

Training Indian ophthalmologists in phacoemulsification surgery: Nine-year results of a unique two-week multicentric training program

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Purpose: To assess the outcome of 2 weeks phacoemulsification training program that is a unique collaboration between premier ophthalmic training institutes of India and Alcon Inc. initiated 10 years ago. **Methods:** Cataract surgeons eager to adopt phacoemulsification surgery as the primary treatment modality were enrolled in an intensive 2 weeks training program across seven premier ophthalmic institutes in India. These surgeons performed supervised phacoemulsification surgery under the guidance of expert faculty. Simultaneously didactic lectures, postoperative video discussions, and wet laboratory training were conducted. To assess improvement in the surgical skills each surgery was scored using the International Council of Ophthalmology-Ophthalmology Surgical Competency Assessment Rubrics (ICO-OSCAR). Phaco Development Specialist supported these surgeons for minimum duration of 1 year and maximum of 9 years and 2 months. In this multicentric study, surgical data of the participants enrolled between June 2010 to August 2018 was retrospectively analyzed. **Results:** Nine hundred 89 ophthalmologists across 27 Indian states and 4 Union Territories were trained between June 2010 and August 2018. The mean age of participants was 40.6 (+ 8.2 years) and 64.8% were males. After completing their training they performed 1,022,508 phacoemulsification surgeries in 9 years and 2 months. At follow-up, 92.11% and 88.77% of the surgeons were performing phacoemulsification at the end of 1 year and final follow-up, respectively. **Conclusion:** This program highlights how partnership model between industry and ophthalmologists can go hand in hand for training and skill development of doctors contributing to much-needed improvement in patient care across societies.

Key words: Cataract, phacoemulsification, training

India is home to a quarter of the world's blind population.^[1] In India, more than 51% of blindness is attributed to cataract,^[2] with total number of blind due to cataract estimated to increase to 8.25 million by 2020.^[2] Over the last several decades, the Government of India has taken robust steps in combating this disease, with India being the first country to adopt the National Prevention of Control of Blindness (NPCB)^[3] and has formulated actionable plans to increase cataract surgical rates (CSR) and reduce the prevailing blindness. The proposed national CSR of 3000 by 2020 has been comfortably achieved, with most large states performing more than 4000 cataract surgeries per million population.^[4,5] This has been a multilayered plan, which has involved understanding the situation, acquiring data, setting up infrastructure, delivering

eye care, and following up patients. The core to this entire process is having well-trained ophthalmologists who are confident in performing independent, high-quality cataract surgery and are able to deliver consistent results in terms of good visual acuity with minimal complications.

Challenges in ophthalmic residency training have been highlighted not only in India, but also in other neighboring countries of Sri Lanka and Pakistan as well.^[6] While the western residency programs have moved towards 'appraisal based approach', the countries of Asian subcontinent still follow the traditional apprenticeship model.^[6] Also, lack of integration of International Council of Ophthalmology (ICO) curriculums and core competencies described by Accreditation Council for Graduate Medical Education (ACGME) in South Asian programs, has called for education reforms, especially in India.^[7] Most of the residency programs focus on basic cataract surgery, which includes Extra Capsular Cataract Surgery (ECCE), and Manual Small Incision Cataract

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Surgery (MSICS), and the All India Ophthalmic Society (AIOS) is working towards streamlining residency curriculums.^[8,9] Very few offer phacoemulsification training, and even if they do, it is usually inadequate for the resident to perform independent phacoemulsification once the residency program finishes.^[1]

To bridge this gap, Alcon (Alcon Inc. headquarters in Geneva, Switzerland), introduced the Phaco Development Program (PDP) in 2010, which is a unique collaborative initiative between Alcon and various teaching ophthalmic institutes across India. Its aim is to support ophthalmologists in their endeavor to enhance their surgical skills, in dealing nuances of phacoemulsification surgery and to establish phacoemulsification as the standard cataract care procedure across the country.

In this paper, we reviewed the training methodology applied, the number of ophthalmologists trained by this initiative since 2010 and the number of surgeries performed by them following their training. This will help to better assess the role of the PDP program in creating sufficient, successful, and sustainable cataract services across the country as well as pave the way forward.

Methods

Alcon Initiative and program details

In 2010, Alcon (Alcon Inc. headquarters in Geneva, Switzerland), started the Phaco Development Program (PDP) as a unique collaborative initiative between Alcon and various tertiary eye care institutes all across India.

