accepted the award on behalf of the organization at the function held at San Jose, California from February 17-19.

Infosys Innovation Award

In a first-of-its-kind initiative, CNN-IBN, in partnership with Infosys, recognized 14 leading exemplary innovations that have not only transformed the lives of millions of Indians but have also made indelible impressions globally. At a prestigious awards ceremony held on March 28, at the JW Marriott Hotel in New Delhi, the people behind these innovations were felicitated. Aurolab was one of the recipients of this prestigious award. Chief Guest Mr. Narayana Murthy, Co-founder and Executive Chairman of Infosys, presented the award which was received by Mr. R.D. Sriram, Director - Operations, Aurolab.

Dr. P. Namperumalsamy Appointed as Member CCH & FW, Govt. of India

Dr. P. Namperumalsamy has been appointed Member of the Central Council of Health and Family Welfare (CCH & FW), the Apex Advisory Body of Ministry of Health and Family Welfare, Government of India, under the Chairmanship of Union Minister for Health and Family Welfare, in August. The other members are State Secretaries of Health, Health Ministers of State and 10 eminent medical leaders in the country.

Rotary and Lions Awards for Dr. G. Natchiar

In recognition of her meritorious service in the field of ophthalmology, Dr. G. Natchiar was awarded the "For the Sake of Honour Award" by Rotary Club of Pondicherry Mid Town on April 7.

She was also presented with the "Lifetime Achievement Award" by the Lions Clubs International District 324 A3 on April 20 in Pondicherry.



Lions Lifetime Achievement Award for Dr. G. Natchiar



Mr. David Green receiving Global Innovation Summit Award on behalf of Aravind

Eye Pep - ICON Award for Dr. G. Natchiar

Dr. G. Natchiar was awarded the Eye Pep ICON Award by the L.V. Prasad Eye Institute at the function held in Hyderabad on October 5.

FNAMS Awarded to Dr. M. Srinivasan

Dr. M. Srinivasan was elected Fellow of the National Academy of Medical Sciences (India) in October.

Recognition

Dr. P. Vijayalakshmi and Dr. A.S. Karthikeyan were elected members of the Technical Resource Group of Rashtriya Bal Swasthya Karyakram (RBSK) launched by the Ministry of Health and Family Welfare. RBSK is



EKAM Foundation's Best Doctor award to Dr. R.D. Ravindran



Dr. R.D. Ravindran receiving the Mehra ACOIN award



Dr. R. Ramakrishnan receiving Dr. Joseph Gnanadickam Memorial Oration award at the TNOA conference



Dr. George V Puthuran after the award ceremony at WGC, Vancouver with World Glaucoma Association President F Grehn and Vice President R.D. Fechtner

a new initiative aiming at early identification and early intervention for children from birth to 18 years to cover defects at birth, deficiencies, diseases, development delays including disability.

Best Doctor Award for Dr. R.D. Ravindran

Ekam Foundation along with Udhavum Ullangal honours doctors who provide exemplary services in their respective field of work as part of their K.S. Sanjivi Awards ceremony. Dr. R.D. Ravindran was presented with the Best Doctor Award at the ceremony held in Chennai on August 29.

Rustom Ranji Oration Award for Dr. R.D. Ravindran

Dr. R.D. Ravindran was conferred the Rustom Ranji Oration Award at the Andhra Pradesh State Ophthalmic Conference held from September 28 - 29.

Mehra ACOIN Award for Dr. R.D. Ravindran

Dr. R.D. Ravindran was conferred Mehra ACOIN Award at the 4th annual conference of the Association of Community Ophthalmologists of India (ACOIN) held at Bhubaneswar, Orissa on November 10.

Dr. Joseph Gnanadickam Memorial Oration Award for Dr. Ramakrishnan

Dr. R. Ramakrishnan was awarded the Dr. Joseph Gnanadickam Memorial Oration Award at the 61st Annual Conference of the Tamil Nadu Ophthalmic Association held at Chennai on August 9.

