

# activity report

April 2022 to March 2023

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ARAVIND EYE CARE SYSTEM

*Vision: Eliminate needless blindness*



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## Photo Credits

Rajkumar M, Aravind-Madurai

Ramesh V, Aravind-Madurai

Mohan Raja S, Aravind-Tirunelveli

Senthil Kumar P, Aravind-Coimbatore

Iruthayaraj P, Aravind-Pondicherry

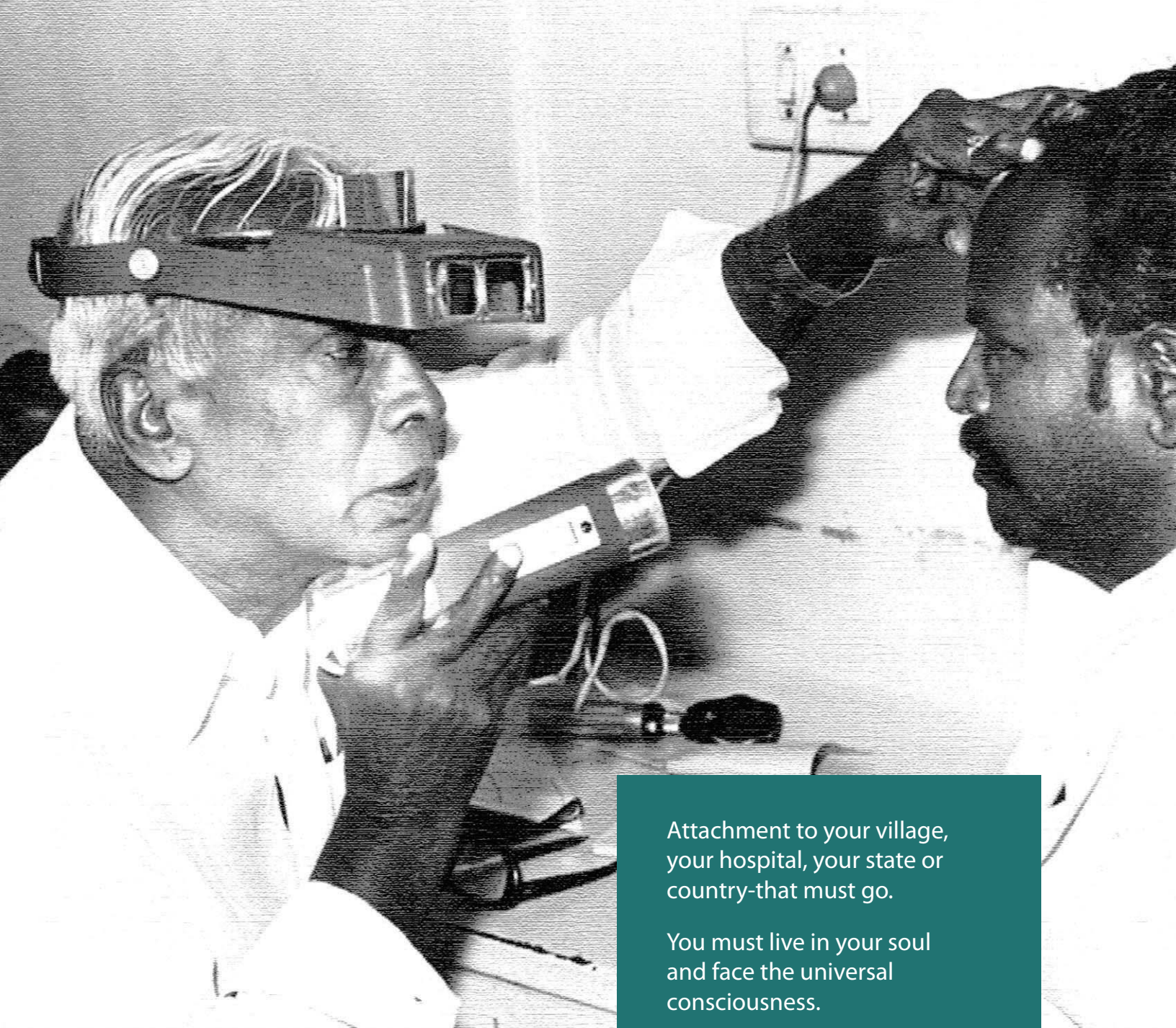
Ramkumar R, Aravind-Pondicherry

Vijaya Kumar S, Aurolab

## activity report

April 2022 to March 2023





Attachment to your village,  
your hospital, your state or  
country-that must go.

You must live in your soul  
and face the universal  
consciousness.

To see all as one.

To have this vision and work  
with strength and wisdom all  
over the world.

To give sight for all.

*... from Dr. V's journal entry, 1980*



# ARAVIND

EYE CARE SYSTEM

## VISION

Eliminate  
needless  
blindness by..



### EYE CARE SERVICES

#### MISSION:

.. by providing compassionate and quality eye care affordable to all



### EDUCATION AND TRAINING

.. by developing ophthalmic human resources through teaching and training



### RESEARCH

.. by providing evidence through research and evolving methods to translate existing evidence and knowledge into effective action



### CONSULTANCY AND CAPACITY BUILDING

.. by enhancing eye care through capacity building, advocacy, research and publications



### OPHTHALMIC SUPPLIES AND EQUIPMENT

.. by making quality ophthalmic products affordable and accessible to the vision impaired worldwide



## EYE CARE SERVICES

### ARAVIND EYE HOSPITALS

Tertiary Eye Care Centres - 7  
(Speciality care, Research & Training)

Madurai 1976  
Tirunelveli 1988  
Coimbatore 1997  
Pondicherry 2003  
Salem 2011  
Chennai 2017  
Tirupati 2019

Secondary Eye Care Centres - 7  
(Cataract services, Speciality diagnosis)

Theni 1985  
Tirupur 2010  
Dindigul 2010  
Tuticorin 2012  
Udumalpet 2012  
Coimbatore City Centre 2014  
Kovilpatti 2019

### OUTREACH PROGRAMMES

#### Free Eye Camps

Community Eye Clinics - 6  
(Out-patient eye care centres for comprehensive eye examination, treatment of minor ailments)

Melur 2004  
Tirumangalam 2005  
Cumbum 2008  
Madurai City Centre 2009  
Sankarankovil 2010  
Pondicherry City Centre 2011

Vision Centres - 107  
(Primary eye care centres for comprehensive eye examination)

### ARAVIND INTEGRATED EYE BANK SERVICES

Madurai  
Tirunelveli  
Coimbatore  
Pondicherry  
Chennai

## EDUCATION AND TRAINING

ARAVIND POSTGRADUATE INSTITUTE OF OPHTHALMOLOGY

LIONS ARAVIND INSTITUTE OF COMMUNITY OPHTHALMOLOGY (LAICO)

## RESEARCH

ARAVIND MEDICAL RESEARCH FOUNDATION  
DR. G. VENKATASWAMY EYE RESEARCH INSTITUTE

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

## CONSULTANCY AND CAPACITY BUILDING

LIONS ARAVIND INSTITUTE OF COMMUNITY OPHTHALMOLOGY (LAICO)

Sharing best practices of Aravind  
Advocacy in eye care

## OPHTHALMIC SUPPLIES AND EQUIPMENT

AUROLAB  
Intraocular lens  
Pharmaceuticals  
Suture needles  
Equipment  
Surgical blades  
Special products

# Highlights

*Aravind's growth is driven by the vision set by the founder Dr. G. Venkataswamy - to eliminate needless blindness. Each and every activity at Aravind, either directly or consequentially contributes towards this vision.*

*In the last year, massive expansion projects were taken up at two of the tertiary care centres to accommodate the growing patient volumes. Construction of a warehouse and an additional housing facility for staff is moving at a fast pace in the Aurolab premises. The new projects currently under construction, together constitute over 1.6 million square feet.*

*Further, some clinics were upgraded with state-of-the-art treatment and diagnostic modalities to provide better care. Proactive measures were taken to reach out to the community and identify patients at an early stage. All these collectively contributed to a significant increase in patient footfall throughout the year.*

## Service expansion and quality assurance

In the last year, Aravind witnessed a significant increase in patient visits at its hospitals and vision centres. Also, there was a notable rise in the number of patients seeking treatment through screening camps. Additionally, the establishment of seven new vision centres also contributed

to expanding Aravind's presence in rural areas, bringing the total count of vision centres to an impressive 105. Furthermore, Aravind has extended its support to governments and other organisations in establishing vision centres, including assisting the government of Bangladesh in setting up of 45 centres in the last year.

*Ground-breaking ceremony of Aravind Eye Hospital, Thanjavur*





The map illustrates the geographical context of the Five Pandya Kingdoms, highlighted in green. These kingdoms are located in the eastern part of Tamil Nadu, bordering Andhra Pradesh to the north and the Bay of Bengal to the east. The kingdoms shown are Thanjavur, Tiruchirappalli, Ariyalur, Perambalur, and Pudukkottai. Surrounding regions include the Rayavaram Kingdom to the north in Andhra Pradesh, and the Chola and Pandya Kingdoms to the south in Tamil Nadu. Major cities and districts are labeled throughout the region, providing a comprehensive overview of the area's history and geography.

The plan for the eighth tertiary care centre of Aravind is getting materialised in Thanjavur, the city of temples of architectural beauty. On its start, Aravind will be capable of satisfying the long-time eye care need of the district's people who come a long way to Madurai for treatment. Spanning in an impressive 400 thousand sq. ft, this modern hospital will feature state-of-the-art facilities, including staff accommodations, is expected to open in October 2024. The ground-breaking ceremony was held on 14th December, 2022.

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## A Look back upon the path travelled

Aravind Eye Hospital, Pondicherry has seen a steady growth in terms of patient volumes and has been on the forefront in eye care innovations and eco-friendly measures. Programmes spanning over a year were organised to commemorate the hospital completing twenty years, the formal culmination of which was on the hospital day celebration held on 18th February 2023.

As part of the celebrations, Aravind-Pondicherry hosted an Alumni Meet which saw alumni from across the country reconnect with old friends and acquaintances and reminisce old memories. A star-studded panel of speakers, including the founding members of Aravind, shared their insights on the global impact of Aravind and discussed newer advancements in ophthalmology practice and research.







*Aravind team with the representatives from University of Michigan and University of Maastricht*

## **Collaboration to fight Non-Communicable Eye Disease**

Aravind is constantly seeking methods to enhance patient care and exploring new avenues for medical research. With Non-Communicable Diseases (NCDs) becoming a growing health concern, Aravind is taking action to address this issue. University of Michigan, USA and Aravind Eye Hospitals were jointly awarded a National Institutes of Health grant by the US Federal Government towards research capacity building.

Aravind will execute this project working in collaboration with the University of Michigan. The primary objective of the project is to provide an interdisciplinary training for clinicians, aimed at developing their knowledge and skills in designing and conducting clinical research. The programme will introduce clinicians to life course approaches in clinical epidemiological research and contribute to preventing and reducing the impact of eye diseases in India's rapidly aging population.

To get the project started, a team comprising members from the University of Michigan and a representative of University of Maastricht based in Bangalore visited Aravind and held discussions with senior members of Aravind between 25 and 27 May 2022. This collaborative effort promises significant research capacity building in Aravind, which in turn will contribute to enhancing eye care in India.



### *In loving memory of Mary Munson*

Aravind lost its very dear friend, Mary Munson on 15th October 2022.

Mary, along with her husband Fred, has been volunteering at Aravind for over four decades, spending a month at Aravind, almost every year. While Fred's focus was on the hospital's leadership and administration, Mary volunteered her time improving its aesthetics, cleanliness, food and a million other things.

While at Aravind, she would constantly think about how she could contribute to improve a place in the most practical way, especially her enthusiastic involvement in the Janakiammal child care centre at Aravind-Madurai. Mary found great happiness in sharing in the successes, joys and achievements of people at Aravind. She was a gracious host to many Aravind staff who visited the US, often going out of her way to make her guests feel welcome and cherish good memories. She became a friend, a mentor and a mother to most of them. She brought so much to life and everyone who knew her felt special around her. Mary's life will be cherished and celebrated for years to come by all those whose lives were touched by her.

## Ophthalmic supplies: Innovations and market expansion

Aurolab continues to invest in technological innovation and global market expansion, all in alignment with the ultimate goal of enhancing the quality and affordability in eye care delivery.

Aurolab has embraced the concept of Total Productive Maintenance (TPM) as a means to enhance productivity, quality, and other crucial aspects within the organisation. Staff's enthusiastic involvement in TPM has led to reduced energy consumption and increased production volume, exhibiting Aurolab's commitment to efficiency and excellence. Furthermore, Aurolab has actively initiated collaborations with NGO organisations in the Middle East and Africa, towards improving their distribution network and address the inherent supply-chain challenges.

## Towards strengthening eye research

AMRF continues to engage in a range of research projects encompassing diverse fields such as Molecular Genetics, Proteomics, Ocular Pharmacology, Bioinformatics, and Stem Cell



TPM deployment at Aurolab

Biology. These projects signify AMRF's plan to advance scientific knowledge and explore innovative avenues in eye care delivery.

The establishment of the Exosome Innovation Centre at AMRF and Regional Research Centres in Tirunelveli, Coimbatore, and Pondicherry reflects AMRF's strategic progression that integrates research and clinical activity, aiming for enhanced patient care. These centres serve as hubs for cutting-edge research and innovation, where scientific advancements can be translated into tangible benefits for patients.

## *Farewell, dear friend*

Aravind is deeply saddened by the death of Manohar Devadoss, the artist-scientist-writer who had a long-time association with Aravind as a patient, mentor and friend. The endowment he instituted in memory of his late wife, Mahema has been a great boon to low vision patients from underprivileged backgrounds. His demise has left a profound void in the hearts of people who were close to him that no one can ever fill.

To pay tributes to this great artist and exemplary human being, Aravind organised a memorial meet, "Multiple Facets of our Mano: Artist of Life" on 27th December 2022. The event provided an opportunity for Mano's family, friends, colleagues, and admirers to come together and celebrate his life and legacy.







*D. Nagarajan receiving the Dr. G. Venkataswamy Memorial Award*

### Dr. G. Venkataswamy Memorial Oration and Award Ceremony 2022

Aravind Eye Care System presented the Dr. G. Venkataswamy Memorial Award 2022 to Doraiswamy Nagarajan in appreciation of his enduring contributions to eye care and in particular towards capacity building of eye hospitals across the world. The ceremony was held at Dr. G. Venkataswamy Eye Research Institute on 1st October 2022. Nagarajan delivered the Oration titled "Society, Service, Spirituality."

### 'Kaushalam' - Transformation for excellence programme

Since inception 45 years ago, strong leadership has been one of the cornerstones of Aravind's pursuit to retain its reputation as a purpose-driven organisation.

To develop a pipeline of purpose-driven leaders at all levels to steer the growing organisation in an ever-changing ecosystem, the leadership at Aravind prioritised this initiative as one of the critical elements to the organisation's

*Participants of Kaushalam at My Village resort, Anaikatti, Coimbatore*



*Being an introvert I usually do not volunteer to participate in such programmes. However, Kaushalam has changed my approach to life a lot. The first session in Pondicherry was a novel experience of team building with my seniors and getting to know a little about leadership. I did enjoy the session but had no idea what to expect next.*

*The Socratic dialogue sessions (all three parts) were life altering. I was compelled to face certain realities I had been avoiding and affirm certain beliefs which rang true for me. The interaction within the group and the understanding moderators made this an impactful experience. Being a part of this programme has shaped and enriched to me as a person, and I am looking forward to the next session. Thank you all for organising this and making it happen in our hectic schedule.*

*-Dr. Meghana Tanwar*

*Medical Officer, Orbit and Oculoplasty Services, Aravind-Madurai*



sustainability. “Kaushalam, Transformation for Excellence” a one-year programme was launched in October 2022 to address this need.

This programme targeted young ophthalmologists who are either leading a department or one of the eye care facilities within the network. Sixteen doctors from different centres of Aravind, willingly enrolled in the programme. The programme consists of three segments:

(a) The foundation course to get to know oneself and develop a bond among the participants held at Pegasus Institute, Pondicherry and Aurosociety’s Sharanam in October 2022

(b) Values-based Infinite Vision Leadership session series held in Chennai (October 2022), Hyderabad (January 2023) and Coimbatore (March 2023).

Aravind Eye Care System is indebted to Masood Hussainy, Vice President, Tata Advanced Systems and Tata Aerospace and Defence, Hyderabad for conceiving and leading the Value-based Infinite Vision Leadership series. His leadership in designing and running tri-series evoked deep reflections and shared the learning by the participants. To facilitate an enriched learning experience, three senior leaders from Tata Advanced Systems, Hyderabad and a senior official from Mahatma Montessori School, Madurai participated in the tri-series. Masood was supported by Dr. Siddharth Narendran, Medical Officer, Aravind-Coimbatore and Sridevi Chavali,

General Manager, Tata Advanced Systems, Bangalore as the co-facilitators of the tri-series.

(c) Visit to organisations has been scheduled for August 2023.

### **Information technology in ensuring efficient eye care delivery**

It has been a year since Aravind’s IT department got its own identity as AUROiTECH and it continues to develop and provide innovative eye care solutions towards ensuring efficient eye care delivery.

It has started revamping eyeNotes, the indigenously developed electronic medical record system by deploying efficient architecture and modern (and modular) technologies. This technology facilitates ease of deployment and support for users-hospitals and end users. Most importantly, it gives control to other user hospitals to develop add-on applications, dashboards and reports to meet their specific needs. During 2022-2023, AUROiTECH implemented eyeNotes in 13 hospitals across India and internationally.

The integration of Optical and Pharmacy with eyeNotes is being done to create seamless sharing of the prescription information. Various IT security policies and solutions have been implemented across Aravind centres to have end to end data security, privacy and data protection.



*Aravind Eye Hospitals made great strides in the past year, with the total out-patient visits approaching six million, a significant 34% increase from the previous year. This led to an exponential increase in the number of surgeries, injections and laser procedures. As the year drew to a close, the collective efforts of Aravind centres resulted in handling a total of 5.7 million outpatient visits and performing over 700 thousand surgeries, lasers, and injections.*



## Patient Care

## EYE HOSPITALS

### Infrastructure development

Aravind Eye Hospital, Dindigul moved to a new facility on 24th July 2022. The 46,000 sq.ft building offers comfortable patient waiting areas, investigation and examination rooms and three operating rooms.

P.S. Velusamy, Chairman, SSM Group as the chief guest, inaugurated the new building and the Guest of Honour was Dr. J. Kumar, Vice-Chancellor, Madurai Kamaraj University.



Aravind-Tirunelveli is undergoing a major expansion and the new facility is nearing completion in the hospital premises. It will house four general ophthalmology units, Contact Lens, four speciality clinics (Paediatric Ophthalmology, Cataract and IOL, Vision Rehabilitation, Orbit and Oculoplasty) and 17 operating rooms spread across two floors.



### New clinics for specialised care

Clinics dedicated to the care of myopia patients were opened at Aravind-Coimbatore and Madurai in collaboration with Zeiss on 27th June and 1st October 2022, respectively. These are equipped with state-of-the-art investigation facilities and offer specialised lenses and treatments as well as counselling for lifestyle modification, to slow down the progression of myopia.

In association with BYNOCS Pvt Ltd, Aravind-Coimbatore opened an exclusive Amblyopia and Binocular Vision Clinic on 22nd October 2022 to cater to older children and adults. The clinic provides treatment to improve binocular vision and stereo acuity especially for patients in whom traditional patching did not yield desired results.



## Project to Enhance Eye Care Service Delivery

### Free surgical care for post-traumatic orbital fractures

August 2019-2023

Aravind-Chennai provided free surgical care for 15 persons with post traumatic orbital fractures which can be vision threatening.

### Eye oncology treatment centre

2022-2027

Aravind-Chennai plans to establish an eye oncology treatment centre for patients suffering from retinoblastoma and ocular deformities due to trauma and cancer.

### Improving paediatric eye care delivery

April 2021-March 2024

Aravind-Tirunelveli's two year project supported by Seva Foundation, USA, aims to improve paediatric eye care services and make it holistic by screening siblings of children with heritable disorders. Between April 2022 and March 2023, the team identified 6,239 probands (refers to the first person in a family to be enrolled for the study) and 7,071 siblings for screening. Of this, 4,008 children attended screening at Aravind-Tirunelveli. Through this screening initiative, 1,481 (37%) siblings were found to have ocular problems. Spectacles were given to 554 siblings. A total of 117 siblings underwent surgery through the project.

## Prevention of blindness due to corneal ulcers

July 2022-June 2024

Aravind-Tirunelveli has embarked on a project to prevent blindness due to corneal ulcers / injuries amongst agricultural labourers. It hopes to achieve this through awareness creation, early identification of the disease, providing prompt treatment and sensitising the people on the adverse effects of using traditional home remedies. The project focuses on thirteen villages in Sankarankovil and Tenkasi. Awareness meetings were organised in the community in which more than 300 people participated.

### Enhancing early glaucoma detection through family screening to reduce glaucoma-related blindness

April 2019-December 2023

Since genetic factors play a key role in all major forms of glaucoma, a project to screen the first degree relatives of patients with glaucoma for early detection was launched. Supported by Standard Chartered Bank - Global Business Services, the project is implemented at Aravind Eye Hospitals in Madurai, Tirunelveli, Coimbatore, Pondicherry and Chennai. As part of this project, automated short text messages are sent to first-degree relatives of glaucoma patients motivating them to come for screening. During April 2022 to March 2023, messages were sent to 26,112 first-degree relatives of 12,585 glaucoma patients. 11,492 relatives visited Aravind Eye Hospitals; among them, 586 were found to have glaucoma and another 2,132 were identified as glaucoma suspects and are under observation or advised for further evaluation.

*A student being given free spectacles at a school children eye screening camp organised by Aravind-Theni*



*Family screening camp for early identification of glaucoma*



## Providing optimal care for economically disadvantaged people with ocular trauma

October 2018-December 2023

Supported by Standard Chartered Bank - Scope, the project aims at supporting 600 patients belonging to low socioeconomic status with ocular trauma over a period of three years. 122 patients with ocular trauma benefitted from the project. The project supported a total of 978 patients, well over the set target of 600.