Tertiary Eye Care Institutes were identified all over India and contacted. These institutes were ophthalmic Centers of Excellence and some of them were already been involved in various training programs. The host hospitals called as Phaco Development Centre of Excellence (PD-CoE) supported the participants for wet laboratory facilities as well as hands-on surgical training on patients on their premises. While identifying the PD-CoE, mutual discussion between hospital authorities and the Alcon team was done to understand hospital resources, wet laboratory, surgical trainers, and patient availability for the program. A Memorandum of Understanding (MOU) was signed between Alcon and the institute for 2 week PD training course. Alcon contributed in providing the support team, surgical equipments in wet lab and consumables for the learning.

Alcon designated one technical person who supported the participant at the PD-CoE throughout the period of the program. This technical support person was trained by Alcon for the specific requirements of this program and was referred to as Phaco Development Specialist (PDS). The PDSs were from various backgrounds like optometry, biomedical engineering, and ophthalmic para-medical staff. Once they enrolled as PDS, he/she underwent exhaustive training and mentoring in phacodynamics, phacoemulsification surgical techniques, and phacoemulsification machine understanding, followed by regular assessment of their knowledge and skill. Alcon-PDP Medical Director, Program Director, and Country Training Manager were involved in assessing the PDS before they were deemed competent to support the participating surgeons during and after PDP. The role of PDS is crucial to the success of this program. The PDS starts visiting the

training institutes even before the start of the training program at that particular PD-CoE. They are also involved in a lot of background work where they build relationship with the PD-CoE, spend time at the facility checking equipment, and ensuring smooth conduction of the program. The PDS is also the first point of contact for the participant, where they start communications before the program starts and understand participant requirement from the program. This helped the PDS and trainers at the CoE to better tailor the program to each individual participant. Educational material, both written and video-based, were shared with the participants. In order to facilitate the surgical progress of the participant, the participants were provided with a logbook to enter case details as well as postoperative outcomes.

The two-week program schedule is depicted in Supplementary Table 1. The participants had access to goat eyes in the wet laboratory every day and were assisted by the PDS in using the phacoemulsification machine. Supervised phacoemulsification steps were practiced on goat's eye in the wet lab and surgeries in the operating room (OR) with constant guidance from the trainers at the CoE. In the OR, the participants were given surgeries in a stepwise manner. They started with incision, followed by anterior continuous curvilinear capsulorhexis (ACCC), and subsequently progressed along in a stepwise manner. Although Supplementary Table 1 mentions the proposed schedule in which the surgeons were given surgical steps, individual adjustments were made based on participant comfort level as well as trainers' discretion. The participants were allowed to perform a complete phacoemulsification case by day 7 of the program, although this could be variable on a case-to-case basis. Along with this, there were arrangements made for the participant to spend time with the training faculty and have case-based discussions, didactic lectures and video-assisted teaching; this ensured a more holistic learning experience for the participant.

Participating Institutes and candidate selection

The PDP is being conducted at 10 different host institutes or PD-CoE all over India over the last 10 years. Three out of these ten hospitals use PDP to train their in-house trainees (post-graduate residents, long-term fellows) and do not host short-term external candidates. These three hospitals were not included in this paper. The remaining seven hospitals accept applications from out of hospital candidates for the two-week program. The program was advertised via ophthalmic discussion portals, and by word-of-mouth. The seven participating hospitals were-

1. Dr. Shroff's Charity Eye Hospital, New Delhi
2. I CARE Eye Hospital, Noida, Uttar Pradesh
3. Susrut Eye Foundation and Research Center, Kolkata
4. Shri Sadguru Seva Sangh Trust, Chitrakoot
5. Chandraprabha Eye Hospital, Jorhat
6. Comtrust Charitable Hospital, Calicut
7. Dr. Thakorbhai V. Patel Eye Institute, Baroda.

Participant selection was flexible and dependent on availability of training slots. Participants were selected as per their surgical skill development need after mutual discussion between the participant and Alcon PDS using the International Council of Ophthalmology-Ophthalmology Surgical Competency Assessment Rubrics (ICO-OSCAR) score, following which PD CoE faculty reviewed their surgical video along with OSCAR score & finalized the candidates. The

selection criteria were flexible in terms of candidate's age and years of practice; however, there were few minimum criteria that were expected from the participants- being a practicing cataract surgeon, being willing to incorporate phacoemulsification surgery as the primary modality of cataract care in his/her practice, and to have access to infrastructure that supports phacoemulsification surgery.