Achievement Award for Dr. R. Ramakrishnan

Dr. R. Ramakrishnan was awarded Achievement Award by the Tamil Nadu Senior Citizens and Pensioners Welfare Association in October for his service towards the development of senior citizens.



Dr. Kalpana being felicitated by Lions club as part of International Women's Day celebrations

Pride of Service Award for Dr. V. Narendran

Dr. Narendran was conferred the Pride of Service Award by the Lions Clubs International - Coimbatore on June 30.

Best Video Award for Dr. George V Puthuran

Dr. George V Puthuran received the Best Video Award for his presentation on "Evolution of an Affordable Aqueous Drainage Implant - An Indian Story" at the World Glaucoma Congress (WGC) held at Vancouver, Canada from July 17-20.

Lions Club Award for Dr. Kalpana Narendran

Dr. Kalpana Narendran was conferred *Potra Padum Pengal* Award by the Lion Clubs International - Coimbatore on the occasion of International Women's Day in March.

ICGS – Best Paper Award for Dr. R. Sharmila

Dr. R. Sharmila was awarded the Best Paper award for her presentation on *Safety and efficacy of concomitant prophylactic sclerostomy with cataract surgery in Nanophthalmic eyes* at the International Congress on Glaucoma Surgery held at Singapore in February 2014.

ICMR Award for Outstanding Clinical and Biomedical Scientists

The Union Minister for Health and Family Welfare, Shri Ghulam Nabi Azad presented the ICMR (Indian Council for Medical Research) Awards to 51 outstanding clinical and biomedical scientists for the years 2009 and 2010 for their work in communicable and non-communicable diseases, maternal and child health and various other medical and biomedical fields.

The ICMR Prize for "Biomedical Research conducted in underdeveloped areas" was presented to Dr.P.Sundaresan for his research work on *Congenital blindness in India: A cluster study on ocular anomalies in Ara, Bihar* on September 29.



Dr. P. Manikandan receiving the ICMR award from Shri Ghulam Nabi Azad



Dr. P. Sundaresan receiving the ICMR award from Shri Ghulam Nabi Azad

The Shakuntala Amir Chand Prize for the year 2009 was presented to Dr. Manikandan Palanisamy for his work on *Epidemiological, clinical and laboratory Investigations of ocular infections*.

Awards at Annual Conference of Glaucoma Society of India

Dr George V Puthuran won the Best Video Award for the video on *Aurolab Aqueous Drainage Implant* at the Annual Conference of Glaucoma Society of India held at Indore, Madhya Pradesh from September 20 - 22.

Dr. Lipi Chakraborty, won the Best Paper Award for her presentation on *Automated fundus image assessment: A novel screening method for glaucoma*.

Awards at Asia – ARVO 2013

Aravind team bagged eight awards at the prestigious Asia-ARVO conference held at New Delhi during October 28 - 31. Listed below are the details of the awardees:



AIOS quiz winners, Dr. Sahil Bhandari and Dr. Chitaranjan Mishra receiving the prize



Mrs. Valarmathi, Honourable Minister for Social Welfare, Govt. of Tamil Nadu presenting the award to Mr. S. Poornachandran

Oral Presentations

Ms. J. LAKSHMI PRIYA

- Genotypic and phenotypic characterization of type III secretion system and evaluation of biofilm formation in *Pseudomonas aeruginosa* causing endophthalmitis (Certificate of Merit - free paper - Immunology and Microbiology)

DR. JAYA CHIDAMBARAM

- Transcriptome analysis of severe bacterial and fungal keratitis: A case - control study (Certificate of Merit - free paper - Immunology and Microbiology)

Poster Presentations

DR. C. GOWRIPRIYA

- A novel approach for live imaging of human limbal niche cells (I Prize)

Ms. SAUMI MATHEWS

- Identification, in vitro expansion and characterization of human limbal niche cells (II Prize)

DR. S. SENTHIL KUMARI

- Exploratory study on Ascorbate and Haptoglobin in cataract Patients (I Prize)

DR. JEYALAKSHMI KANDHAVEL

- Label free quantitation of glycoproteins in tears of mycotic keratitis patients (I Prize)

DR. LIPI CHAKRABARTY

- Computerised evaluation of fundus images: A novel screening method for glaucoma (I Prize)

DR. G. NAMRATA

- Knudson's hypothesis revisited in Indian population (II Prize)

Awards at The Annual Conference of All India Ophthalmological Society (AIOS)

Aravind doctors came out in flying colours at the Annual Conference of the All India Ophthalmological Society held at Agra from February 6 - 9.