## Evaluation of artificial intelligence in a large RoP tele-screening programme in South India with additional evaluation of lower-cost camera systems

October 2020-December 2022

To address the growing need for screening for retinopathy of prematurity (RoP), Aravind-Coimbatore, with support from Seva Foundation, USA, is validating artificial intelligence (AI)-assisted RoP screening on multiple lower-cost camera systems, so that other health systems can implement AI-assisted RoP screening with lesser capital investment. The two-

year project ended in December 2022. As part of the project, a prospective evaluation of AI-assisted RoP screening using Retcam was done. Pilot evaluation of AI-assisted RoP screening showed a potential to reduce the number of tele-readings by 61%, thus reducing a sizable amount of physician grading time. The project evaluated diagnostic performance of lower-cost camera systems (compared to human graders), and performed preliminary evaluation of the diagnostic performance of AI on these images.

## Vision for All

June 2022-May 2024

- With support from Aravind Eye Foundation, Aravind Eye Hospital, Theni has implemented a project in June 2022 to provide comprehensive eye care services to all, to eliminate needless blindness in Theni district and make it a model of “Best Eye Care Zone” in the state of Tamil Nadu. As part of this, free eye screening camps were organised to reach the unreached.
- School children screening camps screened 23,888 students and dispensed 970 spectacles.



RoP is the abnormal growth of blood vessels in the retina of babies who are born prematurely or weigh less than 2Kgs at the time of birth. Lack of timely treatment results in the baby becoming blind for the rest of its life. All major centres of Aravind offer RoP screening in collaboration with neonatal intensive care units (NICUs) of private and government hospitals. Clinical team visits the NICUs to examine the babies and those who are suspected of having developed RoP are referred to the base hospital. In the past year, Aravind centres together screened 18,293 babies of which 3,672 were diagnosed to have RoP. Furthermore, they conduct awareness sessions for paediatricians, general ophthalmologists, neonatologists and other health professionals as their co-operation and understanding of the disease is essential for referring the patients.



## Observing special days to create eye care awareness



World Diabetes Day, Aravind-Chennai



World Glaucoma Week, Aravind-Salem



World Optometry Week, Aravind-Tirunelveli



Myopia Awareness Week, Aravind-Pondicherry



Retinoblastoma Awareness Week...

Aravind-Madurai



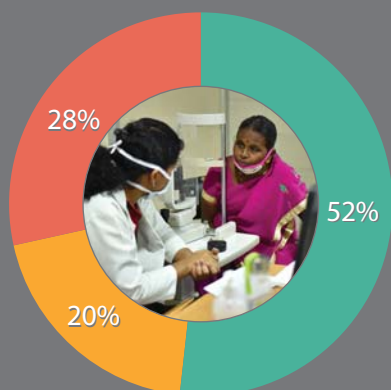
Aravind-Coimbatore



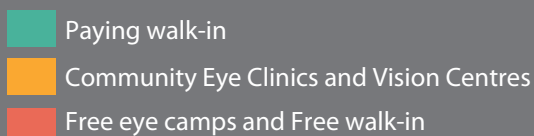


### Out-Patient Visits

<b>HOSPITALS</b>	
Paying Sections	2,981,752
Free Sections	1,038,672
<b>OUTREACH</b>	
Screening camps	600,755
Vision Centres	929,098
Community Eye Clinics/ City Centres	210,879
<u>Total Out-Patient Visits Handled</u>	<u>5,761,156</u>



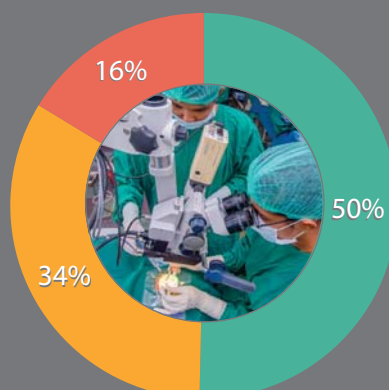
OUT-PATIENT VISITS (2022 - 2023)  
5,761,156



## PERFORMANCE APRIL 2022 - MARCH 2023

	Total	Madurai
<b>OUT-PATIENT VISITS</b>		
<b>HOSPITALS</b>		
Paying Sections	2,981,752	695,813
Free Sections	1,038,672	260,405
<b>OUTREACH</b>		
<b>SCREENING CAMPS</b>		
Comprehensive camps	399,420	102,628
Diabetic Retinopathy screening camps	26,528	9,624
Workplace refraction camps	58,189	6,605
School children examined by Aravind staff*	70,919	4,499
Paediatric eye screening	11,166	-
Mobile van refraction camps	16,240	-
RoP-No. of babies screened in NICUs	18,293	2,144
TOTAL FROM SCREENING CAMPS*	600,755	125,500
VISION CENTRES	929,098	314,024
COMMUNITY EYE CLINICS & CITY CENTRES	210,879	116,290
<b>TOTAL OUT-PATIENT VISITS</b>	<b>5,761,156</b>	<b>1,512,032</b>
<b>SURGERIES, LASER PROCEDURES &amp; INJECTIONS</b>		
Paying Sections	354,676	97,164
Subsidised (walk-ins to the free hospital)	235,118	62,687
Free (through screening camps)	114,584	33,671
<b>TOTAL SURGERIES</b>	<b>704,378</b>	<b>1,93,522</b>

\*While Aravind team screened 70,919 school children, an additional 257,860 children



SURGERIES (2022 - 2023)  
Include laser procedures and injections  
704,378



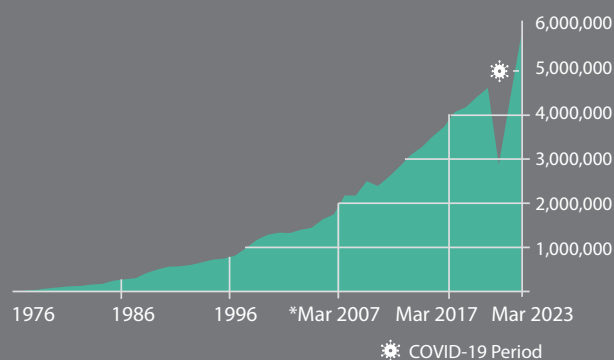
Dindigul	Theni	Tirunelveli	Tuticorin	Kovilpatti	Coimbatore	Tirupur	Udumalpet	CBE CC	Pondicherry	Salem	Chennai	Tirupati
103,228	106,993	3,62,197	67,700	33,863	410,337	60,377	53,135	51,626	316,387	143,418	407,708	168,970
-	36,179	84,829	17,656	10,149	134,406	24,568	26,297	-	111,144	52,696	124,059	156,284
-	16,353	50,096	4,741	-	73,294	4,676	2,535	-	69,460	19,249	37,276	19,112
-	3,010	633	-	-	9,459	-	-	-	2,614	1,024	164	-
-	5,088	9,745	-	-	14,553	309	1,324	-	5,785	6,308	7,720	752
-	2,910	2,264	-	-	39,162	160	-	-	10,803	3,244	5,588	2,289
-	337	-	-	-	2,944	-	-	-	6,925	-	-	960
-	215	-	-	-	7,778	-	-	-	-	8,247	-	-
-	2,524	2,004	-	-	9,081	-	-	-	971	-	1,289	280
-	30,437	64,742	4,741	-	1,56,271	5,145	3,859	-	96,558	38,072	52,037	23,393
-	75,980	187,588	-	-	72,239	17,815	24,466	-	172,509	42,197	22,280	-
-	28,865	33,682	-	-	-	-	-	-	32,042	-	-	-
103,228	278,454	733,038	90,097	44,012	773,253	107,905	107,757	51,626	728,640	276,383	606,084	348,647
6,837	10,499	44,792	4,033	1,630	56,380	3,881	4,615	4,525	41,535	16,477	47,703	14,605
2,586	5,679	21,077	2,695	1,728	31,896	4,078	6,559	-	27,526	12,402	25,053	31,152
-	2,267	12,332	626	-	25,275	824	539	-	20,310	5,269	8,210	5,261
9,423	18,445	78,201	7,354	3,358	113,551	8,783	11,713	4,525	89,371	34,148	80,966	51,018

were screened by teachers/vision screeners and found to be normal. This takes the total outreach screening to 858,615.

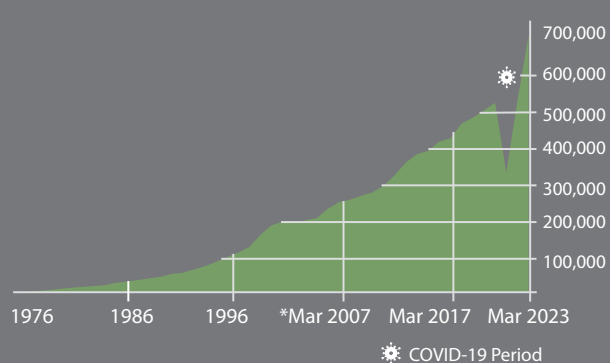
## Growth in Out-patient visits and surgeries since inception in 1976

Since inception, Aravind Eye Hospitals have handled over 77.8 million out-patient visits and performed over 8.7 million surgeries.

OUT-PATIENT VISITS

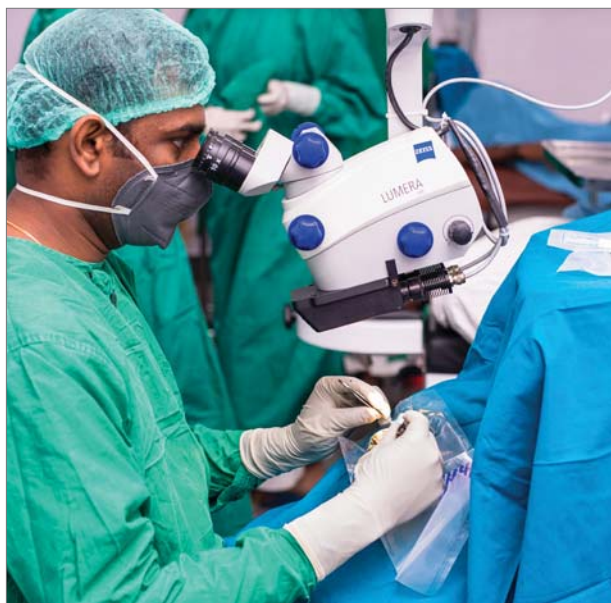


SURGERIES



\* From year 2007, the statistics is for the financial year, April to March





## SURGERIES

	Total	Madurai
Cataract surgeries	<b>4,50,719</b>	119,652
Trab and combined procedures	<b>11,535</b>	1,675
Retina and Vitreous surgeries	<b>18,844</b>	7,926
Squint correction	<b>2,660</b>	795
Keratoplasty (Incl. Graft procedures, Keratomies, DSAEK)	<b>2,205</b>	716
Pterygium surgery	<b>9,703</b>	2,985
Ocular injuries	<b>1,872</b>	440
Lacrimal surgeries	<b>5,861</b>	2,748
Orbit and Oculoplasty surgeries	<b>11,408</b>	4,733
Refractive laser procedures	<b>10,151</b>	2,248
Retinal laser procedures	<b>60,348</b>	13,414
YAG laser procedures	<b>59,442</b>	19,361
Intravitreal injections (Anti VEGF & Steroids)	<b>42,831</b>	11,429
Other surgeries, Laser procedures & Injections	16,799	5,400
<b>TOTAL SURGERIES</b>	<b>704,378</b>	<b>193,522</b>

- At the refraction camps conducted for rural people, 215 people were screened and 40 spectacles were dispensed.
- In collaboration with the district primary health centres (PHCs), eye screening camps for diabetes patients were arranged. The team screened 2,758 diabetes patients of which 113 people were newly identified with diabetic retinopathy.
- 106 RoP screening camps were conducted at the government and private hospitals through which 2,112 babies were screened. 56 babies were referred to the base hospital. Eight babies received laser treatment and 18 babies were given injections.

- On the occasion of World Glaucoma Week, 732 glaucoma patients and their family members were screened at the base hospital, community centre and vision centres. Among them, 112 patients were referred to Aravind-Theni for further investigations.

## Improving adherence to follow up in children with glaucoma in South India

August 2019 - June 2022

Supported by USAID child blindness programme, the three-year project aimed to improve the management of childhood glaucoma by understanding the context of the caregivers of children with the disease.

*Awareness programme for children with glaucoma and their caregivers at Aravind- Madurai*



Dindigul	Theni	Tirunelveli	Tuticorin	Kovilpatti	Coimbatore	Tirupur	Udumalpet	CBE CC	Pondicherry	Salem	Chennai	Tirupati
7,466	13,035	45,725	6,364	2,843	65,554	7,694	10,715	3,060	58,893	26,411	47,935	35,372
-	22	1,596	5	-	5,732	16	-	33	1,065	109	778	504
-	1	2,393	-	-	1,340	-	-	-	3,045	588	2,337	1,214
-	-	294	-	-	994	-	-	-	187	-	224	166
-	-	227	-	-	515	-	-	-	382	40	225	100
79	321	700	-	14	1,149	198	-	65	871	397	1,341	1,583
9	-	178	-	-	383	-	-	-	330	68	324	140
-	35	564	-	-	884	-	-	-	814	3	508	305
30	82	850	-	19	2,513	35	21	86	1,029	87	1,438	485
-	-	1,044	-	-	1,732	-	-	-	1,815	248	2,485	579
-	2,085	9,298	-	-	12,493	-	-	455	7,863	1,620	9,639	3,481
1,765	1,670	7,942	883	475	6,430	687	870	492	5,875	2,425	7,411	3,156
-	1,131	4,332	-	-	10,017	-	-	323	5,884	1,412	5,363	2,940
74	63	3,058	102	7	3,815	153	107	11	1,318	740	958	993
9,423	18,445	78,201	7,354	3,358	113,551	8,783	11,713	4,525	89,371	34,148	80,966	51,018

A total of 188 caregivers of children diagnosed with childhood glaucoma, in and around 10 districts of Madurai were selected. Of this, 161 caregivers could be traced with the details given and home visits were conducted with a detailed questionnaire for the caregivers of children who were adherent and non-adherent to treatment. Out of these, 147 caregivers of children with progressive glaucoma attended Aravind-Madurai for treatment and follow up. Through this programme, anti-glaucoma medications were prescribed to 124 children; glasses were prescribed for 65, and 49 children underwent surgery; low vision assessment and support were given for 57 children. An awareness programme for children and their caregivers was conducted on 2nd April 2022 at LAICO in which 40 children and their caregivers took part.

### Impacting quality of life in women through presbyopia correction

March 2019 - December 2022

Funded by Standard Chartered Bank-Scope, the project implemented by Aravind-Coimbatore aimed to screen 25,000 women for presbyopia correction at their workplace. Between April 2022 and March 2023, a total of 7,305 women were screened through 55 camps and 2,088 women received free spectacles.

### A step further in childhood cataract: Screening, evaluation, management, rehabilitation and training- Focus to eliminate childhood blindness due to cataract in South India

August 2021 - April 2023

Supported by USAID, Aravind-Coimbatore implemented the project with an aim to eliminate childhood blindness due to cataract in south India. The project aimed to train 1,385 paediatric health care providers and school teachers to screen 700,000 children for early identification, timely referral, evaluation and surgery as well as to improve surgical competency of paediatric ophthalmologists and educate general ophthalmologists on follow up and rehabilitation. When the project was completed in March 2023, 1,914 health care workers had received training and together they had screened 868,936 children.

### Patient care excellence workshop

Aravind-Chennai and Novartis Healthcare Pvt. Ltd jointly organised the workshop on 27 -28 July 2022, to come up with ideas to address the operational challenges which directly or indirectly affect patient care service. A total of 19 managers from across the Aravind centres took part. Four trainers from Novartis moderated the sessions. Topics such as enhancing patient experience, creating a learning and research ecosystem and leveraging technology were explored.



## Community Outreach

2022-2023 was a productive year for Aravind's outreach initiatives. Complete relaxation of COVID restrictions made it possible to resume free eye camps in a full-fledged manner. All centres achieved record performance. For the very first time, cataract surgeries through camps crossed 110,000.

During the year from April 2022- March 2023, Aravind's outreach eye camps screened 600,755 patients. A total of 114,584 patients underwent surgery for cataract and other conditions.

## New developments

Electronic medical records were introduced for camp admissions to make the process efficient and hassle-free. Efforts were taken to strengthen screening for speciality eye diseases and their diagnosis through camps and to improve referral and compliance to treatment.

Aravind-Salem opened an accommodation facility for its camp patients on 27th July 2022. The new facility has capacity to accommodate 300 patients.

## Sponsors' day

Every two years, Aravind Eye Hospitals organise Sponsors' Day to acknowledge the unstinting support given by the community sponsors towards the smooth conduct of free eye screening camps. Aravind-Chennai organised its very first Sponsors' Day on 15th October 2022 with 182 sponsors attending the event.

Aravind Eye Hospitals at Coimbatore and Pondicherry organised the event on 18th December 2022 and both the events received overwhelming response. At Aravind-Pondicherry over 380 people attended and at Aravind-Coimbatore, 353 sponsors took part. Aravind-

*Dr. G. Natchiar inaugurating the new accommodation facility for camp patients at Aravind-Salem*



Salem organised Sponsors' Day on 5th February 2023 and 71 sponsors took part.

## Outreach annual planning meet

Annual planning meet of the outreach departments across the Aravind centres was held at Aravind-Chennai on 6-7 January 2023. Camp medical officers, managers, camp organisers and admin assistants from all centres took part. The team discussed previous year's camp performance and planned activities for 2023. They also discussed the need to focus on speciality eye conditions through outreach.

## Eye screening camp at Madras High Court

Aravind Eye Hospital, Chennai conducted an eye camp for the advocates and staff of Madras High Court on 11th August 2022. Chief Justice Munishwar Nath Bhandari inaugurated the camp in the presence of V.R. Kamalanathan, President- Madras Bar Council Association and D. Srinivasan, Secretary-Madras Bar Council Association. A total of 504 people underwent eye screening of which 184 were advocates.

## Special honour on World Sight day

At the World Sight Day programme organised by Lions Club International Dt:318A, Thiruvananthapuram. A. Hemachandran, camp organiser, Aravind-Tirunelveli was honoured in appreciation of the role played by the hospital to provide eye care for the people of Kerala.

## Training programme

A half-day eye health education programme was organised for the field workers of DHAN Foundation who will in turn educate the community on the importance of proper eye care.

*Eye screening camp for the advocates and staff of Madras High Court*



## Outreach Performance

	Total	Madurai	Theni	Tirunelveli	Coimbatore	Pondicherry	Tirupur	Salem	Tuticorin	Udumalpet	Chennai	Tirupati
<b>FREE EYE CAMPS</b>												
<b>Comprehensive Eye Camps</b>												
Camps	<b>1,854</b>	394	89	297	342	255	23	107	32	25	170	120
Patients examined	<b>399,420</b>	1,02,628	16,353	50,096	73,294	69,460	4,676	19,249	4,741	2,535	37,276	19,112
Glasses prescribed	<b>84,630</b>	18,244	4,817	12,252	12,133	14,062	1,690	4,630	749	502	12,286	3,265
Glasses delivered	<b>72,990</b>	16,937	4,356	10,682	10,134	12,018	1,434	3,783	457	384	9,939	2,866
Glasses dispensed on the spot	<b>60,080</b>	15,087	3,434	8,613	9,242	10,490	976	2,487	292	232	7,656	1,571
<b>Diabetic Retinopathy Screening Camps</b>												
Camps	<b>256</b>	47	75	7	83	32	-	10	-	-	2	-
Patients examined	<b>26,528</b>	9,624	3,010	633	9,459	2,614	-	1,024	-	-	164	-
Diabetics screened	<b>15,911</b>	4,607	3,010	281	5,576	1,736	-	592	-	-	109	-
DR Patients screened	<b>2,071</b>	625	258	87	723	288	-	72	-	-	18	-
<b>Refraction Camps</b>												
Camps	<b>265</b>	25	20	47	56	34	2	38	-	4	34	5
Patients examined	<b>58,189</b>	6,605	5,088	9,745	14,553	5,785	309	6,308	-	1,324	7,720	752
Glasses prescribed	<b>20,634</b>	2,455	2,309	3,958	4,981	1,753	66	2,015	-	150	2,747	200
Glasses delivered	<b>17,979</b>	2,281	2,118	3,705	4,468	1,286	38	1,801	-	113	2,012	157
On the spot deliveries	<b>13,287</b>	1,981	1,953	2,857	2,674	985	30	1,533	-	36	1,148	90
<b>Refraction Camps by Mobile Unit</b>												
Camps	<b>154</b>	-	4	-	59	-	-	91	-	-	-	-
Patients examined	<b>16,240</b>	-	215	-	7,778	-	-	8,247	-	-	-	-
Glasses prescribed	<b>4,754</b>	-	41	-	2,552	-	-	2,161	-	-	-	-
Glasses delivered	<b>3,995</b>	-	40	-	2,244	-	-	1,711	-	-	-	-
<b>Eye Screening of School Children-Base Hospital</b>												
Schools served	<b>368</b>	66	18	24	112	46	1	37	-	-	20	44
Camps	<b>317</b>	48	18	24	101	46	1	29	-	-	23	27
Teachers trained	<b>785</b>	2	-	66	-	75	-	-	-	-	600	42
Total children in school	<b>3,28,779</b>	43,115	23,888	37,229	82,365	48,747	189	47,659	-	-	23,846	21,741
Children screened by oph.	<b>70,919</b>	4,499	2,910	2,264	39,162	10,803	160	3,244	-	-	5,588	2,289
Children received glasses	<b>13,454</b>	2,220	973	1,334	3,070	2,540	5	1,745	-	-	766	801
Children identified with eye defects other than Refractive Error	<b>4,768</b>	654	245	324	1,033	1,558	2	554	-	-	184	214
<b>Paediatric Eye Screening Camps</b>												
Camps	<b>48</b>	-	1	-	11	25	-	-	-	-	-	11
Children examined	<b>11,166</b>	-	337	-	2,944	6,925	-	-	-	-	-	960
Refractive errors	<b>16</b>	-	8	-	5	-	-	-	-	-	-	3
Glasses prescribed	<b>12</b>	-	4	-	5	-	-	-	-	-	-	3
Glasses delivered	<b>12</b>	-	4	-	5	-	-	-	-	-	-	3
Other defects identified	<b>687</b>	-	7	-	28	621	-	-	-	-	-	31
<b>RoP Screening</b>												
Screening visits	<b>2,729</b>	484	125	313	1,420	128	-	-	-	-	232	27
Babies screened	<b>18,293</b>	2,144	2,524	2,004	9,081	971	-	-	-	-	1,289	280
Babies with RoP	<b>3,672</b>	299	211	283	2,569	184	-	-	-	-	125	1
RoP Babies treated	<b>402</b>	77	24	122	114	21	-	-	-	-	43	1
<b>VISION CENTRES</b>												
Centres	<b>107</b>	36	7	18	8	17	3	8	-	3	7	-
New + Review	<b>929,098</b>	314,024	75,980	187,588	72,239	172,509	17,815	42,197	-	24,466	22,280	-
Out-patients / day	<b>29</b>	28	35	34	29	36	28	18	-	26	11	-
<b>COMMUNITY EYE CLINICS AND CITY CENTRES</b>												
Centres	<b>6</b>	3	1	1	-	1	-	-	-	-	-	-
New + Review	<b>210,879</b>	116,290	28,865	33,682	-	32,042	-	-	-	-	-	-
Outpatients / day	<b>113</b>	125	93	109	-	103	-	-	-	-	-	-



## Vision Centres

As of March 2023, Aravind had a network of 105 vision centres across Tamil Nadu and Pondicherry. Through rigorous monitoring mechanisms and technology upgrade, the focus is on constant improvement of efficiency and quality of eye care delivery.