Before starting the course, there were extensive discussions between the PDS and the participant highlighting the surgeon's need and surgical areas of improvement.

Participants were expected to fill out self-evaluation forms developed by the Alcon PDP team before the start of the program. Also, all participants were asked to share their cataract surgery videos with the host institute before start of the program facilitated by Alcon PDS.

One PDS was assigned to the participant for the entire duration of two weeks. Not only did the PDS act as a bridge between the participant and the host CoE, he also helped the candidate with daily wet laboratory sessions, understanding phacoemulsification equipment, facilitating faculty lectures and faculty training during surgeries. After course completion, the same PDS supported the participant in his/her practice for a period of at least 12 months.

PD Course curriculum

The PD course emphasized on mastering the basic steps of phacoemulsification. Participants were first trained in patient selection and biometry. All patients undergoing cataract surgery signed an informed surgical consent prior to the surgery. The surgery was registered under a designated faculty's name, who was the training surgeon. Exemption was sought from one of the participating Institute's Review Board (IRB) and the study was conducted in adherence to tenets of the Declaration of Helsinki. Trained and designated faculty at respective CoE supervised all surgeries. The participants started with uncomplicated cataract cases or basic steps of cataract surgery initially and graduated to performing the entire surgery towards the end of their course. Some participants would get an opportunity to operate even on a few challenging cases depending upon their skill level.

Every surgery was scored at the end by the training faculty using International Council of Ophthalmology-Ophthalmology Surgical Competency Assessment Rubrics (ICO-OSCAR)^[10] in discussion with the participant. Post-operative rounds and surgical video discussion were an integral part of this training. The faculty delivered didactic lectures on relevant topics as and when possible. Case details and post operative findings were filled in a logbook at the end of every day.

Dedicated time was also spent in the wet-laboratory practicing steps of phacoemulsification on enucleated goat eyes under PDS's supervision. Nuances of the phacoemulsification machine, fluidics, and phacodynamics were discussed regularly. Participants also got a chance to practice anterior vitrectomy, use of iris hooks, and capsular tension rings depending upon their need and expertise.

Post-course follow-up

Post-program, the progress of each participant was followed by the PDS who was assigned to that participant during the two weeks. The PDS followed up the participant for a

minimum of 1 year, initially by visiting their facility 2 times every month for the first three months, then every month for next 3 months, then 3 monthly for the following 6 months. In case the PDS could not travel to the participant's facility in person, telephonic updates were received and next possible visit was scheduled. All the surgical details were discussed in these visits. Continuous support was provided to the participants during the entire year including support in understanding & application of technology, phacodynamics & parameters for different cataract cases, biometry, and overall development of the participants practice. If required, with the help of the PDS, the guidance of the training faculty at the CoE was also taken for any particular difficulty that the participant surgeons faced during their phacoemulsification procedures.

Study design, data collection, and statistical analysis

The surgical data of the participants enrolled between June 2010 to August 2018 was shared by the participant doctors with the Alcon Phaco Development Specialist and was retrospectively analyzed. All participants were followed up for a minimum of one year. Participants' demographics, type of institute and phacoemulsification surgeries performed by them till August 2019 was noted. Statistical analysis was carried out using SPSS statistical software (SPSS version 21. Inc., Chicago, IL, USA). Statistical significance was defined at a level of 5% ($P < 0.05$).

Results

A total of 989 Indian Ophthalmologists from 27 Indian states and 4 Union Territories were trained at the 7 training institutes over a period of eight years (June 2010 till August 2018). Maximum number of participants were from the states of Uttar Pradesh (148) and West Bengal (130). Fig. 1a shows the geographic location of various training institutes (PDCoE) and Fig. 1b shows number of participants enrolled from each state. The mean age of the participants was 40.6 years (+ 8.2 years, standard deviation (SD)) and 641 (64.8%) were males. More than half of (501 surgeons, 50.66%) the participants who were trained were individual practitioners, working independently. Rest of the participants came either from Government Hospitals (GH), Non-Government Organizations (NGO) or from Private Eye Hospitals (PEH). All participants were followed up for a mean duration of 4.3 years (SD of 2.4 years) after the course finished. A total of 1,022,508 phacoemulsification surgeries were performed by these participants, after finishing their PDP, all over the country over a period of 9 years and 2 months. Fig. 2a shows total number of phacoemulsification surgeries performed year on year by the participants till August 2019 and Fig. 2b shows the indirect contribution of different centers in the number of surgeries performed by their trainees. Table 1 shows the baseline characteristics of participants enrolled in seven training centers over the last eight years and 2 months.