Dr. S.R. Rathinam was awarded the Siva Reddy International Oration Award for her significant contributions towards research on Novel infectious uveitis etiologies.

- Dr. Arijit Mitra won the D B Chandra - Disha Award for the best paper in the Glaucoma session.
- Dr. Sahil Bhandari and Dr. Chitaranjan Mishra bagged the first and second prize respectively of the quiz competition held as part of the conference.
- Dr. Chitaranjan Mishra, won the Prem Prakash - Disha Award for the Best Paper for his presentation on 'Modified Yokoyama Surgery' for Heavy-eye syndrome.

Rotary Awards for Aravind Staff

Ms. M. Chidambaram, Nursing Superintendent and Ms. M. Ramalakshmi, OT Tutor at Aravind - Tirunelveli were awarded Certificate of Recognition by the Rotary Club of Tirunelveli North in appreciation of their sincere efforts in their profession.

Best Employee Award by the Government of Tamil Nadu

As part of International Disabled Day celebrations, Ministry of Social Welfare, Government of Tamil Nadu honoured individuals with disability rendering exceptional service. Mr. S. Poornachandran, Instruments Maintenance Department, Aravind - Madurai was awarded the Best Employee Award at a function held at Anna University, Chennai on December 5. Mrs. Valarmathi, Honorable Minister for Social Welfare presented the award to Mr. Poornachandran.

ASCRS – Ophthalmic Photographer's Society (OPS) Recognition

Fundus images captured by Mr. John of Retina Clinic at Aravind Madurai have been accepted into the



Mr. Lalan Kumar Arya receiving the Best Young Researcher Award



Mr. D. Saravanan receiving the Best Poster Award from Dr. P. Namperumalsamy

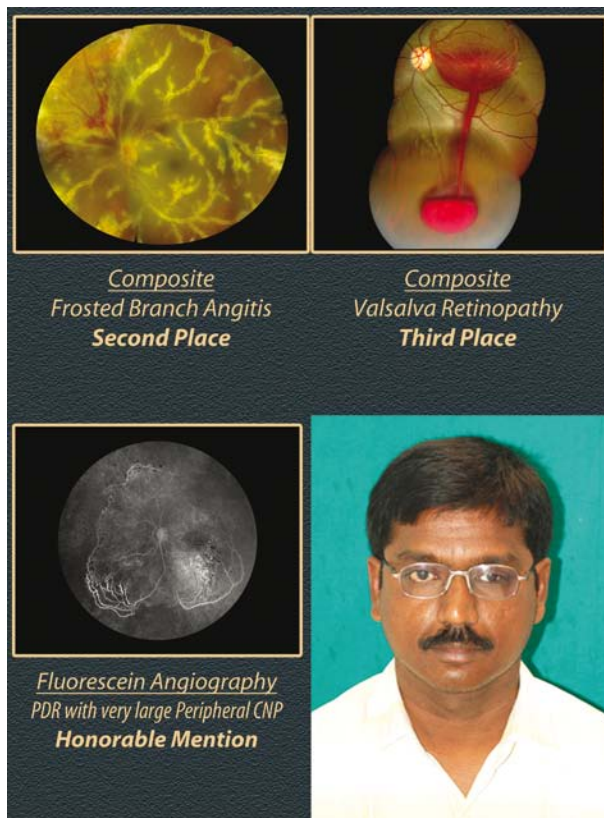
Ophthalmic Photographers' Society Exhibit which will be kept on display at the ASCRS/ASOA Annual Symposium and Congress to be held at Boston, MA, during April 25 - 29, 2014.