During April 2022 - March 2023, Aravind vision centres together handled 929,098 out-patient visits, registering a 29% growth over the last year.

Aravind is now part of the ECHO India programme, using the ECHO platform to conduct regular online learning sessions. Over the past year, 28 ECHO sessions have been conducted for the practicing vision technicians at Aravind's 100+ vision centres, to improve clinical knowledge and impart specific clinical skills. These sessions are moderated by subject matter experts and include case presentations and discussions by the vision centre staff, on topics varying from corneal diseases to patient communication.

In addition, a three-day CME for the staff of all the 105 vision centres of Aravind was arranged from 10 - 12 March 2023. A total of 190 staff took part. The CME consisted of clinical sessions, skill assessments,



*At the CME for the staff of Aravind vision centres*

orientation to soft skills and entertainment activities. Winners of the various competitions were awarded prizes. Skill assessment was done in objective structured clinical examination (OSCE) mode where more than 30 doctors from Aravind-Madurai were involved as resource persons under the guidance of Dr. Kowsalya, In-charge Medical Officer - vision centres as well as Dr. Balaji and Dr. Sivadharshan.

*At the vision centres CME*





### New vision centres

During the year April 2022 to March 2023, Aravind opened seven vision centres across Tamil Nadu and Pondicherry.

1. Tisayanvillai, (June 27)
2. Konganapuram, (July 13)
3. Alangudi, (August 3)
4. Arakandanallur, (September 7)
5. Mudichur, (December 21)
6. Vikravandi, (March 17)
7. Koduvai, (March 23)

### Support for scaling up of vision centres, beyond Aravind

Aravind's primary eye care delivery through vision centres has become a much sought-after model towards ensuring universal coverage in eye health. It has been working with the Govt. of Bangladesh's National Institute of Ophthalmology in setting up vision centres across the country. A total of 135 vision centres were thus established all over the country of which the latest 45 were officially inaugurated by Sheikh Hasina, Prime Minister of Bangladesh on 10th January 2023.

In the last year, Aravind offered vision centre technician training to three persons from Shiva Veerakshi Eye Hospital and Laser Centre, Hosur, Karnataka.



### Eye care awareness creation amongst rural communities

Vision centres frequently organise sessions to create eye care awareness among rural communities. Field workers brief the community about general eye care, create awareness on the facilities available at vision centres and prompt them to seek treatment in case of any eye problem. Such awareness creation programmes were held in several villages adjoining the vision centres.

*Field worker creating awareness on eye care at a village near Elumalai*





## Aravind Integrated Eye Bank Services (AIEBS)

Through awareness programmes and strong networking with NGOs and hospitals, the number of corneas collected has increased to be at par with pre-covid times. Over 56% of the corneal tissues collected last year were through community cornea retrieval programme. The remaining 44% were through the hospital cornea retrieval programme. Eye banks have been closely working with 13 government hospitals in Tamil Nadu and two hospitals in Pondicherry for cornea retrieval. In the last year, three more government hospitals in Vellore, Kanyakumari and Cuddalore were added to the hospital cornea retrieval network. Beyond use within Aravind, AIEBS has distributed corneas, sclera and amniotic membrane to 54 institutions.

### Training

Rotary Aravind International Eye Bank (RAIEB), Aravind-Madurai offered training to seven eye bank technicians, an eye donation counsellor and a co-ordinator.

### Awareness creation

AIEBS regularly organises awareness programmes with support from volunteers, educational institutions, Lions and Rotary clubs and hospitals.

37th National Eye Donation Fortnight was observed from 25th August to 8th September 2022 with a variety of programmes intended to sensitise public on the importance of eye donation and seek their support.

### Statistics

Centre	Eyes Collected	Eyes utilised in Aravind	Sent to other institutions
Madurai	2,726	1064	110
Coimbatore	780	532	16
Tirunelveli	678	249	29
Pondicherry	767	332	24
Chennai	72	62	0
Total	5,023	2,239	179

## Observing Eye Donation Fortnight

Aravind-Madurai



Aravind-Tirunelveli



Aravind-Tirupati



Aravind-Chennai



*Towards its mission of eliminating needless blindness, Aravind places great emphasis on educating and training ophthalmic personnel of all cadres - from postgraduation in ophthalmology courses for doctors to customised course in maintaining ophthalmic equipment for technicians. In the past year, a total of 601 candidates attended various training programmes offered by Aravind.*



## Education and Training



*Aravind offers continuing medical education programmes on varied topics in ophthalmology.*

## **Continuing medical education (CME) programmes organised by Aravind**

### **Paediatric ophthalmology update**

Kancheepuram, 12<sup>th</sup> April 2022

Aravind Eye Hospital, Chennai, in association with Indian Medical Association (IMA) and Indian Academy of Paediatrics (IAP), Kancheepuram district conducted the programme. Discussions revolved on retinopathy of prematurity, paediatric cataract, recent advances in paediatric ophthalmology and approach to common eye problems in children.

### **Workshop on sterilisation and aseptic techniques for ophthalmic operation theatre**

Aravind-Madurai, May – July 2022

Under the aegis of Tamil Nadu State Blindness Control Society & National Health Mission, Govt of Tamil Nadu, Aravind-Madurai organised a series of workshops to enhance and standardise the process and systems for sterilisation and asepsis techniques across the eye departments of the Tamil Nadu Government hospitals. These consisted of two parts: full-fledged, in-depth and hands-on workshops for the Tamil Nadu Government ophthalmic nurses and OT assistants; and a one-day CME for the government ophthalmologists and district administrative officers. A total of 65 nurses attended the



*At the Paediatric ophthalmology update*

workshops held in four batches during May-July 2022 and 41 doctors attended the one-day CME.

The seven-day workshop was a combination of didactic lectures, observation and hands-on training. All aspects of sterilisation and aseptic practices and protocols followed in an ophthalmic operation theatre were covered.

### **Glaucoma stalwarts speak**

Aravind – Chennai, 24<sup>th</sup> July 2022

The CME hosted by Aravind-Chennai had eminent glaucoma specialists from both external institutions and Aravind, sharing their insights on various topics such as childhood glaucoma, complications of tube surgeries, selective laser trabeculoplasty, and Cyclo G6. The CME had several case discussions led by glaucoma fellows of Aravind as well as postgraduate students from other

*Participants at the Workshop on sterilisation and aseptic techniques for ophthalmic operation theatre*







*A participant receiving certificate at the Glaucoma stalwarts speak CME*

institutions. Additionally quiz was also organised during the CME, and the winners were awarded.

### **CME on diagnostic skill transfer course**

Aravind-Pondicherry, 28<sup>th</sup> August 2022

The one day workshop was organised for the ophthalmic residents of various medical colleges. It focused on teaching the practical interpretation of various diagnostic tests and demonstrations. A grand quiz was conducted and prizes were distributed to the winners. A total of 79 residents took part.

*At the 2<sup>nd</sup> National Annual Conference of the Association of Indian Ophthalmic Anaesthesiologists*

## **2<sup>nd</sup> National Annual Conference of the Association of Indian Ophthalmic Anaesthesiologists**

Aravind-Madurai, 24-25 September 2022

Aravind-Madurai hosted the 2<sup>nd</sup> National Annual Conference of the Association of Indian Ophthalmic Anaesthesiologists (AIOA). A total of 142 participants including anaesthesiologists, ophthalmologists, and postgraduates from both specialities took part. The President and General Secretary of AIOA - Dr. S.C. Parakh and Dr. V.V. Jaichandran respectively; Dr. A. Ravichandar, Organising Secretary of the conference and Dr. P. Namperumalsamy, Chairman Emeritus, Aravind Eye Care System inaugurated the conference. The first AIOA Annual Oration was delivered virtually by Dr. Chandra M. Kumar, Visiting Consultant, Newcastle University Medical School, Malaysia, on the topic, *Ocular Hypotonia – anaesthetic implications*.

Scientific deliberations included lectures by eminent guest faculty, live demonstration on ophthalmic blocks, panel discussions and hands-on sessions. There were about 10 free paper presentations and the best two were awarded.







*Participants of Writathon 2022*

## **Writathon 2022**

Aravind-Pondicherry, 14-16 October 2022

Writathon is a 48-hour activity designed for doctors, who will be temporarily freed from their clinical duties, to focus on and produce research articles. At the writathon organised at Aravind-Pondicherry, a total of 32 doctors participated. By the end of the event, the team submitted nine papers to reputed journals for publication.

## **Scleral-fixated intraocular lens skill transfer course**

Aravind-Pondicherry, 8<sup>th</sup> October 2022

Aravind-Pondicherry conducted the course for the medical officers of the Cataract and IOL Services across Aravind Eye Hospitals. A total of 20 medical officers took part. 3D live video surgery was arranged to

demonstrate the novel techniques. Wet lab practice and hands-on sessions were also arranged.

## **Surgical skill transfer course**

Aravind-Pondicherry, 27<sup>th</sup> November 2022

Aravind-Pondicherry organised the course to refine surgical skills of ophthalmologists. Surgeries were screened in 3D to help participants understand the various concepts. Participants were divided into groups and each group took up a topic for discussion such as, phacoemulsification, small incision cataract surgery, dacryocystorhinostomy and lid repair, trabeculectomy, pterygium and corneal tear repair. Wet lab practice was also arranged.

## **Dry lab for postgraduates**

Aravind-Coimbatore, 7-8 January 2023

A total of 122 postgraduates from 32 institutions in Tamil Nadu, Kerala and Karnataka attended the CME

*3D live video surgery demonstration to the participants of Scleral-fixated intraocular lens skill transfer course*



*Participants at the Dry lab for postgraduates CME*





*Workshop on simulator-based training in manual small incision cataract surgery*

organised by Aravind-Coimbatore. Participants were divided into 12 groups and rotated to 12 stations, each demonstrating various diagnostic procedures. A quiz was conducted at the end including all topics and the top five performers were awarded.

#### **Hackathon 4.0**

Aravind-Pondicherry, 6-8 January 2023

Hackathon is a sprint-style event in which people from different disciplines come together to work on a problem statement, for 24-72 hours to derive a working solution. At the Hackathon 4.0 hosted by Aravind-Pondicherry, 13 problem statements short-listed out of 96 entries received. A total of 13 teams comprising doctors from Aravind and engineering students from Vellore Institute of Technology (VIT) worked on these problem statements and came up with innovative

solutions. A 3D printer was made available to create the prototypes. The teams received support from Aurolab, Alphaleus, Remedio as well as from the Instrument Maintenance and Housekeeping departments. Twelve teams were able to formulate prototypes. Cash prizes were awarded to the best three innovations.

#### **Workshop on simulator-based training in manual small incision cataract surgery**

Aravind-Madurai, 21-22 January 2023

Cataract Services of Aravind Eye Hospital, Madurai organised the workshop which included lectures, complex case handling video sessions and hands-on practice on the simulator. A total of 39 participants from various medical colleges took part. Sessions were moderated by faculty from Cataract Services and HelpMeSee.

#### **Introductory workshop on improvement models**

17<sup>th</sup> February 2023

The one-day workshop held at Sharanam, Pondicherry, introduced examples of how 'lean six sigma' can be applied in healthcare setups, with a particular emphasis on the improvement story presented by Dr. Alan Wagner from the Wagner Kapoor Institute, Virginia, USA. Retina and glaucoma consultants, senior leaders, and managers from all the Aravind centres attended the workshop. Dr. Wagner's presentation detailed how his institute has adopted lean six sigma methods to improve the efficiency of its care delivery processes.

*Participants at Hackathon 4.0*







*Dr. Alan Wagner addressing the participants at the Introductory workshop on improvement models*

The workshop also introduced the participants to the 'Model for Improvement' framework and kaizen practices.

### **Workshop on care and maintenance of ophthalmic instruments and equipment**

Aravind-Tirupati, 18<sup>th</sup> March 2023

The Biomedical Engineering Team of Aravind-Tirupati organised the workshop in which a total of 89 participants including ophthalmologists, OT technicians, ophthalmic technicians, ophthalmic assistants and biomedical technicians from in and around Andhra Pradesh and Telangana took part. About 20 faulty equipment brought in by the participants were repaired free of cost during the workshop.

*Participants at the workshop on care and maintenance of ophthalmic instruments and equipment*



During the workshop, a book titled, "Handbook on Ophthalmic Instruments and Equipment Maintenance" developed by the biomedical engineering team of Aravind-Madurai was launched by Dr. Srihari, Former President, Andhra Pradesh Ophthalmic Association. The book serves as a good resource material for mid-level ophthalmic personnel training.

### **Webinars organised during April 2022 to March 2023**

- C.A.A.R.E - Cornea Aravind Alumni Refresher E- Meet, Aravind-Coimbatore, 10<sup>th</sup> April 2022
- IOL formulas and biometry in difficult situations, Aravind-Coimbatore, 17<sup>th</sup> April 2022
- Fight against the mighty white – Multiple facets of retinoblastoma, Aravind-Madurai, 11<sup>th</sup> May 2022
- Refresh your basics in neuro -ophthalmology, Aravind-Madurai, 18<sup>th</sup> May 2022
- Smartphone applications in ophthalmology, Aravind-Salem, 27<sup>th</sup> April 2022
- Demystifying leadership, Aravind-Salem, 24<sup>th</sup> June and 1<sup>st</sup> July 2022
- Kera- ectasia- uncensored, Aravind- Tirunelveli, 17<sup>th</sup> July 2022
- Soft contact lenses and sclerallenses, Aravind-Coimbatore, 28<sup>th</sup> August 2022
- A-Z of optic disc, Aravind-Tirunelveli, 9<sup>th</sup> October 2022

*Release of the book, Handbook on Ophthalmic Instruments and Maintenance*



Dr. Usha Kim moderating the debate



Participants of Writathon with the facilitators

## Library Week

Aravind Library and Information Centre, Madurai observed Library Week from 7-25 January 2023. As part of this initiative, the library conducted an annual three-day event called Writathon, specifically designed for doctors. The event encompassed a range of engaging activities, including a photo quiz featuring clinical images, motivational talks, an online skill test, a treasure hunt, a quiz programme and a debate on "Google Vs Librarian." The event concluded with a prize distribution ceremony to honour all the winners."

## Conferences attended elsewhere

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

Denver, Colorado, USA, 1-4 May 2022

Dr. VIRNA SHAH, Dr. V.R. SARAVANAN and Dr. KARTHIK KUMAR

Neuro-ophthalmology & Retina Departments of Aravind-Coimbatore in collaboration with Vanderbilt University Medical Center, Nashville, Tennessee.

- Assessing vessel density variability in OCT A scans as a means of differentiating papilledema from pseudo papilledema (Poster)

### National Conference on Biotechnology and OMICS Sciences

Karaikudi, 27-28 May 2022

Prof. K. DHARMALINGAM

- Genotype to phenotype: A bridge too far (Keynote address)

Dr. J. JEYA MAHESWARI

- Proteomics in fungal keratitis research: A road map to personalised treatment (Invited talk)

Dr. A. VANNIARAJAN

- Omics to precision medicine in eye cancers (Invited talk)

K. SARASWATHI

- Recurrent alterations of NF- $\kappa$ B pathway in ocular lymphoma (Oral presentation)

PRAVEENKUMAR

- Human corneal miRNAs and their role in *Pseudomonas aeruginosa* keratitis (Poster)

Prof. K. Dharmalingam at the National Conference on Biotechnology & Omics Sciences







Thulasiraj Ravilla at the 105<sup>th</sup> Oxford Ophthalmological Congress

#### HANITHRAJ DEIVARAJAN

- Development of an ultrasensitive CRISPR-based diagnostic platform for point-of-care diagnosis of fungal keratitis (Poster)

Dr. C. Gowripriya and Dr. D. Bharanidharan participated in the conference as invited faculty.

#### 105<sup>th</sup> Oxford Ophthalmological Congress

Oxford, UK, 4-6 July 2022

#### THULASIRAJ RAVILLA

- Journey of Aravind Eye Hospital – some universal insights

#### Conference on Building Innovative Business Models to Improve Care for All

Hosted by SSM Health and Cambridge University – Judge Business School, Cambridge, UK, 11-13 July 2022

#### THULASIRAJ RAVILLA

- Building innovative business models to improve care for all: The Aravind model

#### Annual Meeting of the American Society of Retina Specialists

New York, USA, 16 July 2022

#### DR. NARESH BABU

- Retinal detachment associated with giant retinal tears in 2 stages using short-term tamponade with perfluorocarbon liquid against single stage vitrectomy

#### IAPB South East Asia Regional Meeting

Hyderabad, 20-22 July 2022

THULASIRAJ RAVILLA participated in the IAPB South East Asia Regional Meeting held at Hyderabad.

#### World Eye Bank Symposium

Hosted by Eye Bank Association of Australia and New Zealand, 21-22 July 2022

#### D. SARAVANAN

- Sustainability, maintenance and initiating new projects post COVID (virtual)

#### Global Ophthalmology Summit

Utah, USA, 11-13 August 2022

#### THULASIRAJ RAVILLA

- Aravind Eye Hospital: A case study for global ophthalmology
- Education programmes at Aravind – For India and globally

DR. P. VIJAYALAKSHMI offered a special tribute to Dr. Marilyn Miller (Virtual).

DR. R. KIM moderated the session on Global Eye Health: Technology, innovators, visionaries and gave talks on

- Disrupting healthcare delivery models – The Indian experience
- Beyond the hype: How AI can help in the fight against blindness in low-resource environments (Virtual)

DR. USHA KIM moderated the session on Global challenges of orbital and soft tissue disease and also spoke on Mucor in India (Virtual)

#### DR. VIRNA SHAH

- The challenges of providing neuro-ophthalmic care in low resource countries (Virtual)

#### EURETINA Congress

Hamburg, Germany, 1-4 September 2022

DR. NARESH BABU attended the conference as invited faculty.

#### DR. RENU P. RAJAN

- Effect of intra vitreal Methotrexate as an adjuvant in vitrectomy in cases of retinal detachment with proliferative vitreous retinopathy

#### DR. SARAVANAN

- Management of recurrent retinal detachment

#### 5th World ROP Conference

Dubai, 1-4 September 2022

#### DR. RENU P. RAJAN

- Stage 5 Retinopathy of prematurity: Clinico-demographic profile and outcomes of 25 gauge vitrectomy

#### DR. PRITHVI

- Smartphone gonioscopy (Paper)
- Logbook for a vitreo retinal fellow in ROP
- Frugal ophthalmic anterior and posterior ROP screening device (Video)
- Pediatric choroidal Neovascularisation etiology and treatment and outcomes with

antivascular endothelial growth factor (e-poster)

#### DR. PUJA MAITRA

- Telemedicine- An effective approach to address emerging public health problem of RoP-7 years data (Poster)
- The de facto cancer support group at patient waiting area (Video)

#### DR. PREMA

- Smart phone Vs wide field camera comparison for RoP telescreening (Poster)
- Clinical variant with unique mutation in RBI gene (Video)

#### DR. ABHISHEK

- Demographic profile of premature infants presenting with advantaged stages of RoP in south India: An analysis of 220 eyes (Poster)
- Congenital X-linked retinosis: Demographic profile, clinical features, natural course and surgical indications: Analysis of 70 eyes (Poster)

#### World Ophthalmology Congress (Virtual)

9-12 September 2022

#### DR. AVANI

- Ethambutol optic neuropathy in India with current ATT Regimen (Virtual)

Dr. Prithvi Chandrakanth at the World ROP Congress



## 28th Annual Meeting of the Indian Eye Research Group

Hyderabad, 10-11 September 2022

Prof. Dr. K. Dharmalingam, Director, AMRF chaired the D. Balasubramanian Oration Lecture.

