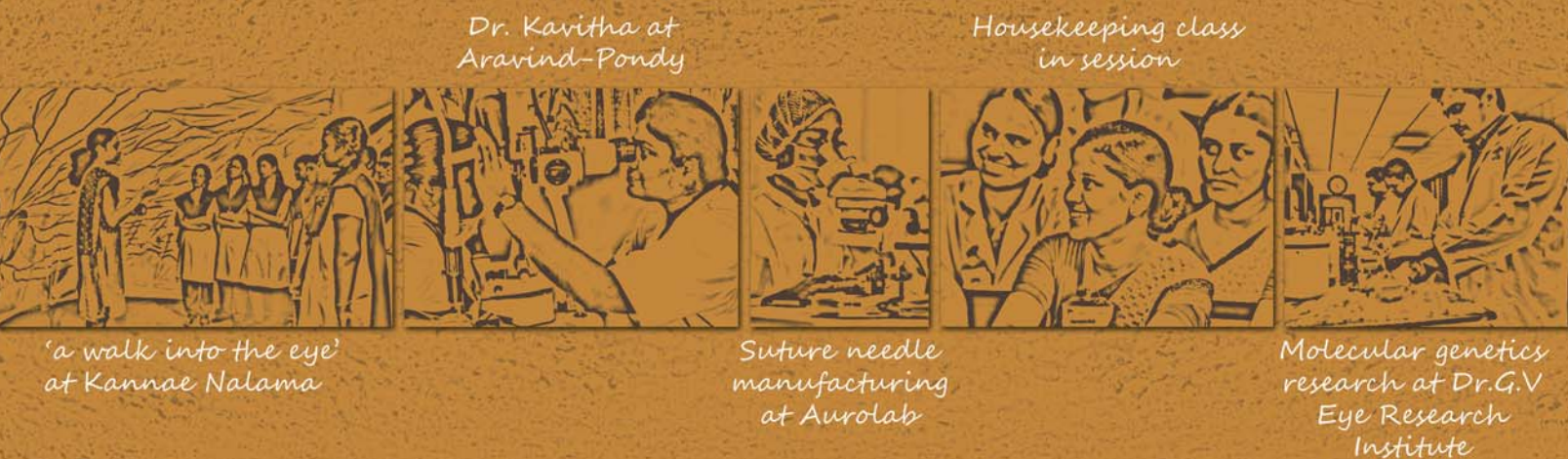


# ARAVIND EYE CARE SYSTEM



activity report 2012-13





### THE MOTHER'S SYMBOL

The central circle represents the Divine consciousness  
 The four petals represent the four powers of the Mother  
 The twelve petals represent the twelve powers of the Mother manifested for Her work



### SRI AUROBINDO'S SYMBOL

The descending triangle represents Sat-Chit-Ananda (the pure consciousness of the divine)  
 The ascending triangle represents the aspiring answer from matter under the form of life, light and love  
 The junction of both, the central square: is the perfect manifestation having at its centre the Avatar of the Supreme-the lotus  
 The water: inside the square-represents the multiplicity, the creation





*One force shall be your mover and your guide,  
One light shall be around you and within;  
Hand in strong hand confront Heaven's question, life:  
Challenge the ordeal of the immense disguise.  
Ascend from Nature to divinity's heights;  
Face the high gods, crowned with felicity,  
Then meet a greater god, thy self beyond Time."  
This word was seed of all the thing to be:  
A hand from some Greatness opened her heart's locked doors  
And showed the work for which her strength was born.*

*- "Savitri" by Sri Aurobindo  
- Book IV, Canto III*



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### *Photo Credits*

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Senthil Kumar, Aravind–Coimbatore







# ARAVIND EYE CARE SYSTEM

## ARAVIND EYE CARE FACILITIES

Mission: to provide high quality, compassionate and affordable eye care 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 OUT-PATIENT Eye Care Centres (Comprehensive Eye Examination, Treatment of minor ailments)



Madurai-City Centre Pondicherry-City Centre

Melur

Tirumangalam

Cumbum

Sankarankovil

### 41 PRIMARY Eye Care Centres (Comprehensive Eye Examination)

#### EYE SCREENING Camps Community Outreach Programmes

In the year ending March 2013, 2,841 camps were conducted through which 554,413 patients were screened and 90,547 surgeries performed.

# VISION: Eliminate Needless Blindness

## EDUCATION AND TRAINING

Mission: to develop ophthalmic human resources through teaching and training



Around 7,300 candidates trained  
from 97 countries

1040 papers published

## RESEARCH

Mission: to provide evidence through research and evolving methods to  
translate existing evidence and knowledge into effective action



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

80 research papers published

10 scholars received PhD

## CONSULTANCY AND CAPACITY BUILDING

Mission: to enhance eye care through capacity building, advocacy, research  
and publications



- Sharing best practices at Aravind
- Advocacy in eye care
- Publications

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

## OPHTHALMIC SUPPLIES

Mission: to make high quality ophthalmic products affordable and accessible  
to the vision impaired worldwide



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

Products exported to more than 130 countries  
worldwide





*“You see, when you talk of service you are thinking of a being that you would like to help, someone who needs your help whether it is sickness or poverty or an accident. Sri Aurobindo says that once you are in that higher consciousness you automatically serve, you don’t have to make an effort. It becomes possible for you to do that, just like a mother does for a child. You see everyone as part of the Divine. You think of everyone as a soul. When you do this, as Ramana Maharishi did, for instance, your love and compassion does not stop with your family or your nation”.*

*Dr. G. Venkataswamy*



# Highlights-2012-13

## A year of milestones

This past year will long stand out as a significant milestone in Aravind's history. Aravind - Tirunelveli completed 25 years and Aravind - Pondicherry, 10 years of service towards eliminating needless blindness. Aravind's training and consultancy arm, Lions Aravind Institute of Community Ophthalmology completed two decades of its service, supporting eye hospitals and eye care programmes globally.

At Aravind - Tirunelveli, to mark the occasion, several activities were held throughout the year - a mega eye care exhibition, mega free eye camps, CME programmes for medical practitioners of different specialities and competitions for school children on eye care. The Silver Jubilee Anniversary day observed on February 16 marked the culmination of the year-long celebrations. Shri.T.Karumuthu Kannan, Managing Director, Thiagarajar Mills Ltd., Madurai was the chief guest for the function. Key persons who offered felicitations during the programme included Dr.Perumalsamy, Vice Chancellor, Noorul Islam University, Mr.Ramakrishnan, Founder, Amar Seva Sangam, Ayakudi, Mr.Gunasingh Chelladurai, President, Chamber of Commerce, Tirunelveli, Mr.A.P.C.V.Chockalingam - Secretary, V.O.C Group of

Educational Institutions, Tuticorin, Dr.Vijayakumar M.D, National President, Indian Medical Association, New Delhi and Vaanamaamalai Jeer, Nanguneri.

Aravind - Pondicherry celebrated its decennial anniversary on February 23. Elaborate programmes were arranged as part of the celebrations, mainly to improve eye care awareness among the community. Dr.T.S.Ravikumar, Director - JIPMER, Pondicherry was invited as guest of honor for the celebrations.



At the inauguration of the Silver Jubilee eye care awareness exhibition at Aravind - Tirunelveli

Mr. Ramakrishnan offering felicitation at the Silver Jubilee celebrations of Aravind - Tirunelveli





## Looking back and surging forward

This past year was a year of collective reflection and one that has set the course for the decade ahead - essentially articulating in concrete terms where Aravind Eye Care System aspires to be in the year 2020. This reflective process drew together several hundred people across the entire system. It involved a deep dive into exploring Aravind's core strengths, calling out untapped opportunities, and clarifying our understanding of Aravind's essential values and the systems and practices built around them. This shared exercise brought everyone involved to a pivotal realization: Aravind is and always has been traveling on a twin track to eliminate needless blindness. One track is that of direct patient care with a strong community focus. This tireless focus on serving the community has resulted in a service delivery model that in the past year alone handled 3.1 million outpatient visits and performed over 371,000 surgeries and laser procedures - representing an outpatient growth of 9% and a 7% growth in surgeries over the previous year. The other track is that of sharing Aravind's best practices and systems with the community of eye care providers, national planners and policy makers. It has involved mentoring them through various means, and assisting

The organization aspires to perform a million surgeries and laser procedures a year by the year 2020. It set similar stretch goals for empowering and assisting other eye care organizations to grow in parallel.

them in making the necessary adaptations to their local settings. Aravind's two decades of experience in engaging with other players in the field and helping grow and improve performance has built deep reserves of trust and true partnership. These assets, alongside the



Dr. P. Namperumalsamy felicitating District Collector Mr. Ashish Kumar, IAS at the inaugural ceremony of Aravind - Tuticorin

global magnitude of need form the basis for Aravind's ambitious new growth target. The organization aspires to perform a million surgeries and laser procedures a year by the year 2020. It set similar stretch goals for empowering and assisting other eye care organizations to grow in parallel. These goals emerged during an intensive two-day retreat on January 4 and 5, that was attended by 60 leaders across the entire organization, and facilitated by long-term Aravind friend and volunteer, Professor Fred Munson.

## Expanding hospital network

Over the course of the last year, two new hospitals were added to Aravind's network in the state of Tamil Nadu, one at Tuticorin on May 5, and the other at Udumalpet on June 10. Both centres will function as satellite hospitals of Aravind Eye Hospital, Tirunelveli and Coimbatore respectively.

The past year also saw the finalization of architectural plans for the Aravind Eye Hospital at

Participants of Aravind 2020 retreat







*Dr. V. Narendran welcoming the audience at the opening ceremony of Aravind - Udumalpet*



*Dr. Ilango inaugurating the Veda sandur Primary Eye Care Centre*

Chennai. The design of this 400,000 sq. ft. facility was expertly led by veteran architect Mr. Gnanaraj with support from a team of volunteer architects from the United States that included Ms. Christie Coffin, Ms. Sudha Hajela and Ms. Lakshmi Nair. Prior to the actual design exercise, several eye hospitals across the United States and Singapore were visited and several meetings were held in order to define the size and scope of services. The volunteer team spent an entire month at Pondicherry working on the plans which have since been submitted to the planning authorities for approval.

### *Evolving primary eye care centres*

The focus on strengthening primary eye care through Aravind's network of vision centres (primary eye care

centres) has led to several new initiatives geared towards comprehensive services that include the promotion of sub-speciality services like glaucoma, diabetic retinopathy, low-vision and pediatric ophthalmology. This is a Sightsavers supported initiative. To increase coverage, two new primary eye care centres were added, one at Veda sandur on May 17, and the other at Devakottai on August 2. Both of these centres are attached to Aravind Eye Hospital, Madurai. The network now has a total of 41 primary eye care centres and covers a population of approximately 3 million. During the last year, these vision centres collectively handled over 275,000 out-patients, averaging almost 1,000 patients and tele-medicine consultations a day. The aspiration is to expand this network of primary eye care centres to cover a population of 10 million, by the year 2020.

Architects and the Aravind team at Khoo Teck Puat Hospital, Singapore conceptualizing the plans for the new hospital at Chennai





## *Nation-level collaborations*

Aravind's founder Dr.V always credited the growth and development of Aravind to Divine forces and their guidance. The organization's journey is studded with serendipitous events. This past year has been no exception. Close on the heels of an internal decision to find ways to work with government institutions to promote eye care, Aravind received a call from the Centre for Innovation in Public Systems (CIPS) requesting assistance in transforming health care in the public sector, and help in achieving world-class quality and efficiency. This call led to a National Workshop on Achieving Excellence in Eye Care Delivery, conducted jointly with CIPS at LAICO on June 16 and 17. The workshop was attended by Union Health Secretary Mr.Desi Raju, Joint Secretary, Ms.Sujaya Krishnan, Mr.Chakrapani, the Director of CIPS and representatives from over 30 government eye hospitals from across the country - mainly Regional Institutes of Ophthalmology and government teaching hospitals. In subsequent meetings following this workshop, the government has initiated action to support willing government eye hospitals to embark on a journey of transformation towards performance excellence.

Three national conferences were conducted at Aravind or led by members of the Aravind family. The 8th Annual Conference of VISION 2020: The Right to Sight – India was held at LAICO on July 21st and 22nd. In order to encourage broader participation by all members of the eye care team, five parallel tracks were organized to discuss Leadership, Operation Theatre Management,



Dr.R.Kim delivering the welcome address at Telemedicon 12

Outreach Management, Optometry and Optical Dispensing and Achieving Excellence in Operations Management.

GLAUCONS 2012 - the 22nd Annual Conference of the Glaucoma Society of India (GSI) was organized by Aravind Eye Hospital, Coimbatore. The conference was attended by over 600 people, including leading glaucoma experts from around the world, such as Dr.Alan Robin, Dr.Paul Lee, Dr.John Fingert, Dr.Aravind Neelakanthan, Dr.Ramesh Ayalla and Dr.Aung Tin.

Telemedicon 2012 - the annual telemedicine conference was organized by Dr.Kim with the active involvement of Aravind Eye Hospital, Coimbatore between November 29 and December 1. It attracted delegates from across the world and saw active participation from practitioners of telemedicine and technology vendors alike.

Participants to the National Workshop on Achieving Excellence in Eye Care Delivery







Mr.G.Srinivasan presenting Dr.G. V. Oration Award to Dr.Alan Robin in the presence of Dr. R.D.Ravindran, Dr. R.Ramakrishnan and Dr. P.Namperumalsamy

### *Six years of the October Summit*

The October Summit – 2012, the sixth in the series saw a number of exploratory workshops. One session that drew considerable international participation, explored Systems Thinking for Achieving Universal Coverage in Eye Care (September 23 -25). The workshop reflected on the real issues in eye care delivery and recognized that taking a comprehensive health systems approach is the key towards achieving the goals of Vision 2020. Sixty-four participants from countries such as Australia, Bangladesh, China, Egypt, India, USA, Nepal, Nigeria, Pakistan, South Africa, Sudan, Switzerland, Sri Lanka, Tanzania, Uganda and the United Kingdom participated.

On October 1 and 2, a consultation was held to determine the Glaucoma Research Priorities for India and the developing world. This was followed by a week long hands-on course on Vision Genomics.

In accordance with what is now an annual tradition, the highlight of the October Summit was the Dr.G.Venkataswamy Endowment Award and Oration delivered on 1st of October. The fourth Dr.G.Venkataswamy Endowment Award was presented

to Dr.Alan Lee Robin, Associate Professor Ophthalmology and International Health, Johns Hopkins University, USA. The award was conferred upon him in appreciation for his outstanding and dedicated contribution to the cause of ophthalmology and prevention of blindness in the developing world in general and India in particular. Dr.Robin's oration was titled Combating Glaucoma in Resource Poor Settings: The Way Ahead.

### *Spreading the Aravind model beyond eye care*

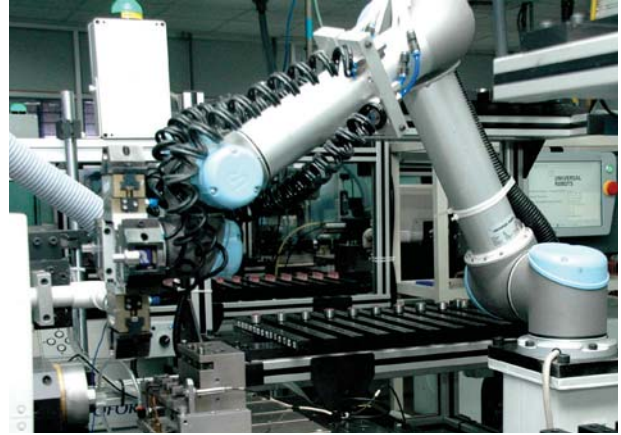
In recent years, the Aravind model has increasingly caught the attention of leaders in the field of social entrepreneurship and business. Several corporate houses such as SAP, BMW, GE, have sent their leadership teams to Aravind to study the model and senior members of Aravind have been invited to give talks at institutions such as IIMs, Oxford, Reliance and Hitachi Consulting.

The Jagriti Yatra continues to give Aravind a prominent place in their itinerary. For the fifth consecutive year, a group of over 450 Jagriti yatris spent a day at Aravind, Madurai on December 28th, giving the





Ms. Anjana explaining the clinic management system software to the SAP team



A robot at work at the IOL manufacturing unit

leadership a unique opportunity to inspire the young leaders of the future with the power of service, and in turn be re-energized by their enthusiasm.

Aravind's work continues to be widely recognized in India and other countries. It is celebrated for aspects as specific as patient safety or its use of IT, all the way up to broader aspects of the model, such as its approach to design and innovation. Individuals at Aravind continue to be honoured with awards and invited to deliver endowed orations across the country and the world.

LAICO completes twenty years of supporting eye care programmes globally. Close to 300 eye hospitals worldwide now have adapted some of Aravind's best practices to increase and improve their eye care services.

### *A commitment to finding the cause of eye diseases*

A decade ago it was predicted that by 2020, the existing backlog of blindness would double and there will be an increasing incidence of blinding eye problems. The need of the hour is to grow exponentially in eye care research to face the challenge ahead. The Dr.G.Venkataswamy Eye Research Institute is actively involved in understanding the disease processes of major age-related eye diseases such as diabetic retinopathy, glaucoma, age-related macular degeneration and cataract, as well as ocular infections. The institute also pioneers newer modalities of treatment to tackle the problem of blindness.

### *Making affordable ophthalmic consumables*

Continuing innovations in the manufacture of various ophthalmic consumables have earned Aurolab a good reputation in the international market. With the registration of several of its products, Aurolab is now poised to make an impact in the countries of Africa, Asia Pacific, Europe and Latin America. Robotic technology is now utilized in the IOL manufacturing to increase efficiency and to reduce rejection rates.

Research in progress at Dr.G.Venkataswamy Eye Research Institute

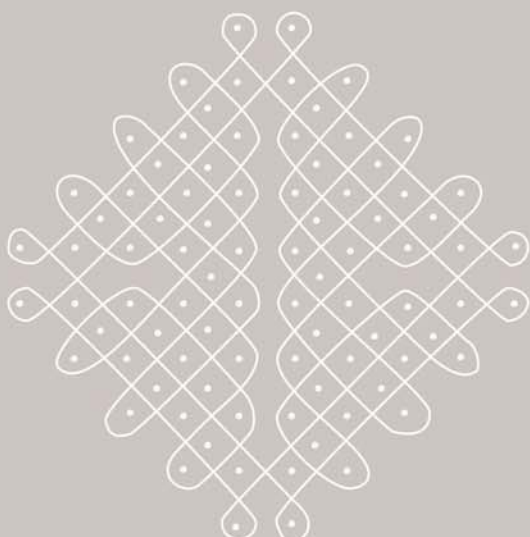






*"We have standardized our operations. Everyone knows exactly what they have to do. The clinical staff must do the diagnosis. We have the most sophisticated equipment here. The doctors must prescribe and operate. The counselor staff must explain all the procedures to the patient. The administration must work like clockwork. There is no laziness here. Staff that do not have the work ethic of Aravind do not stay long. For us the patient is the focus of everything we represent".*

*— Mr. Poobalan, Aravind  
Pondicherry in an interview to 'Daily Maverick' May 2012*



*Patient Care*



## Performance : April 2012 - March 2013

	Total	Madurai	Theni	Tirunelveli	Coimbatore	Pondicherry
<b>OUT PATIENTS - HOSPITAL/CLINICS</b>						
Paying Patients (New+Review)	<b>1,687,639</b>	516,154	80,003	253,100	346,280	240,965
Free Patients (New+Review)	<b>444,353</b>	154,406	21,967	67,241	11,1741	7,6187
Community Eye Clinics (including city centres)	<b>134,707</b>	79,686	19,021	20,038	-	15,962
Vision Centres	<b>276,330</b>	108,502	49,549	54,283	29,806	28,579
<b>OUTREACH</b>						
Comprehensive Free Eye Camps	<b>353,139</b>	114,400	26,305	51,087	87,632	71,000
Diabetic Retinopathy Screening Camps	<b>31,008</b>	4,899	2,634	1,978	15,794	5,549
Refraction Camps	<b>54,577</b>	11,091	3,657	13,086	15,768	10,319
School Eye Screening - through base hospitals	<b>22,514</b>	2,315	1,577	1,056	9,088	8,145
School Eye Screening - through vision centres	<b>3,049</b>	1,723	-	313	899	114
School Eye Screening by Lavelle Project	<b>36,048</b>	-	-	16,452	-	19,596
Pediatric Eye Screening	<b>48,067</b>	1,021	2,508	11,416	3,745	29,377
Mobile Van Refraction Camps	<b>6,011</b>	-	6,011	-	-	-
<b>TOTAL OUTPATIENT VISITS</b>	<b>3,097,442</b>	994,197	213,232	490,050	620,753	505,793
<b>SURGERIES</b>						
- Paying Patients	<b>184,611</b>	69,298	6,507	26,956	41,418	25,478
- Subsidized* (Walk-ins to Free Hospital)	<b>97,281</b>	41,637	3,292	12,227	25,566	12,974
- Free Patients (through outreach)	<b>90,001</b>	35,647	3,360	13,470	19,071	16,943
<b>TOTAL SURGERIES</b>	<b>371,893</b>	146,582	13,159	52,653	86,055	55,395

Dr.Maneksha at the Orbit clinic, Aravind - Tirunelveli



Dr.Nirmala Devy at the Neuro-ophthalmology clinic, Aravind - Pondicherry





Tirupur	Dindigul	Salem	Tuticorin	Udumalpet
38,998	60,969	90,071	39,793	21,306
1,506	-	-	2,140	9,165
-	-	-	-	-
5,611	-	-	-	-
990	-	1,725	-	-
-	-	154	-	-
-	-	656	-	-
-	-	333	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
47,105	60,969	92,939	41,933	30,471
1,934	2,952	7,763	1,482	823
381	-	8	335	861
87	-	1,423	-	-
2,402	2,952	9,194	1,817	1,684

Screening school children at Aravind - Coimbatore



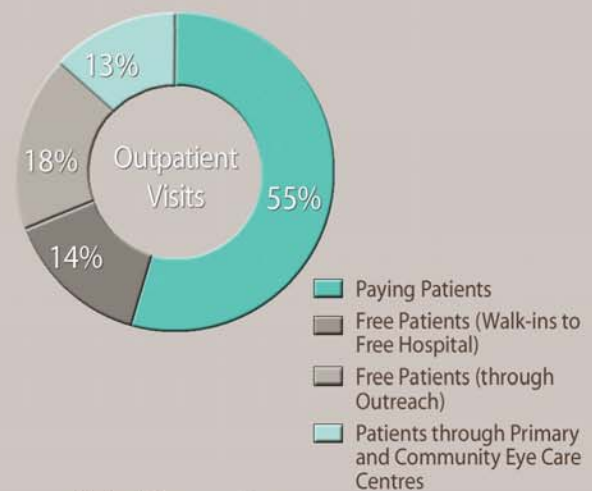
April 2012 to March 2013

*3.1 million*  
outpatient visits

*371,000*  
surgeries and laser procedures

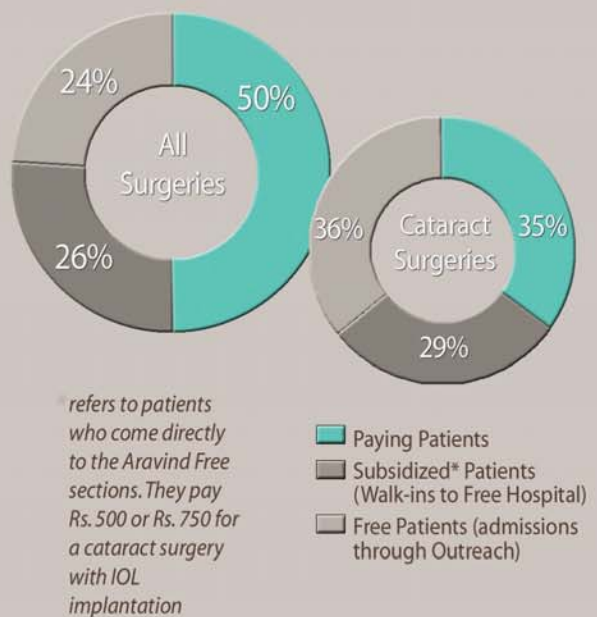
Total Outpatient Visits

3,097,442



Total Surgeries

371,893





## PATIENT CARE

In the year 2012 - 2013, Aravind Eye hospitals together handled 3.1 million outpatient visits and performed over 371,000 surgeries and laser procedures. A 9% growth in outpatient visits and 7% growth in surgeries and laser procedures over the previous year - an increase of 258,753 outpatient visits and 22,619 surgical and laser procedures.