Best Young Researcher Award

Mr. Lalan Kumar Arya was awarded the Best Young Researcher Award for his study on *Molecular based identification of Procerovum varium (Trematode: Heterophyidae) in children causing granulomatous uveitis* at the International Symposium on Intraocular Surgery (ISIS) 2013 organized by Chaithanya Eye Hospital and Research Institute at Trivandrum, Kerala from June 22 - 23. The award includes a certificate and cash prize worth Rs.15,000/-.

Best Poster Award for D. Saravanan

Mr. D. Saravanan, Manager, RAIEB was awarded the Best Poster Prize for his poster on Hospital Cornea Retrieval Programme at the Fourth Annual Meet of SightLife held at Aravind - Madurai from February 28 - March 2.



ASCRS-OPS fundus images captured by Mr. John

DNB Residents Win Allergan Quiz Competition

DNB residents, Dr. O. Annamalai and Dr. Sahil Bandari became the winner and runner up respectively of the Erudio quiz competition conducted by Allergan India Ltd from among the 2453 participants from India and Nepal. Subsequently, they were entitled for a free Bangkok trip for the first Academic Congress - Asian Ophthalmology Society held from February 19 - 21.

Ph.D Awarded by Madurai Kamaraj University

Ms. S. Ananthi was awarded Ph.D in Biomedical Sciences by Madurai Kamaraj University for her thesis, *Understanding pathogenesis of human mycotic keratitis- A proteome wide analysis*. She carried out her study under the guidance of Prof.K.Dharmalingam and Dr.P.Sundaresan.

T. Mark Hodges International Services Award 2014

Mr. Kirubanidhi has been selected for the T. Mark Hodges International Services Award, 2014 by the Medical Library Association (MLA), USA, towards his contributions in laying the foundation for MLA's second century of excellence and achievement in the health information profession. The award will be presented at the Annual Meeting to be held in Chicago, Illinois, USA in May 2014.

PARTNERS IN SERVICE

Aravind's direct patient services are financed internally. However, there are areas which benefit the larger community where Aravind seeks help from like-minded organizations: medical research to discover the causes, prevention and treatment of blindness, eye care consulting to build expertise and capacity across the developing world, and outreach to the rural poor. Without their unflinching support, Aravind would never have been able to significantly contribute to the goal of eliminating needless blindness.

For service delivery, training and more

- Acumen, USA
- Alcon Laboratories Inc, USA
- Canadian International Development Agency, Canada
- Carl Zeiss Meditec, Germany
- CBM International, Germany
- Combat Blindness Foundation, USA
- Essilor, India
- Fred Hollows Foundation, Australia
- Hilton Foundation, USA
- Indian Institute of Management, Bangalore, India
- International Federation of Eye Banks, USA
- Indian Overseas Bank, Chennai, Madurai
- International Agency for Prevention of Blindness
- International Council for Ophthalmology, London
- Lavelle Fund for the Blind, USA
- Lions Clubs International Foundation, USA
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- State Bank of India, Madurai
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- University of Michigan, USA
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- VISION 2020-The Right to Sight, India
- Wescott Williams Ltd., UK
- World Diabetes Foundation, Denmark
- World Health Organization (WHO), Geneva, Switzerland

For research

- Alagappa University, Karaikudi
- All India Institute of Medical Sciences, New Delhi, India
- Aravind Eye Foundation, USA
- Case Western Reserve University, Cleveland, USA,
- Centre for Vision and Vascular Sciences, Queen's University, Belfast, UK
- Cognizant Foundation, Chennai, India
- Dana Centre for Preventive Ophthalmology, Johns Hopkins University, USA
- Defence Research and Development Organisation, Government of India
- Delhi Institute of Pharmaceutical Sciences and Research (DIPSAR), New Delhi
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- Francis I. Proctor Foundation for Research in Ophthalmology, UCSF, USA
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- Indian Institute of Technology, Chennai
- International Centre of Eye Health, UK
- London School of Hygiene and Tropical Medicine, UK
- Madurai Kamaraj University, Madurai, India
- National Eye Institute, USA
- North Eastern Hill University, Shillong, India
- Sastra University, Thanjavur
- Singapore National Eye Centre, Singapore
- Tamil Nadu Dr. M.G.R. Medical University, Chennai, India
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- University of Tasmania, Australia
- University of Wisconsin, Madison, USA
- Vivekananda Mission Ashram, West Bengal, India
- Wellcome Trust, UK
- World Health Organization, Switzerland