Invited talks

### DR. C. GOWRI PRIYA

- Biology of adult ocular stem cells and their role in regenerative medicine

### DR. A. VANNIARAJAN

- Epigenetic alterations in retinoblastoma

Oral presentations

### ISWARYA RADHAKRISHNAN

- Trabecular meshwork stem cell derived exosomes enhance TM cell survival and proliferation

### HANITH RAJ DEIVARAJAN

- Development and validation of a novel CRISPR/Cas12a-based nucleic acid detection platform for the diagnosis of ocular fungal infections

Poster Presentations

### K. SARASWATHI

- Exome sequencing unveiled recurring mutations in NF- $\kappa$ B pathway in ocular b-cell lymphoma

### SUSMITA CHOWDHURY

- Analysis of microstructural changes in an x-linked juvenile retinoschisis patient harboring rs1 g668a mutation by en-face optical coherence tomography imaging

### SETHU NAGARAJANA

- Targeted modulation of e2f3 and kif14 in retinoblastoma



AMRF team at the 28<sup>th</sup> Annual Meeting of the Indian Eye Research Group

### SHREYA DINESH

- Understanding the role of miRNA in aspergillus flavus keratitis progression

### SWATHI CHADALAWADA

- Identification of potential blood miRNAs for diagnosis of intraocular tuberculosis

### NERETHIKA RAVICHANDRAN

- Separation of filtering and non-filtering region of human trabecular meshwork

### P. SARANYA

- Adult human anterior lens epithelial stem cells – changes during ageing and in cataract

### WASEEMA ARIFF

- Age-related changes in the functional characteristics of adult stem cells in human retinal pigment epithelium

### SWAGATA GHOSH

- In-vitro infection models of fungal and amoebic keratitis reveal host cell-type and pathogen specific features of host inflammatory response

### DAIPAYAN BANERJEE

- Deciphering the proteome signature of plasma extracellular vesicles from proliferative diabetic retinopathy patients

## 16<sup>th</sup> Annual National Conference of Vision 2020: The Right to Sight - India

Siliguri, 3-4 September 2022

Paper Presentations

### SANTHOSH GANESH

- Factors influencing non-adherence of follow-up in childhood glaucoma

### R. REGITHA

- Fighting retinoblastoma in the difficult period of COVID-19 pandemic: A retrospective study from a tertiary eye care centre

### D. SARAVANAN

- How eye banks in India can scale while maintaining focus on quality and become sustainable (Panel discussion)
- How not to lose money or burden the patient while growing our eye banks

### JEYAKOHILA

- Analysis of knowledge, attitude and practice of uveitis patients on immunosuppressive therapy

### R. VINOTH KUMAR

- Factors influencing the utilisation of eye care services in a rural district in south India

Aravind team at the 16<sup>th</sup> Annual National Conference of Vision 2020: The Right to Sight - India





**SYED ALI**

- Impact of an online collaborative approach on establishing and strengthening VCs

**VIGNESH**

- Medicolegal cases – Always a challenge – How to manage the right way

**UMAPRIYA**

- Going beyond borders to train the medical, paramedical & administrative staff of Nigeria to conquer blindness

**K. KALAIVENDAN**

- Novel outreach to screen ROP among preterm babies

**SUMATHY A**

- Uberisation of eye care

**JAYASHREE S**

- Aravind rural outreach by mobile application – AROMA

**VIKKY KUMAR M**

- Sharing knowledge repository: towards organisation's sustainability & growth

**G. JEYAKOHILA**

- Analysis of knowledge, attitude and practice of uveitis patients on immunosuppressive therapy

**DR. HARIPRIYA ARAVIND, JAYASREE, SURESH KUMAR, DHIVYA RAMASAMY AND A. MOHAMMED GOWTH** gave invited talks.

**World Cornea Congress**

Chicago, US, 28-29 September 2022

**DR. MANGALA**

- Deep stromal keratitis microsporidiosis, challenges in diagnosis and management
- Glycerol preserved cornea, an alternative during pandemic crisis in emergency keratoplasty

*Dr. Usha Kim and Dr. S.R. Rathinam with Dr. Suzanne Gilbert at the Annual Conference of American Academy of Ophthalmology*

**DR. REVATHI, DR. ARJUN**

- An analysis of long term efficacy upto 10 years after epi-off CXL in children with a sub group comparison of standard Vs accelerated methods (Original Paper)

**DR. REVATHI, DR. ARJUN, DR. PINKAL**

- An analysis of long term outcome after DALK in children with keratoconus

**DR. KALPANA NARENDHAN**

- Tips in acquired paediatric cataract

**DR. SANDRA GANESH**

- Early assessment, intervention and education for children with low vision (Video)

**Annual Conference of American Academy of Ophthalmology**

Chicago, USA, 30<sup>th</sup> September - 3<sup>rd</sup> October 2022

**DR. USHA KIM**

- COVID-19 - associated rhino-orbito-cerebral mucormycosis: A single centre experience of 264 patients

**DR. RATHINAM**

- Masquerading as the masquerade in the Uveitis clinic

**DR. MANGALA**

- MSICS - Advanced look at methods for delivering the nucleus (Instruction course)

**DR. REVATHI**

- Infective keratitis, therapeutic keratoplasty (Instruction course)

**DR. SANDRA GANESH**

- Low vision programme from around the world (Video)

**DR. KALPANA NARENDHAN**

- Surgical management of paediatric cataract

*Dr. Vedhanayaki at the Annual Conference of Uveitis Society of India*

**40<sup>th</sup> Congress of the European Society of Cataract & Refractive Surgeons**

Milan, Italy, 16-20 September 2022

**DR. R. SANKARANANDHAN**

- Retro pupillary iris suture fixation of IOLs

**5<sup>th</sup> Biennial RoP Update**

Cleveland, USA, 8<sup>th</sup> October 2022

**DR. PARAG K. SHAH**

- RoP in India (Virtual)

**South Asian Academy of Ophthalmology Conference (SAO International)**

Delhi, 9-12 October 2022

**DR. MANO AARTHI**

- Established & Emerging Risk Factors of Non- Arteritic AION (Free Paper)

**Annual Conference of Oculoplastic Association of India**

Mumbai, 11- 13 October 2022

**DR. JAYAGAYATHRI, DR. DAYAKAR YADALLA and DR. LINYA THOMAS**

- Warthins cyst of lacrimal sac- A common presentation, rare tumour

**DR. MANEKSHA**

- Lacrimal sac rhinosporidiosis: Clinical profile and Gram stain as a method of preoperative diagnosis
- Interesting cases of orbital foreign body

**DR. ASMA KHAN**

- Hooks: The little round mishaps (Free paper)

**DR. SAI DIVYA**

- A rare case of BCOR expressing Sarcoma in the orbit

**DR. VIJI RANGARAJAN**

- A bridge too far: A simple technique for management of extensive congenital upper eyelid colobomas (Best video)

**Annual Conference of Uveitis Society of India**

Hyderabad, 14-16 October 2022

**DR. S.R. RATHINAM**

- Anterior uveitis- challenging cases

**DR. ANJANA**

- A black spot in the visual field following COVID vaccination (e-poster)

**DR. RADHIKA**

- Small vessel vasculitis presenting as CRAO (e-poster)
- Bilateral choroidopathy in a patient with systemic lupus erythematosus (e-poster)

**G. JEYAKOHILA**

- Photo competition -TREE in MUD

**DR. VEDHANAYAKI** took part in the conference as invited faculty.



Dr. Usha Kim at the Marketing Society Annual Conference

### The Marketing Society Annual Conference 2022

London, UK, 2<sup>nd</sup> November 2022

#### DR. USHA KIM

- An extraordinary story of service, community and innovation

### Annual Conference of Glaucoma Society of India

New Delhi, 17 - 20 November 2022

#### DR. R. SHARMILA

- Lasers in glaucoma - Video assisted
- Valve indication and surgical techniques
- Risk factors techniques in POAG
- Microinvasive glaucoma surgery
- Wetlab - Aurolab aqueous drainage implant

#### DR. VIDYA RAJA

- Basics in OCT (Poster)

#### DR. MANJU PILLAI

- Trabeculectomy minutiae (Session moderator)
- Improving adherence to follow-up in childhood glaucoma
- Glaucoma in uveitic eyes: Long-term clinical course and management measures
- Shunts - Indications & surgical techniques
- Surgical overview of paediatric glaucoma - video assisted (Panelist)
- Paediatric glaucoma (Panelist)
- This too shall pass (Video)
- Atypical presentation of Axenfeld Reiger Syndrome (Poster)

#### DR. NEETHU, DR. SHEETAL

- Surgical pearls for a patch free tube (Video)

### Seva Canada Board Fall Board Meeting

Vancouver, Canada, 18<sup>th</sup> November 2022

SANIL JOSEPH was inducted to the Board of Seva Canada during the annual board meeting. He also participated in a panel discussion during the annual general board meeting held the previous day.

### Asian Neuro Ophthalmology Society Meeting

Bangkok, Thailand, 23-25 November 2022

#### DR. KOWSALYA

- Current concepts in optic neuritis

### 4<sup>th</sup> Annual Conference of Indian Neuro Ophthalmology Society

New Delhi, 26-27 November 2022

#### DR. PADMAVATHY

- Optic Neuropathies (Session moderator)
- Approach to nystagmus

### Aravind Retina doctors at the Annual Conference of Vitreo Retinal Society of India



### Annual Conference of Vitreo Retinal Society of India

Nagpur, 2-4 December 2022

#### DR. R. KIM

Chaired the JM Pahwa Session.

#### DR. NARESH BABU

- Video-based complications session: Wise counsel
- Staged surgical approach for giant retinal tear associated retinal detachment
- Retinal detachment with proliferative vitreoretinopathy - Handling complications

#### DR. RENU P. RAJAN

- Unusual challenge in a child with retinopathy of prematurity

#### DR. T.P. VIGNESH

- Eplerenone for bullous variant of central serous chorioretinopathy - Eplerenone for central serous chorioretinopathy with posterior cystoid retinal degeneration

#### DR. SYED MOHIDEEN

- Macular infarction in a kid: An unusual case due to Protein S deficiency

#### DR. GIRISH BALIGA

- Outcomes of two staged surgery with short term perfluoro-N-octane tamponade versus single surgery for paediatric RRD

#### DR. PRITHVIRAJ

- Surgical outcomes of retinal detachment associated with familial exudative vitreoretinopathy

#### DR. ARPIT SHARMA

- CRAO in ADA -2 deficiency, time to sharpen the Ockham's Razor

#### DR. KULSUM SAYYAD

- Indications, microbiological study and follow-up of scleral buckle removal-12 years of experience



**DR. POOJA**

- Rare case report of preterm infants presenting with retinopathy of prematurity (RoP) along with vasculitis

**DR. VRINDA**

- Bilateral optic disc granuloma

**DR. MANAVI D. SINDAL**

- Update on intravitreal injections (Invited talk)
- What would I choose in which? (DME/AMD/RVO)
- Validating an AI-based referable diabetic retinopathy detection tool integrated on a portable fundus camera for screening at primary eye-care centres (Free paper)
- Tale of two enigmatic pigment epithelium detachments (e-Poster)
- Unusual association with aggressive retinopathy of prematurity

**DR. SIVARANJANI**

- Serous pigment epithelial detachment with RPE rip (e-Poster)
- Acute posterior multifocal placoid pigment epitheliopathy (e-Poster)
- Choroidal osteoma: A case report (Physical poster)

**DR. SIVARANJANI / DR. DEEKSHA**

- Challenging cases PP 170- Role of laser photocoagulation in retinal worms

**DR. ANAND RAJENDRAN****Panelist**

- Scleral buckling in RD surgery
- Dialogue on diabetic eye diseases
- Vitreomacular traction syndrome: Watch Vs operate
- Brain fog and vascular clogs: A unique presentation of susac's syndrome (Poster)

**DR. ADITYA MAITRAY**

- A rare presentation of Susac syndrome (Case presentation)

**DR. V. GEORGE**

- PCV-Switch Vs. continue Vs. combination

**DR. SARAVANAN**

- Art of relaxing retinectomy

**DR. ANAMIKA, DR. HEMALATHA and****DR. ARAVIND** attended the meeting.**Keracon – 10<sup>th</sup> Annual National Conference of the Cornea Society of India**

Mumbai, 9-11 December 2022

**DR. ANITHA**

Didactic lecture given in Trauma session

- Goretex in chemical injuries: our experience (Free paper)

She also gave wetlab training in DALK and delivered a didactic lecture.

**DR. ADITYA G**

- Falling into your own trap - (Case presentation)
- A retrospective analysis of open globe injuries: 4 years structural and visual outcomes (e-poster)
- Trouble shooting in traumatic flap repair- (Free paper)

**DR. ADITEE**

- Surgical outcomes of amniotic membrane transplantation for limbal dermoid in infants and young adults (e-poster)
- Trouble shooting in traumatic lasik flap repair (Case presentation)

**DR. SWETHA**

- Fountain of pus in the eye: A case of adult gonococcal conjunctivitis

**DR. ANITA**

- Herpetic eye diseases (Instructional course: Session moderator)
- Five year study on Acanthamoeba keratitis coinfectious
- Ocular Trauma - (Instructional course: Session moderator)

**WHO-SEAR Meeting**

New Delhi, 12<sup>th</sup> December 2022

**THULASIRAJ RAVILLA** attended the WHO-SEAR meeting on Universal health coverage.

**12<sup>th</sup> National Conference on Cornea and Eye Banking**

New Delhi, 2-4 December 2022

**DR. M. SRINIVASAN** chaired the global leadership submit (Virtual).

**D. SARAVANAN** moderated the session on Efficient and effective eye banking. He presented a free paper on the topic, Successful donor corneal tissue collection models in India – Aravind Eye Banks, Madurai



*D. Saravanan receiving memento at the 12<sup>th</sup> National Conference on Cornea and Eye Banking*

**United Kingdom Paediatric Glaucoma Society Meeting**

London, UK, 27<sup>th</sup> January 2023

**DR. MANJU R. PILLAI** attended the meeting and gave a presentation on the results of the project titled *Improving Adherence to follow up in Childhood Glaucoma*. She presented a video documenting one of the beneficiaries of the project. The project was carried out under the USAID Child Blindness Programme and was well appreciated by all the consultants involved in treating childhood glaucoma around the world.

Dr. Manju also took time to visit paediatric glaucoma facilities at the Moorfields Eye Hospital, London. She also visited the genetic lab associated with it to learn more about genetic studies in childhood glaucoma. Besides, she took time to meet

*Dr. Manju Pillai at the United Kingdom Paediatric Glaucoma Society Meeting*





Dr. P. Sundaresan at the Genomics India 2023 Conference

Dr. Maria Papadopoulos, a paediatric glaucoma consultant as well as a well-wisher of Aravind.

**Genomics India 2023 Conference**  
Bengaluru, 2-3 February 2023

**DR. P. SUNDARESAN**

- Gene therapy for an inherited eye disorder and mitochondriopathy

**Asia Pacific Academy of Ophthalmology Congress**

Kuala Lumpur, Malaysia,  
23-26 February 2023

**DR. NARESH BABU**

- Anatomical and functional outcomes of retinectomy in recurrent retinal detachment: a detailed analysis (Poster)
- Role of intravitreal Triamcinolone Acetonide for hypertensive retinopathy-related macular edema (E-Poster)
- Subretinal gliosis removal in a chronic retinal detachment – An unorthodox approach (Video)

**DR. MUTHUKRISHNAN**

- Anatomical functional outcomes of retinectomy in recurrent retinal detachment: a detailed analysis (Poster)

**DR. S.R. RATHINAM**

- Evolving treatments of non-infectious uveitis

**DR. ANAND R**

- Management of subluxated lens from anterior approach Vs parsplanar approach

- Subthreshold laser for DME
- Code Red! - Subretinal surgical evacuation of massive haemorrhagic polypoidal choroidal vasculopathy (Video)

**DR. ADITYA MAITRAY**

- Mortal Masquerades: The variable presentation of choroidal metastasis (Physical poster)

**DR. ARCHANA**

- Ocular complications post COVID-19 vaccine (Paper)

**High-level Meeting on Integrated People-centred Eye Care**

Hyderabad, 21-23 February 2023

**THULASIRAJ RAVILLA**

- Making IPEC a reality – Priorities and knowledge gaps in the region

**International Conference on Consortium of Universal Research Erudition (ICURE)**

Madurai, 3-6 February 2023

**PROF. K. DHARMALINGAM**

- Diabetic Retinopathy-Prognostic biomarkers and disease biology
- Immune system and the eye

Dr. S.R. Rathinam at the Asia Pacific Academy of Ophthalmology Congress





## *Continuing medical education programmes for Mid-level ophthalmic personnel*

### **V-drill workshop**

Aravind - Madurai, 9<sup>th</sup> April 2022

V-Drill workshop was organised for the mid-level ophthalmic personnel (MLOP) of operation theatres to orient them to the features of vitrectomy in Alcon phaco machine and its instrumentation. A total of 35 nurses took part in this workshop where they were also briefed on the importance of anterior vitrectomy and its management. A total of 35 nurses took part.

### **Workshop on refractive errors and refraction assessment**

Aravind - Coimbatore, 20<sup>th</sup> May 2022

First year trainees arranged the workshop to gain knowledge of refraction and the various steps involved in it. The following topics were covered in the workshop – hand washing, dilatation, visual acuity and interpupillary distance measurement, autorefractometer, and muscle balance. Models of equipment and instruments used in refraction, and cubicle arrangement were displayed.

### **Leadership development programme for MLOPs**

Pondicherry, 24-25 December 2022

Aravind-Pondicherry hosted the two-day programme for MLOPs. At the programme, senior MLOPs underwent training to refine their leadership qualities, coordination and communication skills. The training programme was conducted at Sharanam, supported by Sri Aurobindo Society.

### *V-drill workshop for operation theatre MLOP*



“My life, My pride” is a well-being programme for MLOP at Aravind. It aims to groom them physically, emotionally, and psychologically, enabling them to maintain a balance between their personal and professional lives. Supported by the Aravind Eye Foundation, this programme follows a well-structured and systematic approach with monitoring mechanisms to evaluate its outcomes and impacts. The programme is designed to provide holistic development by imparting lessons and skills that can be effectively applied. The programme includes various activities such as (1) Individual counselling, (2) Life skill development, and (3) Extracurricular events. These activities are carefully planned to promote positive thinking, strengthen emotional and physical well-being, and facilitate overall success in life.

Currently, this programme is being implemented at Aravind-Chennai. To promote intellectual engagements and discussions, the Readers' Club has set up a small library with a pleasant ambience. Additionally, a throw ball team has been formed, and competitions have been conducted. Notably, two girls of the Sports Club participated in the district-level running race and won prizes. Furthermore, a professional counsellor now regularly visits the hospital and delivers motivational talks. Individual counselling services are available based on individual needs. As days pass, the programme is gaining increased visibility, and Aravind has plans to scale this up to other centres as well.

## Residents Social Responsibility Programme

### Honouring crematorium workers

Aravind – Madurai, 3<sup>rd</sup> May 2022

Postgraduate residents of Aravind Eye Hospital, Madurai and Rotary club of Madurai Midtown jointly organised a special event to honour and appreciate the selfless service of the staff of Madurai Anjali Gasifier Crematorium, Keerathurai, during the COVID days. S. Venkatesan, Member of Parliament – Madurai; Dr. J. Sangumani, Dean, Virudhunagar Medical College; senior members of Aravind – Dr. P. Namperumalsamy; Dr. G. Natchiar and Dr. R. Kim were present at the meeting. LIC policies and gold coins were gifted to the family members of the crematorium staff.



Vaanavil 2022

### Vaanavil 2022

Aravind-Madurai, 31<sup>st</sup> December 2022

As part of the social responsibility programme, postgraduate residents of Aravind-Madurai organised Vaanavil, an exhibition-cum-sale of products made by the visually challenged people from Mannarpuram in Trichy. The event had colourful and attractively printed bags, pouches, home furnishing products, stationeries, baby care items, candle sticks and incense sticks kept for sale.

S. Venkatesan, MP, honouring the crematorium workers





## Candidates Trained 2022 - 2023

Total Candidates: 596

<b>POSTGRADUATE COURSES</b>				
Master of Surgery in Ophthalmology (3 years)	20	& Paediatric Retinal Disorders (1 month)	06	
Diplomate of the National Board (3 years)	11	Orientation to Paediatric Ocular Anesthesia for Anaesthetist (1 month)	03	
Post DO DNB (2 years)	19	HelpMeSee Simulation-based Training in MSICS (1 week)	03	
<b>LONG-TERM OPHTHALMOLOGY FELLOWSHIP</b>				
Ant. Segment / Intraocular Lens Microsurgery (2 years)	14	<b>LONG-TERM PARAMEDICAL COURSES</b>		
Orbit & Oculoplasty (18 months)	09	Fellowship in Optometry (2 years)	07	
Paediatric Ophthalmology & Strabismus (18 months)	10	<b>SHORT-TERM PARAMEDICAL COURSES</b>		
Glaucoma (2 years)	17	Vision Technicians	03	
Retina Vitreous (2 years)	18	Fundus Fluorescein Angiography and Ultrasonography	04	
Comprehensive Ophthalmology (2 years)	05	Optical Dispensing	04	
Cornea (18 months)	19	Short Term Course in OT Techniques	08	
Medical Retina (1 year)	10	Short Term Course in Refraction Techniques	09	
Surgical Paediatric Retina Fellowship (ROP) (1 year)	01	Training for Ocularist	06	
Fellowship in General Ophthalmology	31	<b>MANAGEMENT COURSES</b>		
<b>SHORT-TERM OPHTHALMOLOGY FELLOWSHIP</b>				
Orbit & Oculoplasty (6 Months)	02	Community Outreach and Social Marketing for Eye Care Services (3 weeks)	27	
Retina Vitreous (6 Months)	01	Eyexcel – Excellence in Eye Care Training (5 days)	48	
<b>SHORT-TERM CLINICAL COURSES FOR OPHTHALMOLOGISTS</b>				
Clinical Observership Programme in Diagnosis and Management of Glaucoma (1 month)	20	Management Priorities in Eye Care Delivery (1 week)	51	
Lasers in Diabetic Retinopathy (2 months)	01	Management Training and Systems/ Development for Hospital Administrators/ Managers (1 month)	28	
Neuro-Ophthalmology (3 months)	05	Management Training for Eye Care Programme Managers (2 weeks)	13	
Phacoemulsification (1 month)	71	Project Management for Eye Care (1 month)	11	
Small Incision Cataract Surgery (1 month)	59	Instrument Maintenance - For Technicians (1 month)	15	
Short Term Training in Virtual Vitrectomy (2 weeks)	02	Eye Bank Management	01	
Management of Retinopathy of Prematurity		<b>MANAGEMENT COURSES (ONLINE)</b>		
		Ophthalmic Instruments Maintenance - Part I	4	



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*Relationship between cooking fuel and lens opacities in South India: a 15-year prospective cohort study.*  
Am J Ophthalmol. 2022 Nov;243:66-76.
- Mandlik K, Christy SJ, Ravishankar R.  
*Netarsudil-Induced Honeycomb Hypertrophy.*  
Asia Pac J Ophthalmol (Phila). 2022 Nov 4. [Epub]
- Mishra C, Venu Gopal Reddy YC, Damodharan S, Rekha S.  
*Extensive retinal pigmentary degeneration after ophthalmic artery occlusion in a patient with COVID-19 infection.*  
Asia Pac J Ophthalmol (Phila). 2023 Jan-Feb;12(1):109.
- Kohli P, Mishra C, Baliga G, Rajan RP.  
*Multimodal imaging of congenital retinal macrovessel with secondary foveal hypoplasia.*  
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- Mishra C, Muraleedharan S, Kohli P, Kannan NB.  
*Anterior-segment optical coherence tomography findings of endothelial precipitates secondary to silicone oil emulsification.*  
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- Kannan NB, Kohli P, Mishra C, Ramachandran N O.  
*Surgical management of full-thickness macular hole following Nd:YAG laser hyaloidotomy for pre-macular haemorrhage in a patient with anaemic retinopathy.*  
BMJ Case Rep. 2022 Aug 12;15(8):e249564.
- Senthilkumar VA, Kohli P, Mishra C, Mamchiseti K.  
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*LAICO works beyond the borders of Aravind to enhance eye care service delivery through training, capacity building, mentoring and advocacy. Over the past year, LAICO has worked both on developing its own capacity through internal training programmes and has developed innovative strategies to achieve greater impact for its partner hospitals.*



## Consultancy and Capacity Building

## Consultancy and Capacity Building

### LEAP collaborative series

LAICO's collaborative series under the banner LEAP, aims to bring about improvements in specific functional areas of eye hospitals through a collaborative method. These collaboratives employ the principles of Model for Improvement, Plan-Do-Study-Act (PDSA) cycles, and continuous process improvement as strategies to achieve partners aims.