A notable trend observed during the year was the considerable (18%) increase in the outpatient visits at Aravind's Primary Eye Care Centres where services are

provided by trained ophthalmic assistants with online consultation with the ophthalmologists at the base hospital.

### Infrastructure development

Two new hospitals - one at Tuticorin on May 5 and the other at Udumalpet on June 10, were added to the network. A long felt need of an eye care centre



Mr.G.Srinivasan lighting the lamp at the inauguration of Aravind - Tuticorin



Mr.R.G.Mani with Dr.Narendran at the inauguration of Aravind - Udumalpet

### Surgeries Performance in April 2012 - March 2013

	Total	Madurai	Theni	Tirunelveli	Coimbatore	Pondicherry
<b>SURGERIES IN DETAIL</b>						
Cataract surgeries	<b>242,915</b>	98,436	10,646	33,824	52,334	35,156
Trab and combined procedures	<b>6,725</b>	2,417	240	1,176	1,950	735
Retina and vitreous surgery	<b>10,842</b>	4,778	5	1,063	3,500	1,248
Squint correction	<b>2,218</b>	1,061	0	294	620	242
Keratoplasty	<b>2,404</b>	960	3	357	853	226
Pterygium	<b>4,516</b>	1,752	227	434	1,049	786
Ocular injuries	<b>1,922</b>	551	15	128	790	381
Lacrimal surgeries	<b>6,377</b>	3,078	101	871	943	1,274
Laser procedures	<b>72,410</b>	24,674	1,673	11,841	18,711	11,351
Other orbit and oculoplasty surgeries	<b>7,847</b>	3,233	181	1,075	1,619	1,459
Others	<b>7,565</b>	2,697	68	728	2,440	1,438
Refractive surgery	<b>6,152</b>	2,945	-	862	1,246	1,099
<b>TOTAL SURGERIES</b>	<b>371,893</b>	146,582	13,159	52,653	86,055	55,395



in Tuticorin came to reality with the opening of this secondary eye care centre. Staffed by Aravind - Tirunelveli, the centre offers comprehensive eye examinations and management of cataract, refractive errors and glaucoma. The hospital also has an exclusive free section.

The growing eye care needs of Udumalpet community was met only through camps and the Aravind management was keen to open a new hospital at Udumalpet. This became a reality through the generosity of G.Rudrappa Educational Trust and Mr.R.G.Mani who heads it. The hospital serves a population of over 800,000 in 25 kms radius around Udumalpet town. The facility that functions as satellite centre of Aravind - Coimbatore serves paying walk in, free walk in and provides free surgeries to patients from eye camps.

The architectural plan for the proposed 400,000 sq. feet Aravind Eye Hospital at Chennai was also finalized and has been submitted to the planning authorities for approval.

## New initiatives; updating diagnostic and treatment capabilities

With a mandate to improve patient care, several new initiatives were undertaken, and several new equipment were purchased for the various speciality clinics across all Aravind Eye Hospitals.

### Cataract and IOL services

Cataract clinic at Madurai and Coimbatore have a new Visual Function Analyzer which sequentially projects 256 near-infrared laser beams into the eye to measure forward aberrations, processing data point-by-point. This helps in better selection and prediction of quality of vision in patients undergoing multifocal, toric or aspheric IOL implantation. Surgeons benefit from this information when planning surgical procedures such as refractive lensectomies, astigmatic keratotomies as well as procedures with multifocal IOLs and during postoperative evaluations.

### Glaucoma services

The Aurolab Aqueous Drainage Implant (AADI) was implanted in a number of patients with promising results. For patients with refractory glaucoma from resource poor communities in the developing world,

Tirupur	Dindigul	Salem	Tuticorin	Udumalpet
1,895	2,042	6,129	1,148	1,305
48	26	107	26	-
1	-	245	2	-
-	-	-	1	-
1	-	4	0	-
27	41	185	14	1
2	2	52	0	1
44	-	58	8	-
315	793	2,154	554	344
49	37	123	55	16
20	11	137	9	17
-	-	-	-	-
2,402	2,952	9,194	1,817	1,684





AADI is a low cost alternative to the Baerveldt glaucoma implant. AADI is available all over India now at one-tenth the price of the Baerveldt implant.

The interim safety and efficacy outcomes of AADI surgery were presented at the International Congress on Glaucoma Surgery at Glasgow, Scotland and IAPB Annual meeting at Hyderabad in September and at the Annual meet of the Glaucoma Society of India at Coimbatore in October.

Early detection is crucial to prevent vision loss in glaucoma. The clinic acquired the recent generation of Heidelberg Perimeter and the Heidelberg Retinal Tomography which enables the doctor to see the earliest indications of any glaucoma progression under a grant from Narotam Sekhsaria Foundation, Mumbai. The book on Diagnosis and Management of Glaucoma authored by Aravind's senior glaucoma consultants, Dr.R.Ramakrishnan, Dr.S.R.Krishnadas and Dr.Mona Khurana, was released at Aravind - Madurai by Dr.R.Pararajasegaram, Former WHO Consultant on October 1. Dr.G.Chandra Shekar and Dr.Wallace Alward received the first and second copies respectively in the presence of Dr.Alan Robin.

The family screening for glaucoma targeting the siblings and children of persons with glaucoma initiated at Aravind several years ago has been intensified across the hospitals with close to 3,000 patients being screened in the past year. This will help early detection by focusing on individuals at high risk since close to a fifth of such patients are likely to have glaucoma. To improve glaucoma awareness in the community, glaucoma screening has been initiated in the primary

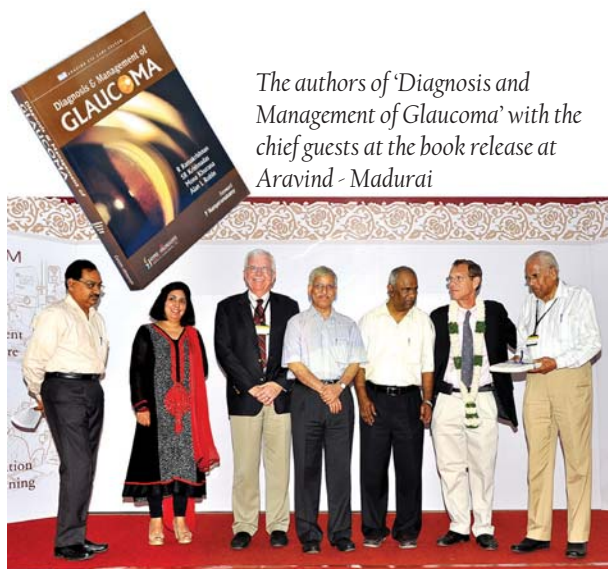
and community eye care centres of Aravind. Screening by a glaucoma specialist is now made available once every 3 months in primary eye care centres and once every month in community centres to promote follow-up and adherence to treatment.

## Retina vitreous services

The clinic has procured spectralis, a multimodality diagnostic imaging of the eye providing high resolution OCT images, enhanced depth imaging of choroid; autofluorescence; combined fundus fluorescein angiography - Indocyanine green angiography under a grant from Narotam Sekhsaria Foundation, Mumbai.

## Pediatric ophthalmology and adult strabismus services

To care for patients with ocular genetic disorders, ocular genetics service has been established at the Pediatric Ophthalmology Services at Aravind - Madurai. Children and adults with ocular genetic disorders and systemic disorders with genetic etiology are seen here. A detailed ocular history and family history is taken as well as the pedigree is drawn. This is followed by a comprehensive ocular examination and a targeted dysmorphology screening and systemic screening of the patient for systemic associations. Children with pediatric retinal dystrophies are evaluated and examined under general anesthesia, in co-ordination with the retina service. Discussion is carried out with



*The authors of 'Diagnosis and Management of Glaucoma' with the chief guests at the book release at Aravind - Madurai*

*Cirrus Optical Coherence Tomography (OCT) examination at Aravind - Tirunelveli*







*Dr. Kalpana at the children's eye care clinic at Aravind - Coimbatore*

the parents on the eye condition, systemic condition and the genetic implications. Appropriate ocular and systemic investigations are advised and referrals are made to further specialists. The family is counseled, the risks and benefits discussed. Clinical molecular genetic testing is also being initiated, even though research testing is done at Dr. G. Venkataswamy Eye Research Institute for several years. Genetic counseling is offered and family members who are at risk are screened, maintaining absolute confidentiality at every step.

The generous grant from Lavelle Fund has helped Aravind Eye Hospitals Pondicherry and Tirunelveli to reach out to and screen a total of one million children in their service areas. Apart from providing the required eye care for these children, the grant has built their capacity to maintain this reach of service in an on-going manner.

### Cornea services

At Aravind - Madurai, a second in-vivo confocal microscope was acquired, to diagnose the etiology of infectious keratitis, such as fungus or acanthamoeba, even before conventional microbiology becomes available. A new topography instrument called Pentacam was acquired to measure the anterior and posterior curvature of cornea along with corneal thickness. This has the special feature to predict the risk of keratoconus in susceptible patients.

Implantable Collamer Lens (ICL) surgery already underway at Madurai, was initiated at Aravind - Coimbatore, and is specially indicated in patients who are not fit for LASIK. Ultimate zyoptix became operational in November. It is a modification of wave



*Pentacam for Corneal Topography at the Cornea clinic at Aravind - Madurai*

front guided laser and precisely corrects not only the existing aberrations but also post lasik aberrations. The clinic started performing keratoprosthesis surgery to restore vision in patients suffering from severely damaged cornea.

Aravind - Tirunelveli added Specular Microscopy machine used primarily to visualize and analyze corneal endothelium to its diagnostic inventory. A new C3R (Corneal Collagen Cross linking with Riboflavin) machine was also acquired which is used to prevent the progression of keratoconus. The clinic was renovated to accommodate more patients in a convenient manner. Considering the increasing number of accidents caused due to improper handling of fireworks especially during festival season, the clinic organized an awareness exhibition on November 3.

### Uvea services

It was a year of two landmark achievements for Uvea Clinic at Aravind - Madurai. One specific category of pediatric uveitis, commonly known as conglomerate tubercle was under research for more than a decade in the clinic. Previous researchers suspected a tubercular etiology, however, there was no improvement after anti tubercular treatment and the initial part of research at Aravind indicated a possible parasitic etiology.

Now molecular research with Real-Time PCR assay using SYBR green, Bi-directional sequencing and BLAST analysis identified the cause as *Procerovum varium* (a trematode of the family Heterophyidae). This collaborative research was carried out with North Eastern Hill University, Shillong. This is the first time that ophthalmologists became aware that a flat



*Trematode Cercaria*

worm can cause granulomatous uveitis in children. The results were published in the journal, Archives of Ophthalmology.

The next significant research was on an epidemic outbreak of viral fever that resulted in blindness in several young men and women in south Indian states. Patients reported to the hospital with fever, joint pain and blurring of vision. Ocular examination revealed retinitis with hemorrhagic borders. Collaborative research with Division of Virology, Defense Research and Development Establishment, (DRDO) Gwalior, confirmed the cause by serology and molecular diagnostics as West Nile Virus. The result was published in International Journal of Infectious Diseases and in the journal, ophthalmology.

### Orbit, oculoplasty and ocular oncology services

Ophthalmic Artery Chemosurgery for Retinoblastoma treatment has been initiated at Aravind - Coimbatore as a collaborative effort between the hospital and Kovai Medical Centre and Hospital (KMCH). In this procedure, the interventional radiologist inserts a catheter from the femoral artery (in the thigh) till the ophthalmic artery and injects a chemotherapy drug (Melfalan). The advantage is that this allows delivery of high concentrations of the drug to the eye (and to the cancer), compared to far lower concentrations when given systemically.

Orbit clinic at Aravind - Tirunelveli was refurbished to accommodate more patients.

Orbit clinic, Madurai established on March 1, a genetic testing centre for childhood ocular cancer (retinoblastoma) in Dr.G.Venkataswamy Eye Research



*Patient with anterior chamber granulomatous uveitis*

Institute. This will carry out genetic diagnosis and provide appropriate counseling to parents of retinoblastoma patients. This was funded by Aravind Eye Foundation, USA. This facility will cater not only the retinoblastoma patients of Aravind Eye Hospital but also other institutions across India. This project will help in early detection and over time reduce vision loss and death due to retinoblastoma in young children. ICMR project for National Retinoblastoma Registry was extended to 2014 and till date has registered 177 new patients since April 2009. The purpose of the programme is to capture all cases of retinoblastoma in the country which will help to understand the magnitude and evolve methods to increase awareness about the disease in the community and manage it better.

*At the chemotherapy ward at Aravind-Madurai*





## Quality assurance systems

Aravind Eye Hospitals have adopted international patient safety goals as part of quality assurance activities. Patient identification practices have been strengthened at all departments and are being continuously monitored. A multi-disciplinary safety committee has been formed to attend to the facility safety and ensure safe environment to all stakeholders. Online incident reporting system has been implemented and all staff have been trained and encouraged to report adverse events including near misses. Several internal audits have been conducted to strengthen the practice. Various quality audits have been conducted in several departments to ensure good documentation, good medicine dispensing practices, etc. An active monitoring system was developed to measure patient satisfaction, suggestions and complaints. A training calendar has been developed with due attention to basic life support during emergency and all staff have undergone the structured training programme.

To monitor, benchmark and improve the quality of the cataract surgeries performed at all Aravind Eye Hospitals, Cataract Surgery Outcome Monitoring software (Cat-QA) has been developed and is currently operational. This application enables detailed analysis of surgical performance of all surgeons, complications, visual outcome and present them in charts and also in graphical form. It also helps the surgeon to benchmark themselves against the best. This system will help to develop appropriate strategies for continuous quality improvement. This software is now open to any eye hospital to monitor their cataract surgery performance.

*Doctors at Aravind - Pondicherry during the weekly clinical meeting through video conferencing with all Aravind Eye Hospitals*



## ARAVIND EYE BANKS

Estimated one lakh patients are awaiting corneal transplantation surgery in India. Statistics shows that only around 20,000 surgeries could be performed in 2011, mainly due to the non-availability of corneas. Cornea collection today meets a meager portion of the real demand. To address this enormous gap between demand and supply, Aravind Eye Banks have evolved better policies to strengthen eye banking activities. Strategy of collecting eyes through eye collection centres run by various voluntary organizations proved to yield better results. Various voluntary organizations including Lions Club, Rotary Club and several NGOs were actively involved in promoting eye donation in their respective service areas. Aravind Eye Banks distributed standard guidelines to all the collection centres, adherence to which would ensure better handling and transportation of the tissues thereby increasing the utilization rate.

With support from Seva Foundation, a deliberate step was taken to strengthen the activities of existing eye collection centres and also to establish new centres in and around Madurai. New instruments and other accessories were given to the collection centres towards this end.

## Strengthening hospital cornea retrieval programme

Rotary Aravind International Eye Bank signed a memorandum of understanding (MoU) with Meenakshi Mission Hospital and Research Centre, Madurai and

*Eye Donation seminar at Government Rajaji Hospital, Madurai*





*Dr.M.Srinivasan giving away certificate for the participant of eye bank technicians course*



*Rtn. Jeyachandran, Past President, Rotary club of Cuddalore offering felicitation during Fortnight celebrations*

Christian Mission Hospital, Madurai for Hospital Cornea Retrieval Programme.

Grief counselors were appointed by Rotary Aravind International Eye Bank, Madurai at the Government Rajaji Hospital and they have done an excellent job in counseling the family members of the deceased person, thereby motivating them towards eye donation. Aravind Eye Bank at Pondicherry has developed a good rapport with the government hospital there. Special awareness programmes were arranged at these hospitals to sensitize the staff on the need for supporting the HCRP and to ensure its smooth implementation.

Towards strengthening the Hospital Cornea Retrieval Programme (HCRP), Rotary Aravind International Eye Bank has signed a MoU with Sight Life. Sight Life supports the eye bank in terms of capacity building and technical assistance.

*Mr. Saravanan, Eye Bank Manager explaining the HCR Programme to a city hospital nurses team*



## Awareness creation

Aravind Eye Banks observe Eye Donation Fortnight every year from August 24 - September 8 with a wide variety of programmes including rally, awareness talks and seminars on radio and local TV channels, campaigns for pledging eyes etc. Voluntary organizations and hospitals which were instrumental in promoting the cause of eye donation were felicitated during the occasion.

Apart from this, awareness sessions on eye banking and eye donation were arranged continually at different educational institutions, hospitals, offices and NGOs. Close to 100 such programmes were organized by Aravind Eye Banks in the last year.

## Training

Four candidates including three grief counselors and a technician underwent structured training at Rotary Aravind International Eye Bank. Various theoretical as well as practical sessions were arranged as part of the curriculum.

## Eye collection and utility 2012-2013

Place	Eyes procured	Eyes utilized for surgery
Madurai	1,549	809
Coimbatore	1,349	680
Pondicherry	757	221
Tirunelveli	420	210
Total	4,075	1,920



## REACHING OUT

In Tamil Nadu, with its population divided equally among the urban and rural areas, all the health care facilities are concentrated in the urban areas. Lack of awareness and poverty further hinder the rural population's access to simple health care. Among those with visual impairment, more than 80% can be either cured or treated. With eliminating needless blindness as its vision, reaching out to this section has been a crucial element of Aravind's work since inception.

Outreach work at Aravind has evolved over the years. Aravind's outreach programme was modeled to overcome the barriers and bridge the gap between the available eye care facilities and the community in need. Initially it was simple screening for cataract and about 40% of surgeries were done at the camp site itself. Later, the 'base hospital approach' model was adopted, where patients are transported from screening eye camps to receive surgery and/or treatment in a permanent facility. This shift not only improved productivity and cost effectiveness of cataract surgery, but also facilitated an aseptic environment so that surgeons could achieve higher quality and better surgical outcomes. Cataract still accounts for 75% of blindness and 60% of low vision cases in spite of the extensive work done in the field. Aravind's outreach proactively sought to address this problem by increasing the number of cataract screening camps.

Over the years, community outreach at Aravind began to provide outreach services for different age-groups of patients and included screening initiatives for

*Mr. Kanagaraj, Dr. Venkatesh and the Aravind - Pondicherry team with Dr. Iqbal Singh, the Governor of Pondicherry at the Awareness rally on World Glaucoma Day*



diabetic retinopathy, glaucoma, pediatric eye problems and other treatable eye diseases. Today 50% of the Aravind eye camps are for screening diseases other than cataract.

With the steep increase in the diabetic population in India, combating blindness due to diabetic retinopathy is a major challenge to the eye care providers. In order to create awareness on Diabetic Retinopathy and to screen as many diabetics as possible, a new project was initiated during the last year. The objective of the project is to develop a cost-effective screening model for diabetic retinopathy. Trained ophthalmic technicians capture the fundus image and transfer it to base hospital for specialist opinion with the help of HOBNOB, a device to connect the base hospital and camp site through internet. The specialist grades the image and sends the report back to the screening spot. As a first step towards this, Aravind Eye Hospital, Theni has started collaborating with Government Primary Health Centres in the district. Aravind's 41st Primary Eye Care Centre was opened at Devakottai on August 2. Earlier in May, another centre was inaugurated at Veda sandur. Seva Canada funded the setting up cost of both these centres.

### Ensuring community participation

The success of Aravind's outreach camps solely rests on the unflinching support given by the local community sponsors. The community-based social service organizations or even well-wishers sponsor camps by taking care of logistics, support services and importantly patient mobilization. To acknowledge their selfless service, Aravind Eye Hospitals at Madurai, Tirunelveli and Pondicherry organized Sponsors Day which was attended by about 250 persons in each centre. This biannual event has become an excellent platform for sharing of rich and diverse experiences by the sponsors.

### Reaching out to create awareness about eye diseases

Using every opportunity to raise awareness on various sight-threatening diseases, the speciality clinics

routinely engaged in campaigns on the occasion of World Sight Day, World Glaucoma Day and World Diabetes Day.

Anniversaries of Primary Eye Care Centres and hospitals provide opportunities to educate the public on the importance of proper eye care and about common eye diseases. One such occasion was the grand eye care awareness exhibition, Kannae Nalamaa, held at Aravind - Madurai during World Sight Day in October. The exhibition received wide response from the public and as many as 6,500 people including students visited the exhibition.

As part of the silver jubilee celebrations, Aravind - Tirunelveli arranged a mega eye camp on February 3. Various eye care awareness sessions and press meets were also conducted as part of the celebrations. An awareness exhibition was also held which was visited by around 2,000 people.

Aravind - Pondicherry arranged an awareness session on children's eye problems was conducted for the first time for school headmasters on February 2. Headmasters from 117 schools participated.

Aravind - Pondicherry arranged an eye care awareness training programme for Anganwadi workers in and around Pondicherry. Around 125 persons participated in the programme.

## Annual planning meeting

Meticulous planning is essential for the smooth functioning of outreach department. This year too, outreach teams from across the Aravind centres were brought together for a two-day meeting at Aravind - Pondicherry on January 10 and 11. The performance of

*Dr.Mahesh Kumar inaugurating the Devakottai Primary Eye Care Centre*



*Dr.P.Namperumalsamy inaugurating the SightFirst seminar at Aravind - Madurai*

the department was assessed and a detailed road map was developed for the year ahead.

## SightFirst seminar for Lions leaders

The annual SightFirst Seminar for Lions Clubs leaders was conducted in different Aravind centres. The aim of this seminar is to educate the Lions on common eye problems.

In collaboration with One Sight - a Luxottica Group Foundation, Pediatric Ophthalmology and Adult Strabismus Clinic at Aravind - Coimbatore screened 75,608 school children and a total of 2,810 glasses were prescribed for those with refractive errors and 745 were referred to base hospital for further treatment. This one-year programme came to an end in June 2012 and has helped create a greater awareness on pediatric eye diseases in the community.