On following up the participants, it was noted that 92.11% and 88.77% of the surgeons were performing phacoemulsification at the end of 1 year and at final follow-up, respectively, in their practice. Out of 518 participants in the age group of 31 to 40 years, 480 (92.66%) were performing phacoemulsification at end of 1 year ($P = 0.8$), and 464 (89.58%) were performing phacoemulsification

Table 1: Baseline characteristics of participants at various training centers

Characteristics	Hospital 5	Hospital 6	Hospital 1	Hospital 7	Hospital 2	Hospital 4	Hospital 3	Total
Number of Participants	135	4	116	130	179	102	323	989
Number of Phacoemulsification performed till August 2019	169,927	2171	132,130	137,247	121,641	54,521	404,871	1,022,508
Type of surgery performed by the participant before joining the program								
Pure SICS	76 (56.30%)	2 (50%)	70 (60.34%)	37 (28.46%)	109 (60.89%)	64 (62.75%)	193 (59.75%)	551 (55.71%)
<30% Phaco	26 (19.26%)	0 (0%)	20 (17.24%)	38 (29.23%)	24 (13.41%)	14 (13.73%)	62 (19.20%)	184 (18.60%)
30% to 50% Phaco	19 (14.07%)	0 (0%)	8 (6.90%)	20 (15.38%)	22 (12.29%)	12 (11.76%)	43 (13.31%)	124 (12.54%)
50% to 70% Phaco	5 (3.70%)	1 (25%)	8 (6.90%)	8 (6.15%)	11 (6.15%)	6 (5.88%)	6 (1.86%)	45 (4.55%)
>70% Phaco	9 (6.67%)	1 (25%)	10 (8.62%)	27 (20.77%)	13 (7.26%)	6 (5.88%)	19 (5.88%)	85 (8.59%)
Age at the time of enrollment (in years)								
21-30	11 (8.15%)	0 (0%)	3 (2.59%)	22 (16.92%)	10 (5.59%)	5 (4.90%)	10 (3.10%)	61 (6.17%)
31-40	70 (51.85%)	3 (75%)	66 (56.90%)	68 (52.31%)	103 (57.54%)	69 (67.65%)	139 (43.03%)	518 (52.38%)
41-50	36 (26.67%)	1 (25%)	33 (28.45%)	25 (19.23%)	49 (27.37%)	18 (17.65%)	115 (35.60%)	277 (28.01%)
51-60	17 (12.59%)	0 (0%)	9 (7.76%)	11 (8.46%)	14 (7.82%)	8 (7.84%)	50 (15.48%)	109 (11.02%)
>60	1 (0.74%)	0 (0%)	5 (4.31%)	4 (3.08%)	3 (1.68%)	2 (1.96%)	9 (2.79%)	24 (2.43%)
Mean±SD	40.34±7.98	40±7.26	40.87±8.14	38.52±8.89	39.79±7.48	38.84±7.54	42.55±8.28	40.63±8.2
Gender								
Female	44 (32.59%)	2 (50%)	35 (30.17%)	61 (46.92%)	83 (46.37%)	34 (33.33%)	89 (27.55%)	348 (35.19%)
Male	91 (67.41%)	2 (50%)	81 (69.83%)	69 (53.08%)	96 (53.63%)	68 (66.67%)	234 (72.45%)	641 (64.81%)
Type of Institution								
GH	20 (14.81%)	0 (0%)	14 (12.07%)	4 (3.08%)	38 (21.23%)	11 (10.78%)	29 (8.98%)	116 (11.73%)
Individual	70 (51.85%)	2 (50%)	49 (42.24%)	93 (71.54%)	85 (47.49%)	60 (58.82%)	142 (43.96%)	501 (50.66%)
NGO	1 (0.74%)	0 (0%)	18 (15.52%)	1 (0.77%)	8 (4.47%)	6 (5.88%)	18 (5.57%)	52 (5.26%)
PEH	44 (32.59%)	2 (50%)	35 (30.17%)	32 (24.62%)	48 (26.82%)	25 (24.51%)	134 (41.49%)	320 (32.36%)
Years of follow-up								
Mean±SD	4.09±2.26	2.5±1.73	4.93±2.59	5.12±2.37	3.58±1.78	2.17±1.24	5.1±2.41	4.36±2.4