ARAVIND EYE FOUNDATION

Founded in 2001, the Aravind Eye Foundation supports the mission of the Aravind Eye Care System to eliminate needless blindness and promote sustainable, high quality, patient-centric eye care across the world. In this role, the foundation facilitates knowledge-sharing and partnerships with higher education, social enterprise, health care, government and non-profit organizations. The Aravind Eye Foundation also provides funding to programs of the Aravind Eye Care System, which are not self-sustaining by Aravind's core operations:

Ring of Hope

Now in its tenth year, the Ring of Hope Fund pays for treatment of patients - primarily children - who suffer from retinoblastoma, a life and sight-threatening form of eye cancer. Last year, 430 patients received free surgery, chemotherapy, radiation and custom-prostheses, bringing the total number of patients helped to more than 1,300.

The Ring of Hope provides not only free treatment to the patient, but support to the whole family. Often patients come to Aravind with other family troubles - unemployment, other illnesses, money problems - the doctors and nurses at Aravind focus on bringing hope to everyone involved.

Sathish and his family are a typical Ring of Hope story. His parents brought Sathish to Aravind Eye Hospital when he was just two years old. Both eyes were affected with retinoblastoma, and his left eye had to be removed to keep the cancer from spreading. Around the same time Sathish's father was diagnosed with stomach cancer and died shortly thereafter.

Sathish and his mother were devastated by his father's death - and left without an earning member of the family. Under these difficult conditions, Sathish's mother found it nearly impossible to continue his treatment. Ring of Hope stepped in and paid for all Sathish's treatment expenses, plus the family's food and travel. Sathish was fitted with a custom prosthetic to replace his left eye, and received chemotherapy to save his right eye.

Today, Sathish is free from cancer and excelling at school. His mother passed her government exams, and was appointed Village Administrative Officer. The family is grateful to the Ring of Hope donors who helped them through a very tough time.



Dr. P. Namperumalsamy inaugurating the Pathamadai Vision Centre along with team from Proof Eyewear

Rural Vision Centers

Rural Vision Centers are a critical part of Aravind's plan to provide universal access to eye care, connecting even remote villages with experienced Aravind doctors. To date, Aravind has opened 46 centers across Tamil Nadu, and plans to set up 130 centers by 2020.

This year, Aravind Eye Foundation sponsored the start-up costs and first year operating budgets for vision centers in the villages of Pathamadai, Vadamadurai, and Oddanchatram with support from the So-hum Foundation and Proof Eyewear and in Auroville and Kadayam, thanks to a generous grant from philanthropists Anne and Julie Kelly. At the end of 2013, all AEF-funded centers had seen more than 30,000 patients, recommended more than 1,800 patients for cataract surgery and fitted nearly 15,000 people with eye glasses.

In July, Proof Eyewear executives travelled from Boise, Idaho, to India and joined Aravind staff and local dignitaries to inaugurate the Pathamadai vision center. Proof also designed frames to commemorate the occasion with an inscription in Tamil: "More than one fourth of the world's blind people live in India. Help eliminate needless blindness. Do Good".

Capacity Building

Sub-Saharan Africa has some of the world's highest rates of blindness from cataracts - and not nearly



Mr. N. Bala Baskar IAS, Secretary-Auroville Foundation inaugurating the vision centre in the presence of Dr. G. Natchiar and Dr. R. Venkatesh

enough qualified eye care professionals. To address this great need, the Hilton Foundation has awarded a three-year grant for \$1.5 million to support capacity building in Sub-Saharan Africa. Aravind Eye Foundation administers this grant. Aravind will work with hospitals in Kenya, Ethiopia, Nigeria and Zambia to help increase their surgical output and quality and reach more patients in poor, rural communities.