*Dr.Aravind and Dr.Kim with Mr.Anshul Mishra, District Collector, Madurai who inaugurated the Kannae Nalama exhibition at Aravind - Madurai*



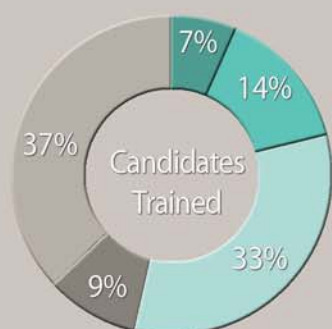


## Outreach Performance April 2012 - March 2013

	Total	Madurai	Theni	Tirunelveli	Coimbatore	Pondicherry	Tirupur	Salem
1. Regular Comprehensive Eye Camps								
Camps	1,492	384	116	309	385	284	6	8
Patients examined	353,139	114,400	26,305	51,087	87,632	71,000	990	1,725
Glasses advised	73,469	19,851	7,228	11,450	16,635	17,899	146	260
Glasses ordered	62,005	16,611	6,479	9,092	13,500	16,013	106	204
On the spot deliveries	44,692	13,202	3,567	6,262	11,023	10,559	0	79
%	72%	79%	55%	69%	82%	66%	0%	39%
2. Diabetic Retinopathy Screening Camps								
Camps	204	29	28	16	98	30	-	3
Patients screened	31,008	4,899	2,634	1,978	15,794	5,549	-	154
Diabetics identified	11,376	2,693	1,661	943	4,060	1,971	-	48
DR Patients identified	1,745	347	192	165	832	203	-	6
3. Refraction Error Camps								
Camps	243	47	18	58	62	54	-	4
Patients examined	54,577	11,091	3,657	13,086	15,768	10,319	-	656
Glasses prescribed	16,492	3,454	1,626	3,560	4,153	3,555	-	144
Glasses ordered	13,467	2,946	1,544	2,911	3,073	2,891	-	102
On the spot deliveries	7,373	1,975	750	1,714	2,026	833	-	75
%	55%	67%	49%	59%	66%	29%	-	74%
4. Eye Screening of School Children- BH*								
Schools	124	32	12	14	33	30	-	3
Teachers trained	606	130	163	82	151	78	-	2
Total strength-children screened	188,943	37,652	19,183	12,625	69,689	47,094	-	2,700
Children examined by ophthalmologist	22,514	2,315	1,577	1,056	9,088	8,145	-	333
Children with eye defects	10,030	1,501	1,334	860	2,662	3,442	-	231
5. Eye Screening of School Children - VC*								
Schools	24	12	-	4	6	2	-	-
Teachers trained	68	39	-	25	2	2	-	-
Total strength-children screened	34,781	18,540	-	8,184	6,527	1,530	-	-
Children examined by ophthalmologist	3,049	1,723	-	313	899	114	-	-
Children with eye defects	1,727	900	-	306	463	58	-	-
6. School Children Screening Camps by Lavelle Project (AEH - TVL & PDY)								
Schools	440	-	-	368	-	72	-	-
Teachers trained	2,305	-	-	1,070	-	1,235	-	-
Total Strength-children screened	256,589	-	-	113,992	-	142,597	-	-
Children examined by ophthalmologist	36,048	-	-	16,452	-	19,596	-	-
Children with eye defects	10,261	-	-	5,308	-	4,953	-	-
7. Pediatric Camp								
Camps	234	7	8	92	22	105	-	-
Children examined	48,067	1,021	2,508	11,416	3,745	29,377	-	-
Refractive error	1,636	159	86	381	621	389	-	-
Glasses prescribed	263	81	23	4	76	79	-	-
Glasses ordered	192	76	22	4	17	73	-	-
Other defects identified	1,962	75	26	294	334	1,233	-	-
8. Mobile Van Refraction Camps								
Camps	80	-	80	-	-	-	-	-
Patients screened	6,011	-	6,011	-	-	-	-	-
Glasses prescribed	1,833	-	1,833	-	-	-	-	-
Glasses ordered	1,491	-	1,491	-	-	-	-	-
9. Vision Centres								
Centres	41	16	7	6	5	5	2	-
New + Review	276,330	108,502	49,549	54,283	29,806	28,579	5,611	-
Outpatients / day	22	22	23	29	19	18	9	-
10. Community Eye Clinics								
Centres	4	2	1	1	-	-	-	-
New + Review	79,929	40,870	19,021	20,038	-	-	-	-
Outpatients / day	64	66	61	65	-	-	-	-
11. City Centre								
Centres	2	1	-	-	-	1	-	-
New + Review	54,778	38,816	-	-	-	15,962	-	-
Outpatients / day	88	125	-	-	-	51	-	-

\* BH - Base Hospitals; VC - Vision Centres

A total of **472** candidates underwent clinical, paramedical and management courses at Aravind during 2012 - 2013



Ophthalmologists

- PG in Ophthalmology
- Fellowship in Ophthalmology
- Short term clinical courses

Other eye care personnel

- Short term courses for Paramedics
- Management courses

Class for nurses at Aravind-Pondicherry



Wetlab session for IOL trainees



## CANDIDATES TRAINED 2012-13

TOTAL CANDIDATES : 472

### POST GRADUATE COURSES

Diploma in Ophthalmology (2 years)	6
Master of Surgery in Ophthalmology (3 years)	12
Diplomate of the National Board (3 years)	5
Post DO DNB (2 years)	8

### LONG TERM - OPHTHALMOLOGY FELLOWSHIP

Ant. Segment / Intraocular Lens Microsurgery (2 years)	7
Orbit & Oculoplasty (18 months)	3
Pediatric Ophthalmology & Strabismus (18 months)	9
Glaucoma (2 years)	15
Retina Vitreous (2 years)	16
Cornea (18 months)	12
Comprehensive Ophthalmology (2 years)	3

### SHORT TERM - FELLOWSHIP (FOR INTERNATIONAL CANDIDATES)

Orbit & Oculoplasty (6 months)	3
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### SHORT TERM - CLINICAL COURSES

ECCE - IOL Microsurgery (1 month)	10
Small Incision Cataract Surgery (1 month)	30
Phacoemulsification (1 month)	45
Diagnosis and Management of Glaucoma (1 month)	25
Lasers in Diabetic Retinopathy Management (2 months)	39
Vitrectomy (Virtual) (2 weeks)	3
Management of Retinopathy of Prematurity & Pediatric Retinal Disorders (1 month)	2

### SHORT TERM - PARAMEDICAL COURSES

Optical Dispensing (3 months)	6
OT Techniques (2 months)	5
Refraction Techniques (2 months)	26
Orthoptist (6 months)	1
Pediatric Nurse (3 months)	1
Ocularist (3 weeks)	2
Fundus Fluorescein Angiography and Ultrasonography (2 months)	3

### MANAGEMENT COURSES

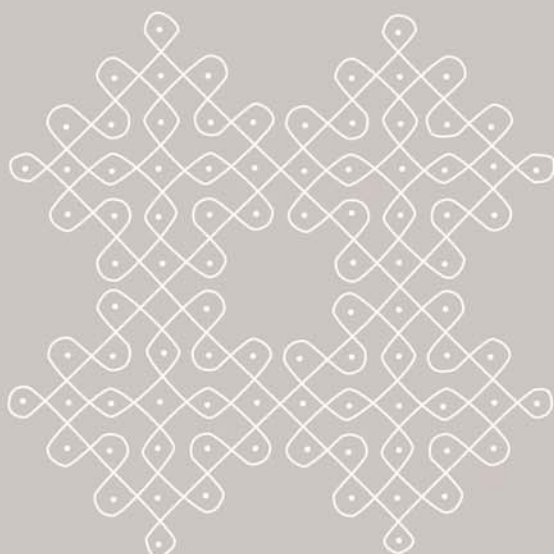
Priorities in Eye Care Delivery (1 week)	26
Training for Eye Care Programme Managers (2 weeks)	15
Training and Systems Development for Hospital Administrators / Managers (4 weeks)	18
Project Management for Eye Care (4 weeks)	5
Eyexcel – Expanding Global Eye Care Workforce through Excellence in Training (4 Days)	38
Research Methodology (5 Days)	33
Community Outreach and Social Marketing of Eye Care Services (4 weeks)	19
Instrument Maintenance - For Technicians (6 weeks)	21





*“It was not only the surgical experience that will benefit me for years to come, but the chance to take in Aravind as a whole, to see its spirit, witness its outreach, and be a part of its daily efforts to rid the country of needless blindness. I now go back to the US a more complete ophthalmologist, refreshed with a perspective on what it means to be a positive force in the larger community.”*

*— Rishi Doshi  
California Pacific Medical Center,  
USA*



## Education and Training

# EDUCATION AND TRAINING

Lack of well-trained eye care professionals is one of the main bottlenecks to tackling the global problem of curable blindness. To address this, Aravind offers a wide array of education and training programmes that target different cadres of professionals in eye care. These include fellowship and residency programmes, short term courses, Continuing Medical Education programmes, conferences, and workshops that target both clinical and non-clinical staff. Each year, an average of about 500 eye care professionals are trained through these programmes. To date Aravind has trained a total of more than 7,300 individuals from 97 different countries.

## CMEs held at Aravind

### CME on Biology to Molecular Biology: Changing Scenario in Medicine

Aravind - Tirunelveli, April 28

As part of the Silver Jubilee Celebrations of Aravind -Tirunelveli, this one day CME was organized at the hospital under the auspices of Indian Association of Medical Microbiologists, Tamil Nadu and Pondicherry chapters. The CME was inaugurated by Dr.V.R.Muthukkaruppan, Director-Research, Aravind Medical Research Foundation, Madurai and a total of 163 participants including medical and non-medical postgraduates of microbiology, pathology, biochemistry, molecular biology and biotechnology attended.

*CME on Biology to Molecular Biology: Changing Scenario in Medicine*



## Glaucoma CME

Aravind - Salem, July 1

The CME was conducted in two sessions covering eight different topics. Aravind's senior Glaucoma consultants and Dr.Sireesh G Nelvigi, Nethradama, Bangalore, handled the different sessions. A total of 32 participants attended the CME.

## 23rd update in ophthalmology for postgraduate students

Aravind - Tirunelveli, July 16 - 20

The field of ophthalmology has undergone revolutionary changes and the main purpose of this CME was to make the participants familiarize with the recent trends and update themselves. Postgraduate students in ophthalmology representing various states of the country, fellows and trainees from Aravind Hospital attended the CME. A total of 30 participants attended the update.

## Focus 2012 - Neuro-ophthalmology update

Aravind - Tirunelveli, July 21 - 22

Ophthalmologists from various states of the country, postgraduates, fellows and trainees attended the CME. The CME was enriched by the presence of distinguished faculty including Dr.Karl C Golnik, Professor of Neuro-ophthalmology, Cincinnati Eye Institute, USA and

*Faculty at Focus 2012 - Neuro-ophthalmology update*







*Dr.R.D.Ravindran, Dr.Haripriya and Dr.P.Namperumalsamy with Dr.Prema Padmanabhan, Dr.George Beiko, Dr.Alan Crandall, and Dr.Geoff Tabin at the inauguration of PHACOEXCEL 2012*

Dr.Sharon Tow, Head and senior consultant,  
Department of Neuro-ophthalmology, Singapore  
National Eye Centre.

## PHACOEXCEL 2012

Aravind - Madurai, October 12 - 14

More than 150 delegates participated in the programme and attended lectures which were handled by several distinguished faculty, national and international. Guest faculty including Dr.Alan Crandall, Dr.Geoff Tabin, Dr.George Beiko and Dr.Prema Padmanabhan contributed immensely to the scientific sessions. Live surgery telecast included an array of different phaco technologies in managing difficult cataracts. Apart from lectures and presentations, around 30 delegates participated in wet lab phacoemulsification training on model eyes and EyeSi simulator.

## Neuro-ophthalmology CME

Aravind - Madurai, November 18

Neuro-ophthalmology CME was conducted for neurologists, neurosurgeons, physicians and ophthalmologists and the primary aim of this meet was to increase the interaction between the different specialities in the field of neurology. Altogether 75 participants attended the meeting.

## Optocon 2012

Aravind - Tirunelveli, December

The field of optometry, contact lens and low vision has been witnessing revolutionary changes and immense growth in the last one decade. With the increase in awareness among public in general and patients in particular on eye care, it is important for professionals in optometry, contact lens and low vision aids to work together and meet the challenges in the current field. This CME aimed to orient the participants on the new developments in this field.

## CME on Diabetic Retinopathy

Aravind - Salem, December 15

Commemorating World Diabetes Week, Aravind - Salem organized a Diabetic Retinopathy CME. A total of 15 participants including postgraduate students in ophthalmology, practicing ophthalmologists in and around Salem and Namakkal districts participated.

## Eye Opener 2013

Aravind - Tirunelveli, February 10

Aravind - Tirunelveli organized the CME for general practitioners, general physicians, pediatricians, gynecologists and ophthalmologists. The purpose



*Instruments maintenance workshop at Aravind - Salem*

of this CME was to provide participants with the fundamentals of ophthalmology, practice and advances within the field, as well as to provide an opportunity for networking with professionals of diverse backgrounds in health care.

### **CME for Eye Care Professionals of Karnataka State**

Aravind - Coimbatore, March 4

Aravind - Coimbatore organized a half day CME for the ophthalmologists, district programme managers and ophthalmic assistants of the various districts in the state of Karnataka. Totally 36 participants attended the CME which mainly focused on diabetic retinopathy, pediatric cataract and strabismus, importance of family glaucoma screening and basic contact lens fitting.

## **Workshops and Conferences conducted**

### **Workshop on Care, Maintenance and Elementary Repair of Instruments in an Eye Hospital**

Aravind - Salem, May 28 - 30

This three day workshop was led by Instruments Maintenance team from Madurai consisting of Prof.V.Srinivasan, Mr.Poornachandran, Mrs.Ganga, and Ms.Kanagalakshmi and co-ordinated by Ms.Kalaiselvi, Instruments Maintenance Department, Aravind - Salem. A total of nine participants benefitted from this workshop. Over hundred defective instruments brought by the participants were fixed during the workshop.



*Dr.R.Ramakrishnan lighting the lamp at the inaugural function of Glaucons 2012*

### **GLAUCONS 2012**

Aravind Eye Hospital, Coimbatore hosted GLAUCONS 2012 - The 22nd Annual Conference of the Glaucoma Society of India (GSI) at Le Meridien Hotel in Coimbatore. The conference as a whole was a grand success with 601 registered delegates and faculty, including eminent foreign faculty such as Dr.Alan Robin, Dr.Paul Lee, Dr.John Fingert, Dr.Aravind Neelakanthan and Dr.Ramesh Ayalla from the USA and Dr.Aung Tin from Singapore.

The three day programme included varied learning sessions consisting of instruction courses, scientific deliberations and wet lab session. It was an excellent platform of interaction for ophthalmologist in practice and glaucoma specialists of national and international repute.

### **8th International Telemedicine Conference - Telemedicon 12**

Coimbatore, November 29 - December 1

Aravind Eye Care System hosted the 8th annual International Telemedicine Conference of the Telemedicine Society of India at Hotel Le Meridien, Coimbatore, India. The conference showed the progress that has been made to date in improving doctor to patient relationship, using the latest communication techniques along with digital technology and what is likely to come next. Much of the Telemedicon 12 conference was devoted to case studies with people deploying telemedicine explaining how it has already been implemented and used. The conference also included information on the new medical devices being





*Dr.R.Kim and Dr.P.Namperumalsamy with other faculty at the release of the Proceedings at Telemedicon 12*

developed to aid in telemedicine (such as devices to listen to a patient's heart, measure blood pressure, etc.) are being modified to create a digital signal that can be sent by telephone or wireless, so a doctor in a remote location can evaluate the patient from a distance. In addition to the group meetings, individual workshops were held, where more detailed information was discussed. About 280 people attended the event.

### **Workshop on skill-building for eye hospital librarians**

Aravind - Madurai, November 26 - 28

Aravind Library and Information Centre conducted a workshop for developing the competence of eye hospital librarians. The workshop was sponsored by SEVA Foundation and was attended by a total of thirteen participants.

The centre also facilitated a two-day seminar on PubMed search which was handled by Ms.Vasumathi Sriganesh, CEO - Friends of QMed Knowledge Foundation, Mumbai in June 2012. Discussions revolved on medical databases, electronic resources, and improving library services.

### **Skill development for vision technicians**

IL& FS - Health Practices with technical support and knowledge transfer from Aravind Eye Hospital has been assisting the Government of Tripura in providing primary eye care through Vision Centres in the state of Tripura since 2007. The programme is poised to



*Ms.V.R.Rajeswari and Ms.N. J.Tamilarasi as invigilators for the examination for vision centre technicians in Tripura*

scale up in rural parts of India based on demonstrated community benefits in preventing avoidable blindness in the state. As part of this programme, Ms.V.R.Rajeswari and Ms.N.J.Tamilarasi, senior refractionists from Aravind Eye Hospital, Madurai visited Indira Gandhi Memorial Hospital, Tripura to conduct theory, viva voce, and practical examination for 17 vision technicians and to evaluate their performance. This is a new initiative of Aravind and Infrastructure Leasing and Financial Services Limited (IL and FS) under the programme Skill development for vision technicians.

### **Towards developing professional competence**

With a view to ensuring professional development of the staff and employees, various seminars and guest lectures by eminent faculty were conducted throughout the year. Live surgery sessions and weekly grand rounds provide ideal opportunities for the medical personnel to keep themselves updated. Similar learning sessions are arranged for mid-level ophthalmic personnel and other cadres on a regular basis. Senior doctors are also sent to prestigious ophthalmic institutes across the world to observe and learn the best practices followed there and implement them in their work.



*Dr. Frederick with Dr. Joseph Demer at Jules Stein Eye Institute, Los Angeles*

## Internal Capacity Building

Dr. FREDERICK, Consultant, Pediatric ophthalmology services, Aravind - Pondicherry was at Jules Stein Eye Institute, Los Angeles in November 2012 to undergo observership with Dr. Sherwin J. Isenberg, Chief, Ophthalmology division, Los Angeles county harbor / UCLA Medical Center and Dr. Joseph I. Demer, Chief, Pediatric ophthalmology and Strabismus Division. Dr. Frederick was present when Dr. Isenberg was operating on inferior rectus muscle and discussed with him the precautions to be taken to prevent complications and also several other techniques in squint correction. He could also interact with Dr. Federico G Valez, Assistant Professor of ophthalmology.

At Wilmer Eye Institute, Johns Hopkins University, Baltimore, Dr. Frederick worked with Dr. David I. Gyton, Director, Krieger Children's Eye Center and Dr. Michael X. Repca, Professor of ophthalmology and got some insights into the treatment of amblyopia and got a deeper understanding about several techniques in pediatric eye surgeries. He also had the opportunity to observe rare procedures like transposition of vertical muscles and vessel sparing surgery. He met with Dr. Hee-Jung Park who is collaborating with Aravind in one of the research studies and shared a few practical points to develop new software for documenting school screening programmes.

Dr. RAJESH PRABHU, Consultant, Pediatric ophthalmology services, Aravind - Coimbatore visited Children's Eye Hospital, Boston in November 2012 and observed pediatric ophthalmologists Dr. Peterson and Dr. David Hunter. It was an exciting learning experience



*Dr. Rajesh Prabhu with Dr. David G Hunter at Children's Eye Hospital, Boston*

for him to watch their surgical techniques and management strategies. He also got a chance to observe the other ophthalmic sub specialities on a rotational basis. At Jules Stein Eye Institute, Los Angeles, he got to interact with Dr. Sherwin Isenberg and Dr. Demer and observed their procedures in the outpatient department and operation theatre.

In continuation of the AAO visit in November 2012, Dr. PANKAJA DHOBLE, Consultant, Retina services, Aravind - Pondicherry interacted with eminent Vitreous Retina Macula consultants Dr. Yannuzzi, Dr. Yale Fisher and Dr. Richard Spaide. She closely observed the meticulous work up of the Retina patients by these specialists. She learnt the importance of Autofluorescence in dry AMD. Autofluorescence could easily identify Reticular Pseudo Drusen, which have been identified as risk factor for developing late stage AMD. She got an overview of Deeper imaging of the eye with enhanced depth OCT and swept source OCT. She could learn more about the treatment procedures in wet AMD. She saw Dr. Stanley Chang operate at Columbia Hospital and learnt the use of localized radial sponge for Retinal Detachment Surgery. At Massachusetts Eye and Ear Infirmary, Dr. Pankaja was exposed to clinical and surgical skills in the management of coexisting retinal diseases. At Kellogg Eye Centre, Ann Arbor, she observed Dr. Heckenlively and Dr. Jaysunder in Electrophysiology and Macular Dystrophy Clinic.

Dr. VIDYA, Consultant, Glaucoma services, Aravind - Madurai was at Byers Eye Institute, Stanford University and observed Dr. Kuldev and Dr. Robert Chang, Professors in Ophthalmology. She observed their clinical and surgical skills, their meticulous way of treating each and every patient and so on. She had an experience





*Dr.Vidya with Dr.Kuldev Singh and Dr.Robert Chang at Stanford University*

there with SLT (selective laser trabeculoplasty) which is the treatment of choice for all patients whose IOP is not controlled with medications and before any surgical interventions. At the University of Iowa, she met with Dr.Wallace Alward, Director of Glaucoma services, learnt more about gonioscopy and had the opportunity to see a rare case of NVG with both Ahmed and Baerveldt implant, in which the superior conjunctiva was eroded being treated successfully. She also got a chance to interact with Dr.John Fingert.

Dr.G.ANITHA, Medical officer, Aravind - Tuticorin, visited Wilmer Eye Institute in November 2012 and observed Dr.Pradeep Ramulu, Associate Professor of Ophthalmology, Glaucoma Department. She got exposure into a lot of Tube surgeries. How the team manages the post-operative complications was a true learning experience. She had the opportunity to be with Dr.Alan Robin at his hospital. His technique of releasable suture in Trabeculectomy surgeries was really educative for her.

*Dr.Anitha with Dr.Shingleton at OCB, Boston*



## Conferences Attended Elsewhere

Participation in conferences helps staff keep abreast of the latest advances in the field and also provides opportunity for productive interactions with peer groups. Listed below are the major national and international conferences attended by the Aravind staff and the presentations made by them

### Annual Conference of Delhi Ophthalmological Society New Delhi, April 12-13

DR.SAURABH ARORA

- Low fluence PDT for early onset CNVM following LASIK
- Myopia as a protective factor against central serous chorio-retinopathy

### 27th APAO Congress

A joint meeting with the European Society of Ophthalmology and in conjunction with the 106th Congress of Korean Ophthalmological Society.

Busan, Korea, April 13 - 16

DR.M.SRINIVASAN

- Improving outcome in non phaco cataract surgery: Incision construction; astigmatism control; complications.
- Improving outcome in non phaco cataract surgery: Logistics of safe high volume surgery

MR.R.D.THULASIRAJ

- Impact of near vision impairment on work productivity

DR.KOWSALYA

- Clinical profile of ocular cranial nerve palsy

DR.ARUNA RATHAKRISHNA

- Vision assessment in children

DR.SANDRA C. GANESH

- Pearls on prescribing glasses in children
- Low vision aids in children

DR.KALPANA NARENDRAN

- Tips on amblyopia management using case examples
- Vision rehabilitation post cataract

DR.V.NARENDRAN

- Screening for ROP
- ROP: An overview at the instruction course on pediatric retinal disorders

DR.V.R.SARAVANAN

- Pathogenesis and classification of ROP

DR.PARAG K SHAH

- Interesting cases
- Anti-VEGF in pediatric retina

DR.P.S.VIVEK

- Outcome of primary congenital glaucoma undergoing combined trabeculectomy - trabeculectomy in South Indian population

DR.V.R.SARAVANAN

- Coats disease and PHPV

DR.KIRUBA PAUL

- *Incidence of cerebral venous sinus thrombosis (cyst) in papilledema*

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

Florida, USA, April 18 - 25

DR.HARIPRIYA ARAVIND

- *Chief instructor for the instruction course posterior capsule rupture and zonular dialysis management*
- *SICS in challenging situations*
- *Comparison of complication rates between phacoemulsification and manual small-incision cataract surgery (free paper)*
- *Spherophakia to aphakia and back (video)*
- *Instructor for the skill transfer course on M-SICS*

DR.GEORGE VARGHESE PUTHURAN

- *Need for MSCICS in the modern era of micro incision cataract surgery*
- *Tube repositioning into anterior chamber for tube related complications of aqueous drainage services (video)*

DR.R.VENKATESH

- *Instruction course on MSICS and PCR and Zonular dialysis management*

Dr.Venkatesh also visited Iowa city to meet genetic research team Dr.John Fingert and Dr.Ed Stone. He also got an opportunity to discuss with the Glaucoma team regarding IFACE study and future research studies at Dana Center and Wilmer Eye Institute, USA.