SICS- Small Incision Cataract Surgery, Phaco- Phacoemulsification. GH- Government Hospital; NGO- Non Government Hospital; PEH- Private Eye Hospital; SD- Standard Deviation

at the final follow-up ($P = 0.08$), constituting the highest number in this group. Also, 94.23% of doctors working with NGOs were found to be performing phacoemulsification at the final follow-up, which was the highest, compared to their counterparts working in GH, PEH or as individual practitioners. In comparison, 84.69% doctors working in Private Eye Hospitals were performing phacoemulsification at final follow-up ($P = 0.03$) [Table 2].

Comparisons were also made after grouping participants as those performing only manual small incision cataract surgery (MSICS), performing <30% phacoemulsification, performing 30%-50% phacoemulsification, performing 50%-70% phacoemulsification, Performing >70% phacoemulsification at the time of enrollment. Out of the 551 doctors only performing MSICS (and no phacoemulsification) before the PDP, 501 (90.93%) doctors were performing phacoemulsification

at the end of one year and 446 (86.39%) were performing phacoemulsification at final follow-up [Table 3].

Discussion

The Indian medical education system requires approximately ten years to produce a specialist.^[11] With the minimum age to start medical school being 17 years, the average age of an ophthalmologist finishing residency has been noted to be 32 years.^[9,11] However, it takes a few additional years of supervised clinics and surgeries that make an ophthalmologist confident to manage and operate on patients independently. Out of the 1285 annual ophthalmology residency seats on offer,^[11] and roughly 900 ophthalmologists being trained every year,^[12] residency training varies considerably from program to program.^[9] Uneven nature of training, lack of standardized curriculum and variable quality of academic programs have all

Table 2: Doctors in various age groups and hospitals performing Phacoemulsification at 1-year follow-up and at final follow-up (August 2019)

Characteristics	Participants performing phacoemulsification at end of 1 year TOTAL-911 (92.11%)	Participants not performing phacoemulsification at end of 1 year Total-78 (7.89%)	P*	Participants performing phacoemulsification at final follow-up TOTAL 878 (88.78%)	Participants not performing phacoemulsification at final follow-up Total-111 (11.22%)	P*
Age in years						
21-30 (n=61)	57 (93.44%)	4 (6.56%)	0.84	57 (93.44%)	4 (6.56%)	0.082
31-40 (n=518)	480 (92.66%)	38 (7.34%)		464 (89.58%)	54 (10.42%)	
41-50 (n=277)	254 (91.70%)	23 (8.30%)		248 (89.53%)	29 (10.47%)	
51-60 (n=109)	99 (90.83%)	10 (9.17%)		90 (82.57%)	19 (17.43%)	
>60 (n=24)	21 (87.50%)	3 (12.50%)		19 (79.17%)	5 (20.83%)	
Type of Institution			0.50			0.033
GH (n=116)	109 (93.97%)	7 (6.03%)		104 (89.66%)	12 (10.34%)	
Individual (n=501)	461 (92.02%)	40 (7.98%)		454 (90.62%)	47 (9.38%)	
NGO (n=52)	50 (96.15%)	2 (3.85%)		49 (94.23%)	3 (5.77%)	
PEH (n=320)	291 (90.94%)	29 (9.06%)		271 (84.69%)	49 (15.31%)	
Total	911 (92.11%)	78 (7.89%)		878 (88.78%)	111 (11.22%)	

* Comparing different age groups & between different types of institutions. GH- Government Hospital; NGO- Non Government Hospital; PEH- Private Eye Hospital; SD- Standard Deviation

Table 3: Doctors performing Phacoemulsification at 1-year follow-up and at final follow-up (August 2019) compared to the type of surgery performed by them before joining PDP