LAICO launched its second batch of the LEAP NABH collaborative series on 27th February 2023. Five hospitals that are preparing for entry level certification have enrolled in this programme. The timeline of the collaborative series was reduced from 12 months to 8 months starting from March till October 2023. Gap assessment visits were made to all five hospitals. The second batch of LEAP collaborative, aimed at improving the performance of existing vision centres and establishing new ones, came to an end in November 2022. It consisted of four learning sessions, which provided a platform for sharing experiences and best practices among the partner hospitals. A total of 17 hospitals from India, Africa, and Bangladesh took part. LAICO team visited 22 vision centres run by seven partner hospitals and suggested recommendations for improvement. It also assessed the location identified for establishing a vision centre by Grameen GC Eye Hospital in Bangladesh.

The collaborative helped improve the service delivery of 24 existing vision centres and facilitated the establishment of 14 new centres by the partner hospitals. A total of 51,411 outpatient visits and 4,907 cataract surgeries were recorded by existing vision centres, representing growth rates of 27% and 50%, respectively. Additionally, newly established vision centres recorded 13,867 out-patient visits and 612 cataract surgeries, bringing the combined additional cataract surgeries to 2,248.

### Support for free cataract surgeries

As part of the CSR activity, BOSCH, a leading global supplier of technology and services, has been collaborating with LAICO to provide free cataract surgeries across India. As part of the third phase of this project, LAICO identified 24 potential partners in 12 states and supported a total of 3,840 cataract surgeries. The project came to an end in March 2023.

### Project UP Sight

As an ongoing support to Sitapur Eye Hospital (SEH), Uttar Pradesh, LAICO continues to undertake various initiatives both at the strategic and operational levels to strengthen the leadership team, hospital operations and build the HR capacity. Aravind's doctors were sent to SEH to support the team in performing speciality surgeries. A set of staff went to help with IT system upgrade and electronic medical record implementation; streamline inventory management and operation theatre processes. Aravind's senior team periodically visited the hospital to see its progress and suggest ways for

improvement. LAICO facilitated a goal setting workshop for the entire team of SEH on 15 and 16 February 2023. Following this, a three member leadership team, Dr. (Col) Madhu Bhadauria, Director RIO, SEH Trust; Dr. (Brig) V.K. Baranwal, Chief Medical Officer, SEH and Deepak Kanade, Chief Administrative Officer, SEH visited Aravind-Madurai during 13-14 March 2023 to discuss institution building and the way forward. Staff of SEH belonging to different cadres were also given training in their respective areas at Aravind.

*Dhivya Ramasamy, Dr. Indiradurai and Shobanadevi during their visit to vision centre of Grameen Eye Hospital, Bogra, Bangladesh for onsite technical support*





## Facilitating visioning process

LAICO offered inputs to the senior teams of various organisations who wished to replicate the Aravind model in their own settings and also brainstormed the prospects of future collaboration. It also supported its partner hospitals that have had a leadership transition recently, for a comprehensive long-term planning and for creating buy-in amongst the stakeholders in developing a shared vision for the future. Towards this, LAICO facilitated visits by the senior leadership teams from the following hospitals and organisations:

- LEpra Society, Hyderabad, 23-27 August
- SEVA Foundation, Nepal, 10-13 October
- RR Lions Eye Hospital, Palakol, Andhra Pradesh, 21-22 October
- Akhand Jyoti Eye Hospital, Mastichak, Bihar, 30 October-5 November
- Grameen Health Care Services, Dhaka, Bangladesh, 20-24 November
- Fernandez Foundation Maternity Services, Hyderabad, Telangana, 16-19 November
- International Smart Card (ISC), Baghdad, Iraq, 18-20 March (who are planning to set up an eye hospital)

## Capacity building visits

### Eye Foundation Community Hospital, Ijebu, Nigeria

11-16 July 2022

LAICO Consultancy team analysed the performance of the hospital and its vision centres. Discussions revolved around the barriers in outreach eye care programmes, improving patient volume in vision centres and opticals acceptance rate.

### Tulsi Chanrai Foundation Eye Hospital, Abuja, Nigeria

17-19 July 2022

During the visit, a detailed capacity assessment was done to assess the gap, for performing 10,000 surgeries a year. Detailed analysis of outpatient patterns was done and opportunities for improving outpatient flow to manage patient volume and cycle time were discussed. The team analysed refraction and optical sales data and presented the gap in optical services to plan for working on specific areas and improving the acceptance rate.

### Jorhat Lions Eye Hospital, Jorhat, Assam

16-19 July 2022

As part of the Lavelle capacity building project, LAICO team made a follow up visit to the hospital to understand the current practices and processes and

*Team from International Smart Card with Aravind senior leaders and staff*





*Visit to Sudarshan Netralaya - Dr. Kalpana inspecting the site for expansion of hospital*

facilitate a discussion towards improving its day to day management.

### **Sudarshan Netralaya, Amreli, Gujarat**

17-18 October 2022

Aravind consultancy team visited the hospital to understand the hospital's growth potential, current gaps and challenges and develop an action plan to address these. The team conducted a full-fledged performance review on various indicators after understanding and analysing the annual performance data. They also analysed the hospital's infrastructure requirements and the need for adding more services in the near future.

### **Shardha Netralay, Dhule, Maharashtra**

12-16 December 2022

LAICO team visited the hospital to guide the team to develop a strategic plan that will help it to become a high-volume tertiary eye care centre. As a first step of

*B.S. Ganesh Babu, Dr. Rohan Daniel with Dr. Kunle Hassan at eye foundation community hospital*



*Dr. V.R. Vivekanandan, K.M. Sashipriya and R. Suganya during their visit to Shardha Netralay*

the planning exercise, the visiting team assessed the implementation of activities recommended in 2019 and the gaps that need to be addressed immediately.

### **Cape Coast Teaching Hospital, Cape Coast, Ghana**

5 - 11 February 2023

Aravind Consultancy team visited the hospital to provide inputs on developing it to become a centre of excellence in eye care.

### **Internal capacity building**

LAICO facilitated a course on Lean Six Sigma Green Belt, a popular process improvement methodology that combines the principles of Lean and Six Sigma to improve quality, reduce waste, and increase customer satisfaction. LAICO faculty as well as managers of Aravind Eye Hospitals took part in this virtual course which had five classes, each of 3-hour duration, during January to February 2023. A total of 15 people took part. This comprehensive training programme covered various aspects of improvement, including statistical analysis, process mapping, project management, and change management. Peria Regupathy, a certified Lean Six Sigma Master Black Belt and Champion handled the session.

### **ACCESS project wrap-up meeting**

Aravind Eye Care System has been working with five partner hospitals in sub-Saharan Africa, from Kenya, Zambia, Ethiopia and Nigeria since 2012 through the ACCESS Initiative (African Centres of Excellence in Cataract Services). This project was supported by Hilton Foundation through two grants that concludes in May 2023. The final meeting of the ACCESS initiative was held at LAICO from 20-25 March. The team from





*ACCESS Project wrap-up meeting*

Nigeria joined the meeting via zoom. A senior leadership team from the Cape Coast Teaching Hospital, Ghana and representatives from HCP Cure Blindness also joined the meet.

## Teaching and Training

### Curriculum development workshop for patient communication and counselling

Orbis-India has taken the initiative to develop the following four hospitals as regional resource centres to deliver training related to patient counselling and patient communication:

- Dr Shroff's Charity Eye Hospital, Daryaganj, Delhi
- Netra Nirmay Niketan, Chaitanyapur, West Bengal
- Little Flower Eye Hospital and Research Centre, Ernakulam, Kerala
- PBMA's H V Desai Eye Hospital, Pune, Maharashtra

At the three-day workshop organised from 19-21 December LAICO brought together experts in the field of patient communication along with representatives

*Participants of curriculum development workshop*



from regional resource centres to develop curriculum for effective patient communication and counselling. LAICO will also help develop a full-fledged training package for the resource centres to carry forward and deliver in their respective regions.

### Aurosiksha

Aurosiksha, Aravind's online portal for Mid Level Ophthalmic Personnel (MLOP) is making steady progress towards its goal of developing Aravind as a centre of Excellence in MLOP training and becoming a resource centre for MLOP training. Subscribers of Aurosiksha's training resource library have increased to 9555. With training materials uploaded for 23 competencies this year, Aurosiksha now offers a library of training materials for over 170 competencies.

Aurosiksha's learning management system (LMS) helps eye hospitals manage the delivery of MLOP training. The LMS features online tests, a digital skill assessment tool, classroom session scheduling, attendance tracking, and the entry of formative and summative assessment scores. During April 2022 to March 2023, 1,936 new users have begun using Aurosiksha's LMS, taking the total number of users to 5308.

In addition, monthly online quizzes - on topics such as spectacles and contact lens dispensing, ocular chemotherapy - with over 500 responses each month, contribute to continued learning for MLOP. In order to further enhance their knowledge, fortnightly microlearning titbits called Siksha Bites have been launched.

### AIOS-ARC leadership development programme

Every year, the Academic and Research Committee (ARC) of All India Ophthalmological Society (AIOS)



*Participants of AIOS-ARC leadership development programme*

organises Leadership Development Programme (LDP) for a cohort of ophthalmologists who wish to improve their practice management and leadership skills. In the last year, LAICO conducted this programme on 10th-11th September. About 30 ophthalmologists who were the participants of LDP (2020-21 and 2021-22) took part. The programme discussed topics such as building a high-performing team; sustainable drivers of revenues and profits; quality and challenges ahead.

## October Summit 2022

### Leveraging Artificial Intelligence (AI) and enhancing performance

Aravind has been exploring the possibilities of adopting AI for improving eye care and has made significant progress in the screening of diabetic retinopathy and



*GSI partners meet*

retinopathy of prematurity. Introduction of eyeNotes (Aravind developed electronic medical record system) enabled it to capture more accurate patient information and make them available in a timely manner. The workshop was organised to brainstorm how AI can be leveraged on the clinical and nonclinical areas of patient care with a view to enhance overall performance.

Twenty two staff from various Aravind centres took part. Senior consultants from iMerit, an AI data solutions firm-Dr. Jaideep Jesson Rayapudi and Vibhor Goel handled various sessions.

### GSI partners meet

LAICO, 10- 11 October 2022

After a gap of three years, it was time to resume fellowship with all partners in Seva's Global Sight Initiative (GSI) network. Twenty participants from

*Dr. G. Natchiar addressing the participants at the workshop on operational excellence*





nine hospitals and two representatives from SEVA foundation took part. The meeting analysed the performance of partner hospitals on various metrics and explored the key areas for improvement. There were also discussions to arrive at a consensus on appropriate mentoring approaches that will effectively address the needs of the partner hospitals.

### **Fostering improvements for excellence in care**

LAICO 12-13 October 2022

Advancements in science and technology, and ever-increasing expectations of patients create extensive opportunities for eye care providers to continuously improve their systems and processes. In the process, they face several operational challenges which can be addressed through a scientific approach. Hence workshop introduced improvement methodologies and tools that hospitals would find useful to address operational problems and bring improvements in care delivery. A total of 28 participants from 17 hospitals in India and Africa took part.

### **Workshop on operational excellence**

LAICO, 17-20 October 2022

The internal workshop focused on topics such as retaining Aravind's work culture, managing quality, patient care management, monitoring, materials management, insurance facilitation and how to become an effective manager.

A total of 63 managers and senior MLOP across all branches of Aravind Eye Hospital participated. The workshop started with a performance update by the individual hospital teams. Group discussions were held on common issues such as hospital-acquired infections, patient safety, and arrival patterns. An exhibition of the calendars of various departments, proud moments, and various innovations were displayed.

## **Health Services Research**

LAICO's Research Division assisted international organisations-Seva Foundation, Orbis International-Bangladesh, ChildSight Foundation Global-Bangladesh, and IAPB-South East Asia to conduct a Rapid Assessment of Refractive Error (RARE) survey in Forcibly Displaced Myanmar Nationals (Rohingya Refugees) residing in camps at Cox's Bazar, Bangladesh. Based on the requirements from the study team in Bangladesh, LAICO's research team developed the study database and digital data collection process using tablets. As the data was being collected data management and data analysis was carried out.

The department conducted a Research Methodology Workshop for the ophthalmology residents of SEH, Sitapur, Uttar Pradesh on 21st and 22nd February. Ten residents took part. The workshop covered topics such as literature review, sample size calculations, statistical analysis and points to keep in mind while preparing the thesis. To build research culture at LAICO, the Research Division organises weekly journal clubs attended by Aravind employees and members from LAICO's partnering institutions, both national and international. 49 journal club sessions were held in the past year, of which 12 were handled by external participants.

The Research Division organised WRITATHON 1.0 on 28th and 29th January which was a culmination of its weekly research enhancement activity conducted every Saturday for LAICO faculty. As a result of the initiative, two papers got published in peer reviewed journals and other manuscripts are in different stages of completion.

The department has also initiated three 'Systematic Review and Meta-Analysis'. The first study investigated the accuracy and agreement of Transpalpebral tonometry with Goldmann applanation tonometry. The next review scrutinised the diagnostic accuracy of AI in diabetic retinopathy screening in real world settings, and the third meta-analysis will compute the prevalence of glaucoma in India. The manuscripts are getting ready to be published.

*In an effort to enhance research activities involving both clinicians and scientists, regional research centres have been established at Tirunelveli, Pondicherry and Coimbatore. These centres have already initiated several major research programmes. Another major initiative of AMRF, the Exosome Innovation Centre is now fully functional, and has already attracted users from other organisations. The multi-centric study to identify the biomarkers for the prediction of the progression of diabetes to diabetic retinopathy has been completed and published in JAMA.*



Research



## Molecular Genetics

The current focus of research is to develop in-vitro models of Leber's hereditary optic neuropathy (LHON) and Leber's congenital amaurosis (LCA) using siRNA-mediated genetic knockdown and site-directed mutagenesis, respectively in order to investigate the candidate genes that influence disease progression. In LHON, this study utilised mouse 661W cells as precursors for retinal ganglion cells (RGCs), which might represent an ideal model to study the molecular mechanisms that cause RGC degeneration. In LCA, GUCY2D gene tightly regulates cGMP expression of photoreceptors. Site-directed mutagenesis was performed to determine the functional consequences of GUCY2D mutants. Thus, the in-vitro model helps understand the effect of GUCY2D missense mutations in the function of photoreceptor degeneration.

## Genetics of ocular tumours

During the year, 58 retinoblastoma (RB) patients including 12 follow-up patients were checked for their genetic status of RB1 gene. Germline and somatic mutations were identified in 22 and 4 patients respectively. Appropriate genetic counselling was provided for families based on the mutation pattern. Absence of the germline mutations in the remaining 32

patients implies that RB is not passed on to the next generation.

Tumour samples of five patients without any RB1 mutations were analysed for altered transcripts and identified two variants causing distinct splicing alterations leading to intron retention and exon skipping. Three tumours showed no RB1 gene expression. Gene amplifications of receptor tyrosine kinase found in RB tumours suggested them as potential drug targets. Focused PCR array approach identified alterations of six key genes involved in multiple cancer pathways.

RB is also influenced by epigenetic alterations as evident from the differential expression of 246 microRNAs and their 80 target genes. Newer drugs were developed against specific molecular targets in cell culture systems which might help combat chemoresistance in RB. In tumours with invasions and metastasis to central nervous system, GD2 synthase was found to be higher, which can be used as a potential marker for RB tumour spread into other systems.

Ocular adnexal lymphoma is the most frequent orbital neoplasm found in 8–10% of all extranodal lymphomas. The clinical characteristics and their effect on survival and outcome were reviewed in ocular adnexal lymphoma patients, presented during 2012 to 2019. Disease specific survival was found to be better in patients less than 55 years of age.

## Proteomics

### Diabetic retinopathy project

Extracellular vesicles (EVs) are lipid-bilayered non-dividing nano-vesicles that carry physiology-altering biological information in the form of regulatory nucleic acid, protein, lipids and metabolites. While their role in cancer angiogenesis is being widely established, their contribution in diabetic retinopathy (DR) pathogenesis is largely unexplored. The team has used ultracentrifugation, nanoparticle tracking analysis/transmission electron microscopy/immunoblotting to isolate and characterise EVs from plasma and vitreous humour from patients with proliferative DR. Using proteomics approach, the team has identified and shortlisted EV proteins that are unique/enriched in either plasma or vitreous humour of PDR patients. This study is a stepping stone to understanding what vitreous humour (VH) EV proteins are represented in circulation and thus can be used as EV-based biomarker candidates.

*Nucleic acid extraction using Vacuum manifold*



## Pterygium project

Pterygium is a highly prevalent, conjunctival eye disease that has a significant impact on quality of life and causes vision impairment, mostly affecting people with low socioeconomic status working outdoors. While altered epigenetic modifications by chronic sunlight exposure plays a pivotal role in skin cancer, the role of epigenetic changes in pterygium pathogenesis is not explored although UV exposure is a causative factor. The team proposes to test this using genome-wide DNA methylation profiling, transcriptomics and proteomics approach. Using proteomics and transcriptomics approach, the team has identified and shortlisted targets in angiogenic, fibrotic, and inflammatory pathways altered in pterygium. These candidates will be targeted using small molecule inhibitors in a fibroblast cell-culture model.

## Keratoconus project

The team has investigated the mechanism of action of a novel chemical cross-linker for the treatment of keratoconus. Experiments to study the mechanism of action revealed that the novel cross-linker regulates genes related to extracellular matrix (ECM), focal adhesion, and WNT signalling pathways in the corneal epithelium. In corneal stroma, ECM, metalloprotease, collagen synthesis and TGF $\beta$  signalling pathways are affected coupled with the reduction in inflammatory genes. The cross-linker could reduce the inflammatory conditions associated with keratoconus. Matrix metalloprotease (MMP-2 and 9) analysis by gelatin zymography in the corneal epithelial and stromal layers showed consistent decrease of MMP-2 and MMP-9 activity after crosslinker treatment. Cathepsin G activity is decreased in stroma of keratoconus cornea after corneal collagen crosslinking (CXL) treatment. The CXL possibly inhibits the surge in activity of MMP-2, MMP-9, and cathepsin-G, thereby reducing the degradation of matrix in keratoconus cornea. CXL also brings together the disorganised collagen fibres in stroma leading to the increase in stiffness in keratoconus corneas. The novel chemical crosslinker seems to be associated with inhibition of the signalling pathways involving the MMP-2, and MMP-9, leading to corneal stiffening, thereby halting the progression of keratoconus disease.

## Ocular Pharmacology

There exists differential steroid responsiveness in patients on long-term steroid therapy for any inflammatory eye diseases which limit the usage of steroids in a clinical set up. Therefore, the team has undertaken a study to investigate the role of miRNA in the regulation of glucocorticoid receptor (GR) signalling and to develop new miRNA-based therapeutics for the treatment of steroid-induced glaucoma.

In order to achieve this, an ex vivo model of steroid-induced ocular hypertension was established using human organ culture anterior segment (HOCAS) and assessed the differential glucocorticoid responsiveness in Indian donor eyes. Followed by this, human trabecular meshwork cells (HTM) with known glucocorticoid (GC) responsiveness was established to investigate the differential expression of mRNAs and miRNAs between GC-responder and non-responder HTM cells after Dexamethasone treatment. Interestingly, this study revealed a distinct gene and miRNA signatures and pathways identified between them using next generation sequencing technology. Further, in order to demonstrate the role of miRNA in SI-OHT/glaucoma, the hsa-miR-483-3p has been chosen from the differentially expressed miRNAs. It was found that the hsa-miR-483-3p was found to regulate ECM proteins through smad4/TGF- $\beta$ 2 signalling, more pronounced in GC-R as compared to GC-NR HTM cells. Further, the efficacy of miR483-3p in an ex vivo model of SI-OHT has been demonstrated. The team has validated the findings of in-vitro miRNA functional role using HOCAS. This study also identified some other unique miRNAs and pathways which can be exploited to further develop miRNA-based therapeutics for the management of steroid glaucoma and POAG.

## Bioinformatics

The lab develops bioinformatics tools and provides next-generation sequencing data analysis services for in-house research projects. VarP tool has been developed recently to predict the pathogenicity of variants from the whole genome or exome data set, which outperformed all the existing tools in predicting single nucleotide variants and small insertions and deletions. eyeVarP tool has been developed to identify pathogenic variants specific to eye diseases, which also prioritise the variants with given specific patients' phenotype and inheritance pattern. In tandem, the lab had identified



TB-specific miRNAs as potential diagnostic markers in aqueous humour or vitreous humour of the ocular TB patients, which have been tested in the serum of the ocular-TB patients. A list of miRNA markers has been identified that predict the disease severity in fungal keratitis.

## Stem Cell Biology

Adult stem cells present in almost every tissue of the body are responsible for maintaining the tissue homeostasis throughout life. The focus of research in this department is to understand the basic biology of the adult ocular stem cells, changes in the content/function of these stem cells with ageing and in diseased condition, and to develop better stem cell based therapy for ocular diseases. Studies are being carried out on limbal epithelial stem cells in relation to limbal stem cell deficiency, trabecular meshwork stem cells in glaucoma, lens epithelial stem cells in age-related cataract, and retinal pigment epithelial stem cells in age-related macular degeneration.