### Annual Conference of US Association for Research in Vision and Ophthalmology

Fort Lauderdale, Florida, USA, May 6 - 12

Dr.P.Namperumalsamy led a group of young Scientists from Aravind Medical Research Foundation to attend US ARVO meeting held in Fort Lauderdale during the

Dr.George, Dr.Haripriya and Dr.Venkatesh with Dr.Stan Pletcher and Dr.David F Chang at the ASCRS



second week of May and presented the Aravind research activities at the Indo-US collaborative vision research programme. Posters presented by doctors, scientists and research scholars are as follows:

DR.R.VENKATESH

- *Indian Family Angle Closure Evaluation (IFACE) study*
- *Aravind Pseudoexfoliation (APEX) study - Intraoperative results*

DR.P.SUNDARESAN

- *Genetic carrier screening for oculocutaneous albinism in India*
- *MIER1 polymorphisms and age-related cataract in India*
- *Association of ARHGAP22, PLXDC2 genes polymorphisms with type-2 diabetic retinopathy in Indian population*

DR.S.SENTHILKUMARI

- *Elucidating the correlation between the levels of macular xanthophylls and A2E in normal Indian donor eyes*

LALAN KUMAR ARYA

- *Molecular based-identification of procerovum varium (trematode: heterophyidae) in human eye causing granulomatous uveitis in children of south India*

K.RENUGADEVI

- *Prenatal molecular diagnosis of fetal sample*

LAKSHMIPRIYA

- *Characterization of pseudomonas aeruginosa Type Three Secretory System (TTSS) effector molecules (Exo U/S/T) from human corneal ulcer*

N.PRASANTHI

- *Evaluating the role of myocilin and optineurin genes in familial primary open angle glaucoma*

P.MURUGESWARI

- *Secretion of vascular growth factors / inflammatory cytokines by RPE is inhibited by Ranibizumab*

### Annual Conference of the World Association of Eye Hospitals (WAEH)

Bangkok, Thailand, June 5 - 7

DR.R.RAMAKRISHNAN

- *Role of vision centres in providing primary eye care – Aravind model*

### Eighth Pacific Health Summit

London, UK, June 12 - 15

DR.R.VENKATESH

- *Aravind model of using technology for prevention of blindness*

### 10th Annual Meeting of International Society for Stem Cell Research (ISSCR)

Pacifico Yokohama, Yokohama, Japan, June 13 - 16

Ms.Saumi Mathews, Junior Research Fellow, Aravind Medical Research Foundation had the opportunity to attend the 10th Annual meeting of ISSCR and present the poster titled *Identification of CD 90 and CD 105 positive mesenchymal stem cells in the anterior human limbal stroma*. She





Dr.R.Venkatesh at the Eighth Pacific Health Summit at London

was awarded travel fellowship by the Indian Council of Medical Research and other support from Defence Research and Development Organization (DRDO) and Aravind Medical Research Foundation to attend the meet.

#### Xth European Glaucoma Society Congress Copenhagen, Denmark, June 17 - 22

DR.MOHIDEEN ABDUL KADER, DR.DEVENDRA MAHESHWARI,  
DR.RENGAPPA RAMAKRISHNAN, GANESH V. RAMAN

- *A novel approach for glaucoma screening: Family screening of primary open angle and primary angle closure glaucoma patients*

DR.GANESH V RAMAN, DR.JULINDA JAHU, DR.KAUSHIK DHUME, DR.SHILPA PATIL, DR.SUSHEEL DESHMUKH,  
DR.SATHYAN PARTHASARATHI, DR.SHARMILA

- *Outcome of bleb revision using scleral patch graft for complications following trabeculectomy*

DR.R.SHARMILA, DR.GEORGE V. PUTHURAN, DR.JYOTI BABU,  
DR.S.R.KRISHNADAS AND DR.SANGEETA VIVEK PATIL

- *Outcome of repeat trabeculectomy with Mitomycin C*

#### ARMD-A Stand Alone Meet

Jakarta, Indonesia, June 14 - 17

DR.V.NARENDRAN, DR.GEORGE J MANYATH

- *Management guidelines for wet AMD - Indian scenario*

#### Indian AMD Congress

Dubai, July 14

Dr.V.Narendran, Dr.Rodney Morris, Dr.V.R.Saravanan and Dr.Amit Gupta participated in the Congress.

#### Meeting of the International Neuro-ophthalmology Society (INOS) Meeting 2012

Singapore, June 15 - 18

DR.PADMAVATHY

- *Pediatric optic neuritis: Clinical features and visual outcome and attendance (E poster)*

#### International AMD Classification Meeting

California, USA, August 16 - 18

Dr.R.Kim was invited to be in a panel of 25 experts in macular degeneration. The aim of this group is to develop the best way to characterize the clinical phenotype of AMD at different stages. And to develop a Simple classification in AMD to be used by all the ophthalmologists and another classification which will be based on the phenotyping and genotyping of AMD. In this context, he participated in this meeting held at Irvine, California on August 16 - 18.

#### Asia-Pacific Society of Ophthalmic Plastic and Reconstructive Surgery

Singapore, August 23-25

DR.USHA KIM

- *Challenging cases from around the World - how I have managed: The India experience (video)*

Dr.R.Kim at the international AMD classification meeting, California, USA



EUCORNEA and European Society of Cornea and Refractive Surgeons (ESCRS)  
Milan, Italy, September 5 - 10

DR.K.THIRUVENKATAKRISHNAN

- *Pseudomonas (poster)*

DR.BISWAJIT

- *Low vision aids in pediatric age group-How far is the dream? A 2-year analysis in a tertiary care eye hospital of South India*

DR.ANITA RAGHAVAN

- *Persistence of viable fungi in excised button in therapeutic keratoplasty and clinical implication (best paper award)*

DR.R.REVATHI

- *Persistence of viable fungi in excised button in therapeutic keratoplasty and clinical implication in the session on Infection and immunity (best paper award)*

2nd World Congress of Pediatric Ophthalmology and Strabismus

Milan, Italy, September 7 - 9

DR.KALPANA NARENDRA

- *What is the acceptance of the subspecialty of pediatric ophthalmology and strabismus in India?*
- *Poor visual behaviour in infants - clinical profile and visual outcome*

DR.RAJESH PRABH, DR.KALPANA, DR.R.SUBRAMANIAM, DR.A.RATHAKRISHNA

- *To study the effect of teachers training programme in successful screening of refractive errors in school children, by the teachers (free paper)*
- *Efficacy of fulltime occlusion therapy in management of amblyopia in 8 to 15 years old children*

DR.RAMAKRISHNAN SUBRAMANIAM, K.NARENDRA, R.PRABU, N.AGRAWAL

- *Surgical outcomes in monocular elevation defect*

DR.RAMAKRISHNAN

- *Surgical outcome in monocular elevation deficiency in pediatric patients (poster)*

Dr.Shetty with Dr.Paolonucci at 2nd world congress of pediatric ophthalmology and strabismus, Milan, Italy



DR.SHASHIKANT SHETTY

Invited speaker for the instruction course on Nystagmus  
Topic: *Head posture and visual acuity improvement following surgery for Nystagmus.*

He underwent observership with Professor Dr.Paolo nucci in San Guissipi Hospital, Milan during September 10 - 15. He also spent a week with Dr.Alan Spielmann, Nancy, France from September 16 - 22.

International Congress on Glaucoma Surgery  
Glasgow, Scotland, September 12 - 15

DR.GEORGE V PUTHURAN

- *Interim outcomes of safety and efficacy of Aurolab Aqueous Drainage Implant (AADI)*

9th General Assembly of International Agency for Prevention of Blindness  
Hyderabad, September 17 - 20

DR.P.NAMPERUMALSAMY

- *Overview of the epidemic of diabetic retinopathy*
- *Convener for the two sessions of the course on diabetic retinopathy: New paradigms for management in areas of limited resources*

- *Diabetic retinopathy programme management*

- *Session on eye care for everyone in India*

V.VIJAYAKUMAR, DR.R.KIM, R.D.THULASIRAJ

- *Diabetic retinopathy: Remote screening model using information technology (working with diabetologists)*

P.VINOTH, R.D.THULASIRAJ

- *Online learning for eye care professionals.*

R.MEENAKSHI SUNDARAM, R.D.THULASIRAJ,

DR.G.NATCHIAR

- *Community engagement in screening camps*

K.M.SASHIPRIYA, R.D.THULASIRAJ AND DR.R.KIM

- *Enhancing access to diabetic retinopathy services through partnerships beyond eye care*

SURESH KUMAR, K.M.SASHIPRIYA

- *Enhancing eye care through organizational capacity building - LAICO's recent experience*

MOHAMMED GOWTH, A.MANIMUTHU, R.D.THULASIRAJ

- *Innovation to improve access - Aravind primary eye care centre experience*

ROSS CUNNINGHAM, SANIL JOSEPH

- *Investigating gender - related barriers to eye care amongst cataract patients in Tamil Nadu*

DR.K.VIENA

- *Sibling motivational card - a new initiative for early diagnosis in pediatric ocular defects*

DEEPA KRISHNAN

- *Where do you stand? (poster on Eye 2)*

DR.FREDERICK MOUTTAPPA

- *School screening programme in South India: How successful are we?*



DR.BISWAJIT

- *Low vision aids in pediatric age group –How far is the dream?*  
*A 2-year analysis in a tertiary care eye hospital of south India*

MS.PRIYA ADHISESHAN

- *An innovative approach in teachers' training - our experience*

## 22nd Congress of the International Society Geographical and Epidemiological Ophthalmology (ISGEO)

Hyderabad, September 21 - 22

DR.FREDERICK MOUTTAPPA

- *School screening programme in South India: How successful are we? (poster)*

MS.PRIYA ADHISESHAN

- *An innovative approach in Teachers' training - our experience*

## Annual Conference of Bangladesh Academy of Ophthalmology

Dhaka, Bangladesh, August 28

DR.MAHESH KUMAR

- *Localization of neuro-ophthalmic lesions through clinical examination*

He also visited the Grameen Eye hospitals at Bogra, Bangladesh and interacted with the doctors on diagnosing neuro-ophthalmic conditions and examined patients in the outpatient clinic.

## Annual Conference of Nigerian Ophthalmic Society

Lagos, Nigeria, August 29 – September 1

Dr.Naresh Babu was the invited faculty for the Nigerian Ophthalmic Society meet held in September.

## International Symposium in Ophthalmology

Hongkong, September 14

DR.ANURADHA

- *Diffuse iris atrophy in Mumps kerato-uveitis*

## National Retinoblastoma Registry Meet

New Delhi, October 3

Dr.Usha Kim was the 6th PI (Principle Investigator) at the meeting of the National Retinoblastoma Registry held at National Institute of Pathology, Safdarjung Hospital, New Delhi.

## Annual Conference of Glaucoma Society of India – GLAUCONS 2012

Coimbatore, October 5-7

DR.R.VENKATESH

- *Carbon-dioxide laser assisted deep sclerectomy surgery - our experience*
- *How should I manage a bleb leak post operatively?*

Dr.Venkatesh, Dr.Ganesh Raman and Dr.Murali Ariga participated in the debate entitled “Glaucoma civil war – Pandiyan Kings” and also in the discussion on glaucoma publication from India.

DR.S.KAVITHA

- *Importance of family screening in angle closure glaucoma*

Dr.K.Palaniswamy and Dr.Kavitha were the instructors during the Wet lab session. Dr.Kunal Nikle attended the conference.

## E-Posters

DR.ARJIT MITRA

- *Ahmed Glaucoma Valve (AGV) in refractory glaucoma - outcome, complications and management of complications*
- *Effectiveness of different screening modalities in diagnosing glaucoma and prevalence and need for glaucoma screening at the community outreach programmes in the rural population*
- *To quantify and document the numerical change in anterior segment parameters in primary angle closure suspects pre and post Laser Peripheral Iridectomy (LPI) on immediate and long term follow up*

DR.PRAVEEN KANT SHARMA

- *Outcome of trabeculectomy with mitomycin-C in the glaucoma secondary to iridocorneal endothelial syndrome (best e-poster award)*

DR.GAJANAN D C

- *Case report: Ghost cell glaucoma following radiation therapy to adeno cystic carcinoma of lacrimal gland*

DR.P.SATHYAN

- *Outcomes of primary trabeculectomy with MMC (0.02%) for primary glaucomas*

participation in instruction courses:

DR.R.RAMAKRISHNA, DR.MURALI ARIGA

- *Interpretation and analysis of visual fields*

DR.R.VENKATESH, DR.S.R.KRISHNADAS, DR.ARUP

CHAKRABORTHY

- *Trabeculectomy and beyond*

DR.MURALI ARIGA

- *Which is the best perimeter for my practice?*

DR.S.R.KRISHNADAS

- *A critical evaluation of epidemiological studies from India: ACES*
- *When should I consider?*

DR.MOHIDEEN ABDUL KADER

- *A study of initial therapy for glaucoma in southern India: glaucoma outcomes and treatment (INGOT study)*

DR.MANJU R PILLAI

- *Today is there a role for non-penetrating glaucoma surgery in an Indian ophthalmologist's practice?*

DR.GEORGE V PUTHURAN

- *In what way are eyes with pseudo exfoliation different from those without - things to keep in mind when planning treatment for such patients?*

Dr.R.SHARMILA

- *Which medication for glaucoma is safe in infants and children?*

Dr.RONNIE GEORGE

- *When should I call an angle occludable? When should I treat an occludable angle?*

Dr.Manju Pillai facilitated the quiz prelims session.

Dr.R.Ramakrishna, Dr.Mohideen Abdul Kader, Dr.S.R.Krishnadas, Dr.George Varghese Puthuran, Dr.R.Sharmila, Dr.Manju Pillai and Dr.Ganesh V Raman facilitated the wetlab session.

### 8th International symposium on Uveitis

Halkidiki, Greece, October 19 – 22

Dr.RATHINAM SIVAKUMAR

- *Methotrexate Vs. Mycophenolate mofetil: Results of a randomized clinical trial*

Dr.B.Manohar Babu also participated in the meeting.

### 23rd Annual Conference of the Oculoplastic Association of India

Amritsar, Punjab, October 26-28

Dr.USHA KIM

- *Let's Interact - Interesting case discussion*
- *Management of ptosis with marcus gunn phenomenon*
- *Pearls and pitfalls in ptosis management*

Dr.P.Namperumalsamy, Chairman Emeritus has been invited by the Amritsar Academy of Ophthalmology as Chief Guest for inauguration ceremony on October 27.

Dr. Rathinam Sivakumar at 8th International symposium on Uveitis, Halkidiki, Greece



### Free Papers:

Dr.NAMRATA ADULKAR, Dr.USHA KIM, Dr.SHILPA TANEJA MITTAL

- *Adenoid cystic carcinoma of the lacrimal gland: clinical features, management and outcome*

Dr.VIDHYA N, Dr.USHA KIM

- *Visual outcome of optic nerve sheath fenestration in patients with papilledema*

Dr.NAMRATA ADULKAR, Dr.USHA KIM, Dr.SHILPA TANEJA MITTAL

- *Orbital lymphoma: what to expect and how to manage?*

Dr.NAMRATA ADULKAR, Dr.USHA KIM, Dr.BIJNYA BIRAJITA PANDA

- *Phakomatous choristoma within corneal stroma – a rare presentation*

### E- Posters:

Dr.USHA KIM, Dr.NAMRATA ADULKAR, Dr.BIJNYA PANDA

- *Superior oblique muscle entrapment in orbital fracture presenting as acquired Brown's syndrome*

Dr.NAMRATA ADULKAR, Dr.N VIDHYA, Dr.USHA KIM, Dr.BIJNYA PANDA

- *Ocular metastasis as the first sign of bronchogenic carcinoma*

Dr.NAMRATA ADULKAR, Dr.SHILPA TANEJA MITTAL

- *Clinical analysis of metastatic orbital tumors*

### Annual Conference on Mitochondria in Health and Disease

Gandhi Nagar, November 2-3

Dr.P.SUNDARESAN

- *Mitochondrial involvement in ocular disorders; Emphasizing Leber's hereditary optic neuropathy in Indian scenario*

BIBHUTI BALLAV SAIKIA

- *Mitochondrial DNA variants associated with Leber's hereditary optic neuropathy (poster)*

Dr. P. Namperumalsamy receiving the Outstanding Humanitarian award at the AAO





Annual Conference of American Academy of Ophthalmology (AAO)

Dr.P.Namperumalsamy received the Outstanding Humanitarian Award at the conference.

DR.RATHINAM SIVAKUMAR

- Methotrexate Vs. Mycophenolate mofetil: Results of a randomized clinical trial
- I hate those white dots (at the Uveitis subspecialty day)

Dr.Rajesh Prabhu, Dr.Fredrick Mouttappa, Dr.G.Anitha and Dr.Pankaja and Dr.Vidya Raja were the others from Aravind who participated in the AAO conference.

XXXVI National conference of Indian Association of Medical Microbiologists

New Delhi, November 22 - 25

DR.LALITHA PRAJNA

- Increasing non-albicans Candida from ocular infections and antifungal susceptibility patterns

Annual Meeting of Uvea Society of India

Bhubaneshwar, Orissa December 1 - 2

Dr.B.Manohar Babu was invited as faculty.

Joint Meeting of 28th Congress of APAO & 71st Annual Conference of AIOS

Hyderabad, January 17 - 20

DR.P.NAMPERUMALSAMY

Chairman and speaker for the symposium

- Update on age related macular degeneration
- Epidemiology and prevention of AMD

DR.R.D.RAVINDRAN

- Chairman for the symposium on cutting edge technology in cataract surgery
- Chairman and speaker for the symposium assessing the value of an academic mission relative to the demands of cost effective patient care deliver
- Monitoring for better patient care and outcomes
- Public health and glaucoma
- Chairman and speaker for the symposium Manual small incision cataract surgery
- Transition from ECCE to SICS
- Chairman for the symposium financing of ophthalmic service in the Asia Pacific area
- Chairman and speaker for the symposium age related macular degeneration in Asia Pacific region
- Prevalence of early and late age - related macular degeneration in India, findings from the INDEYE and other Indian studies
- Chairman for the symposium Vision 2020 practice management

DR.S.R.KRISHNADAS

- In advanced disease: When should we just give up?

- Chairman and speaker for the symposium Epidemiology and management of glaucoma in low and middle income countries

- The Indian national glaucoma outcome treatment study
- Chaired glaucoma society of India symposium

DR.N.V.PRAJNA

Chaired the symposium ophthalmic residency education

DR.R.KIM

- Anti - VEGF in AMD
- Steroids in DME
- Retinotomies and retinectomies
- Update on DR telescreening programs at Aravind - Madurai India (instruction course)

DR.USHA KIM

- Emergencies in orbital vascular disorders
- Leucocoria in a child: the challenges in diagnosis and how to increase the rate of early diagnosis of disease (instruction course)
- Chairman and speaker for the session best of grand rounds my most difficult case

DR.RATHINAM SIVAKUMAR

- Post surgical infectious granulomatous uveitis
- Parasitic uveitis
- Case presentation for the session on challenges in the management of uveitis
- Atypical presentations of posterior uveitic entities

DR.LALITHA PRAJNA

- Emerging fourth - generation fluoroquinolone resistance in pseudomonas aeruginosa keratitis isolates
- Clinical microbiological spectrum in India

DR.HARIPRIYA ARAVIND

- Indian intraocular lenses are the world's best (pro)
- Pseudoexfoliation (PXF) as a risk factor for intraoperative complications during cataract surgery
- Cataract surgery in exfoliation syndrome - How to avoid a disaster
- IOL options in inadequate support IOL options in inadequate support (instruction course)
- Subluxated cataracts and capsule stabilizing devices (instruction course)

DR.GEORGE PUTHURAN

- Preservatives and glaucoma management
- What is the role of laser therapy in POAG?

DR.S.MAHESH KUMAR

- Emergency neuro - ophthalmology session (Chief instructor)
- Ocular motility defects (Instructor)
- Should we treat traumatic optic neuropathy with steroids? (pro)
- Chaired the session on challenging cases in neuro ophthalmology

DR.P.SUNDARESAN

- Current trends in ophthalmic genetics

- Glaucoma and cornea - Hereditary patterns based on genetic mutations (instruction course)
  - Molecular genetics of diabetic retinopathies
- DR.R.MURALIDHAR
- Nystagmus surgery simplified (instruction course)
- DR.MANORANJAN DAS
- Lasik with mechanical keratome
- DR.K.NARESH BABU
- Modified technique of sclera fixation (instruction course)
- DR.ANAND RAJENDRAN
- Age related macular degeneration review of clinical trials - instructor
  - Atypical manifestations of diabetic retinopathy
- DR.KOWSALYA A
- Pupillary disorders (instructor in emergency neuro-ophthalmology session)
- DR.SANDRA
- Low vision management in children (instruction course)
- DR.GAURISH KHANNA, DR.KALPANA NARENDRAN,
- DR.SANDRA CHANDRAMOULI
- Monocular elevation deficiency - clinical associations and surgical outcomes
- DR.VIJI RANGARAJAN
- Manual SICS in hard cataracts
- DR.V.NARENDRAN
- Short coming of DR screening programme and solution
  - X linked retinoschisis
  - Chaired free paper session on uveitis
- DR.PARAG K SHAH
- Specific features of acute ROP in India and role of vitrectomy
  - CNVM angioid streaks
  - Role of radiation in retinoblastoma management and future direction in management of refracting RB
- DR.V.R.SARAVANAN
- Update on procedure for ARMD
- DR.AMIT GUPTA
- Correlation between branch vein occlusion related macular edema, morphology and treatment response with bevacizumab and triamcinolone
  - Bilateral morning glory disc anomaly with contractile disc, retinal detachment, transsphenoidal meningocele and pituitary dysfunction
  - Dexamethosone implant various indication, efficiency and safety profile
- DR.SAURABH ARORA
- Intra-vitreous ranibizumab with adjunctive laser therapy in patient with DME
  - The surgical management of uveal effusion syndrome
  - Microbiological profile and visual outcome in patient who developed endophthalmitis after intra vitreal injection
- DR.SANDEEP BACHHU
- Microbiological profile and visual outcome in patient who developed endophthalmitis after intra vitreal injection

- Comparison of long term refractive, visual and structural outcome following green and infra red laser for zone 1 ROP
- A novel NR 2E3 mutation in a family with goldmann favre syndrome and retinal vasoproliferative tumor
- Dexamethosone implant various indication, efficiency and safety

### Free Papers

DR.NIRAJKUMAR AGARWAL

- Result of IOL power calculation by Haigis - L formula after post refractive surgery (LASIK) for myopia

DR.LIPI CHAKRABARTY

- Computerized evaluation of fundus images: a novel screening method for glaucoma

DR.NAMRATA ADULKAR

- Opticochiasmatic arachnoiditis - a cause of visual impairment in tuberculous meningitis

DR.ROOPASREE B.V

- Clinic histopathological analysis and outcome of management in cases of suspected ocular surface neoplasia retrospective analysis of 109 cases

DR.KUHELI BHATTACHARYA

- Changing trends in fellowships retrospective study over two decades (best free paper)

DR.R.VENKATESH

- Posterior capsule rupture and zonular dialysis management (instruction course)

DR.S.KAVITHA

- Importance of family screening in angle closure glaucoma (free paper)

DR.NIRMALA DEVY AND DR.DAYAKAR YADALLA

- Emergency neuro-ophthalmology- diagnosis and management (instruction course)

DR.ANKUSH

- Thermography in ocular inflammation

DR.PRANEET

- Comparison of efficacy of 1% topical variconazole Vs 5% topical natamycin for the treatment of fungal keratitis in tertiary eye care centre

DR.PADMAVATHY

- Acute visual loss / emergency neuro ophthalmology (instruction course)

DR.NEELAM PAWAR

- Syndromic and non syndromic corpus, callosal, agensies - ocular and neurological association

### E-Posters:

DR.MANEKSHA

- Clinical profile and treatment outcome of ocular rhinospondiosis in a tertiary eye care center

DR. ADITI JAIN

- Visual outcome in NA - AION

DR.ASHISH AHUJA, DR.MOKASHI POOJA

- Pediatric cranial nerve palsies
- Anaemic retinopathy secondary to disseminated intravascular coagulation



DR.RATHNESH KUMAR

- Case series of severe postoperative uveitis after uneventful cataract surgery

DR.PRATHMESH MEHTA

- Intra operative performance and postoperative outcome of manual small incision cataract surgery using capsular tension devices in moderate to severe traumatic subluxated cataract

DR.SEEMA RAMAKRISHNAN

- Prospective, randomized study comparing the effect of Nepafenac 0.1% and ketorolac tromethamine 0.4% on macular thickness in cataract surgery patients with low risk for cystoids macular edema

DR.BISWAJIT DEY

- Unique identification tag (UIT) – a newer innovation for improving the quality and safety in high volume cataract surgery set-ups

DR.PALANISWAMY .K

- A comparative biometric analysis of open angles and narrow angles

DR.ADITYA BANSAL

- Size zeros in fashion, thinner cornea not a taboo!!!