Type of surgeries performed by the participant before joining PDP	Participants performing phacoemulsification at end of 1 year Total 911	Participants not performing phacoemulsification at end of 1 year Total 78	P*	Participants performing phacoemulsification at end of final follow-up Total-878	Participants not performing phacoemulsification at end of final follow-up Total-111	P*
Pure SICS	501 (90.93%)	50 (9.07%)	0.27	476 (86.39%)	75 (13.61%)	0.05
<30% Phaco	169 (91.85%)	15 (8.15%)		167 (90.76%)	17 (9.24%)	
30%-50% Phaco	116 (93.55%)	8 (6.45%)		112 (90.32%)	12 (9.68%)	
50%-70% Phaco	42 (93.33%)	3 (6.67%)		41 (91.11%)	4 (8.89%)	
>70% Phaco	83 (97.65%)	2 (2.35%)		82 (96.47%)	3 (3.53%)	

*Comparing different categories of surgeons. PDP- Phaco Development Program, SICS- Small Incision Cataract Surgery, Phaco- Phacoemulsification

The decrease in the percentage of phacoemulsification surgeries being performed at final follow-up as compared to 1 year follow-up was the least among surgeons working in NGOs as compared to their counterparts working in GH, PEH or as individual practitioners. This could be because the number of surgeries performed at NGOs is usually high and at a subsidized rate, giving the surgeon an opportunity to keep performing phacoemulsification. On the other hand, the Private Eye Hospitals usually work on a 'fee-for-service' model, where the patients pay for the surgery. In models such as these, the doctors may not, sometimes, get a chance to operate as per their will. Hence, it is important to ensure that the doctor has an arrangement, in terms of patients and support of the hospital management where he/she can continue performing phacoemulsification even after the training is over.

Most of the young ophthalmologists are focused on securing a long-term sub specialty fellowship at premier institutes. But with limited training opportunities, much larger number of

applicants, and several limitations that may prevent surgeons from opting for a long-term fellowship, we feel that there is definitely a larger role for more short-term training courses. This way, more number of ophthalmologists can be trained, and focus could shift towards mid-career ophthalmologists wanting to enhance their basic skills and becoming good comprehensive ophthalmologists. Such short-term yet monitored courses would add immense value in a country like ours, where resources and good opportunities are often missing. This paper also brings to focus the lack of opportunity, which exists in our system for skill up gradation for practicing ophthalmologists. The PDP has in a way set up a role model for similar courses should in other subspecialties, which could provide support and supervision for ophthalmologists in practice interested in learning newer treatment modalities. 'Sandwich' training programs could be arranged for ophthalmologists who are busy in their respective practice and cannot take breaks for a long duration training program. A 'Sandwich Program' would comprise of digital training platforms, where the ophthalmologist could do part

of his/her training remotely without physically being present for the course; this could be followed up with shorter, more intensive hands-on time at the hospital. These efforts would help them in providing good ophthalmic care to the community and at a grass root level. We hope other organizations and institutes working in ophthalmic education can organize similar short-term training programs in various sub specialties and contribute not only to education but also indirect patient care.

What is unique about this program, however, is the mutually beneficial partnership of the training ophthalmologists, trainee ophthalmologists and the ophthalmic industry. Also, the idea of maintaining a logbook gives credibility to the program and allows the surgeons as well as the trainers to objectively analyze the outcomes of the training. Success of this course also is attributed to the constant follow-up and support provided by the team of dedicated and committed PDS as well as the entire team of the Alcon PDP. Detailed 2-week break up of the program, meticulous planning, careful participant selection and long-term follow-up of the participant is the backbone of PDP. These activities will not only contribute to the training of the estimated 23,500 ophthalmologists in the country (10,000 ophthalmologists in 2005 and an average of 900 graduating every year),^[12] but also help reduce the incidence of blindness. Most importantly, this analysis shows us that the quality of surgery can be improved drastically, and that most modern surgical techniques can be applied even at the community level, when the trainee surgeon returns back to his/her hometown in different parts of India.

Conclusion

During this time of global medical emergency, where there are talks of greater investment in medical technologies and as we expect global health policies to be re-written in the coming months, we should not forget the importance of investing in training doctors as well. National and global efforts are required where doctors, including ophthalmologists, receive standardized training platforms, so that we do not have a shortfall of skilled personnel. This particular program is one such example of how partnership model between industry and ophthalmologists can go hand in hand for training and skill development of doctors contributing to patient care across societies. It also brings a novel concept of pre training assessment, standardized course curriculum with post course follow-up support, which can be replicated all over the country and may be other countries as well will ensure that the learning from the program is furthered and is practiced for a long time to come.