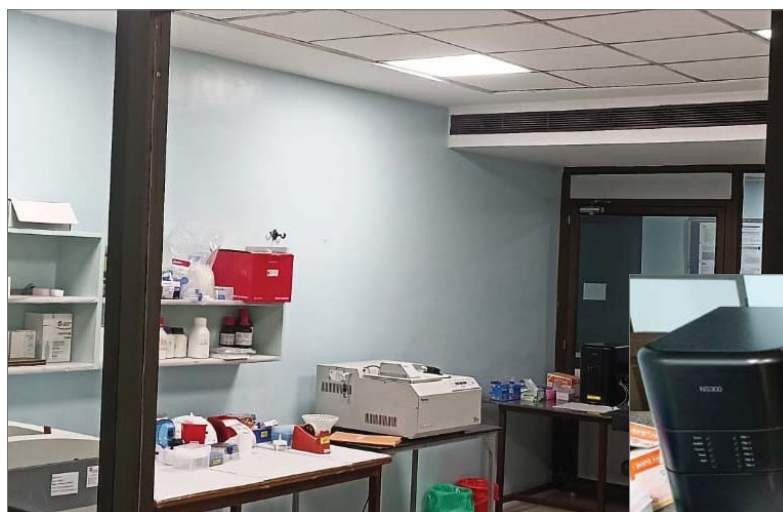
The major highlights of the research carried out this year include identification of the stem cells for human retinal pigment epithelium to be located in the peripheral region based on the functional properties of adult stem cells. In addition, an age-related reduction in the functional properties of the retinal pigment epithelial stem cells as well as lens epithelial stem cells has been established. Recent research on exosomes from the trabecular meshwork (TM) stem

cells identified these nanovesicles to enhance cell proliferation and anti-oxidant potential of TM cells indicating the possibility of developing a nanovesicle-based therapy for TM regeneration in patients with primary open angle glaucoma. Studies are being carried out to identify the molecular regulation of human trabecular meshwork stem cells and retinal pigment epithelial stem cells.

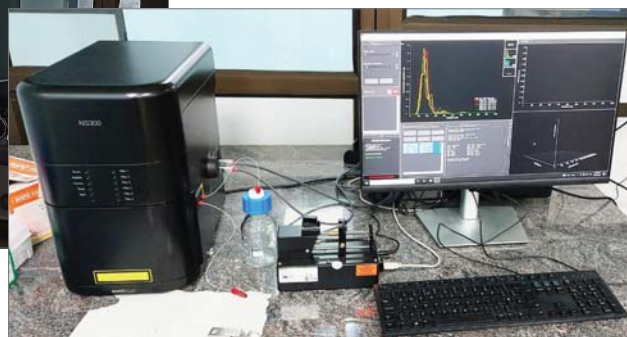
## Infrastructure development

### Exosome innovation centre

Extracellular vesicles (EVs) or exosomes (small EVs) are lipid-encased nanoparticles that carry information from parent cells in the form of DNA, RNA, protein, lipids and metabolites and can alter the cellular physiology of local cells or distal cells by travelling through peripheral blood. The involvement of EVs in several (patho) physiological processes along with their molecular composition reflecting the parent cell in health and disease state, makes EVs an excellent tool for diagnostic biomarkers and understanding their role in disease pathogenesis. AMRF has established a state-of-the-art facility to facilitate exosome research in ocular and other related areas. This facility is a part of the translational initiative for the basic research programmes at AMRF. It includes the infrastructure and equipment for carrying out end-to-end workflow right from isolation, confirmation, and characterisation of exosomes.



*Exosome innovation centre at AMRF*





*Dr. P. Namperumalsamy inaugurating the regional research centre at Aravind-Coimbatore*

### Regional research centres

To strengthen and expand the scope of research, regional research centres were established at Aravind-Tirunelveli, Coimbatore, and Pondicherry. These centres are equipped with adequate infrastructural facilities to initiate research programmes in collaboration with AMRF. Plans are underway to establish a similar centre at Aravind-Chennai.

### Conferences / Workshops conducted

#### Training programme on tissue culture techniques

*3<sup>rd</sup> September 2022*

The Department of Immunology and Stem Cell Biology conducted the one day training as part of the scientific social responsibility activity of an ongoing project funded by Science and Engineering Research Board, New Delhi. A total of 10 Ph.D scholars from surrounding colleges and universities took part. The programme included invited talks and laboratory sessions.

#### Seminar on biomedical applications of fundamental research and future potential

*14<sup>th</sup> October 2022*

As part of October Summit 2022, AMRF organised the seminar to familiarise the teaching faculty from various colleges on the research programmes and various facilities at Aravind. The aim was to motivate them to encourage their students to take up research. A total of 22 teachers from colleges in and around Madurai attended the seminar.

#### AMRF - Dartmouth education and research conference

*29-30 November 2022*

AMRF conducted the conference in collaboration with Dartmouth College, Hanover, USA. Eleven students from Dartmouth College presented research proposals on various eye diseases. Research works carried out

*College teachers at the seminar on biomedical applications of fundamental research and future potential*







*AMRF - Dartmouth education and research conference*

at AMRF were presented as posters by the research scholars. Details of core research facilities and ongoing research projects were presented by AMRF scientists to the Dartmouth team.

### **Workshop on basics of tissue culture**

*7-11 February 2023*

The five-day workshop included a series of lectures and laboratory sessions to give hands-on training on tissue culture techniques. It had 16 participants including faculty, research scholars and postgraduates from surrounding colleges and universities in Madurai.

## **Ongoing projects**

### **Basic research**

- Molecular regulators associated with the maintenance of human trabecular meshwork stem cells in relation to their reduction in aging and glaucoma
- Molecular characterisation of human retinal pigment epithelial stem cells and their role in age related macular degeneration
- Identification and characterisation of adult human retinal pigment epithelial stem cells
- Adult stem cell derived extracellular vesicular miRNAs for trabecular meshwork regeneration in glaucoma
- Characterisation of adult human lens epithelial stem cells in the maintenance of tissue homeostasis throughout life and their functional status in cataractous lens
- Deciphering predictive and preventive methods in the progression of pterygium using multi-omics approaches

*Participants of the workshop on basics of tissue culture with AMRF team*



## PhD Awarded by Alagappa University



Aloysius Abraham

Department of Molecular Genetics

*Thesis: Identification of modifier genes involved in tumorigenesis of retinoblastoma*

Guide: Dr. A. Vanniarajan



K. Lavanya

Department of Immunology and Stem Cell Biology

*Thesis: Micro RNAs specific to corneal epithelial stem cells*

Guide: Dr. Gowri Priya Chidambaranathan



A. Divya

Department of Proteomics

*Thesis: Interaction of pathogenic fungi with human corneal epithelial cells*

Guide: Prof. K. Dharmalingam

- Screening the Kadaladi family with early onset glaucoma for Myocilin gene mutations
- Whole genome sequence analysis of selected family members of the Kadaladi family and identification of markers for the early detection of JOAG using tear extracellular vesicles
- Surfaceome profile of extracellular vesicles
- Development and validation of a non-invasive point-of-care diagnostic tool for fungal keratitis
- Mechanotransduction in retinal pigmented epithelium homeostasis and degeneration: Implications in age-related macular degeneration
- Role of dietary fatty acids in the progression of diabetic retinopathy
- Role of human corneal miRNAs in the onset and severity of fungal keratitis
- Understanding the mechanism of action of a novel chemical cross-linker designed to treat keratoconus
- Translational genomics of ocular cancers
- Targeted modulation of E2F3 and KIF14 pathway in retinoblastoma refractory to existing chemotherapeutic drugs
- Molecular characterisation of tumor progression in retinoblastoma
- Molecular characterisation of ocular lymphoma for improved disease prognosis
- Role of miRNA in the regulation of glucocorticoid receptor signalling and development of new therapeutics for steroid-induced glaucoma
- Identification of druggable targets for attenuating the progression of pterygium development
- Deciphering the role of extracellular vesicles in the modulation of host immune response in fungal keratitis patients
- Proteomic and metabolic analysis of microbial keratitis patient's tear to identify biomarkers of corneal microbial ulcer progression
- Investigating the role of extracellular vesicles in pathogenesis of diabetic retinopathy
- Proteomic analysis of vitreous humour extracellular vesicles in patients with proliferative diabetic retinopathy
- Role of trabecular meshwork stem cell-derived extracellular vesicular miRNAs in human trabecular meshwork regeneration
- Molecular characterisation of Leber's congenital amaurosis in South Indian cohort
- Investigating the crosstalk between nuclear and mitochondrial genome in patients with Leber's hereditary optic neuropathy
- Molecular genetics of juvenile X-linked retinoschisis in South Indian population
- Expression profiling of human corneal miRNAs and their role in *Pseudomonas aeruginosa* induced keratitis
- Identification and analysis of alternative transcripts in retinoblastoma progression
- Identification of dysregulated MicroRNAs in ocular fluids as diagnostic markers for intraocular tuberculosis
- Identification of host immune factors as predictor of severe human fungal keratitis and their utility in disease management
- Modelling macular degeneration using human pluripotent stem cells for better understanding of disease pathophysiology and to investigate novel therapies

## Clinical research

### Glaucoma

- Screening the Kadaladi family with early onset glaucoma for Myocilin gene mutations and development of ER stress reversing novel chemical entities as topical ophthalmic formulations
- A prospective, randomised, comparative study of efficacy and safety of subtenon injectable 20µg Mmc Vs 40µg Mmc in trabeculectomy patients



- A comparative analysis of non-absorbable 10-0 nylon sutures with absorbable 10-0 Vicryl sutures in phaco-trabeculectomy surgery
- A comparison of viscoat augmented delivery of injection mitomycin-C and conventional subconjunctival injection of Mitomycin C in phacotrabeculectomy
- Randomised control trial: Once daily Netarsudil Vs twice daily Timolol in patients with elevated intraocular pressure
- Surgical outcome of Tanito microhook ab interno trabeculectomy with phacoemulsification Vs gonioscopy-assisted transluminal trabeculectomy with phacoemulsification in patients with mild to moderate open angle glaucoma: A randomised comparative study at a tertiary eye care centre
- To assess the safety and efficacy of combined phacoemulsification trabeculectomy Vs phacoemulsification- non penetrating deep sclerostomy in advanced glaucoma - A randomised control study at a tertiary care centre
- To evaluate the efficacy and safety of Aurolab aqueous drainage implant on intraocular pressure reduction in paediatric patients with refractory glaucoma
- Asia primary tube versus trab study
- Shared medical appointments randomised trial
- Enhancing early glaucoma detection through family screening to reduce glaucoma related blindness
- Screening of juvenile open angle glaucoma patients and their family members for myocilin gene mutations
- Evaluation of the accuracy of an automated algorithm for glaucoma detection from colour fundus photographs taken on a low-cost camera as compared with the gold standard clinical evaluation - A prospective study
- Safety and stability of topical Latanoprost eye drops: A randomised prospective observational study
- Non-inferiority of Nanodropper-mediated microdrops vs. standard drops of 0.5% timolol maleate in patients with open-angle glaucoma or ocular hypertension
- Smart phone drop reminder app and smart box
- Family – primary glaucoma evaluation study
- Improving adherence to follow-up in childhood glaucoma
- Family screening of glaucoma
- An open label, multicentric, phase III, prospective study to evaluate the efficacy, safety and tolerability of triple fixed dose combination of Timolol 0.5% + Brimonidine 0.2% + Brinzolamide 1% eye drops in patients with open angle glaucoma/ocular hypertension not responding to dual drug therapy
- A randomised, multicentric, active controlled, parallel-group study to access efficacy and safety of fixed dose combination of Netarsudil and Latanoprost ophthalmic solution (0.02%w/v + 0.005% w/v) in comparison with Latanoprost eye drops (0.005% w/v) in patients with open angle glaucoma or ocular hypertension
- A comparison of the efficacy and cardiovascular adverse events between conventional, commercial 0.5% Timolol maleate and 10 µL drops of 0.5% Timolol maleate using a nanodropper adaptor in adults with primary open-angle glaucoma or ocular hypertension
- Comparing outcomes of femto laser assisted cataract surgery to conventional phacoemulsification in nanophthalmos eyes - A randomised controlled trial
- Structural and functional correlation in nanophthalmic eyes
- Factors affecting follow-up adherence of glaucoma patients
- An analysis of re-surgeries following primary glaucoma surgical interventions
- Long term surgical outcomes of glaucoma associated with Sturge Weber syndrome in Children
- Factors affecting diabetic retinopathy patients' adherence to scheduled follow-up
- Role of miRNA in the regulation of glucocorticoid receptor signalling and development of new therapeutics for steroid-induced glaucoma
- Real world data collection of VISULAS green selective laser trabeculoplasty in routine office / hospital use

## Cataract

- To compare the effect of existing hydrophilic intraocular lens and newly designed hydrophilic intraocular lens over posterior capsule opacification rates in cataract patients
- To assess the safety and efficacy of posterior chamber phakic intraocular lens in patients with high myopia
- Comparative analysis of single dose intraoperative sub-conjunctival depot steroid to routine topical steroids and NSAIDS in phacoemulsification
- The natural history of IOL in eyes with exfoliation syndrome
- Visual performance comparison between phacoemulsification and manual small incision cataract surgery in eyes with senile cataract: A prospective randomised clinical trial
- Comparative analysis of simulator-based training and traditional wetlab training on the cataract surgical outcome in manual small incision cataract surgery: A prospective study
- Validation of cataract detection tool: An artificial intelligence based app on android mobile
- Effect of Nd: YAG laser posterior capsulotomy on higher order aberrations
- Characterisation of adult human lens epithelial stem cells in the maintenance of tissue homeostasis throughout life and their functional status in cataractous lens
- To study the safety and performance of high refractive index cast molded hydrophobic intra ocular lenses with age-related cataract patients
- Effect of preloaded capsular tension ring on clinical outcomes during and after phacoemulsification cataract surgery
- A prospective, randomised, double blind, comparative study to evaluate the surgical performance of Nanocut and Aurolab round stock surgical blades for making corneal incisions during cataract surgery.
- Detection of posterior capsule integrity in posterior polar cataract during pre-operative biometry using IOL master 700
- Comparing outcomes of femto laser assisted cataract surgery to conventional phacoemulsification in nanophthalmos eyes- A randomised controlled trial

## Cornea

- Steroids and cross-linking for ulcer treatment
- Screening, diagnosis, and treatment of keratoconus in Down's syndrome patients from South India- A prospective study
- To assess the safety and efficacy of posterior chamber phakic intraocular lens in patients with high myopia
- A prospective study of postoperative astigmatism in 1 year post penetrating keratoplasty patients in a tertiary care hospital in south India
- PCR based detection and identification of Microsporidia (Coarse SPK) and its species from patients with keratitis
- Standard Vs novel medication form based counselling for corneal ulcer
- Automated quantitative ulcer analysis study
- Rose Bengal electromagnetic activation with green light for infection reduction study
- Seasonal conjunctivitis outbreak reporting for prevention and improved outcomes
- Epidemiology and rapid diagnosis of fungal keratitis in India: A multicentric approach
- Identification of druggable targets for attenuating the progression of pterygium development
- Role of human corneal MiRNAs in the onset and severity of fungal keratitis
- Prediction of the identity of the fungal pathogen (*Fusarium* vs *A. flavus*) using tear protein as diagnostic markers
- Role of extracellular vesicles in the modulation of host immune response in fungal keratitis
- Diagnostic accuracy of smartphones for photographing corneal scars

## Paediatric Ophthalmology

- A multi-centric, randomised, controlled trial to compare the efficacy of 0.01 Vs 0.05% atropine in progression of myopia in the Indian population
- Assessment of parental awareness about paediatric visual problems by a knowledge-attitude-practice (KAP) survey
- Correlation of refractive error in siblings of paediatric patients attending a tertiary level eye hospital
- Identification of potential barriers to timely access to sibling eye check up
- Effect of combined Atropine and patching Vs patching alone for treatment of severe amblyopia in children aged 3 to 12 years
- Augmented loop Myopexy with IOL in heavy eye syndrome
- Role of LDA in myopic progression in Indian population
- Filamentary keratitis post strabismus
- Other eye surgery in patients with traumatic 3rd nerve palsy
- Unique case of isolated superior oblique Palsy
- Acute onset esotropia post lockdown
- Optic nerve glioma in children
- Motility assessment in glaucoma drainage devices
- Profile of secondary IOL in paediatric patients: A retrospective study

- Bynocs Vs patching combined squint +IOL in paediatric population
- Surgical outcome of Helveston syndrome
- Outcome of cataract surgery in children with congenital glaucoma having Aurolab aqueous drainage implant
- Surgical outcomes of superior oblique tuck as a single surgery for acquired superior oblique palsy – A retrospective analysis
- Adjustable strabismus surgery in children under general anaesthesia -A retrospective observational study
- Unilateral resect recess for near distance disparity in convergence insufficiency exotropia
- ERG in nanophthalmos

## Retina

- Efficacy and impact of artificial intelligence based retinal screening at rural primary eye care centres in southern India
- Subjective high-risk patient counselling randomisation project
- Genetic characterisation of macular telangiectasia (MacTel) 2 in the Indian population
- A study on the differential expression of Piwi-interacting RNAs(piRNAs) and altered Piwi-like protein interactions in diabetic retinopathy
- A double masked, parallel group, randomised, multicentre, clinical study to compare efficacy and safety of Intas Ranibizumab with Lucentis® in patients with neovascular (wet) age-related macular degeneration
- Clinical profile and multimodal imaging characteristics of macular telangiectasia type 2 in Indian population
- Validation of an offline artificial intelligence system integrated on a smartphone fundus camera for age-related macular degeneration screening
- An extension study to evaluate the long term efficacy and safety of Ranibizumab compared with laser therapy for the treatment of infants born prematurely with retinopathy of prematurity
- Structured post-marketing surveillance to collect the safety data of intravitreal Aflibercept injection in patients with wet age-related macular degeneration during real world clinical practice
- Improving retinopathy of prematurity telemedicine systems in south India
- Long-term effects of semaglutide on diabetic retinopathy in subjects with type 2 diabetes
- A phase III, comparative, double blind, randomised, multi centre study to compare the efficacy, safety and immunogenicity of Sun's Ranibizumab with reference biologic in patients with neovascular age-related macular degeneration
- A randomised, phase 3, double-masked, parallel group, multicentre study to compare efficacy and safety of Q1205 versus Lucentis in subjects with neovascular age-related macular degeneration
- A multicentric, extension study to evaluate the safety and efficacy of MYL-1701P in subjects with diabetic macular edema completed MYL-1701P-3001



- A randomised, active-controlled, double-masked, parallel-group, phase 3 study to compare efficacy and safety of CT-P42 in comparison with Eylea in patients with diabetic macular edema
  - Accuracy of smart phone based mydriatic fundus camera in the detection of CMV retinitis
  - A prospective study for ocular and systemic pathologies
  - Evaluation of topical Hydroxypropyl methylcellulose in reducing the post intravitreal injection discomfort through a questionnaire
  - A pilot study to understand the impact of Zydus Cadila's Bevacizumab with Roche's Bevacizumab in patients with retinal pathology
  - A comparative study to determine the impact of an altered patient flow using fundus imaging in the general OPD of a tertiary eye hospital in south India
  - A prospective study to evaluate the early real-world evidence of Brolucizumab in patients with polypoidal choroidal vasculopathy
  - Knowledge, attitude and practice (KAP) Questionnaire study on retinopathy of prematurity among ophthalmologists in a tertiary care hospital
  - Laser for retinopathy of prematurity under subtenon anesthesia - A randomised control study
  - A randomised clinical trial to determine the impact of an altered patient flow using fundus imaging in the general OPD of a tertiary eye hospital in south India
  - Anatomical outcomes of posterior sclerostomy with and without Mitomycin C in nanophthalmos with uveal effusion syndrome
  - Combined pars plana vitrectomy with inferior endolaser ablation of pars plana in neo-vascular glaucoma
  - Comparative analysis of the outcome of large macular holes operated with platelet rich plasma derived nanovesicles versus platelet rich plasma
  - Establishment of Aravind registry for inherited diseases of the eye
  - Intraocular lens type and retinal oxidative stress
  - A pilot study to assess the efficacy of oral Lamivudine for macular edema due to retinal vein occlusions
  - Deep Learning-based automated macular fluid quantification and predictive analytics for patients with BRVO
  - Intravitreal Triamcinolone acetonide for macular edema in hypertensive retinopathy
  - Clinical features, management and outcome of diabetic retinopathy complicated by chronic myeloid leukemia
  - Intravitreal Dexamethasone implant (Ozurdex) combined with vitrectomy for diabetic macular edema
  - Clinical profile, microbiological study, and follow up of scleral buckle removal - 12 years of experience from a tertiary eye centre
  - Factors affecting diabetic retinopathy patients' adherence to scheduled follow-up
  - A prospective comparative study of Lutein and Zeaxanthin adjunctive therapy with pars plana vitrectomy in macula of rhegmatogenous retinal detachment
  - A 96-week, two-arm, randomised, single-masked, multicentre, phase III study assessing the efficacy and safety of Brolucizumab 6 mg compared to panretinal photocoagulation laser in patients with proliferative diabetic retinopathy
  - A phase 3, randomised, double-blind parallel group, multicentre study to compare efficacy, safety, pharmacokinetics, and immunogenicity of BP05 Versus EU- Approved Lucentis® in patients with wet (neovascular) age-related macular degeneration.
  - A randomised, double-masked, parallel-group, multicenter clinical study to evaluate the efficacy and safety of AVT06 Compared with EU-Eylea® in subjects with neovascular (wet) age-related macular degeneration
  - A phase III, prospective, randomised, parallel group, double-blind, multicentre study to compare the efficacy, safety, and immunogenicity of Lupin's Aflibercept with Eylea® in patients with neovascular age-related macular degeneration
- ### Orbit and Oculoplasty
- The learning curve in external dacryocystorhinostomy: Experience of a fellowship trainee at a tertiary care centre
  - Translational genomics of ocular cancers
- ### General Ophthalmology
- Remote mobile phone app for diagnosis of anterior segment disease - a new model for community based screening
- ### Uvea
- Diagnostic markers for ocular tuberculosis
  - A phase III, multicentre, sham-controlled, randomised, double-masked study assessing the efficacy and safety of intravitreal injections of 440 µg DE-109 for the treatment of active, non-infectious uveitis of the posterior segment of the eye
- ### Neuro-ophthalmology
- Role of microperimetry in toxic neuropathy and optic neuritis- A cross sectional study
  - Demographic profile and ophthalmic manifestations of ocular myasthenia- A hospital based retrospective study
  - Neuro ophthalmic manifestations of tuberculosis
  - Neuro ophthalmic manifestations in thyroid disorder- A five year retrospective study
- ### Health Systems Research
- Impact of electronic medical record implementation on provider and patient satisfaction
  - Global estimation of cataract surgeries
  - Causes and visual outcomes of ocular injuries among patients visiting primary eye care centres in south India
  - Prevalence of glaucoma in India - A systematic review and meta-analysis
  - Evaluation of the accuracy and reliability of transpalpebral tonometers compared with Goldmann Applanation Tonometer – A systematic review and meta-analysis
  - A prospective, observational study to determine the impact of an altered patient flow using fundus imaging in the general OPD of a tertiary eye hospital in south India
  - Impact of community-based eye health education programme on service uptake and speciality diagnoses in vision centres

*The year saw Aurolab launching new products, promising uncompromised vision for patients. A new division was opened for spectacles to address the massive and increasing problem of refractive errors. Various developmental initiatives were introduced towards ensuring maximum productivity, high quality of products as well as safety of employees. Aurolab expanded its reach with various products entering new international markets.*



## Ophthalmic Supplies and Equipment



## New products

### Aurovue Vivid continuous focus vision IOL

Aurolab launched its most technologically advanced product, Aurovue Vivid – Continuous Focus Vision IOL, in June 2022, during the annual conference of All India Ophthalmological Society. This product, a combination of refractive and diffractive optics, provides smoother transition in resolution between near, intermediate, and far distances – covering from functional near vision (40 cm) to distance vision (4m and beyond) without perceptible visual disturbances. This design significantly improves the quality of vision and quality of life post-cataract surgery. Aurovue Vivid is built on the trusted Aurovue hydrophobic platform, with over 15 years of unblemished track record and over 1.5 million implantations globally.