DR.JAYASHREE

- Intra operative complications and final visual posterior polar cataract

DR.MAITRI SUTHAKAR

- Leutic posterior scleritis with retrobulbar neuritis

DR.MRUNAL KSHIRSAGAR

- Traumatic optic neuropathy: the untold story

DR.MAITHIL THAKKAR

- Case series of vogt koyanagi harada (VKH) syndrome: spectrum, clinical profile and visual outcome at a tertiary eye care centre in south India
- A rare case of localized bilateral conjunctival amyloidosis – a 8 year follow up

DR.PRAGNYA RATHOD

- Response of early and prompt initiation of steroids and immune suppressants in a case of pediatric vogt koyangi harada syndrome
- Retained prolene suture as a cause of recurrent dacryocystitis

DR.V.NARENDRAN

- Short coming of DR screening programme and solution
- X linked retino schisis
- Chaired free paper session in uveitis

DR.PARAG K SHAH

- Specific features of acute ROP in India and role of vitrectomy
- CNVM angiod streaks
- Role of radiation in retinoblastoma management and future direction in management of refracting RB

DR.V.R.SARAVANAN

- Update on procedure for ARMD

DR.GAJENDRA VERMA

- Visual side effects of panretinal photocoagulation in diabetic retinopathy

DR.AMIT GUPTA

- Correlation between branch vein occlusion related macular edema, morphology and treatment response with bevacizumab and triamcinolone
- Bilateral morning glory disc anomaly with contractile disc, retinal detachment, transsphenoidal meningocele and pituitary dysfunction
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- Microbiological profile and visual outcome in patient who developed endophthalmitis after intra vitreal injection (co-author)
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- A novel NR 2E3 mutation in a family with goldmann faure syndrome and retinal vasoproliferative tumor (co-author)
- Dexamethosone implant various indication, efficiency and safety profile (co-author)

DR.GAURISH KHANNA, DR.KALPANA NARENDRAN,

DR.SANDRA CHANDRAMOULI

- Monocular elevation deficiency - clinical associations and surgical outcomes

## Annual Conference of Ophthalmological Society of Bangladesh

Bangladesh, March 8-9

Dr.G.Natchiar and Ms. Deepa Krishnan attended the Annual Conference of Ophthalmological Society of Bangladesh in the first week of March. Dr.Natchiar was invited to deliver Dr.Alim Memorial Lecture after which she was felicitated by Ms.Sheikh Hazina, Prime Minister of Bangladesh. Aravind team also visited BIRDEM - Bangladesh Institute of Research and Rehabilitation for Diabetes, Endocrine and Metabolic Disorders, Islamia Eye Hospital, National Institute of Ophthalmology and Prime Bank Eye Hospital.

## ARTICLES PUBLISHED IN PEER-REVIEWED JOURNALS

### AM. J. OPHTHALMOL

JOSEPH, CORNELIA REENA; LALITHA, PRAJNA; KAVITHA, R  
SIVARAMAN; KIM, R; UMESH CHANDRA BEHERA

- *Real-time polymerase chain reaction in the diagnosis of acute postoperative endophthalmitis*

VOL: 153 (6) 2012 JUN. P.1031-1037

HE, MINGGUANG; NAIDOO, KOVIN S; SAPKOTA, YUDDHA D;  
THULASIRAJ, R D; VARMA, ROHIT; ZHAO, JIALIANG; ELLWEIN,  
LEON B

- *Prevalence and correction of near vision impairment at seven site in China, India, Nepal, Niger, South Africa, and the United States*

VOL: 154 (1) 2012 JUL. P.107-116

LALITHA, PRAJNA; SRINIVASAN, M; REVATHY, R; MEENAKSHI,  
R; JEENA MASCARENHAS; PRIYA, J L; SY, A; OLDENBURG, C  
E; RAY, K J; ZEGANS, M E; MCLEOD, S D; LIETMAN, T M;  
ACHARYA, NISHA R

- *Nocardia keratitis: clinical course and effect of corticosteroids*

VOL: 154 (6) 2012 DEC. P.934-939.E1

### ARCH OPHTHAL (JAMA OPHTHALMOL)

SHUKLA, DHANANJAY; ABHISHEK SHARAN AND RAMESH  
VENKATESH

- *Optical coherence tomography and autofluorescence findings in photic maculopathy secondary to distant lightning strike*

VOL: 130 (5) 2012 MAY P.656-658

ROBIN, ALAN L; THULASIRAJ, R D

- *Cataract blindness*

VOL: 130 (11) 2012 NOV. P.1452-1454

DURGA S. BORKAR; SUZANNE M. J. FLEISZIG; CHELSIA LEONG;  
LALITHA, PRAJNAITHA, MUTHIAHSRINIVASAN; AVANTI A.  
GHANEKAR; CONNIE TAM; WING Y. LI; MICHAEL E. ZEGANS;  
STEPHEN D. MC LEOD; THOMAS M. LIETMAN; NISHA R.  
ACHARYA

- *Association between cytotoxic and invasive pseudomonas aeruginosa and clinical outcomes in bacterial keratitis*

VOL: 131 (2) 2013 FEB. P.147-153

KATHRYN J. RAY, MA; LALITHA PRAJNA,; MUTHIAH SRINIVASAN,  
MD; MANOHARAN GEETHA,; RAJARATHINAM KARPAGAM; DAVID  
GLIDDEN; CATHERINE E. OLDENBURG,

- *Fluoroquinolone treatment and susceptibility of isolates from bacterial keratitis*

VOL: 131 (3) 2013 MAR. P.310-313

RATHINAM, SIVAKUMAR R; LALAN KUMAR ARYA; USHA, KIM  
R; LALITHA, PRAJNA; VEENA TANDON

- *Novel etiological agent: molecular evidence for trematode-induced anterior uveitis in children*

VOL: 130 (11) 2012 NOV. P.1481-1483

PRAJNA, N VENKATESH; TIRUVENGADA KRISHNAN; JEENA

MASCARENHAS; REVATHY, R; LALITHA, PRAJNA; SRINIVASAN,  
M; ANITA RAGHAVAN; OLDENBURG, CATHERINE E; RAY,  
KATHRYN J; ZEGANS, MICHAEL E; MCLEOD, STEPHEN D;  
PORCO, TRAVIS C; ACHARYA, NISHA R; LIETMAN, THOMAS M;  
MYCOTIC ULCER TREATMENT TRIAL GROUP

- *The mycotic ulcer treatment trial: a randomized trial comparing natamycin vs voriconazole*

VOL: 131 (4) 2013 APR. P.422-429 [EPUB 2012 DEC.]

### ARCH DIS CHILD FETAL NEONATAL ED

PARAG, K SHAH; NARENDRAN, V AND KALPANA, NARENDRAN

- *Aggressive posterior retinopathy of prematurity in large preterm babies in south India*

VOL: 97 (5) 2012 SEP. P.F371-375

### BMC RES NOTES.

ANSHUMAN VERMA; MANORANJAN DAS; SRINIVASAN, M;  
PRAJNA, N VENKATESH; SUNDARESAN, P.

- *Investigation of VSX1 sequence variants in South Indian patients with sporadic cases of keratoconus*

2013 MAR 18;6:103

### BR J OPHTHALMOL

SHUKLA, DHANANJAY; ABHISHEK SHARAN

- *Epimacular membrane secondary to an optic nerve head lesion*

VOL: 96 (7) 2012 JUL. P.1038-1039

PRAJNA, N VENKATESH; LALITHA, PRAJNA; JEENA MASCARENHAS;  
TIRUVENGADA KRISHNAN; SRINIVASAN, M; VAITILINGAM, C M;  
OLDENBURG, CATHERINE E; SY, AILEEN; KEENAN, JEREMY DAVID;  
PORCO, TRAVIS C; ACHARYA, NISHA R; LIETMAN, THOMAS M

- *Natamycin and voriconazole in fusarium and aspergillus keratitis: subgroup analysis of a randomised controlled trial*

VOL: 96 (11) 2012 NOV. P.1440-1441

### CANCER BIOTHER RADIOPHARM

PARAG, K SHAH; SELVARAJ, U; NARENDRAN, V; GUHAN, P;  
SAXENA, S K; DASH, A

- *Indigenous (125)I brachytherapy source for the management of intraocular melanomas in India*

VOL: 28 (1) 2013 JAN. P.21-28

### CORNEA

LALITHA, PRAJNA; PRAJNA, N VENKATESH; OLDENBURG,  
CATHERINE E; SRINIVASAN, M; THIRUVENGADA KRISHNAN;  
JEENA MASCARENHAS; VAITILINGAM, C M; MCLEOD, S D;  
ZEGANS, M E; PORCO, T C; ACHARYA, NISHA R; LIETMAN, T M

- *Organism, minimum inhibitory concentration, and outcome in a fungal corneal ulcer clinical trial*

VOL: 31(6) 2012 JUN. P.662-667



LIN, CHARLES C; LALITHA, PRAJNA; SRINIVASAN, M; PRAJNA, N VENKATESH; MCLEOD, STEPHEN D; ACHARYA, NISHA R; LIETMAN, THOMAS M; PORCO, TRAVIS C  
*- Seasonal trends of microbial keratitis in south India*  
 VOL: 31 (10) 2012 OCT. P.1123-1127

## EYE

PRAJNA, N VENKATESH; THIRUVENGATA KRISHNAN, T; JEENA MASCARENHAS; SRINIVASAN, M; OLDENBURG, C E; TOUTAIN-KIDD, C M; SY, A; MCLEOD, S D; ZEGANS, M E; ACHARYA, N R; LIETMAN, T M; PORCO, T C  
*- Predictors of outcome in fungal keratitis*  
 VOL: 26 (9) 2012 SEP. P.1226-1231

## HUM MOL GENET.

ASAI-COAKWELL, M; MARCH, L; DAI, XH; DUVAL M; LOPEZ, I; FRENCH, CR; FAMULSKI J, DE; BAERE, E; FRANCIS, PJ; SUNDARESAN, P; SAUVÉ, Y; KOENENKOP, RK; BERRY, FB; ALLISON, WT; WASKIEWICZ, AJ; LEHMANN, OJ.  
*- Contribution of growth differentiation factor 6-dependent Cell survival to early-onset retinal dystrophies.*  
 VOL: 22 (7) 2013 APR. P.1432-1442 [EPUB 2013 JAN 22.]

## INDIAN J OPHTHALMOL

MURALIDHAR, R; SIDDALINGA SWAMY, G S AND VIJAYALAKSHMI, P  
*- Completion rates of anterior and posterior continuous curvilinear capsulorhexis in pediatric cataract surgery for surgery performed by trainee surgeons with the use of a low-cost viscoelastic*  
 VOL: 60(2) 2012 MAR. P.144-151  
 HARIPRIYA, ARAVIND; SYEDA, TARANUM S  
*- A case of endophthalmitis associated with limbal relaxing incision*  
 VOL: 60 (3) 2012 MAY P.223-225  
 KOTHARI, ABHISHEK; NARENDRAN, V AND SARAVANAN, V R  
*- In vivo imaging of the retinal periphery using conventional optical coherence tomography systems*  
 VOL: 60 (3) 2012 MAY P.235-239

PARAG, K SHAH; NARENDRAN, V; SELVARAJ, U; GUHAN, P; SAXENA, SANJAY K; DASH, ASHUTOSH; ASTRAHAN, MELVIN  
*- Episcleral plaque brachytherapy using BARC I-125 ocu-prosta seeds in the treatment of intraocular tumors: a single-institution experience in India*  
 VOL: 60 (4) 2012 JUL. P.289-296

SHUKLA, DHANANJAY; ABHISHEK SHARAN  
*- Grapevine from the optic nerve head*  
 VOL: 60 (4) 2012 JUL. P.338-339

THULASIRAJ, R D; DHIVYA RAMASAMY  
*- Advocacy for eye care*  
 VOL: 60(5) SEP.-OCT. 2012 P.376-379

BABAR M QURESHI; RABIU, MANSUR; ABDULAZIZ AL-RAJHI; VAN LANSINGH; KRISTEN ECKERT; KUNLE HASSAN; THULASIRAJ, R D; MOHAMMAD MUHIT; ROHIT C KHANNA; CHAUDHRY ISMAT  
*- Best practice eye care models*  
 VOL: 60(5) SEP.-OCT. 2012 P.351-357

SHUKLA, DHANANJAY; JAY KALLIATH; ADIDI PATWARDHAN; NARESH, KANNAN B; SOUBHYA, B THAYYIL  
*- A preliminary study of heavy brilliant blue G for internal limiting membrane staining in macular hole surgery*  
 VOL: 60 (6) 2012 NOV. P.531-534

GEORGE, J MANAYATH; NARENDRAN, V; ANURADHA GANESH; SAURABH ARORA  
*- Low-fluence photodynamic therapy for early onset choroidal neovascular membrane following laser in situ keratomileusis*  
 VOL: 60 (6) 2012 NOV. P.584-585

KAUSHIK U DHUME; KIRUBA E PAUL  
*- Incidence of pupillary involvement, course of anisocoria and ophthalmoplegia in diabetic oculomotor nerve palsy*  
 VOL: 61(1) JAN. 2013 P.13-17

USHA, KIM R; KAVITHA R SIVARAMAN  
*- Penetrating orbital injuries from plant material during pond and river diving*  
 VOL: 61(2) FEB. 2013 P.76-77

## INT OPHTHALMOL

JEENA MASCARENHAS; SRINIVASAN, M; CHEN, M; REVATHY, R; MEENAKSHI, R; LALITHA, PRAJNA; OLDENBURG, C E; RAY, K J; GLIDDEN, D V; COSTANZA, S; LIETMAN, T M; ACHARYA, N R  
*- Differentiation of etiologic agents of bacterial keratitis from presentation characteristics*  
 VOL: 32 (6) 2012 DEC. P.531-538  
 MOSTER, S J; FAKHRAIE, G; VENKATESH, R; MOSTER, M L; ZHAO, Y; MOSTER, M R  
*- Relationship of central corneal thickness to postural IOP changes in patients with and without glaucoma in southern India*  
 VOL: 32 (4) 2012 AUG. P.307-311

## INDIAN J MED MICROBIOL

ARUN KANNAN; GOWRI PRIYA, C; LALITHA, PRAJNA; RATHINAM, SIVAKUMAR R  
*- Efficiency of two commercial kits in serodiagnosis of leptospiral uveitis*  
 VOL: 30 (4) 2012 DEC. P.418-422

## INVEST. OPHTHALMOL. VIS. SCI.

SUNDARESAN, P; PRAVEEN VASHIST; RAVINDRAN, R D;  
SHANKER, A; NITSCH, D; NONYANE, B A; SMEETH, L;  
CHAKRAVARTHY, U; FLETCHER, A E

- *Polymorphisms in ARMS2, HTRA1 and complement genes and age-related macular degeneration in India: findings from the INDEYE study*

VOL: 53(12) 2012 NOV. P.7492-7497

## J APPLIED SCIENCES

GANESH BABU, T R; SHENBAGA DEVI, S AND VENKATESH, R

- *Automatic detection of glaucoma using optical coherence tomography image*

VOL: 12 (20) 2012 P.2128-2138

## J CATARACT REFRACT SURG

HARIPRIYA, ARAVIND; CHANG, D F; REENA, M; MADHU SHEKHAR

- *Complication rates of phacoemulsification and manual small-incision cataract surgery at Aravind Eye Hospital*

VOL: 38 (8) 2012 AUG. P.1360-1369

## J MED MICROBIOL

SUBHA SIVAKOLUNDU; RATHINAM, SIVAKUMAR R; GOWRI PRIYA, C; MANJULA SRITHARAN

- *Serological diagnosis of leptospiral uveitis by HbpA-IgG ELISA*

VOL: 61 (PT 12) 2012 DEC. P.1681-1687

## J OPHTHALMIC INFLAMM INFECT

DAVIS, E J; RATHINAM, SIVAKUMAR R; OKADA, A A; TOW, S L;  
PETRUSHKIN, H; GRAHAM, E M; CHEE, S P; GUEX-CROSIER, Y; JAKOB, E; TUGAL-TUTKUN, I; CUNNINGHAM, EMMETT JR.;  
LEAVITT, J A; MANSOUR, A M; WINTHROP, K L; HILLS, W L;  
SMITH, J R

- *Clinical spectrum of tuberculous optic neuropathy*

VOL: 2 (4) 2012 DEC. P.183-189

## MICROSC RES TECH.

GOWRI PRIYA, C; TILAK PRASAD; PRAJNA, N VENKATESH;  
MUTHUKARUPPAN, V R

- *Identification of human corneal epithelial stem cells on the basis of high ABCG2 expression combined with a large N/C ratio*

VOL: 76 (3) 2013 MAR. P.242-248

## MYCOSES

MANIKANDAN, P; VARGA, J; KOCSUBE, S; ANITA RAGHAVAN;  
REVATHY, R; NEMETH, T M; NARENDRA, V; VAGVOLGYI, C;  
PANNEER SELVAM, K; SHOBANA, C S; BABU SINGH, Y R;  
KREDICS, L

- *Epidemiology of aspergillus keratitis at a tertiary care eye hospital in south India and antifungal susceptibilities of the causative agents*

VOL: 56 (1) 2013 JAN. P.26-33

## OPHTHALMIC EPIDEMIOLOG

KRISHNADAS, R; RAMAKRISHNAN, R

- *A study of initial therapy for glaucoma in southern India: India glaucoma outcomes and treatment (INGOT) study*

VOL: 19 (3) 2012 JUN. P.149-158

SENGUPTA, SABYASACHI; THIRUVENGADA KRISHNAN;  
RAVINDRAN, R D; VAITILINGAM, M C

- *Changing referral patterns of infectious corneal ulcers to a tertiary care facility in south India - 7 year analysis*

VOL: 19 (5) 2012 OCT. P.297-301

## OPHTHALMOLOGY

ALDAVE, ANTHONY J; SANGWAN, VIRENDER S; BASU, SAYAN;  
BASAK, SAMAR K; HOVAKIMYAN, ANNA; GEVORGYAN, OFELYA;  
KHARASHI, SOLIMAN A; JINDAN, MOHANNA AL; TANDON, RADHIKA;  
JEENA MASCARENHAS; MALYUGIN, BORIS; PADILLA, DOMINGA B;  
MASKATI, QURESH; AGARWALA, NISHEETA;  
HUTAURUK, JOHAN; SHARMA, MANOJ; YU, FEI

- *International results with the Boston type I keratoprosthesis*

VOL: 119(8) 2012 AUG. P.1530-1538

## OPHTHALMIC SURG LASERS IMAGING

GEORGE, J MANAYATH; NARENDRA, V; SANDEEP ARORA;  
RODNEY, J MORRIS; SARAVANAN, V R; PARAG, K SHAH

- *Graded subthreshold transpupillary thermotherapy for chronic central serous chorioretinopathy*

VOL: 43 (4) 2012 JUL. P.284-290

## OPHTHALMIC SURG LASERS IMAGING RETINA

JAY KALLIATH, SHUKLA D

- *Foveal duplication artifact with spectral-domain optical coherence tomography*

VOL: 44 (1) 2013 JAN.-FEB. P.94-96

## PLOS ONE

SIVAGNANAM ANANTHI, NAMPERUMALSAMY VENKATESH  
PRAJNA, PRAJNA LALITHA; MURUGESAN VALARNILA;  
KUPPAMUTHU DHARMALINGAM

- *Pathogen induced changes in the protein profile of human tears from fusarium keratitis patients*

VOL: 8(1) 2013 JAN. P. 1-16.

## RETINA

SHUKLA, DHANANJAY; JAY KALLIATH; KARTHIK SRINIVASAN;  
NITHY, N; ANAND RAJENDRAN; NARESH, KANNAN B; UMESH  
CHANDRA BEHERA

- *Management of rhegmatogenous retinal detachment with coexisting macular hole: a comparison of vitrectomy with and without internal limiting membrane peeling*

VOL: 33 (3) 2013 MAR. P.571-8. [EPUB 2012 DEC.]

SHUKLA, DHANANJAY; JAY KALLIATH; MANISH TANDON;  
VIJAYAKUMAR, B

- *Vitrectomy for optic disk pit with macular schisis and outer retinal dehiscence*

VOL: 32 (7) 2012 JUL.-AUG. P.1337-1342





*“The course has been very helpful for all of us and for the office as it gave us an understanding of various issues, diseases, equipment, data, information etc, which is useful for planning . . . It also gave us an idea about various planning tools, for calculating cataract need, hospital optimization, human resource need etc. All these were helping our programme team in better planning.”*

*— Ms. Elizabeth Kurien, Regional Director – India, Sightsavers International on the ‘Course for Eye Care Programme Managers’*



*Consultancy  
and Capacity Building*

Completing two decades of promoting best practices for the control of blindness globally, LAICO now, is in a position to build on its strengths and exploit new opportunities. Its most impactful work has been organizational capacity building that enhances the performance and effectiveness of eye hospitals across the developing world. A process that was initiated in 1993 to support Lions Eye Hospitals in India has since expanded to mentor over 290 eye hospitals worldwide. Besides this, LAICO has also been involved in research and playing a key role as an advisory body.

In an attempt to leverage its strengths and contribute in a more significant manner, a retreat was held in January to define LAICO's aspirations for 2020 and define the road map for achieving them.

## National workshop on Achieving Excellence in Eye Care Delivery

LAICO, June 16 - 17

The country's continued economic growth has led to a spurt of innovations including redefining the potential and possibilities in eye care. Regional Institutes of Ophthalmology (RIO), being the apex institutions, for eye care services in the respective states, have the mandate to play a vital role in developing key policies, training the staff from the government hospitals at district and primary levels in addition to carrying out research. The dynamically changing paradigm in recent

times has brought out the need for all stakeholders to come together to understand current situation and their potential and how RIOs and others could gear themselves up to achieve higher levels of efficiency and effectiveness. National Workshop on Achieving Excellence in Eye Care Delivery organized by Centre for Innovation in Public Systems (CIPS), Hyderabad and hosted by LAICO provided an ideal platform for deliberations towards this end. Directors of RIOs, senior leaders from government hospitals and medical colleges and State Programme Officers of National Programme for Control of Blindness (NPCB) and key people from a couple of NGO hospitals participated in the workshop. The workshop was officially inaugurated by Shri. Keshav Desiraju, then Special Secretary, Ministry of Health and Family Welfare, Government of India while Ms. Sujaya Krishnan, Joint Secretary at the same ministry spoke on 'Policy Perspectives'.