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Conflicts of interest

There are no conflicts of interest.

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Supplementary Table 1: Two-week training schedule for the participants

Phaco Development Program (PDP) 2 Weeks Schedule		
Time	Agenda	Concerned Person
Day 1-Monday		
09:00 AM-10:00 AM	Course Introduction	PDS
10:00 AM-11:00 AM	Hospital Introduction	Administrator
11:00 AM-01:00 PM	OR& System Orientation	PDS& Admin
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab-Incision, CCC & Hydro procedure	PDS
03:00 PM-04:30 PM	Lecture-Proper Patient Selection	Consultant
Day 2-Tuesday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR - Incision, CCC& Hydro procedure*	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab-Incision, CCC & Hydro procedure	PDS
03:00 PM-04:30 PM	Lecture-Incision, CCC & Hydro	Consultant
04:30 PM-05:00 PM	OR Case Review	Consultant
Day 3-Wednesday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Incision, CCC & Hydro procedure*	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab-Trenching & Cracking	PDS
03:00 PM-04:30 PM	Lecture-Nucleus Management	Consultant
04:30 PM-05:00 PM	OR Case Review	Consultant
Day 4-Thursday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Trenching & Cracking*	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab - Trenching & Cracking	PDS
03:00 PM-04:30 PM	Lecture-Phaco Dynamics	PDS
04:30 PM-05:00 PM	OR Case Review	Consultant
Day 5-Friday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Trenching & Cracking*	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab - Nucleus Management	PDS
03:00 PM-04:30 PM	Hands on: Machine Orientation	PDS
04:30 PM-05:00 PM	OR Case Review	Consultant
Day 6-Saturday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Nucleus Management*	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab- Complete Phacoemulsification Surgery	PDS
03:00 PM-04:30 PM	Lecture-Ophthalmic Viscosurgical Devise	Consultant
04:30 PM-05:00 PM	OR Case Review	Consultant
Sunday		
Day 7-Monday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Complete Phacoemulsification surgery	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab - Management of PCR& Anterior Vitrectomy	PDS

Contd...

Supplementary Table 1: Contd...

Phaco Development Program (PDP) 2 Weeks Schedule

Time	Agenda	Concerned Person
03:00 PM-04:30 PM	Lecture-PCR Management & Anterior Vitrectomy Principles	Consultant
04:30 PM-05:00 PM	OR Case Review	Consultant
Day 8-Tuesday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Complete Phacoemulsification surgery	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab- Complete Nucleus Management	PDS
03:00 PM-04:30 PM	Lecture-IOL (Various Types & Implantation Pearls)	Consultant
04:30 PM-05:00 PM	OR Case Review	Consultant
Day 9-Wednesday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Complete Phacoemulsification surgery	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab- Complete Nucleus Management	PDS
03:00 PM-04:30 PM	Lecture-IOL Formula & Biometry	Consultant
04:30 PM-05:00 PM	OR Case Review	Consultant
Day 10-Thursday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Complete Phacoemulsification surgery	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab- Complete Nucleus Management	PDS
03:00 PM-04:30 PM	Lecture-Complications Overview	Consultant
04:30 PM-05:00 PM	OR Case Review	Consultant
Day 11-Friday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Complete Phacoemulsification surgery	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab- Complete Nucleus Management	PDS
03:00 PM-04:30 PM	Queries & Doubts Clarification	Consultant and Participant
Day 12 - Saturday		
08:00 AM-08:30 AM	Post Op Rounds	Participant & Trainer
08:30 AM-12:30 PM	OR-Complete Phacoemulsification surgery	Consultant
01:00 PM-02:00 PM	Lunch	Canteen
02:00 PM-03:00 PM	Wet lab- Complete Nucleus Management	PDS
03:00 PM-04:30 PM	Queries Clarification & Feedback Session	Consultant and Participant

PDS- Phaco Development Specialist, PDP- Phaco Development Program, OR- Operating Room, CCC- Continuous Curvilinear Capsulorhexis, Phaco- Phacoemulsification, IOL- Intra Ocular Lens. *Complete phaco case can be given depending upon the expertise of the participant & faculty discretion