Spectacles for Scholars

Poor vision is directly connected to poor school performance and Aravind's school screening program aims to identify and correct vision problems early in a child's education. This year AEF expanded the

Spectacles for Scholars program to hospitals in Madurai, Theni, Coimbatore, Pondicherry, and Salem, sponsored screenings of more than 40,000 school children, and provided 4,151 eye glasses free of charge.

Low-Vision

Started in 1999, Aravind's Vision Rehabilitation Center helps about 5,000 visually-impaired patients annually to improve their quality of life. Working with Freedom Scientific, AEF secured free and discounted video magnifiers for patients' use.

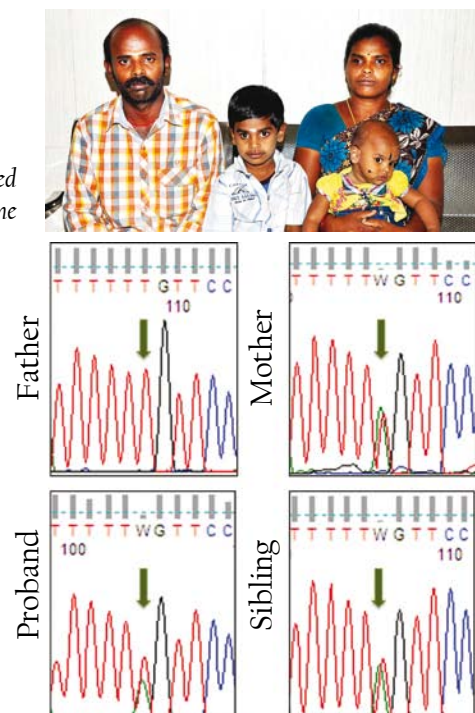
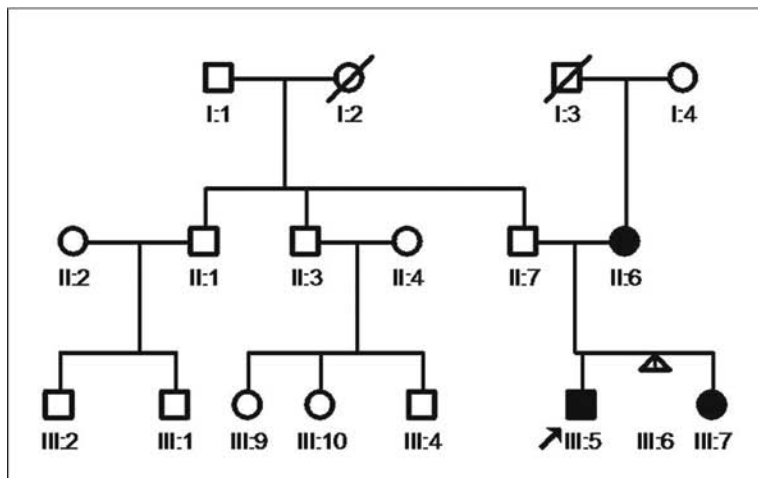
Aravind is indeed fortunate to have the support of so many friends, dedicated to Dr. V's vision of eliminating needless blindness.

Research

Roughly 10% of childhood eye cancers in India have a genetic component - yet, genetic testing and counselling remain far beyond the means of most Indian families. AEF provided the seed funding to establish the first genetic testing lab in the developing world. This year the Allene Ruess Memorial Trust committed to fund three years of operating costs, after which, the lab will be self-sustaining from affordable patient fees and research projects.

Aravind Hospital - Pondicherry received a grant to compare the complications between Manual Small Incision Cataract Surgery (MSICS) and Phacoemulsification (PE). AEF also sponsored a micro-biology research fellow at the Aravind Medical Research Center.

In a family with mother and child affected with retinoblastoma, genetic testing helped to predict retinoblastoma in the next child and treat her on time



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