## Aravind hosts the 8th Annual conference of VISION 2020: The Right to Sight – India

Aravind - Madurai, July 21 - 22

Aravind Eye Care System, Madurai hosted the 8th Annual Conference of Vision 2020: The Right to Sight - India with several sessions arranged under five parallel tracks namely Leadership, Operation theatre management, Outreach management, Optometry and optical dispensing and Achieving excellence in

*Participants at National workshop on Achieving Excellence in Eye Care Delivery*







*At the inauguration of the 8th Annual Conference of VISION 2020: The Right to Sight - India*

operations management. Participating hospitals were also invited to submit free papers under any of the above-mentioned themes.

The conference was officially inaugurated by Ms.Sujaya Krishnan, Joint Secretary, Ministry of Health and Family Welfare, Govt. of India in the presence of Mr.Anshul Mishra IAS, District Collector - Madurai and Dr.P.Namperumalsamy, Chairman Emeritus - AECS. A total of around 400 delegates comprising leading ophthalmologists and eye care professionals from across the country participated in the conference.

## October Summit

### Systems Thinking for Achieving Universal Coverage in Eye Care

LAICO, September 23 - 25

The main purpose of the workshop was to reflect on the real issues in eye care delivery and recognize that a comprehensive health system's approach is the key towards achieving goals of Vision 2020. The workshop focused on deciding actionable directions at the global

*Participants at Systems Thinking for Achieving Universal Coverage in Eye Care*





*Dr. Alan Robin at the 'Research Priorities in Glaucoma' Meet*

level as well as at the operational level for achieving the goals of V2020: The Right to Sight. Deliberations revolved around proven strategies that could be implemented in different regions to improve eye care services. The workshop also identified areas that require further research with focus on universal coverage and improving service delivery. Sixty - four participants from countries such as Australia, Bangladesh, China, Egypt, India, USA, Nepal, Nigeria, Pakistan, South Africa, Sudan, Switzerland, Srilanka, Tanzania, Uganda and UK participated.

### **Developing Research Capabilities and Assessing Research Priorities in Glaucoma**

LAICO, October 1 - 2

With the clinical volume, talented staff, and amazing resources, Aravind is able to provide greater insights to the world in research related to glaucoma. To assess the priority areas for research, glaucoma experts from around the world were brought together for a two-day consultation at Aravind. Dr. Alan Robin, Johns Hopkins University, USA; Dr. Paul Lee, W.K. Kellogg Eye Center, Michigan, US; Dr. John Fingert, University of Iowa, US; Dr. Joel S. Schuman, Fox Vision Restoration of UPMC, Pittsburgh; Dr. Wallace L M Alward, University of Iowa Hospital and Clinic, US; Dr. Ken Nischal, University of Pittsburgh Medical Center, Pittsburgh, Dr. Pararajasegaram, Former Consultant, WHO, Geneva were the various facilitators of the workshop. Around 50 persons participated in the discussion.



*Dr. R.D. Ravindran addressing at SF 1588-Enhance eye care services at Lions eye hospitals in India*

### **Sharing best practices: Towards strengthening Lions Eye Hospitals**

As part of the SF-1588 project towards strengthening Lions Eye Hospitals in India, four specially designed workshops were held in the month of April, June, October and December. A total of seven workshops were planned for this project, three of which happened during 2011-2012. Altogether of 73 Lions Eye Hospitals benefitted from participating in these workshops.

### **Consultancy and Capacity Building Initiatives**

As part of capacity building process of eye hospitals, needs assessment visits were carried out to various hospitals in India, Bangladesh, Kenya and Tanzania. Vision Building workshop was arranged subsequently in May 2012 in which Midnapur Lions Charitable Eye Hospital, Midnapur, West Bengal and Prime Bank Foundation, Dhaka, Bangladesh participated.

Aravind team consisting of Dr. Shivakumar, Consultant, Cataract and IOL Services, Aravind - Tirunelveli, Mr. R. Suresh Kumar, Faculty - LAICO and Mr. R. Meenakshi Sundaram, Senior manager, Outreach made follow-up visit to County hospitals at Taihe, Pengze and Poyang, Jiangxi Province, China in the second week of December. The purpose was to assess the development made by these hospitals since the eye care services business plan workshop held in August 2011. The team also visited outreach camps organized by these hospitals and then met together at Poyang for



further discussions. Challenges in patient compliance and demand generation were discussed at length and necessary recommendations were given.

Dr.R.Venkatesh, Chief medical officer, Aravind - Pondicherry and Mr.B.S.Ganesh Babu, Senior manager, IT and Systems visited Nepal Eye Hospital from December 16-21 to understand its functioning in various areas and aspects and to give appropriate recommendations for improvement. The team also conducted a workshop for board members to develop the future course of action and helped identify training requirements for the staff which could be offered through LAICO.

## Evaluation Visits

With support from Sightsavers International, LAICO has been providing valuable inputs to various hospitals in the proper implementation of Diabetic Retinopathy (DR) services. Dr.Naresh Babu, Consultant, Retina vitreous service, Aravind - Madurai and Mr.V.Vijayakumar, Faculty, LAICO evaluated DR services at Greater Lions Eye Hospital, Siliguri from June 29 - July 2 in connection with the World Diabetes Foundation's DR Project - "Prevent Diabetic Retinopathy, protect sight". A DR symposium was also arranged during which Dr.Naresh Babu delivered talk on developing a long-term strategy to prevent blindness due to diabetic retinopathy.

Ms.Deepa Krishnan, Assistant Administrator, Aravind-Madurai visited Sala Uno Eye Hospital, Mexico City, Mexico in the last week of November to assess the progress made by the hospital since

Aravind's first intervention and also to provide inputs towards developing their patient care services. Current operational and strategic issues were discussed and recommendations were given.

## Onsite Training & Support

Aravind team consisting of Dr.K.Tiruvengada Krishnan, Chief, Cornea services, Aravind - Pondicherry and Ms.K.M.Sashipriya, and Mr.A.Mohammed Gowth from LAICO visited Innovation Eye Care Centre, Kisi, Kenya in the first week of December to help outline a developmental plan for the hospital. The team suggested inputs on site plan and lay out for optimum use of the available space. Vision building workshop facilitated by the Aravind team was arranged for the staff. The team also visited the different government hospitals in and around the area to get an understanding of health and eye care delivery system in the region. Detailed discussions were held regarding human resource management practices and outreach. Aravind team assessed the clinical and non-clinical protocols and necessary recommendations were given.

Ms.Anjana Deep, Manager, Patient care, Aravind - Madurai visited LM Patel Rotary Eye Hospital, Mumbai during September - October 2012 to provide inputs on improving patient flow, organizing the Medical Records department and strengthening the community outreach activity. Recommendations were also given in the areas of demand generation and ensuring proper utilization of manpower.

Ms.Ushalini, Manager - Quality assurance, Aravind - Madurai was at Srikan Institute of Ophthalmology,

*Dr.Naresh Babu, Mr.V.Vijayakumar, Siliguri*



*Dr.K.Tiruvengada Krishnan, Mr.A Mohammed Gowth at Kisi, Kenya*





*Ms.Ushalini at Kakinada, Andhra Pradesh*

Kakinada, Andhra Pradesh from January 21 - February 21 to identify the areas where the institution needs support and facilitate implementation of required changes so as to ensure the smooth running of the hospital. She helped in initiating performance review practices and expense monitoring in all the purchase and outreach activities. Stores software was redesigned in terms of categorization and reports generation.

Ms.N.Kasthuri, Bio medical engineer of the Instruments Maintenance Department, Aravind - Madurai was deputed to go over to L.M.Patel Rotary Eye Hospital, Mumbai for a week to help them in managing their instruments department and to orient them on the proper maintenance of equipment. During her time there, she was able to service as many as 38 pieces of equipment and could impress on the hospital the need to have a trained technician to take care of the instruments.

Mr.Ranjithkumar, Assistant Administrator, Aravind - Coimbatore visited the Sala Uno Clinic, Mexico in January and spent a month there to streamline the activities of various departments such as outpatient care, operation theatre, counseling, outreach and vision centre.

## Collaborative for Achieving Excellence

This learning series is focused on helping the participating hospitals improve their financial sustainability by increasing their paying clientele. This is achieved through a structured process of continuous improvement - a yearlong engagement with periodic inputs and reviews. The inaugural session was held at LAICO on December 20. The second learning session will be held in April 2013.



*Mr.Ranjithkumar with the Sala Uno team at Mexico*

## Eye Care Collaborative for Improving Hospital Performance

LAICO, September 29 - 30

The main purpose of the collaborative was to enable the participating hospitals to pilot the model for improvement developed by Institute for Healthcare Improvement (IHI) in the Indian context based on the Aravind Model. Eye Care Collaborative brought together 17 participants from six hospitals to facilitate improvement in their processes. Collaborative consists of three learning sessions, and the inaugural one was hosted by LAICO and organized by ACCESS Health International. Subsequently a second learning session was also hosted in February.

*Dr.Dayakar Yadella, Mr.Sanil Joseph and Ms.Dhivya Ramasamy with the course participants at Dhaka, Bangladesh*







Mr.R.Meenakshi Sundaram at Taihe, Jianxi Province, China



Ms.D.Ganga, Mr.S.Poornachandran at Asuncion, Paraguay

## Eye Care Management Training

### Eye Care Programme Management Training for Fred Hollows Foundation (FHF) and Partner Organizations

Dhaka, Bangladesh, May 19 - 24

Aravind team consisting of Dr. Dayakar Yadella, Medical officer, Aravind - Pondicherry and Mr. Sanil Joseph, and Ms. Dhivya Ramasamy from LAICO organized "Eye Care Programme Management Training for FHF and Partner Organizations" at Dhaka, Bangladesh. The course was designed to instruct the participants about the basics of eye care service delivery and eye care programme design and implementation. Seventeen participants from FHF Bangladesh and Ispahani Islamia Eye Hospitals attended this workshop.

Mr. Suresh Kumar at Cairo, Egypt



### FHF – LAICO Outreach Management Workshop

April 23 – May 1

Mr. R. Meenakshi Sundaram conducted outreach management workshop for a people's hospital in Taihe, Jianxi Province, China. The entire workshop was facilitated by Fred Hollows Foundation, China. RMS also facilitated another workshop for community workers at Bright Eye Hospital, Chengdu, Sichuan Province.

### Aravind's instruments maintenance team at Foundation Vision

Paraguay, July 1 - 17

Ms. D. Ganga, Mr. S. Poornachandran and Prof. V. Srinivasan were at Foundation Vision, Asuncion, Paraguay for conducting an instruments maintenance workshop for technicians of Latin American Countries. Eleven participants - three from Mexico, two from Bolivia, one from Honduras and five from Paraguay attended.

### Eye Care Management Course for Hospital Managers

Cairo, Egypt, July 21 - 25

Mr. Suresh Kumar, Faculty - LAICO facilitated a five days management course for government eye hospital managers of Cairo, Egypt. The course was organized by Egypt Institute of Community Ophthalmology (EICO) which is a part of Al Noor Foundation. Twelve participants attended the course.

## Customized training programme for Eye Care Programme Managers of FHF, Pakistan

LAICO, September 25 - 30

A five - member team of eye care programme managers from Fred Hollows Foundation, Pakistan were at LAICO to undergo a week-long training programme on various aspects of eye care programme management.

## Operations research

Operations research studies currently underway at LAICO are:

- Counseling for Cataract Surgery: Effect on patient knowledge, decisional conflict and satisfaction
- Gender Differentials in the Seeking of Health Care

## Workshop on Internal Capacity Building for Research

LAICO, March 27 - 28

Dr. Ken Bassett, from British Columbia Centre for Epidemiology and International Ophthalmology, University of British Columbia, Vancouver, Canada facilitated the workshop which mainly aimed to develop internal capacity of LAICO to carry out meaningful operational research projects.

## Projects division

### Ongoing projects

#### Eye Care for a Million Children - Lavelle Pediatric Eye Care Project

(Strengthening Pediatric Eye Care Services at Aravind Eye Hospitals, Tirunelveli and Pondicherry).

The objective of the project is to screen one million children (age group between 0-17 years) and provide comprehensive eye care to those in need, in the service area of Aravind Eye Hospital, Tirunelveli and Pondicherry. The strategy to reach one million children was by training school teachers in vision screening of all students in the schools or childcare workers in the case of pre-school children. The ophthalmologist will then examine the defective students identified by the teachers or referred by childcare workers.

During this third and final year of the project, 33 awareness programmes were organized and nearly 7,300 people learnt about pediatric and other eye diseases through seminars, guest lectures and exhibitions. 1,316 preschool teachers and 2,165 school teachers were trained to identify pediatric eye problems among students and children at Anganwadi (pre-school childcare) centres. The teachers screened 289,292 school students and 45,980 preschool children (0- 5 years) and provided 7,384 spectacles to the students with refractive error. The project further supported

*The Lavelle Pediatric Eye Care Project meeting with the Lavelle Fund Board Members at Aravind - Pondicherry*





65 pediatric cataract surgeries and 18 ROP laser procedures.

#### HOBNOB project

The objective of the project is to develop a screening model for Diabetic Retinopathy (DR) by trained ophthalmic technicians using low cost mobile technology among known diabetic patients in the community.

HOBNOB is a device to connect the base hospital and camp site through mobile data services. This is a cost effective method of DR screening by an ophthalmic technician. The ophthalmic technician captures the fundus image and transfers it to base hospital with the help of HOBNOB for specialist opinion. The Retina specialist grades the image and sends back the report to the screening spot.

Aravind Eye Hospital, Theni has taken the initiative in establishing a public-private-partnership for DR screening at Government Primary Health Centres in Theni district. In this regard, the district health authority has given permission to screen all diabetes patients registered at Primary Health Centres.

During April 2012 - March 2013, nearly 42 screening programmes were organized. Around 1,000 diabetes patients were screened at Primary health centres and diabetologists' clinic. Among them 118 were diagnosed as having DR. All DR patients were referred to Aravind - Theni for further management.

#### New projects

Universal Eye Care and Comprehensive Eye Care for a million people: using Technology and Primary Eye Care Centres as the foundation – building a scalable model in Tamilnadu, India.

The main goal of this Sightsavers - supported project is to develop a sustainable service delivery model by providing sub-speciality services through primary eye care centres in linkage with base hospital (Tertiary care). As part of the project, a team from Sightsavers visited LAICO in March and had discussions with the project team to work out the details of the proposal and log frame. Through this project, it can be demonstrated as to how these centres can ensure universal coverage, to include speciality eye diseases such as diabetic retinopathy, glaucoma, pediatric eye ailments, corneal diseases, low vision and visual impairment. This project is being implemented in 15 primary eye care centres that are located in the service area of Aravind Eye Hospital, Madurai. The project is expected to commence from June 2013.

#### Accelerating Change to Meet Global Eye Care Needs (So-Hum Project)

The purpose of the project is to accelerate expansion of high quality, sustainable, community-oriented eye care institutions. Aravind along with Seva Foundation has initiated this programme through which 8 mentor

*Mr.Suresh Kumar and Mr.R.D.Thulasiraj with the Seva team at San Francisco, USA*





Mr.R.D.Thulasiraj, Mr.Sanil Joseph with the M.Sc. Community Eye Health at LSHTM, London

institutions (7 plus LAICO) are working with 35 “mentee” eye hospitals to improve their services and sustainability. This project commenced in June 2012.

### Internship at Kaiser Permanente

California, USA, October 22 - November 24

Mr.R.Suresh Kumar was at Kaiser Permanente to understand the process of systematically bringing about improvements in hospitals. He worked hands-on, on medication management and provided his recommendations to improving patient compliance. During the time, he also attended hospital management session at the American Public Health Association meeting.

### Wellcome Trust fellowship for research

Mr.Sanil Joseph was chosen for the Masters Fellowship of The Wellcome Trust, UK which will support him with a research grant for 30 months which includes support for doing a M.Sc. level course in UK. He had secured admission for M.Sc. in Public Health at the London School of Hygiene and Tropical Medicine, classes for which started on September 24. As part of this Fellowship, Mr.Sanil after completing the Masters programme in September 2013 will carry out a health services research on diabetic retinopathy screening back at Aravind.



Mr.R.D.Thulasiraj at Davos, Switzerland

## Other Major Events

Mr.R.D.Thulasiraj, Executive Director-LAICO

- was invited as faculty for the Community Eye Health Workshop held at Fundacion Vision, at Asuncion, Paraguay. He handled the Management module covering the core strategic processes of marketing, production and quality.
- At the London Institute of Hygiene and Tropical Medicine, he handled the management module for the M.Sc. in Community Eye Health students.
- was invited to participate in the meeting of Queen Elizabeth Diamond Jubilee Trust, one of its major areas of focus being eye care especially, diabetic retinopathy and trachoma.
- at the Clinical Health Informatics Leadership (CHIL) meeting, held at Cardiff, London on October 26, he delivered a talk on the Aravind model of delivering low cost eye care.
- at the Emerge Conference 2012, held at Oxford, on October 27 and 28, he spoke on ‘The secret to achieving scale: Having a “killer” business model’
- participated in the Seva Board meeting in San Francisco and also in the thirtieth anniversary celebrations of Seva-Canada at Vancouver.
- addressed the audience at the grand rounds session of the University of British Columbia, Vancouver
- participated in the World Economic Forum Annual meeting 2013 held at Davos, Switzerland, January 23 - 27
- presented the Aravind model at the Wavelength Connect held at London, on March 12 and 13

Reform/KPMG Health Conference: The front line: International Workforce Summit, London, UK, January 24  
Mr.Sanil Joseph spoke on the Aravind model and participated in a panel discussion at the session on High performance healthcare: boosting workforce productivity around the world.





*“Modern technology combined with spiritual consciousness is the need of the day...we want people who have a capacity for all technical skills but we also want people to grow in spiritual consciousness, so that they can act from that consciousness and also handle an electron microscope-both. That would be a wonderful thing, because then you would know and see things from a different perspective.”*

*- Dr. G. Venkataswamy*

Research

# RESEARCH

## Molecular Genetics

The focus of research is on understanding the Molecular Genetics of commonly occurring eye diseases in Indian population such as Diabetic Retinopathy, Glaucoma, Cataract, Corneal Dystrophies and Retinal Dystrophies. Studies have been initiated to explore involvement of mitochondria in Primary Open Angle Glaucoma.

The association of microRNA with keratoconus has been demonstrated in collaboration with Queens University, Belfast, UK. The department has identified the candidate gene for ocular coloboma in collaboration with Center for Human Molecular Biology and Genetics, Sichuan Academy of Medical Sciences and Sichuan Provincial People's Hospital, Sichuan, China.

In the INDEYE study- the association of SLC35D1 gene polymorphisms has been demonstrated in patients with different types of cataract in the Indian population. Screening for RPE65 gene mutations in Lebers Congenital Amaurosis (LCA) patients in the population is being carried out with the hope of implementing gene therapy.

The department has also analyzed several families with Retinoblastoma for mutations in RB1 gene and the findings help Aravind ophthalmologists to initiate early

treatment of this tumour in new-born babies with good results.

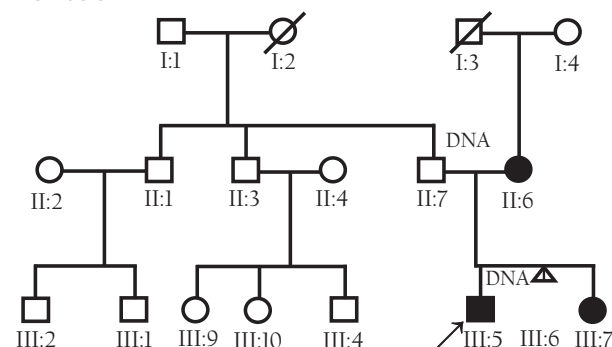
Many of the studies were designed to understand the molecular mechanisms of various eye diseases at the level of gene expression.

The department organized a workshop entitled "Vision Genomics" which motivated many young researchers in India to involve in basic/ophthalmic research.

## Stem Cell Biology

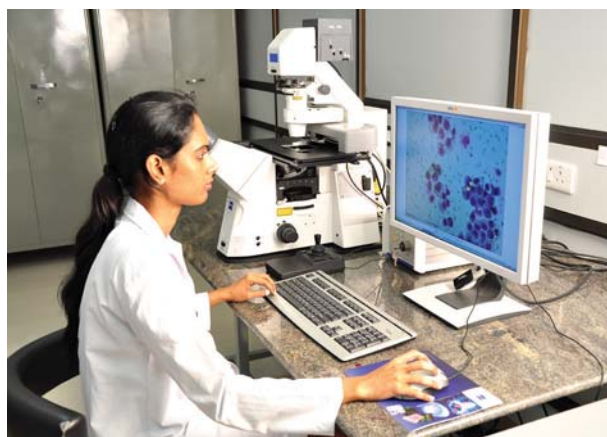
Use of adult stem cells in regenerative medicine is gaining more prominence in recent years. The focus of research is to understand the Biology of human corneal epithelial stem cells. Earlier a two parameter concept for identifying potential stem cells, and a simple method for ex-vivo expansion of the limbal / buccal epithelial stem cells for corneal surface reconstruction in limbal stem cell deficient patients in compliance with good manufacturing practice were established. In order to improve stem cell expansion and transplantation outcome, have been generated data to understand the importance of micro environment or supporting cells in the limbus.

Pedigree of familial retinoblastoma with three affected members



Retinoblastoma was diagnosed in the proband (III:5) at 4 months and treated by removal of eyeball. His mother (II:6) had already lost one eye because of this tumor. We predicted the higher risk of inheriting the disease in the sibling (III:7). Clinical examination of the new born baby as early as 12 days and genetic analysis confirmed retinoblastoma. By appropriate treatment at the earliest restored the vision in the newborn child

Laser Capture Microdissection is used to identify and collect a specific population of epithelial cells in order to elucidate the molecular characteristics of human corneal epithelial stem cells





## Ocular Pharmacology

The department focuses on Diabetic Retinopathy by using *in-vitro* model to understand the pathogenic mechanisms that link hyperglycemia with retinal tissue damage. A high expression of Aldose Reductase Gene (ALR) in retinal pigment epithelial cells was observed when challenged with pathological glucose concentration (25mM Glucose) as compared to normal glucose (5mM Glucose). This was also observed in retinal tissues obtained from diabetic donor eyes. This finding further confirms the involvement of ALR in mediating diabetic complications in retina. Further studies are underway to elucidate the effect of aldose reductase inhibitor in reducing the biochemical complications and VEGF secretion mediated by high glucose.

In Age Related Macular Degeneration (AMD), studies are being carried out to understand the normal distribution of macular carotenoids especially Lutein and Zeaxanthin (eye antioxidants) in Indian donor eyes across different age groups using High Performance Liquid Chromatography (HPLC) and to correlate the accumulation of aging pigment (A2E) by LC/MS/MS. Low levels of lutein and zeaxanthin (eye anti-oxidants)

were observed in maculae and high accumulation of aging pigment (A2E) in South Indian eyes. This study would give insight into role of carotenoids in preventing the accumulation of A2E which is believed to mediate the progression of AMD.

The department has recently established *ex-vivo* model system “Human Organ Culture Anterior Segment (HOCAS)” for screening drugs with potential anti-glaucoma property using Human Donor Eyes which is beneficial to identify new class of drugs for glaucoma.