*Ribolink*



*Aurovue Vivid continuous focus vision IOL*



*At the launch of spectacles unit in Aurolab*

### Ribolink

Ribolink ophthalmic solution is a sterile and single-dose formula for corneal cross-linking procedures. It is instilled in the eye during irradiation of UV-A light as part of the para-surgical procedure of corneal collagen cross-linking. The principal objective of riboflavin ophthalmic solution is to provide a barrier against UV-A penetration beneath the corneal stroma to protect the delicate internal structures of the eye, such as the corneal endothelium, lens, and retina. The administration of Riboflavin in association with UV-A light retards the progression of keratoconus and prevents the necessity of a corneal transplant.

## New initiatives and developments

### On-line data collection

Aurolab installed an IoT based software system in a few select lathes to collect the machine's critical information such as production time, breakdown time and type of breakdown. Previously, it was done manually. This is towards Aurolab's manufacturing, eventually becoming compliant to industry 4.0 standards.

### Launch of optical division

Refractive error remains one of the biggest causes of needless blindness. With support from Seva Foundation, USA, Aurolab opened an Optical Division on December 14 with an aim to provide premium quality spectacle lenses at an affordable rates. At present, it procures these lenses from renowned manufacturers and supplies them to hospitals. Aurolab plans to manufacture them in-house in future.





*The event held at Aurolab to formally launch TPM across its various divisions*

## Deployment of total productive maintenance

Total Productive Maintenance (TPM), a concept originated in Japan, is a strategic method for continual improvement and excellence in all aspects of an organisation. It helps improve productivity, quality, cost, delivery, morale, safety, and the environment. Aurolab has been experimenting with this hugely successful management strategy tool for about a year and the results have been truly encouraging. A special function was organised to celebrate this success and also to deploy it across the various divisions of Aurolab formally.

Deploying TPM brought immediate results in reducing energy consumption and an increase in production volume.

Steps to reduce compressor energy consumption have brought down the air consumption from 3 CFM to 1 CFM in lathes, thereby resulting in considerable reduction in the noise level. This helped save about 500 units of electricity per day.



## Launch of TPM logo and mascot







*Aurolab's national sales meet at Radisson Blu, Chennai. Around 130 field staff took part.*

## Regulatory affairs

### Management review meeting

Operations and activities of each division in Aurolab are streamlined through a quality management system which involves standard audits by 50 internal quality auditors. The results of these audits are shared in the management review meeting conducted every three months to meet the requirements of ISO 13485 standard. Aurolab successfully conducted the 100th management review meeting on 12<sup>th</sup> September 2022.

### Product registration, approval, and certifications

Aurolab registered 18 products for the first time in 17 countries which include Saudi Arabia, Uzbekistan, Argentina and re-registered 26 products in 22 countries. Aurocoat plus got registered in Bolivia and Peru. Aurolab has cleared Ukraine GMP Audit and registered two pharma products.

Aurolab has started to work with NGO organisations in the Middle East and Africa towards expanding their distribution network.

Aurolab got approval for 13 medical devices such as Glide and Trocar from the Central Drugs Standard Control Organisation, India. It also got 510K (FDA) approval for Cornsiol, the cornea preservative used by eye banks, and this has enabled entry into the US market.

## Marketing

- As a first of its kind in the field of ophthalmic equipment marketing, Aurolab organised a road

show for a real-time demonstration of Hawk-i slit lamp with Third-I imaging system, targeting ophthalmologists in Uttar Pradesh and Tamil Nadu in August and October respectively.

- A campaign promoting hydrophobic IOLs was conducted across various hospitals in Uzbekistan with over 100 participants and received orders for around 10,000 units.
- Aurolab's sales training workshop (ASTRA) for the 46 new joiners was organised at LAICO in two batches in the months of July 2022 and February 2023.

## CMEs, training programmes and conferences

At a training programme for ophthalmologists organised by Aravind-Chennai from 25-26 November 2022, Aurolab explained the benefits of its toric lenses for astigmatism correction.

CMEs and wet lab trainings were organised in Bangladesh, Egypt and Malaysia where Aurolab demonstrated its products.

Aurolab participated in major national and international trade shows and ophthalmic conferences to create awareness of its products.

## Support to vision centres

Aurolab offers the necessary hardware, software, and equipment as a package to help set up vision centres. A total of 200 vision centres run by NGOs and private hospitals and institutions across the nation benefitted from this package since its launch in 2019.



## Aurolab at various ophthalmic conferences





# Recognitions and Achievements

## RECOGNITIONS

### Health Care Climate Challenge 2022

6<sup>th</sup> December 2022



Global Green and Healthy Hospitals, an international network of hospitals dedicated to reducing their environmental carbon footprint and promoting environmental health through its initiative “Health Care without Harm” chose Aravind Eye Care System as Health Care Climate Champion 2022 among the health care institutions in Asia. The award recognises Aravind’s initiatives across the three pillars of the health care climate challenge – mitigation, resilience and leadership – to reduce carbon footprint.

### Legendary Institution Award

Madurai, 21<sup>st</sup> May 2022

Rotary International District 3190 honoured Aravind Eye Hospital, Madurai with the award in recognition of its contributions to community ophthalmology, at the inaugural session of the Rotary National Conference on Community Ophthalmology.

### Tamil Nadu Medclave Honour

Chennai, 19<sup>th</sup> November 2022

Aravind - Chennai received the Confederation of Indian Industry’s Tamil Nadu Medclave Honour for Ophthalmology.

### News18 Madurai Business Award 2022

Madurai, 25<sup>th</sup> November 2022

Aravind - Madurai was chosen for the award in the Healthcare category.

### Certificate of Appreciation

Palayamkottai, 26<sup>th</sup> January 2023

Aravind - Tirunelveli received a certificate of appreciation for exemplary performance under Chief Minister’s Comprehensive Health Insurance Scheme. Dr. V. Maneksha, Chief, Orbit and Oculoplasty Clinic received the certificate from V. Vishnu, IAS District Collector, Tirunelveli during the Republic Day Celebration.

### Aarogyasri Award

Tirupati, 15<sup>th</sup> August 2022

Aravind – Tirupati was chosen for this award for the best performing eye hospital under the state govt’s Aarogyasri insurance scheme, for the year 2021-2022.

### Children’s Champion Award

New Delhi, 25<sup>th</sup> March 2023

Aravind Eye Care System was honoured with the Children’s Champion Award by the Delhi Commission for Protection of Children’s Rights, an apex body of the Govt. of Delhi. The award was given in recognition of Aravind’s services to visually impaired children.

Dr. P. Vijayalakshmi, Aravind’s founding member and a senior paediatric ophthalmology consultant, Aravind-Madurai who played a pivotal role in changing the face of paediatric ophthalmology in India received the award at the function held in New Delhi.

### Rotary Vocational Excellence Awards

Madurai, 22<sup>nd</sup> April 2022

According to a study conducted by the Stanford University in the year 2021, Dr. M. Srinivasan, Director Emeritus, AECS; Dr. S.R. Rathinam, Chief, Uveitis Services, Aravind-Madurai and Dr. Lalitha Prajna, Chief Microbiologist, Aravind-Madurai were listed among the top researchers in ophthalmology. The Rotary Club of Madurai felicitated them at a special programme held at LAICO.

In the consequent survey published by the Stanford University in October 2022, in addition to the three doctors mentioned above, Dr. N. Venkatesh Prajna, Director, Academics, AECS was added to the list.



Dr. P. Vijayalakshmi receiving the TNOA Lifetime Achievement Award from Manohar Devadoss

### FICCI Healthcare Humanitarian Award

New Delhi, 11<sup>th</sup> October 2022

Dr. P. Namperumalsamy, Chairman Emeritus, AECS was chosen for this year's award.

### AAO Secretariat Award

22<sup>nd</sup> July 2022

American Academy of Ophthalmology (AAO) honoured Thulasiraj Ravilla, Director-Operations, AECS with the Secretariat Award 2022 in appreciation of his contribution to the Academy and ophthalmology.

### Lifetime Achievement Award

Coimbatore, 5-7 August 2022

Dr. P. Vijayalakshmi, Senior Paediatric Ophthalmologist and Chief, Low Vision Services, Aravind-Madurai received the Tamil Nadu Ophthalmic Association (TNOA) Lifetime Achievement Award 2022.

### Esteemed Positions in Ophthalmology Forums

- Dr. R. Ramakrishnan, Advisor, Aravind-Tirunelveli was elected as the President of TNOA for the period 2022- 2023, at its annual conference held at Coimbatore from 5-7 August 2022
- Prof. K. Dharmalingam, Director, AMRF was elected as the President of Indian Eye Research Group at its 28th annual meeting held at Hyderabad from 10-11 September 2022
- Dr. Manju R Pillai, Medical Consultant, Glaucoma Services, Aravind-Madurai was elected Member – South Zone of the Executive Committee of the Glaucoma Society of India in December.

### Dr. A.P.C.V. Velayutham Memorial Oration Award

Tuticorin, 17<sup>th</sup> April 2022

At the event organised by V.O. Chidambaram Educational Society, Dr. R.D. Ravindran, Chairman, Aravind Eye Care System delivered the oration on *Eliminating blindness in India / Tamil Nadu..... Where are we now in our journey?*

### Dr. Gullapalli N Rao Endowment Lecture Award

Mumbai, 2<sup>nd</sup> June 2022

At the 80th Annual National Conference of All India Ophthalmological Society, Dr. R.D. Ravindran delivered the endowment lecture on *The science of ophthalmology and my philosophy.*

### T.K. Alexander Memorial Oration Award

Kozhikode, 25<sup>th</sup> November 2022

Dr. R.D. Ravindran delivered the oration titled *Ensuring good patient experience & satisfaction in our practice* at the Annual Conference of Kerala Society of Ophthalmic Surgeons.

### Oration Awards at the Annual Conference of Andhra Pradesh Ophthalmic Society

Vijayawada, 14<sup>th</sup> October 2022

Dr. R. D. Ravindran delivered the Dr. P. Siva Reddy Oration on *Ensuring good patient experience and satisfaction in day-to-day practice.*

Dr. R. Ramakrishnan delivered the Dr. Sonty Sriram Lecture on *Drug-induced glaucoma.*

### Prof. B.P. Kashyap Memorial Oration 2022

Patna, 15<sup>th</sup> October 2022

Dr. R. Kim, Chief Medical Officer, Aravind-Madurai delivered the oration titled *Unmet need in the management of diabetic retinopathy* at the 35th Eastern India Zonal Ophthalmological Congress.

### Visiting Professorship at Wills Eye Hospital

Philadelphia, Pennsylvania, 1<sup>st</sup> June 2022

Dr. N. Venkatesh Prajna, Chief, Cornea and Refractive Surgery Services, Aravind-Madurai was appointed as Visiting Professor at Wills Eye Hospital. He delivered lectures as part of the David Paton Lectureship on Aravind's training initiatives, its work on fungal keratitis and vision centres.





*Dr. P. Namperumalsamy receiving the FICCI Healthcare Humanitarian Award from Smriti Irani, Union Minister of Women, Child Development of India and Minority Affairs*



*Dr. P. Vijayalakshmi receiving the Children's Champion Award from Dr. S. Muralidhar, Chief Justice, Odisha High Court*



*Dr. Usha Kim receiving the News18 Madurai Business Award for Aravind from Thangam Thennarasu, Minister of Industries, Govt. of Tamil Nadu*



*K. Revathy and Riyah Jaitika receiving the Tamil Nadu Medclave Honour for Aravind-Chennai from M. Subramanian, Minister for Health, Govt. of Tamil Nadu*



*Dr. Ashok Vardhan receiving the Arogyasri Award from K. Venkata Ramana Reddy IAS, District Collector, Tirupati*



*Dr. R. Ramakrishnan as the President of Tamil Nadu Ophthalmic Association*



*R. Meenakshi Sundaram receiving the Legendary Institution Award for Aravind*



*Rotary Vocational Excellence Award for Drs. M. Srinivasan, S.R. Rathinam and Lalitha Prajna*





*Dr. R.D. Ravindran receiving the Dr. Gullapalli N. Rao Endowment Lecture Award from Aishwarya Rai*



*Dr. N. Venkatesh Prajna after delivering the Wills Eye Paton Lecture*



*Dr. V. P. Meera Lakshmi receiving the DNB gold medal and certificate from Dr. Bharathi Pravin Pawar, Union Minister of State for Health, Govt of India*



*Dr. R. Venkatesh receiving the Best Doctor Award from the Lieutenant Governor of Puducherry, Dr. Tamilisai Soundararajan in the presence of N. Rangasamy, Chief Minister, Pondicherry*



*Amazing Woman Award for Dr. Usha Kim*



*Doctors' Day Awards for Dr. Syed Mohideen Abdul Kader, Dr. D. Chandrasekar and Dr. Rodney Morris*



*Aaravind team with the video awards at the ASCRS*



### Amazing Woman Award

Madurai, 8<sup>th</sup> March 2022

In recognition of her outstanding achievement and success in professional and social life, Dr. Usha Kim, Chief - Orbit, Oculoplasty, Ocular Oncology and Ocular Prosthetics Services was conferred the 'Amazing Woman Award' by the Women Empowerment forum of TN Chamber Foundation, Madurai.

### Best Doctor Award

Pondicherry, 28<sup>th</sup> August 2022

Dr. R. Venkatesh, Chief Medical Officer, Aravind-Pondicherry was awarded the Best Doctor Award by the News18 TV network as part of its Sigaram2022 award ceremony.

### Doctors' Day Awards

1<sup>st</sup> July 2022

On the occasion of National Doctor's Day, Dr. Syed Mohideen Abdul Kadar, Chief, Retina and Vitreous Services, Aravind-Tirunelveli was honoured for his exemplary contribution under the Ayushman Bharat Pradhan Mantri Jan Yojana scheme. V. Vishnu, IAS District Collector, Tirunelveli presented the award. IMA, Coimbatore and Coimbatore North Round Table honoured Dr. Rodney J Morris, Medical Consultant, Retina and Vitreous Services and Dr. D. Chandrasekhar, NABH Consultant, Aravind-Coimbatore for their distinguished services to the community.

### Rising Star Award

Chandigarh, 5<sup>th</sup> November 2022

Dr. R. Sankarananthan, Medical Officer, Cataract and IOL Services, Aravind-Madurai was presented the Rising Star Award for simulation in ophthalmology

*Dr. R. Sankarananthan with the Rising Star Award*



*Dr. Renu P. Rajan receiving the L.C. Dutta Memorial Oration Award*

by the International Society of Manual Small Incision Cataract Surgeons.

### L.C. Dutta Memorial Oration Award

Guwahati, 25<sup>th</sup> February 2023

Dr. Renu P. Rajan, Medical Consultant, Retina and Vitreous Services, Aravind-Madurai received the award organised by Chandraprabha Eye Hospital, Guwahati. He delivered the oration on the topic, *Retinopathy of prematurity: Preventing a lifetime of needless blindness.*

### Best Nurse Award

Tirunelveli, 12<sup>th</sup> May 2022

S. Sangeetha, Aravind Community Eye Clinic, Sankarankoil was felicitated by Red Cross Society in recognition of her service to the society, on the occasion of International Nurses Day.

*S. Sangeetha receiving the Best Nurse Award*



## ACHIEVEMENTS

### Annual Conference of American Society of Cataract and Refractive Surgery (ASCRS) - Film Festival Awards 2022

Washington, 22 - 26 April 2022

Runner-up

- Dr. R. Venkatesh  
Category: *Glaucoma Surgery*  
Title: *The lost sponge – Safe application of MMC sponges in trabeculectomy*
- Dr. Fredrick Mouttapa, Senior Consultant – Paediatric Ophthalmology Services, Aravind-Pondicherry.  
Category: *Quality in Teaching*  
Title: *Dyes in ophthalmology*
- Dr. Sathya Ravilla, Medical Officer, Paediatric Ophthalmology Services, Aravind-Tirupati  
Category: *Special interest*  
Title: *Are you aware of your posture when you operate?*

### DNB Gold Medal

New Delhi, 20<sup>th</sup> June 2022

Dr. V.P. Meera Lakshmi, Aravind Eye Hospital, Theni topped the Ophthalmology speciality of the Diplomate of the National Board (DNB) examination at the national level. At a special function held in New Delhi, she received the Dr. G. Venkataswamy Gold Medal Award from Dr. Bharathi Pravin Pawar, Union Minister of State for Health, Govt of India.

### Awards at All India Ophthalmic Conference

Mumbai, 2-5 June 2022

- Dr. Kirandeep Kaur, Consultant, Paediatric Ophthalmology Services, Aravind-Pondicherry - Best physical poster in Neuro-ophthalmology - for her poster titled *Retrospective analysis of multiple cranial nerve palsies at a tertiary eye care hospital*
- Dr. Kunal Madlik, Cornea Consultant, and Dr. Shivaraj Tagare, PG Resident, Aravind-Pondicherry received Consolation prize at the *Think under the apple tree* session for the video titled *Low cost pterygium Burr, and Incremental innovations in operation theatre* respectively.
- Dr. Siddharth Narendran, Consultant, Cataract and IOL Clinic, Aravind-Coimbatore - Rema Mohan Award for best paper in medical retina titled *Mechanotransduction in retinal pigmented epithelium homeostasis: implications in age related macular degeneration*

- Dr. Prithvi Chandrakanth, Fellow, Retina and Vitreous Services, Aravind-Coimbatore;  
*Think under the apple tree* session  
Second Prize for, *Slit lamp based intraocular lens microscope (SLIM)*  
Consolation prize for *Smartscope Kit*  
Best free paper award in glaucoma for the paper titled, *Smartphone gonioscopy*  
Best poster award in comprehensive ophthalmology for the paper titled, *Fungal morphology identification using IOLSCOPE*  
He also received the International Ophthalmic Hero Award 2021.
- Dr. Hirika Gosalia, PG Resident, Aravind-Coimbatore was the First runner up in the free paper presentation, on Neuro-ophthalmology.  
Title-*Bruchs membrane opening minimum rim width to differentiate glaucomatous from non glaucomatous optic atrophy.*  
She was elected as the Executive Member of Young Ophthalmologists Society of India and also won the film festival award in special category video titled *ASPI for Residents.*
- Dr. Maheswari, Fellow, Retina and Vitreous Services, Aravind-Coimbatore secured First prize in free paper presentation on Community Ophthalmology.  
Title: *Trash to treasure retcam: Treasure to save sight amidst pandemic*
- Dr. Sindhuja Murugesan, Aravind-Coimbatore became a Fellow of All India Collegium of Ophthalmology.

### Awards at Tamil Nadu Ophthalmic Association Conference

Coimbatore, 5-7 August 2022

- Dr. Devendra Maheshwari, Medical Consultant, Glaucoma Services, Aravind-Tirunelveli - received Dr.Velayutham Best Paper Award.  
Title: *Early outcomes of a modified AB interno sulcus placement of Aurolab aqueous drainage implant tube.*
- Dr. A. Fathima, Medical Consultant, Paediatric Ophthalmology and Strabismus Services, Aravind-Tirunelveli received Best Innovation Award.  
Title: *Fundus assessment technique – To assess fundus during anterior segment surgeries.*
- Dr. Tejaswi Prasad, Medical Consultant, Cornea Services, Aravind-Madurai received Best Poster Award. Title: *Clinical and pathological characteristics of OSSN in south Indian population.*



- Dr. D. Chandrasekhar, Consultant, Aravind-Coimbatore received the Dr. Agarwal Award for Excellence in Teaching
- Dr. Siddharth Narendran, Aravind-Coimbatore - CP Gupta Award for Best Paper in all categories. Title: *Development of a Ultra-sensitive Crispr- Based Diagnostic Platform for Diagnosis of Fungal Keratitis.*
- Dr. Hirika Gosalia won Captain Subramaniam Best Video Award for the video titled *ASPI for residents* and second prize in general quiz and ET Selvam Quiz.
- Dr. Jebintha Brayan M, Aravind-Coimbatore received Dr. MN Best Paper Award in Cataract. Title: *SPECIAL (Sitting Phaco Emulsification of Cataract and Intraocular Lens Implantation).*
- Dr. Shafeena, Fellow, Aravind-Coimbatore - First Prize in General Quiz and Second Prize in ET Selvam Quiz.
- Dr. B. Pranesh, Aravind-Coimbatore won second prize in Time Saver session.
- Dr. Rihana.A, MS Resident, Aravind-Madurai received the Best Paper Award. Title: *Vitreous amyloidosis in familial amyloid polyneuropathy*
- Dr. Sathya T Ravilla, Aravind-Tirupati received 3<sup>rd</sup> place in Pitch Perfect Innovation session for *Squintometer- prism holding device*

### Awards at the Annual National Conference of VISION 2020: The Right to Sight – India

Siliguri, 3-4 September 2022

Best Paper Awards:

- D. Yesunesan, Senior Faculty, LAICO - *Generating demand for, and enhancing uptake of eye care services during and post COVID scenario*

- S. Sangeetha, Manager, Administration, Aravind – Coimbatore - *An analysis study on perception of presbyopia among rural and urban women*

### Awards at the 28th Annual Meeting of the Indian Eye Research Group (IERG)

Hyderabad, 10-11 September 2022

- Hanith Raj Deivarajan, Project Fellow, Microbiology lab, AMRF received Best Paper Award for the paper titled, *Development and validation of a novel CRISPR/ CAS12A based nucleic-acid detection platform for the diagnosis of ocular fungal infections.*
- R. Iswarya, Senior Research Fellow, Department of Immunology - received travel grant for her work on *Trabecular meshwork stem cell derived exosomes enhance TM Cell survival and proliferation.*

### Awards at the 5th World ROP Conference

Dubai, 1-4 September 2022

- Dr. Prithvi Chandrakanth, Aravind-Coimbatore won Best Video Award for the video titled, *The journey of a vitreoretina fellow in RoP Screening*
- Dr. Puja Maitra, Aravind-Coimbatore won second prize in Poster Podium Presentation. Title: *Telemedicine- An effective approach to address emerging public health problem of ROP*

### Winners – Prolate Quiz

Chennai, 5 September 2022

- Dr. Yuvraj Madhav and Dr. Aditya Anand, Senior Residents, Aravind – Pondicherry got the second Place in Prolate Puzzle – Quiz for post-graduates organised by Regional Institute of Ophthalmology, Chennai.