## Proteomics

Disease Proteomics analysis of the host tissue: Primary focus of the proteomics groups is understanding the proteome level changes in ocular diseases such as keratitis, Primary Open Angle Glaucoma (POAG) and diabetic retinopathy, since the onset and progression of the disease alters protein expression as well as their interaction. The alterations in protein expression manifests well ahead of the clinical symptoms and our studies with human tears from mycotic keratitis patients showed alteration in the expression of proteins

### Human Organ Culture Anterior Segment (HOCAS) System for Trabecular Meshwork Outflow Studies

*Anterior segment dissected from fresh donor eyes is mounted in a specially designed Petri dish as shown in the figure A. It is kept alive with medium supplemented with nutrients supplied at a constant rate using pump and maintained for weeks at 37 °C with 5% CO<sub>2</sub>. The intraocular pressure (IOP) is continuously monitored using pressure transducers and data is collected at a specific time interval for a desired duration*



A. Anterior segment in culture

during the early stages of the disease. Analysis of fusarium infected tear using DIGE (Difference Gel Electrophoresis) showed stage specific expression of several proteins, which could be used as biomarkers after appropriate validation. Around ten proteins (Lacritin, Lacrimal lipocalin precursor, Cystatin, Haptoglobin alpha, Haptoglobin beta, Apolipoprotein, ZAG protein, Alpha-1 antitrypsin, Albumin and Lactoferrin) are differentially expressed and their expression is specific to the stage of disease. Similarly the efficacy of the treatment was also reflected at proteome level.

Proteome analysis of Aqueous Humor (AH) in the case of POAG shows differential regulation of proteins across different stages such as mild, moderate and severe when compared to AH of control. Among them, two proteins, Transferrin and Prostaglandin D synthase show distinct variation in the AH of POAG patients. Interestingly the alterations in the expression of isoforms of transferrin are observed in POAG samples when compared to that of control, which is taken for validation in large samples by western blot using transferrin specific antibody.

In case of diabetic retinopathy differential expression of proteins such as Apolipoprotein E, C2, A-1, J, Hemopexin, Alpha 1 antitrypsin, ceruloplasmin, Alpha 1B glycoprotein, complement C3, Haptoglobin was observed between the serum of NDR (Non Diabetic Retinopathy) and PDR (Proliferative Diabetic Retinopathy) from Indian population. In addition the quantitative studies using DIGE showed the serum haptoglobin alpha-2 isoforms existed as three spots and the expression of these spots vary in PDR when compared to the NPDR.

*LTQ Orbitrap Velos Pro Mass Spectrometer for Proteomics applications*



Disease proteomics - analysis of the pathogen: Recently substantial grant was given by DBT-Govt. of India to establish a center of excellence in fungal keratitis, a programme that supports the study on human mycotic keratitis including the pathogens. The mechanism of the pathogenesis would be studied using proteomics approach with samples from both the host and the pathogen in the coming years.

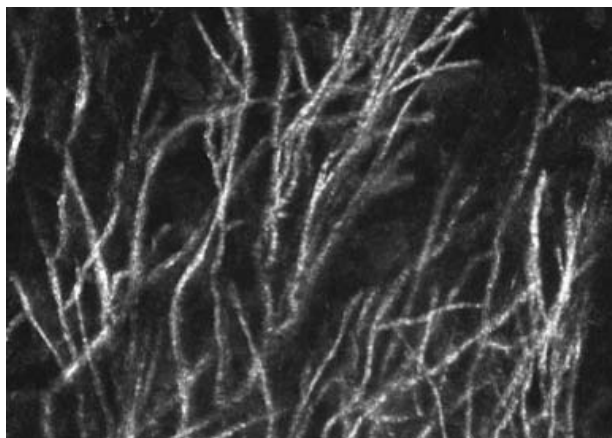
## Microbiology

The thrust area of research in the Department of Ocular Microbiology is to identify and characterize the ocular pathogens like Methicillin Resistant Staphylococcus Aureus (MRSA), Pseudomonas aeruginosa, acanthamoeba and trematodes by phenotypic and genotypic approaches. By screening the MRSA isolates, the community acquired MRSA strains were found to be more prevalent than hospital acquired strains in causing ocular infections and also most of the community acquired MRSA isolates harbor the PVL gene which may be responsible for the pathogenicity and ocular morbidity. Phenotypic studies have shown that the initial attachment of the clinical isolates of P.aeruginosa with the host involves flagellum and type IV pili. Further, biofilm forming efficiency may be directly associated with Multi Drug resistance in ocular infections. The host innate and adaptive immune response mechanisms are being studied in the context of fungal and bacterial corneal ulcers. A higher percentage of specific type neutrophils (PMN-17) was observed in the fungal keratitis patients and they may cause extensive damage to the corneal tissue.

*In Vivo Confocal Microscope (IVCM) in action: The Corneal Module is advanced to gently touch the cornea and the images are recorded by the machine*







*Fungal hyphae within the cornea of a patient with fungal corneal ulcer*

The new modality of *In-Vivo* Confocal Microscopy (IVCM) offers a unique opportunity to directly visualize the patient's cornea at the cellular level during health and disease. Such high resolution imaging is achieved by using a scanning laser which is focused on to point of interest in the cornea. Up until now, the gold standard method to detect corneal infection is the use of microbiological culture and microscopy, which takes several days and can miss infection in many cases. IVCM technique is very effective in immediately imaging any fungal structures or parasitic cysts present in the infected cornea of patients. This technology is now available to diagnose severe bacterial and fungal infections of the cornea, as well as to identify ways in which this tool can be used to monitor the healing response in the cornea.

## Bioinformatics Centre

The Bioinformatics Centre has been established at Aravind Medical Research Foundation (AMRF) in 2012 to conduct various research projects to general genetic and clinical data base on eye diseases and to aid translational vision research. Bioinformatics is an emerging field between biological and computational sciences. The main focus of the centre is to provide state-of-art computational methods involving genome analysis, mutational analysis, protein structure-function analysis, protein-protein interactions, evolutionary analysis and data analysis of next-generation sequence data, all of which would help to understand the pathogenesis of eye diseases.

Currently the centre has been developing a structure-based bioinformatics approach to understand the molecular mechanisms of genetic eye diseases by which the mutations leads to disease. Further, the web database-Bioinformatics pipeline system for Indian Genetic Eye Diseases is being developed to provide a helpful platform to understand the pathogenesis of eye diseases. The bioinformatics analysis is underway to understand the pathogenesis and virulence factors of eye disease caused by microorganisms.

## Translational Research

**Corneal surface reconstruction:** Transplantation of bioengineered 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. A state-of-art class 1,000 good manufacturing facility is being used for such *ex-vivo* expansion, the first of its kind in India for ophthalmic research.

**Evaluation of Aurolab Aqueous Drainage Implant (AADI) for its cell adhesion property:** Glaucoma drainage implants have been used conventionally to drain the aqueous humor from anterior chamber to an external reservoir in glaucoma patients and long term success is limited by fibrous encapsulation of the base plate. Recently, Aurolab launched Aurolab Aqueous Drainage Implant, a cost effective implant for developing countries. In order to evaluate AADI for its cell adhesion property, the surface free energy - a measure of hydrophobicity / hydrophilicity and the attachment of human tenon fibroblasts to its surface are being analyzed in comparison to Baerveldt implant (one of the successful implants in market).

**Association between VEGF and outcome of glaucoma surgery:** One of the major causes for increased IOP even after trabeculectomy is excessive conjunctival scarring. Vascular Endothelial Growth Factor (VEGF) plays a role in the wound healing process and higher levels has been implicated with poor outcome. Since tenon fibroblasts are the main effector cells in wound healing and fibrotic scar formation, we are trying to correlate the levels of VEGF in tenon tissue and aqueous humor of primary open angle glaucoma patients and outcome of surgery.

## Workshop on Vision Genomics

October 3 - 9

The workshop in the October Summit was attended by twenty three participants from various parts of India including research scholars/post graduate students in the field of life sciences. The programme involved individual hands on training on various molecular techniques. Faculty for the workshop included Dr.Wallace Alward, Dr.John Fingert, University of Iowa, USA; Dr.Colin Willoughby, Queens University, Belfast, UK; Dr.G.Kumaramanickavel, Dr.Kunalray, Dr.Subhabrata Chakravarti; Dr.Thangaraj, Dr.Krishnaswamy, Dr.Karuthapandian. Aravind faculty also joined in facilitating various sessions. This workshop provided the participants, an opportunity to understand the applications of modern techniques in the field molecular genetics. This programme was supported by Department of Biotechnology and Indian Council of Medical Research.

## Ongoing Projects

- Characterization of the host immune response during corneal infection with pathogenic fungi and bacteria
- Genotypic characterization and analysis of virulence factors in Methicillin resistant Staphylococcus Aureus (MRSA) causing ocular infections in South India
- Etiology and immunopathogenesis of subconjunctival and anterior chamber granulomatous uveitis in children of South India
- Epidemiology, pathogenomics, and system biology of A. flavus infections in India - an integrative approach
- Studies in the diagnosis and pathophysiology of corneal necrosis in severe microbial keratitis
- Translational research to generate Corneal / Buccal Epithelial stem cells with GMP compliance for corneal surface and socket reconstruction
- Enrichment of human limbal epithelial stem cells to understand the stem cell related properties by whole genome analysis and p63 isoform expression profile
- A pilot study to analyse the limbal epithelial stem cell Niche in limbal stem cell deficient patients
- Effect of VEGF levels in Tenon tissue on the outcome of glaucoma surgery
- Evaluation of cell adhesion properties of Aurolab Artificial Drainage Implant in comparison with Baerveldt implant
- Quantitative Proteomics of host pathogen interaction in human Aspergillus keratitis

- Center of Excellence in Human Mycotic Keratitis
- Identification of Biomarkers for primary open angle glaucoma
- Molecular genetic analysis of candidate genes associated with pediatric eye diseases: exclusively anophthalmia and microphthalmia in India
- Genetic screening in a large family with Primary Open Angle Glaucoma (POAG)
- Mitoscriptome analysis to understand the pathogenesis of diabetic retinopathy using tissue microarray
- ABCB6 and ABTB2 genes screening for ocular anomalies
- Genetic analysis of Retinoblastoma in South Indian population
- A genetic component to the INDEYE study of cataract and age - related macular degeneration in India
- Mitochondrial Genes involvement in Leber's Hereditary Optic Neuropathy (LHON)
- Molecular genetics of Leber Congenital Amaurosis in South Indian population
- 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
- A pilot study to understand the relationship between Vitreous Ascorbate to Plasma in non-diabetic patients undergoing vitrectomy
- Human Organ Culture Anterior Segment (HOCAS)

## Ongoing Clinical Projects

Aravind Eye Hospitals & Postgraduate Institute of Ophthalmology

### Cornea

- To compare Spectral Domain Optical Coherence Tomography (SDOCT) and Pentacam to assess corneal scars
- Impact of aberrations post Descemet's stripping endothelial keratoplasty on visual outcome comparing methods of specimen collection in deep keratitis cases
- Parasitic ulcer treatment trial
- Mycotic ulcer treatment trial
- Acanthamoeba Keratitis longitudinal study



## Glaucoma

- Study of factors affecting adherence to glaucoma treatment protocol
- Effect of VEGF levels in Tenon tissue on the outcome of glaucoma surgery
- Evaluation of cell adhesion properties of Aurolab Artificial Drainage Implant in comparison with Baerveldt Implant.
- A 3-month, open-label, non-comparative, observational study of Bimatoprost 0.01% (Lumigan®0.01%) in the clinical setting
- Indian Family Angle Closure Evaluation (IFACE) study- Part II
- A phase 2b double-masked, randomized, active-controlled, dose-response study assessing the safety and ocular hypotensive efficacy of AR-12286 in patients with elevated intraocular pressure for 3 months
- A phase 2b, double-masked, randomized, active-controlled, study assessing the safety and ocular hypotensive efficacy of AR-12286 in patients with low tension glaucoma
- A prospective evaluation of open-angle glaucoma subjects randomized to treatment with two trabecular micro-bypass stents in conjunction with cataract surgery or cataract surgery only
- Luminous: Study to observe the effectiveness and safety of Lucentis through individualized patient treatment and associated outcomes
- Survey: Glaucoma Awareness in Patients
- Evaluation of postgraduate clinical education in a tertiary eye care system
- Cost effectiveness analysis of anti glaucoma medications
- Genetic analysis of MFRP (Membrane Frizzled Related Protein) and evaluation of phacoemulsification with or without anterior sclerostomy in nanophthalmic eyes
- A prospective, randomized, controlled clinical trial comparing topical medical therapy with Selective Laser Trabeculoplasty (SLT) as initial treatment for open angle glaucoma in south Indian population
- Merck - Compare the efficacy and safety of preservative free MK - 2452 (0.0015%) and preservative free Timolol Maleate (0.5%) in patients with POAG and OHT
- Research study: Genetic screening in a large family with primary open angle glaucoma

## Cataract

- Comparison of refraction stabilization and surgical induced astigmatism between microincision phacoemulsification surgeries

- Aravind Pseudoexfoliation IOL study- genetic Analysis
- Comparison of the reduction in IOP, changes in corneal endothelial cell count and anterior chamber angle parameters using ASOCT following clear corneal phacoemulsification with manual small incision cataract surgery
- To study the safety and efficacy of topical Nepafenac eye drops with topical Prednisolone acetate in patients undergoing YAG peripheral iridotomy
- Barriers to acceptance of cataract surgery
- The role of homocysteine in Aravind Pseudoexfoliation IOL Study
- Clinical evaluation of Toric intraocular lens made by Aurolab
- The natural history of intraocular lens in eyes with exfoliation syndrome (APEX IOL Study); multicentric
- Counseling for Cataract Surgery: Effect on patient knowledge, decisional conflict and satisfaction
- Prospective Review of Early Cataract Outcomes and Grading (PRECOG)
- A prospective open label observational study to evaluate the safety and surgical performance of surgical blade (Aurosleek) in cataract patients.
- Comparison of complication rates between Phaco and MSICS at Aravind Eye Hospital

## Retina

- Non randomized control study of comparing 20% Sulphurhexafluoride [SF6] with 100% Sulphurhexafluoride [SF6] in macular hole surgery
- Non randomized control study of comparing Sclera Fixated Intraocular Lens [SFIOL] implantation vs Iris Fixated Intraocular Lens [IFIOL] implantation in cases with inadequate posterior capsular support
- A pilot study comparing the portable retina camera (CavCam XII) to the Topcon Retina Camera
- AMD phenotype study
- Visual outcome and optical coherence tomographic features in patients undergoing vitrectomy for Rhegmatogenous retinal detachment
- Autofluorescence imaging, spectral-domain optical coherence tomography, HFA and visual function correlation in patients with retinitis pigmentosa
- Study to observe the effectiveness and safety through individualized patient treatment and associated outcomes
- A 12 month, open label, multicenter study to evaluate the efficacy and safety of intravitreal injections of ranibizumab 0.5mg on cystoids, Spongy and Mixed patterns secondary to Diabetic Macular Edema

- Genetic analysis of NR2E3 gene in a family with enhanced S cone syndrome and vasoproliferative tumour of retina
- Study to evaluate utility of DNA macrochip in clinical management and outcomes in endophthalmitis
- A randomized control study of ILM Peeling with Indocyanine Green, Trypan Blue and Brilliant Blue dyes used in macular hole surgery

## Uvea

- A phase III, multinational, multicentre, 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 subconjunctival and anterior chamber granulomatous uveitis in children

## Pediatric

- Sensitivity and specificity of teachers screening during school screening programme
- Academic performance of school children-before and after wearing spectacles
- Training all the class teachers Vs conventional training method- a comparative study
- Barrier for referrals under 0 - 5 years age group
- Compliance on wearing spectacles
- Surgical outcome of large V pattern

## Orbit

- National retinoblastoma registry - ICMR
- Translational Research to Generate Corneal/Buccal Epithelial Stem Cells with GMP Compliance for Corneal Surface and Socket Reconstruction
- Identification of mitochondrial biomarkers in retinoblastoma
- 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
- Establishing the genetic testing centre for childhood ocular cancer (retinoblastoma) in Aravind Medical Research Foundation

## Low vision

- Effectiveness of low vision referrals: An assessment of patient quality of life and physician perceptions of low vision services at Aravind Eye Hospital

## Neuro-ophthalmology

- Factors affecting the course and outcome of ischemic oculomotor, trochlear and abducens nerve palsy

## Clinical Trials

### Aurolab

- Clinical evaluation of Toric intraocular lens made by Aurolab
- 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

## Operations Research

### Lions Aravind Institute of Community Ophthalmology

- Counseling for Cataract Surgery: Effect on patient knowledge, decisional conflict and satisfaction
- Gender Differentials in the Seeking of Health Care





*Aurolab has dramatically altered the face of eye care in India since it brought the price of the intraocular lens down to a tenth of international prices in the late 1990s. Since then, it has grown to market its products in more than 130 countries. About 60% of its total sales go to non-profit organisations.*

*“Governments in Colombia, Argentina, Sudan, Nepal and many more countries use their health care budgets more effectively by opting for low cost-high quality Aurolab products instead of those supplied by multinational companies and thus serve a larger mass of needy people,” says the head of a global NGO which fights blindness.*

*- N. Madhavan, Business Today, June 2013*

*Ophthalmic Supplies*

# MANUFACTURING OPHTHALMIC SUPPLIES

Adopting the latest manufacturing technology, Aurolab introduced a range of products especially addressing the needs for better diagnosis and management of glaucoma as well as diseases of cornea and retina. Various improvisations were made in intraocular lenses (IOL) to deliver better visual outcomes. Registration of many of its products in various countries ensured the international reach of Aurolab.

Aurolab now has fully automated line for antiseptics and disinfectants processing as well as CNC lathes for blade manufacturing. To top it all, the IOL division utilizes robotic technology to increase efficiency and reduce rejection rates.

## New Products

### Aurovue

Aurolab has come up with a new and improved hydrophobic acrylic IOL with material and design changes that translates to better outcomes for the patient. This was possible due to Aurolab's recently acquired advanced capabilities in the production of raw materials for foldable IOLs and in optical designing. One can now expect more such advancements in materials and design.

### I-Vision

A new brand of hydrophilic foldable IOL, I-Vision, was launched with Truedge (Square edge) technology. This technology helps in prevention of PCO after cataract surgery thereby reducing chances of secondary cataract.

### Truedge Aspheric

Very few manufacturers in the world offer the aspheric technology on PMMA IOLs. As IOLs used in developing nations are predominantly of PMMA material, Aurolab has introduced the neutral aberration aspheric IOL in PMMA platform. Aspheric optic design is superior to conventional spherical optic design and provides sharper vision to the patients.

### Cornisol

Aurolab has come up with a superior preservative medium at 1/4th of the market price for long term storage of donor corneas (up to 14 days) in eye banks.

### Tacrolimus Ointment

This ointment is an immunosuppressant used mainly for corneal indications. Aurolab is the first to introduce this





drug in India in the form of a sterile ointment specific to ophthalmic use. Aurolab is now working towards registering this drug in international markets.

### Slit Imager

Aurolab introduced a device to capture the images of the eye as seen through a slit lamp eye piece. This device, a combination of a commercially available camera with a specially designed adaptor and a built-in eye piece is a low cost approach to capture the necessary images. The images captured through Slit Imager can be used for documentation purposes, clinical studies, record keeping and also aids in better diagnosis at vision centres.

### Auoprost RT

Latanoprost is one of the preferred drugs for glaucoma. This drug is a cold chain product and should be stored under refrigeration to retain its efficacy. This restricts the prescription of this drug to less-privileged patients. Aurolab has come up with a new formulation of Latanoprost, Auoprost RT, which retains its efficacy even without refrigeration. The price is also within affordable limits.

### Aurosil 1500

Purer, thicker and denser silicon oil benefits the surgeons as it reduces emulsification rate once injected in the eye during retinal detachment surgeries. This is expected to deliver superior performance compared to the 1000 Cst silicon oils, that is presently available in the markets.

### Aurosleek

Aurolab has come up with highly precise ophthalmic blades manufactured from thinner raw material using automated grinding process. These blades come with Aurolab designed and patented tip guard, that is very simple to use and provides necessary protection to the tips.

## Marketing Activities

For the first time, Aurolab sponsored a live surgery session during the Annual Conference of Tamil Nadu Ophthalmic Association held at Trichy from August

10-12. Dr.Haripriya Aravind and Dr.P.Sathyan performed live surgeries using Aurolab PEGASUS Phaco Machine. Aurolab also sponsored sessions on its various products at different conferences.

Aurolab has widened its international market by appointing authorized distributors in various countries of Africa, Asia Pacific, Europe and Latin America. Aurolab has strengthened its market for IOLs, sutures, viscoelastics, trypan blue, silicone oil, sodium hyaluronate and blades in Egypt, Mexico and Ethiopia. The successful completion of product registration enables smooth and easy transaction of products between the countries.

## Prominent Trade shows attended

### ASCRS

Mr.Vishnu Prasad and Mr.Sathya Moorthy participated in the joint meeting of American Society of Cataract and Refractive surgeons and American Meeting of Ophthalmic Administrators held at Chicago, USA during April 20 - 24.

### ESCRS

Mr.Vishnu Prasad, Mr.Venkatesa Kannan and Mr.Alexander represented Aurolab at the 30th European Society of Cataract and Refractive Surgeons conference held at Milan, Italy, from September 8 - 12.

### AAO

Mr.Vishnu Prasad, Mr.Sathya Moorthy. Mr.Antony Renny represented Aurolab at the 116th American Academy of Ophthalmology Conference at Chicago, USA, during October 10 - 25.

*At the 9th General Assmebly of IAPB, Hyderabad*





*At the Joint Congress of APAO and AIOC, Hyderabad*

#### 9th General Assembly of IAPB

Aurolab got an excellent opportunity to promote its products at the meeting which was held in Hyderabad during September 17 - 20.

#### Joint Congress of APAO and AIOC

Aurolab participated as silver sponsor and launched Slit Imager and Cornisol at the 28th Congress of the Asia-Pacific Academy of Ophthalmology and 70th All India Ophthalmic Conference held in Hyderabad from January 17 - 20.

Participation in various state/regional level conferences provided a strong foothold for Aurolab products in the Indian market.

### Regulatory Activities

#### CE certification

The annual ISO and CE certification audits were carried out successfully. Aurolab is in the process of obtaining CE certification for Auroflex Toric IOL and Aurovue.

#### FDA Audit

USFDA audit for silk and nylon suture needles was successfully completed.

### HR Activities

Human Resource department at Aurolab arranged awareness sessions and seminars on various health – related and general topics for the benefit of the staff. Motivational lectures conducted on different occasions helped the staff develop positive attitude towards the various aspects of life. An outbound learning workshop was arranged for the marketing and sales staff at Pegasus learning centre, Pondicherry from July 16 - 17. The training focused on aspects of effective communication, team building and group dynamics. The department also arranged elaborate celebrations for the crèche kids' graduation day and on the occasions of national and other festivals.

#### Dr.APJ Abdul Kalam Visits Aurolab

January 27

Dr.APJ Abdul Kalam, Former President of India and a well-wisher of Aravind visited Nithyatha as well as Aurofarm and interacted with the senior staff of AECS. A presentation about the growth and development of Aurolab over the past twenty years was presented. Dr.Kalam delivered an inspirational address to the entire staff assemble there.



## Central Functions

Since its inception in 1976 as a 11 bedded hospital, Aravind has come a long way- both in terms of volume and range of work done in the field of eye care. From a single facility, now eye care is delivered through a network of 57 facilities across the state of Tamilnadu. With growth and expansion come the challenge of coordination, leveraging cross-learning opportunities and ensuring that all units continue to tread the path of excellence. This challenge resulted in the creation of a central structure to bring about excellence in cross-cutting functions like HR, Information Technology, Finance, Quality, Operations, Training and new projects.

### Human Resource Development

*"You don't find people; you build them"*  
– Infinite Vision

With the HR theme for the year 2012 designated as "Year for employee development", various initiatives were implemented with a view to bring out the best in the employees and thus contribute to the success of the organization. Various leadership development programmes and workshops for different cadres were also arranged towards ensuring the holistic growth of the employees.

The HR retreat facilitated by Ms.Cindy Harrison offered insights for strengthening the existing system and also helped develop concrete long-term goals. Development of Human Resource Information System (HRIS) software is currently underway which enables for easy storing and retrieval of data relevant to human resource management.

Pondicherry staff at training programme, Pegasus, Pondicherry



### Internal training programmes

#### Training programme at Pegasus for OT staff

Aravind – Pondicherry, April 1

Staff of operation theatre and Housekeeping departments of Aravind - Pondicherry was taken to Pegasus training institute for an outbound learning programme on April 1 and June 8 respectively. The main idea of this was to develop their skills in effective communication, proper planning, and proper delegation and distribution of work. It was a great learning experience for the participants. A similar programme was arranged for the doctors of Aravind – Pondicherry from November 10-12.

#### Self-development workshop

Aravind – Coimbatore, August 12

Self-development workshop was arranged for the Supervisors, Tutors, and staff of opticals and refraction of Aravind – Coimbatore. The session was facilitated by

Ms.Karpagavalli, Ms.Umapriya, Ms.Nevetha, Ms.Dharani, Ms.Soundaraleela at self development workshop





Aravind photography and videography team at P.S.G. College of Arts and Science

Mr. Vijay Samuel Benjamin from Light House leadership organization. It was an opportunity for the staff to reflect on their strength and their learning areas. This kind of self realization workshop had a greater impact in helping the participants to understand their real potential and how they can make a change in their life and in making a difference in the lives of people they are interacting with.

### Workshop for trainees of opticals department

A total of 41 second year optical sales staff and technicians across the Aravind Eye Hospitals attended the workshop held at Aravind-Coimbatore on September 9 and 10. The main purpose of this workshop was to give orientation on customer centred communication, Aravind culture, new updates in optical industry and teamwork.

CME for vision centre staff at Aravind-Pondicherry



### Continuing professional education for the staff of audio-visual department

To provide newer insights in the field of photography and videography, a session was arranged for the entire audio-visual team of Aravind at Coimbatore from December 13 to 15. Facilitated by Mike Myers, the sessions offered a thorough learning experience for all the participants. They also got an opportunity to visit the audio-visual department of P.S.G College of Arts and Science and interact with the faculty members.

### CMEs for MLOPs

To constantly update the ophthalmic assistants on the latest developments in the field of ophthalmology, CMEs were also arranged on a regular basis. Given the fact that Aravind's primary eye care centres (vision centres) see more than two lakh patients a year, the staff there should be well-oriented into the various aspects of eye care. To ensure this and to impart them new knowledge in the field of treatment and diagnostics, CMEs were held specifically for the staff of vision centres in March.

### Employee welfare initiatives

Janakiamma Child Care Centre at Aravind Eye Hospitals is of immense assistance to the working mothers in the organization providing a safe, clean and pleasant environment for the children. The centre also organizes various programmes including summer camps which truly provide a rejuvenating and learning experience for the kids.

Creche children during summer camp







Graduation day celebration

Excursions arranged for staff of different cadres during the course of the year provided the much-needed respite from the hectic work schedule and also helped strengthen the spirit of teamwork among them. Children of staff appearing for board exams were given special motivational lectures to allay their fear of exams and to excel in their studies. Those who passed out meritoriously were acknowledged and congratulated at a special function.

Sanitary workers of Aravind-Pondicherry were presented with a token of appreciation by Dr. G. Natchiar for their exceptional service.

To familiarize the staff with the principles of Mahatma Gandhi and the life led by him, a special quiz competition was arranged at Aravind – Madurai on October 19. The resource book for the quiz was his autobiography “The Story of My Experiments with Truth”. Five teams were selected for the final round. The team from Orbit and Oculoplasty Clinic consisting of

Dr.G.Natchiar with Sanitary workers at Aravind - Pondicherry



Inauguration of children's park by Lavelle fund board of Directors

Ms.R.Regitha, Ms.C.V.Chinnathai and Ms.A.S.Priyanka became the winners. Aravind - Pondicherry opened a Children's Park on November 9 which was inaugurated by Lavelle Fund Board of Directors.

Festivals both of national and international importance were celebrated elaborately across all the Aravind centres which revealed the team spirit and a sense of unity among the staff and employees.

### Joining hands with the community

Aravind is also actively involved in organizing various programmes for the benefit of the community at large. One such event was the Stephen Covey Memorial Lectures co- hosted by LAICO and The Hindu on September 14 -15.

Aravind hosted the fifth session of Madurai Madhura Geetham 2012, annual musical festival held in Madurai in commemoration of Bharat Ratna Ms.M.S.Subbulakshmi on her birth anniversary celebrations starting from September 15.

LAICO hosted a motivational talk by three unique individuals who have dedicated their lives to bringing smiles to the world through the power of unconditional giving on January 23. Sri.Jayesh Patel and his wife Anar Patel, co-founders of Manav Sadhna, a NGO based in Ahmedabad delivered a moving account of their activities especially in the field of hygiene and education in the slums of the city. Nipun Mehta, Founder, ServiceSpace reiterated the importance of unconditional giving to make this world a better place to live and also narrated the origin of the organization. His wife, Ms.Guri Mehta too shared her feelings and experiences of being one of the founding members of ServiceSpace.

## Information Technology and Systems

Effective deployment of information technology and systems helps in improving the quality and efficiency eye care service delivery at Aravind. Aravind's IT solutions continue to be recognised in various fora and this year too, one of these - Cataract surgeries quality assurance system was acknowledged by NASSCOM and CNBC as the Best IT Innovation in Healthcare. The department is currently in the process of developing Electronic Medical Record System which allows for better transparency and aids in easy retrieval of necessary data.

Various enhancements were made during the year in the areas of patient care management, intranet and system administration.

### Patient care management

To monitor patient flow in the operation theatre and analyse the waiting time at various stages, operation theatre MIS was implemented. Display monitors were set up in each operation theatre to display the patient information for the surgeon to review before operating.

Biochemistry lab: Barcode labels were introduced for sample collection and order tracking. All the equipment were integrated to capture the results directly into the system.

Cataract Quality Assurance-Benchmarking at surgeon level: This enables the surgeon to compare his scoring with rest of his team as well as overall hospital. Currently, all the surgeons have credentials to access the information relating to their surgeries.

Accommodation Management Software: was upgraded to web-based version.

### Developments on Intranet

New services were added in the existing intranet system. Internal event management systems were revamped and extra features were added. A portal for uploading and viewing videos related to ophthalmic care and surgeries was also developed on the intranet. A new web portal named Aurovikas was developed to enter information related to education and training programmes and do website marketing. Content management system was routinely revamped for the various eye care management sites as well as the Aravind website maintained in-house. Additions were also made in the content management system of V2020 e-resource for better dissemination of resources. The department was also involved in

developing webpages for various conferences and also created a website for the Indian Association of Medical Microbiologists, Tamilnadu chapter. A web portal was also developed for the member hospitals of World Association of Eye Hospitals, to evaluate their performance.

### System administration

Improvements were made in the internal system administration to facilitate better networking. Complete networking, installation and setup of systems in Tuticorin and Udumalpet branches and several vision centres were completed successfully during this year. High Definition (HD) videoconference facility which supports 40 scopia desktop clients from intra and internetwork was implemented in all Aravind centres.

HOBNOB Technology was tested and implemented in Diabetic Retinopathy screening in Theni district. This is a cost-effective method compared to the VSAT technology.

Omega Network Attached Storage (NAS) was configured to take back up of data stored locally in the desktop or laptop by the users. It enables users to take backup of the data created and stored locally in their hard drive into this storage and restore when the local data is lost.

Complaints Management System was implemented at Aravind Eye Hospital, Pondicherry to report the problems faced by the users in terms of hardware, software, networking etc. This helps to keep track of the complaints and take appropriate actions.

### Support to consultancy and capacity building initiatives

Performance monitoring systems were developed for Lion Eye Hospitals and IAPB supported eye hospitals which would enable them to share their performance details into the system. The senior technical leaders and programme managers can access and generate reports in terms of performance and different key metrics. Another online system was developed to manage data related to the Seva-supported TOMS project.

This year also, IT tools were shared with various non-profit eye care organization in order to enhance their information system.

Integrated Hospital Management System software was implemented in the following hospitals:

- Eye Foundation Hospitals at Ikeja, Lagos, Ijebu Ode and Victoria Island in Nigeria





Mr.S.P.Praveen Kumar, Mr.S.Venkatesh at Asuncion, Paraguay

- Clinica Central and Clinica Social at Fundacion Vision, Paraguay
- Grameen Eye Hospital, Thakurgaon and Kishoreganj- Bangladesh

To understand the current systems and to assess the possibilities and requirements for customization of software, need assessment visit made to two hospitals in India.

In order to ensure better utilization of the software, the IT team visited various hospitals in India to review and provide necessary support to enhance the software.

### Aravind Tele-ophthalmology Network

Tele ophthalmology network at Aravind enables the organization to collaborate with different diabetes centres for the screening of diabetic retinopathy patients. A total of 2179 cases were evaluated during the year ending March 2013.

Around 520 videoconferencing sessions consisting of a total of 730 hours were conducted during the year and the average time taken per session was around 1 hour 30 minutes.



Dr. S.R. Krishnadas facilitating the workshop on skill-building for eye hospital librarians

### Aravind Library and Information Centre

Workshop on skill-building for eye hospital librarians

Aravind Library and Information Centre conducted a workshop for developing the competence of eye hospital librarians from November 26 to 28. The workshop was sponsored by SEVA Foundation and was attended by a total of thirteen participants.

The centre also facilitated a two-day seminar on PubMed search which was handled by Ms. Vasumathi Sriganesh, CEO - Friends of QMed Knowledge Foundation, Mumbai in June 2012. Discussions revolved on medical databases, electronic resources, and improving library services.

## Awards and Accolades

Each recognition that comes in the way of the organization reflects the goodwill and trust it has earned in the community. These recognitions inspire the staff to work harder towards the goal of eliminating needless blindness. Last year too saw many of the Aravind leaders and staff winning laurels at various fora, both international and national.

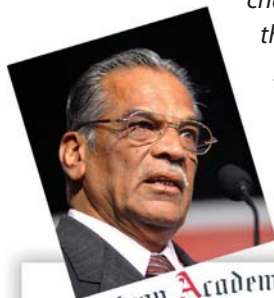
### Sitaram Jindal Prize

New Delhi, December 4

The 'Sitaram Jindal Prize for Healthcare' is instituted to accolade exceptional service of current significance rendered by individuals or organizations for the welfare of Indian citizens in the country. The award for the year 2012 was presented to Aravind Eye Care System. Dr.R.D.Ravindran, Chairman, Aravind Eye Care System received the award from Sri Sri Ravishankar who graced the occasion as chief guest.

### AAO Outstanding Humanitarian Service Award

Dr. P.Namperumalsamy was presented with the Outstanding Humanitarian Service Award by the American Academy of Ophthalmology at the Academy's Joint Annual Meeting in Chicago, USA in November 2012. This award recognizes individuals involved in humanitarian projects including participation in charitable activities, care to the indigent and community service.



### IAPB South East Asia Regional Award

Dr.R.D.Ravindran was awarded the South East Asia Regional Award by the International Agency for Prevention of Blindness during the Agency's annual general body meeting held In September at Hyderabad.

### IPE – CSR Corporate Governance Social Innovation Award

Mr.R.D.Thulasiraj was awarded the Social Innovation Award as part of the IPE-CSR Corporate Governance Awards at Mumbai on November 24. This award recognise the best practices in corporate social responsibility and contributions made by an organization which has made a difference to the people and the community and played a role of responsible citizen.

### Hermes Award

Paris, France, May 10

Aravind Eye Care System received the Hermes Award 2012 instituted by The European Institute for Creative Strategies and Innovation at the National Meeting

Dr. R.D.Ravindran receives the S R Jindal Prize 2012 for Healthcare from Sri Sri Ravishankar







*Dr.R.Pararajasegaram with the Hermes Award*

for Chief Innovation Officers held at Paris on May 10. Dr.R.Pararajasegaram, long-term friend and well-wisher of Aravind received the award.

### **IAPB "Eye Health Hero" Title**

The Instruments Maintenance Department at Aravind was recognized as "Eye Health Hero" by the International Agency for the Prevention of Blindness during its annual general body meeting held in September at Hyderabad. This acknowledgement came in recognition of the department's work which is really making a difference in aiding vision and restoring sight all over the World.

### **Best IT Innovation in Healthcare Award**

Aravind Eye Care System won the Best IT Driven Innovation in Healthcare Award presented by Lenovo and powered by NASSCOM and CNBC-TV18 for its Cataract Surgeries Quality Assurance system project. Mr.B.S.Ganesh Babu received this award on behalf of

Prof.Srinivasan, Mr.Poornachandran and Ms.Ganga with the IAPB "Eye Health Hero" Title



*Mr.Ganesh Babu with 'Best IT Innovation in Healthcare Award'*

Aravind Eye Care System on February 20 at a function held in Mumbai.

### **Daljit Singh Gold Medal**

Chennai, July 7

The Indian Intraocular Implant and Refractive society honoured Dr.G.Natchiar with the Daljit Singh Gold Medal during the annual conference of the IIRSI held in January. This award came in recognition of her excellent work in the field ophthalmology.

### **Rotary Award of Excellence for Dr.G.Natchiar**

Mumbai, August 28

Dr.G.Natchiar was awarded the Award of Excellence by L.M.Patel Rotary Eye Hospital, Mumbai and Rotary Club of Mumbai, North West, Malad in recognition of her outstanding contribution to the cause of eye care and her expertise in establishing the Rotary Eye Hospital.

Dr.G.Natchiar receiving the Daljit Singh Gold Medal from HE Rosaiah, the Governor of Tamil Nadu



## Award for Best Patient Safety Initiatives

Hyderabad

Aravind-Pondicherry received award for Best Safety Initiatives at the International Congress of Patient Safety held in September at Hyderabad International Convention Centre.

## Lions Clubs Felicitate Aravind Staff

Ms.Seetha Maheshwari, Eye bank co-ordinator, Aravind - Tirunelveli was appreciated by Lions Club of Pavoorchatram and Lions Club of Tirunelveli and was given Certificate of Appreciation at a special function organized there.

Lions Club of Tirunelveli Central conferred Ms.M.Chidambaram, Nursing Superintendent, Aravind-Tirunelveli with "Best Nursing Care Award" for her untiring service to the mankind over the past 30 years. The award was presented at a grand function organized at St.Xavier's College, Tirunelveli on April 13.

## XOVA-Excellence In Ophthalmology Vision Award

Aravind - Pondicherry, November  
Department of Pediatric Ophthalmology, Aravind, Pondicherry won the Excellence in Ophthalmology Vision Award in November for the innovative initiatives in Improving the teacher training model in India to identify ocular defects among school children.

## Distinguished Alumnus award for Dr. Aravind

Dr.Aravind Srinivasan was awarded the Distinguished Alumnus Award for the year 2013 by the PSG Institute of Medical Sciences and Research at Coimbatore on January 25.

## Successful Woman Award

Dr.Kalpana Narendran was conferred Successful Woman Award by the Lion Clubs International - Coimbatore on

Lions Clubs' Felicitation to  
Ms.Seetha Mageshwari and  
Ms.Chidambaram



Dr.Rathinam Sivakumar receives the FAMS Award

the occasion of International Women's Day on March 8 at Coimbatore.

## FAMS Award

Dr.Rathinam Sivakumar was awarded FAMS by the Tamil Nadu Dr.M.G.R.Medical University on October 13 at Chennai.

## National Level JCI Outstanding Professional Award for Sanil Joseph

Mr.Sanil Joseph was awarded the Outstanding Professional Award by the Junior Chamber International (Jaycees) at the annual conference held at Trichur, Kerala on December 28. Starting from 2000, every year, JCI INDIA recognizes and honours three achievers at the national level as Outstanding Businessmen/Industrialists and Professionals. He is the first person to receive this award from the Madurai chapter of the Jaycees.

Dr.Veena with the XOVA-Excellence In Ophthalmology Vision Award





### Alim Memorial Award

*Dr.G.Natchiar was awarded the Alim Memorial Award by the Ophthalmological Society of Bangladesh on 26 February.*

### Special Recognitions by the Tamil Nadu Dr.MGR Medical University

*Dr.R.Ramakrishnan was presented with the Best Teacher Award at the silver jubilee celebrations of the University held at Chennai on November 23.*

*Dr.R.Kim, Dr.Prajna, Dr.Kalpna Narendran and Dr.Haripriya Aravind were awarded the Best Doctor Award at the same function.*

*Dr. Karthick Srinivasan was conferred the “Young Achiever Award” by the University on the occasion of the Doctors’ Day and University Day celebrations at Chennai on July 1.*

### Best Paper Award

*Dr.Anita Raghavan was awarded the Best Paper Award for the paper, Persistence of viable fungi in excised button in therapeutic Keratoplasty and clinical implication at the EU Cornea Congress held in Milan, Italy in September.*

### Dr. Andrew Craig Best Poster Award

*Ms.Sudha Priya Soundara Pandi of AMRF received this award with a Trophy and a cash price of £500 at the 9th Alumni Research Meeting Day held in Belfast, UK.*

### GLAUCONS Award

*Aravind team consisting of Dr.Saumendra Nath Ghose and Dr.Lipi Chakraborty became the winners of the Glaucoma Quiz conducted as part of the conference held in Coimbatore.*

### AIOS - APAO Awards

*Dr.Kuheli Bhattacharya won the Best Free Paper Award in the Subspecialty of Ophthalmic Education at the Joint Meeting of APAO and AIOS held in Hyderabad in January. Dr.Kunal Rana from Aravind - Madurai won the quiz conducted as part of the conference.*

### Award for Research Scholars

*Research Scholars at Aravind – Tirunelveli, Mr.N.Murugan and Mr.G.Ramesh Kumar got first and second prize for oral free paper presentation at National Seminar on Microbial Techniques for Sustainable Environment held at Sri Paramakalyani College, Alwarkuruchi, Tirunelveli in March. In the Seminar 166 free papers were presented on various fields of life science.*

### ICMR Grant for Dr.Gitansha Sachdev

*Dr.Gitansha, second year MS resident at Aravind-Madurai has been awarded ICMR grant for her thesis Safety and Efficacy of Corneal Collagen Cross-linking with Riboflavin in Progressive Keratoconus.*

### Aravind Eye Care System finds Place in the 2012 Indian MAKE Finalists

*Aravind finds place in the Finalists list in the 2012 Indian Most Admired Knowledge Enterprises (MAKE) study. This is an established benchmark to recognize India’s leading organizations for their ability to leverage enterprise knowledge to deliver superior performance in the areas of innovation, operational effectiveness and excellence in products and services. Teleos will announce the 2012 Indian MAKE Winners later this year.*

*Special recognitions by the Tamil Nadu Dr. MGR Medical University*

*Dr. Kalpna Narendran*



*Dr. Haripriya Aravind*



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*Dr. Karthick Srinivasan*



# Partners in Service

*The scale that Aravind has achieved today would not have been possible without the whole-hearted dedication of its partner organisations, collaborating centres and well-wishers. Their commitment indeed has always been incredibly helpful in taking forward its mission and positively impacting the lives of many.*

## 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
- Indian Institute of Management, Bangalore, India
- Indian Space Research Organisation, India
- International Federation of Eye Banks, USA
- Indian Overseas Bank, Chennai, Madurai
- International Agency for Prevention of Blindness
- International Eye Foundation, USA
- International Council for Ophthalmology, London
- Lavelle Fund for the Blind, USA
- Lions Clubs International Foundation, USA
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- Rotary International, USA
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- State Bank of India, Madurai
- Standard Chartered Bank, UK
- TIFAC–CORE, Department of Science and Technology, Government of India
- Topcon, Japan
- University of Michigan, USA
- University of California, Berkeley
- 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
- Case Western Reserve University, Cleveland, USA,
- Centre for Vision and Vascular Sciences, Queen's University, Belfast, UK
- Defence Research and Development Organisation, Government of India
- Department of Biotechnology, Government of India
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- Francis I. Proctor Foundation for Research in Ophthalmology, UCSF, USA
- Indian Council of Medical Research, India
- Indian Institute of Technology, Chennai
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- University of Giessen, Germany
- University of Wisconsin, Madison, USA
- University of Iowa, USA
- Vivekananda Mission Ashram, West Bengal, India
- Wellcome Trust, UK
- World Health Organization, Switzerland



## The Aravind Eye Foundation

The Aravind Eye Foundation was established in 2001 to help Aravind spread its sustainable model of high quality, patient-centric eye care to India's rural populations and to other developing countries. It does so by facilitating knowledge sharing and partnerships with higher education, social enterprise, healthcare, government, and other non-profits. The AEF also supports a variety of programs of the Aravind Eye Care System, which are not self-sustaining by Aravind's core operations:

### Rural Vision Centers

AEF has sponsored the set-up and first year operating costs for vision centers in the villages of Kadayannallur, Uthukuli, and Srivilliputtur. At the end of 2012, these centers had seen more than 15,000 patients, recommended 720 for cataract surgery, and fitted 2028 with eye glasses.

### Ring of Hope

Founded in 2004, the Ring of Hope Fund pays for treatment of patients - primarily children - who suffer from retinoblastoma and other eye cancers. To date, more than 900 patients have received free surgery, chemotherapy and radiation and custom-prostheses.

Nearly 10% of childhood eye cancers in India are genetic. Aravind Eye Foundation has provided seed funding to establish the first genetic testing lab in Asia. This lab will offer affordable testing to families from India and across the developing world.

### Spectacles for School Children

This year AEF sponsored screenings of 36,633 school children through Aravind Eye Hospital-Madurai to raise awareness and identify refractive issues and provided

947 eye glasses free of charge to those who cannot afford to buy them.

### Training and Education

Thanks to a grant from the AlleneRuess Memorial Trust, five doctors travelled to the US to observe and train with renowned US surgeons and researchers, as well as attending the Annual meeting of the American Academy of Ophthalmology.

### Research

AEF granted initial seed funding to purchase the equipment and accessories required to establish Human Organ Culture Anterior Segment System (HOCAS) at the Aravind Medical Research Foundation in Madurai. This system will investigate the effect of various anti-glaucoma drugs and also help researchers understand glaucoma pathogenic mechanism.

AEF also sponsored five fellows who are researching infectious and genetic diseases of the eye, common in the developing world.

### Eye care for a Million children

With support from the Lavelle Fund for the Blind, Aravind has completed two successful years working on this project in Pondicherry and Tirunelveli area. This year:

- 664,417 children were screened through their school screening program
- 16,326 school children with refractive errors were provided spectacles
- 212 children underwent cataract surgery
- 748 premature babies were screened for Retinopathy of Prematurity (ROP) and
- 33 laser procedures were performed

### Capacity Building for Sala Uno Hospital, Mexico

Sala Uno is an eye hospital based in Mexico City providing secondary eye care. Inspired by Aravind's business model, the founders of Sala Uno came to Aravind for training in eye care program development. AEF supported Sala Uno in arranging for consultancy services from LAICO with the help of a grant received from Inter-American Development Bank (IDB-Mexico). Within last two years, they have been able to create a successfully sustainable, high volume set up by introducing Small Incision Cataract Surgery technique.

Aravind Eye Foundation is grateful to the many supporters, who give their time, talent, and treasure to fulfill Aravind's mission of eliminating needless blindness.

Dr. Usha Kim with Dr. Christine Melton, Ms. Donna Campbell and Dr. Richard Hirschman in the Orbit Clinic at Aravind-Madurai



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