Hanith Raj Deivarajan receiving the Best Paper Award



R. Iswarya receiving the travel grant at the Annual Meeting of the Indian Eye Research Group



Dr. Puja Maitra receiving the second prize in Poster Podium Presentation



### Best Video Award

Milan, Italy, 16-20 September 2022

- Dr. Hirika Gosalia, Aravind-Coimbatore won Best Video Award for the video on *Anterior segment photography with intraocular lens – An innovative learning tool* at the European Society of Cataract and Refractive Surgery Conference.

### CAHO Award for Innovation

Mumbai, 24<sup>th</sup> September 2022

- Dr. Prithvi Chandrakanth, Medical Officer, Retina Services, Aravind-Coimbatore won second prize in the Innovation session for *Smart phone-assisted frugal retinopathy of prematurity screening* at CAHOTECH 2022 organised by Consortium of Accredited Healthcare Organisations (CAHO).

### Winners – Photography Contest

Cochin, 18<sup>th</sup> September 2022

- Dr. Maya T.J, Dr. Rinu George, Dr. Meera Mohanakumar, Aravind-Coimbatore became winners of the photography contest organised by Giridhar Eye Institute as part of its silver jubilee symposium.

### Winners – USI Photo Contest

Hyderabad, 14-16 October 2022

- Dr. Radhika T and Dr. Anjana Somanath, Medical Consultants, Uvea Clinic, Aravind-Madurai won the first and second prizes respectively at the photo contest organised by the Uveitis Society of India (USI) at its annual conference.

### Best Free Paper Award - Maharashtra Ophthalmological Society Conference

Nasik, 14<sup>th</sup> October 2022

- Dr. Pinank Kharkande, Aravind-Coimbatore won first prize for the paper titled, *Ethambutol optic neuropathy: Another conundrum* at the Annual Conference of Maharashtra Ophthalmological Society.

### Awards at the 32nd Annual Conference of Oculoplastic Association of India

Mumbai, 11-13 November 2022

- Dr. Maneksha V, Chief – Department of Orbit and Oculoplasty, Aravind Eye Hospital, Tirunelveli received Best Free Paper Award for *Lacrimal sac rhinosporidiosis: Clinical profile and a method of preoperative diagnosis*
- Dr. Viji Rangarajan, Chief, Department of Orbit and Oculoplasty, Aravind – Coimbatore received Best Video Award on *A bridge too far: A simple technique for management of extensive congenital upper eyelid colobomas*

### Best Paper Award – Annual Conference of Kerala Society of Ophthalmic Surgeons

Kozhikode, 27<sup>th</sup> November 2022

Dr. Prithvi Chandrakanth won Padma Bhushan Dr Siva Reddy Best Paper Award for the paper titled, *Smartphone gonioscopy*.

### Photo Contest Winner -Karnataka State Ophthalmic Conference

Hubli, 9-11 December 2022

Dr. Divya Shenoy, Fellow, Paediatric Ophthalmology, Aravind-Madurai won second prize in photography competition.

### J.M Pahwa Best Free Paper Award

Nagpur, 2-4 December 2022

Dr. Siddharth Narendran won the J.M Pahwa Best Free Paper Award for the paper, *Development of a novel crispr based diagnostic platform for rapid diagnosis of fungal endophthalmitis* at the 31st Annual Conference of Vitreo-Retinal Society of India.

### Winners - Second Edition of CII Puducherry Innovation Contest 2022

- Dr. Megha Nair, Cornea Fellow and Dr. Shivaraj Tagare, Retina Fellow, Aravind-Pondicherry - Innovation: *i – Verter*
- Dr. Jenani, Cataract and IOL Fellow, Aravind-Pondicherry along with a team of students from Pondicherry Technological University  
Innovation: *Saline reading monitor*

### FIFA Award Winner - AIOS Midterm Conference

Patna, 6-8 January 2023

Dr. Apurva Nagtode, DNB Resident, Aravind-Pondicherry won the FIFA Award for the best video in *New Technique* Category. Title: *The lost sponge!- Safe application of MMC sponges in Trabeculectomy!*

### Best Scientific Paper Award – Asia Pacific Academy of Ophthalmology Congress

Kuala Lumpur, Malaysia, 23-26 February 2023

- Dr. Prithvi Chandrakanth, Aravind-Coimbatore received the Best Scientific Paper Award at the 38th Asia-Pacific Academy of Ophthalmology Congress. Title of the paper: *Slit Lamp based intraocular lens Microscope: A point of care diagnostic tool for fungal hyphae detection*



## Top 5 Finalists – Surgical Video Competition

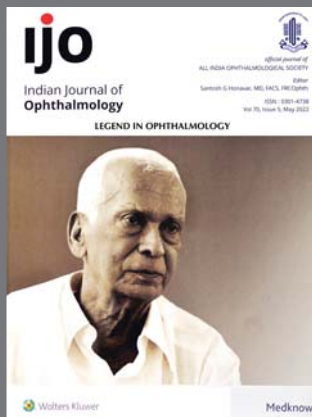
Pondicherry, 13<sup>th</sup> March 2023

A surgical video of Dr. Swati Upadhyaya, Medical Consultant, Glaucoma Services, Aravind-Pondicherry. became one among the Top 5 Finalists in the competition conducted by the American Glaucoma Society. Title of the video: *Gateway to safe gonioscopy-assisted transluminal trabeculotomy*.

## Best Oral presentation Award

Madurai, 28<sup>th</sup> February - 1<sup>st</sup> March 2023

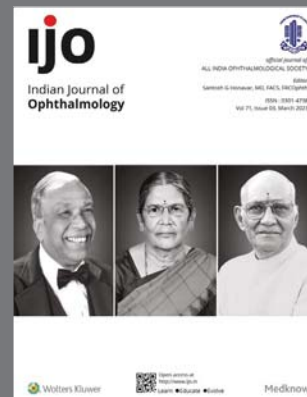
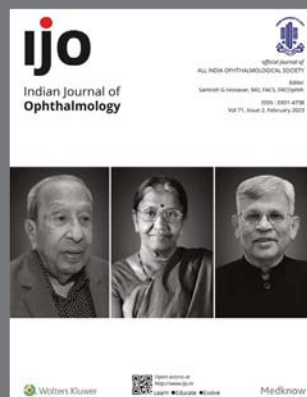
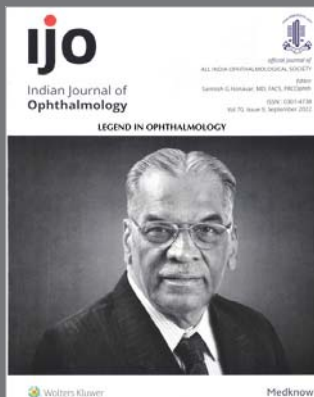
C. Prakash, Senior Research Fellow, Department of Genetics, AMRF was given the award for his presentation titled, *Nuclear gene implications in LHON probands decodes autosomal recessive forms of inheritance* at the 4th International Conference on Genome Biology and 54th Annual Aqua-Terr Day held at Madurai Kamaraj University.



As a fitting tribute to Aravind's founding members, Indian Journal of Ophthalmology carried special articles on them in its various issues over the past year. Dr. G. Venkataswamy was featured in the February 2022 issue, in Tales of Yore, which portrays the giants in ophthalmology who are no more.

Dr. P. Namperumalsamy was featured on the cover page of IJO in May 2022, as part of its Living Legends Series in consideration of his pioneering work to elevate the status of ophthalmology In India and the world. The issue also had a guest editorial written by him.

Dr. G. Natchiar and Dr. P. Vijayalakshmi were featured in Women in Ophthalmology column in the February and March 2023 issues respectively, in recognition of their immense contributions to ophthalmology as a clinician, mentor and researcher.



# Aravind Eye Foundation

Founded in 2000, the Aravind Eye Foundation supports the Aravind Eye Care System in its mission to eliminate needless blindness through philanthropy, volunteerism, and partnership. Since Aravind's core operations are internally funded, the foundation prioritizes those areas where external support can be a catalyst for innovation or can scale proven programs across our network of hospitals or to other countries. Foundation board members and advisors come from a wide variety of fields, including clinical care, medical research, technology, higher education, venture capital, and healthcare management. Following the intent of Aravind's founder, Dr. G. Venkataswamy, the foundation strives to remove all barriers to high-quality, compassionate care for all, regardless of ability to pay.

## Caring for our patients

Patient care has long been a focus for the foundation, not only actual diagnosis and treatment, but also covering the hidden costs which make it challenging for poor patients to receive treatment. Transportation, accommodation, and medicines can become obstacles for completing a cycle of chemotherapy or needed for a corneal ulcer.

This past year, the Ring of Hope program saw 53 new eye cancer patients, and provided 1,283 patient visits



and genetic testing for 81 patients and their relatives, completely free of cost. A complete cycle of treatment takes many months and includes diagnosis, surgery, chemotherapy, radiation, and custom prosthesis – per patient cost is between \$1,000 - \$2,000. Often there is a genetic component, so Aravind provides free testing to discover whether other family members are at risk for cancer. Since the program was started in 2004, 779 patient lives have been transformed.

One of those patients was six-month-old Fathima who was diagnosed with retinoblastoma and advised for nine cycles of chemotherapy. She also had cardiac problems, so chemo had to be administered in the ICU of a nearby multi-specialty hospital, with Aravind overseeing her eye care. The cost of such complex treatment would have been completely beyond the means of her family. The Ring of Hope fund took care of all her treatment costs.

The foundation also started similar programs to support treatment for corneal ulcers and ocular trauma. These conditions generally affect the poorest patients – day labourers, fishermen, farmers – who are injured at work. Without immediate treatment, they can lose their sight and their livelihoods. So far, the foundation supported the treatment and associated costs of 1,970 corneal ulcer patients, thanks to donations from the Gowri Family. A total of 117 ocular trauma patients were treated with support from the Madison Community Foundation.

*Retinoblastoma Survivors' Meet, Aravind - Madurai*





## Reaching out

Taking eye care beyond hospital walls to the people has always been a cornerstone of Aravind's philosophy. Its rural vision centers are able to provide all care for 85- 90% of the patients, including on-site eye exams, telehealth consultations, medicines, and eye glass prescriptions. Overall, Aravind Eye Foundation has funded 21 rural vision Centers since 2011; this past year, those centers handled 184,369 patient visits, provided 23,743 eye glass prescriptions, and enabled 7,669 cataract surgeries.

Aravind has a total of 105 rural vision centers across Tamil Nadu, and many of the older ones need equipment upgrades and building renovations to continue providing high-quality, comprehensive eye care. This year the foundation undertook a multi-year program to renovate 41 centers that are ten years or older, initially supported by the Sachin Gupta Family.

Short-sightedness is growing around the world; by 2050, more than 50% of the population will have myopia 10% will be legally blind. This is particularly challenging among school-aged kids, since so much learning happens visually.

Foundation's school screening program is now 10 years old – it has screened 1.3 million school children and given away 58,028 eyeglasses. The program had to be interrupted during the pandemic, but it is back in schools and making up for the lost time. This program is supported by Warby Parker.



*A student being screened at a school eye screening camp*

## Building capacity and taking care of our staff

When Dr. V. said that Aravind's mission was to eliminate needless blindness, he didn't put any



*My Life, My Pride programme - Volleyball team at Aravind Eye Hospital, Chennai, Tamil Nadu*

geographic limits around it. Sharing the Aravind model with other hospitals throughout the world is an important and growing part of the foundation's work. Currently, it is working with other eye hospitals across India, Bangladesh, and sub-Saharan Africa, supported by multi-year grants from Conrad Hilton Foundation, Johns Hopkins Bloomberg School of Public Health, and Lavelle Fund for the Blind.

Additionally, the foundation started a multi-year pilot project, under the guidance of Aravind's Chairman Emeritus, Dr. P. Namperumalsamy, to create a Center of excellence or "Best Eye Care Zone" in Theni District, Tamil Nadu. In its first year, Aravind conducted 136 screening camps to identify new cases of diabetic retinopathy, refractive errors among school children and adults, retinopathy of prematurity (ROP), and glaucoma. It is planned that this project will serve as a model for other communities in Tamil Nadu and across India and other developing countries.

While serving others, we also need to nurture ourselves. This was the first full year of a new wellness program – "My Life, My Pride" for Aravind's Mid-level Ophthalmic Personnel. They are Aravind's nurses, administrators, counsellors – more than 80% of its workforce. These young women from nearby villages, face both professional and personal challenges. The program has started in Chennai and Madurai with group and individual counselling, as well as reading and fitness clubs.

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Aravind Eye Foundation is thankful to its donors for their kindness and generosity in supporting Aravind Eye Care System's vision of eliminating needless blindness.

*It is ourselves we are helping.  
It is ourselves we are healing.  
- Dr. G. Venkataswamy*



# Partners in Service

Aravind Eye Care System is grateful for the support of like-minded individuals and organisations in its mission to eliminate needless blindness. Their commitment has helped the organisation bring light to countless lives, making a significant impact in saving vision.

## For service delivery, training and more

- Alcon Laboratories Inc, USA
- A.L Shah, Pondicherry, India
- Aravind Eye Foundation, USA
- Bosch India Foundation, Bengaluru, India
- Carl Zeiss Meditec, Germany
- CBM International, Germany
- Combat Blindness Foundation, USA
- Conrad N. Hilton Foundation, USA
- Dr. Shroff's Charity Eye Hospital, New Delhi, India
- Dr. Ravi Rengachari, Pondicherry, India
- Federation of Indian Chambers of Commerce & Industry, New Delhi, India
- Fred Hollows Foundation, Australia
- Indian Overseas Bank, India
- India Alliance, Hyderabad, India
- Institute for Health care Improvement, USA
- International Agency for Prevention of Blindness, UK
- Kaushal Devendra Gupta, Pune, India
- Lavelle Fund for the Blind, USA
- Lakshmi Eye Care Support Services LLP, Tamil Nadu, India
- Lions Clubs International Foundation, USA
- L V Prasad Eye Institute, Bhubaneswar, India
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- The Tamil Nadu Dr. MGR Medical University, Chennai, India

- Tirumala Tirupati Devasthanams, Tirupati, India
- TOMS, USA
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- Tulsi Chanrai Foundation, Nigeria
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- VISION 2020 - The Right to Sight, New Delhi, India
- World Diabetes Foundation, Denmark
- World Health Organization, Switzerland
- XOVA: Excellence in Ophthalmology Vision Award, USA

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- National Eye Centre, Singapore
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- Ramakrishna Hospital, Coimbatore, India
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- Rio hospital for women and children, Madurai, India
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- Science and Engineering Research Board, New Delhi, India
- Seva Foundation, USA
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- Syracuse University, New York, USA
- Tamil Nadu State Blindness Control Society, Chennai, India
- University of Edinburgh, UK
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DR. HANUMANTHU SAMEERA, MS

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Medical Consultants  
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## PAEDIATRIC OPHTHALMOLOGY & ADULT STRABISMUS SERVICES

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Medical Consultants  
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DR. NEELAM PAWAR, MS

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DR. DEVENDRA MAHESWARI, MS  
Medical Consultants  
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DR. MADHAVI R, DNB  
DR. LOPAMUDRA BISWAL, MS  
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## CONSULTANT PHYSICIAN

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Medical Consultants  
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DR. V. MANEKSHA, MS  
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## FREE HOSPITAL

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### Manager

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Nursing Superintendents

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A. S. SHANMUGA SUNDARI

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Manager-Administration

M. MUTHUPANDIAN, PUC

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Manager-Quality & Inpatient Services

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Manager-Glaucoma Clinic

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Manager-IT & Systems

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Manager-Projects & Outreach

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Librarian

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DR. MENAKA, DO, DNB

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S. RADHIKA

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G.B. AMUDHA

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A.M. APPUSAMY, D.E.E.E

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K. ALAGUMANI, M.LI.SC, M.Phil

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### Medical Consultant

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### Chief

DR. A. BALRAJ, DNB

## UVEA SERVICES

### Chief

DR. S. BALA MURUGAN, MS

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A. SUBBULAKSHMI

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### Manager-Camp

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### Manager - Patient Care & Vision Centre

K. HARIKRISHNAN, BA

### Manager - IT & Systems

M. ASHOK, MCA

### Manager - Stores

S. VADIVELMURUGAN, B.Sc

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DR. POULOMI DAS, MS

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## CORNEA & REFRACTIVE SURGERY

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## MICROBIOLOGY

### Medical Consultant

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## ANAESTHETIST

DR. CITRARASU M, DA ANES

## NURSING SUPERINTENDENT

V.S. RAMYA

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I. SERAN, MBA (HM); FEHM

### Manager Accounts & Finance

R. SAKTHIVEL, BA

### IT & Systems

A. KUMARESAN, BCA

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## ARAVIND-CHENNAI

### Chief Medical Officer

DR. S. ARAVIND, MS, MBA

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### Chief

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DR. SARANYA, DO, DNB  
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DR. SWATHIJA, MS

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## PHYSICIANS

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DR. J.P. JANISH PRABHAKAR, MBBS, MEM,  
MBA  
DR. MANOPRAKASH MANOHARAN. MBSS

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### Manager – Community Outreach & Eye Bank

RAJESH, B.SC, MSW, PG.DIPLOMA

### Manager - Quality Assurance

RIYAH JAITIKA, PGDMM

### IT & Systems

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## ARAVIND-TIRUPATI

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DR. S. ASHOK VARDHAN, DO, DNB

## RETINA-VITREOUS SERVICES

### Chief

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## NEURO OPHTHALMOLOGY SERVICES

### Medical Consultants

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## PHYSICIAN

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## MICROBIOLOGY

DR. NIBANDHANA G, MD

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Manager-Patient Care

DAMIEN JACOB, MBA

Outreach Camp Manager

V. VASUDEVA REDDY, DECE

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DR. S. REKHA, MS

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DR. S. PREETHI, MS

### Manager

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## ARAVIND-TUTICORIN

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### Medical Consultants

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DR. S. GOMATHI NAYAGAM, MS

### Manager-Patient Care & Administration

N. MOHAMMED GHOUSE, MBA

## ARAVIND-UDUMALPET

### Medical Consultants

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DR. AMARTYAJIT MUKHERJEE, MS

DR. MURALIKRISHNAN, MS

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### Medical Director Designee

DR. MANORANJAN DAS, DNB

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PGDC

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### Medical Director Designee

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### Medical Director

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### Medical Director Designee

DR. SEEMA RAMAKRISHNAN, DO,

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### Scientist

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M.SC, PH.D  
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### Associate Faculty

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DR. SWAGATA GHOSH, M.SC, PH.D

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### Chief Accounts Officer

M.L.S. VAITHIYANATHAN, BBA, C.A.

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### & POSTGRADUATE INSTITUTE OF OPHTHALMOLOGY

**MADURAI** - 1, Anna Nagar, Madurai 625 020, Tamil Nadu, India. Phone: (0452) 435 6100

**TIRUNELVELI** - S.N. High Road, Tirunelveli Jn. 627 001, Tamil Nadu, India. Phone: (0462) 435 6100

**COIMBATORE** - Avinashi Road, Coimbatore 641 014, Tamil Nadu, India. Phone: (0422) 436 0400

**PONDICHERRY** - Cuddalore Main Road, Thavalakuppam, Pondicherry 605 007, India. Phone: (0413) 261 9100

**SALEM** - Sankagiri Main Road, Nethimedu, Salem 636 002, Tamil Nadu, India. Phone: (0427) 235 6100

**CHENNAI** - Poonamallee High Road, Noombal, Chennai 600 077, Tamil Nadu, India. Phone: (044) 409 56100

**TIRUPATI** - Alipiri to Zoo Park Road, Beside NCC Campus, Tirupati 517 505,  
Chittoor District, Andhra Pradesh, India. Phone: (0877) 250 2100, 350 2100

**THENI** - Periyakulam Road, Theni 625 531, Tamil Nadu, India. Phone: (04546) 252 658

**TIRUPUR** - Dharapuram Main Road, Chettipalayam Post, Tirupur 641 608, Tamil Nadu, India.  
Phone: (0421) 226 6100, 87547 28996

**DINDIGUL** - Old door no 21/1 Thadicombu Road, Dindigul-624 001, Tamil Nadu, India. Phone: (0451) 244 8100

**TUTICORIN** - Meenakshipuram West, Near Old Bus Stand, Tuticorin 628 002, Tamil Nadu, India. Phone: (0461) 230 0410

**UDUMALPET** - 112, Dhalli Road, Opp. Palaniandavar Mills, Udumalpet 642 126, Tamil Nadu, India. Phone: (04252) 260 400

**COIMBATORE CITY CENTRE** - Cowly Brown Road, R.S. Puram, Coimbatore 641 002, Tamil Nadu, India  
Phone: (0422) 254 0400

**KOVILPATTI** - 4/897, New Appaneri, Padmavathi Garden, Thiruvankadam Main Road, G.V.N. College (PO),  
Kovilpatti 628 502, Tamil Nadu, India. Phone: (04632) 290 800, 85258 22027, 85250 66250

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## ARAVIND MEDICAL RESEARCH FOUNDATION

### DR. G. VENKATASWAMY EYE RESEARCH INSTITUTE

1, Anna Nagar, Madurai 625 020, Tamil Nadu, India. Phone: (0452) 435 6550

## AUROLAB

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DR. G. VENKATASWAMY EYE RESEARCH INSTITUTE  
1, Anna Nagar, Madurai 625 020, Tamil Nadu, India. Phone: (0452) 4356550

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AUROLAB  
1, Sivagangai Road, Veerapanjan, Madurai 625 020, Tamil Nadu, India. Phone: (0452) 244 6100



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