



Impact of COVID-19: Identifying the Barriers in Ophthalmology Training

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Abstract

Introduction: Actions taken to carry out sustainable practice in ophthalmology during the COVID-19 pandemic have put the training process at an impasse. There is an enormous reduction in surgical volume and patient care by residents.

In this article the authors discuss the primary challenges faced by ophthalmology residents during the pandemic and propose potential solutions.

Purpose: To investigate the obstacles ophthalmology residency training has faced during the COVID-19 pandemic and discuss the viable methods that can be adapted to create a sustainable training atmosphere.

Design: A review of current ophthalmology training practices to recognize lacunas in the system that limit the training of residents during the pandemic.

Methods: A review of recent trends in ophthalmology training, PubMed Central query for training in ophthalmology and the author's exhaustive experience in surgical and clinical training has been utilized to assess the current training scenario.

Results: Actions taken to carry out sustainable practice in ophthalmology during the COVID-19 pandemic have put the training process at an impasse. There is an enormous reduction in surgical volume and patient care by residents.

Conclusion: Although several pedagogical innovations were adopted to continue the training during the pandemic, there is still a need to realize the emergent nature of the problem and embrace alternative methodology to continue quality training in ophthalmology.

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Introduction

Translation of the healthcare sector has played a critical role in the world's sustenance in the past year. However, providing quality Ophthalmological care has become a double-edged sword with the surge of COVID-19 cases. Amongst several challenges posed by the disease, one of the chief concerns is the high rate of transmission of the virus; 48%-62% of spread occurs via pre-symptomatic carriers of disease [1]. The most common mode of transmission is the droplets expelled during talking, coughing, sneezing, etc. According to the US Centre for Disease Control and Prevention, exposure within six feet of an infected person with a laboratory-confirmed illness or a clinically compatible illness for 15 minutes or more in 24 hours period might add to the risk of transmission [2]. Thus, the only acceptable strategy to prevent community spread in the absence of an adequate pharmaceutical intervention is to reduce the contact [3]. As a result, there was a worldwide acceptance of the concept of social distancing.

It forced Ophthalmologists to discontinue most of their elective patient care, as social distancing is nearly impossible in Ophthalmology Out-Patient Department (OPD). It became difficult to even perform the routine OPD procedures in Ophthalmology without avoiding the potential risk of exposure, as most of the procedures in ophthalmology require examining the patients at proximity [4].

Besides patient care, another vital aspect of the specialty that withstands the pandemic is the training of the resident cohort [5]. There is an emergent need for a detailed analysis of the Ophthalmology training scenario worldwide. The purpose of this article is to examine the effects of the SARS-CoV-2 pandemic on ophthalmology training and propose methods to augment and restructure the training process in precarious times as these.

Barriers in ophthalmology training

Clinical knowledge and skill set development

Mastering the microsurgical skills in ophthalmic surgeries requires persistence and diligence so much that a resident needs to perform 70-80 surgeries before he/she can master the skills of phacoemulsification [6]. Training in ophthalmology requires clinical competency and technical proficiency. Hence, the specialist training program in India aims to provide clinical and surgical knowledge with the skills and attitude of the surgeon [7]. Fundamental of training being, passing of skill set gradually in a well-fashioned manner from expert physicians to trainee residents.

The current pandemic has cut down the learning opportunities in term of reduced OPD patients and cancelled elective surgeries. Also, procedures like direct ophthalmoscopy, gonioscopy, Goldmann applanation tonometry that have very little working distance have become difficult to perform routinely, making the learning of skills further impossible without risking transmission of SARS-CoV-2. Hence, the first-year residents are finding it difficult to learn these procedures. The reason being they cannot follow the conventional order of training. At most centers, residents had to begin with an indirect ophthalmoscope even before they could pick up the technique of direct ophthalmoscopy. Learning 90 D/60 D examination, slit-lamp examination, Goldmann applanation tonometry is only advised with a protective shield and other protective gears to curtail the spread of COVID-19. However, face shields, masks and protec-

tive glasses once donned make it next to impossible to carry out the ophthalmic examination, steepening the learning curve of new residents and proving a further deterrent to the training process.

Approaching the training in order not only adapts the trainees to the equipment but makes it easy to interpret the findings. Present circumstances only permit the trainees to examine the patient at a distance, in a brief interval of time. As a result, the perceived difficulty of the skill is much more in new residents as compared to the trainees who received training in the pre-COVID era [8]. Second, learning the skills that require precision has turned furthermore arduous, with compulsory usage of personal protective equipment while examining patients because of added difficulties of fogging, difficulty adjusting optical system, the difference in refractive indices etc. Factors like these can contribute to psychological burden and have a deleterious effect on well being of trainees [9].

Bereavement of the theatre

11 Mar 20, when WHO declared COVID-19 a pandemic, is a date that has fatefully altered the course of training of a generation of surgeons. Whilst elective procedures were being cancelled with the rise of COVID-19 cases, there were continuous efforts by the surgical trainers to re-establish the training, but in vain [10]. Even when emergency care has been continued, there were efforts to manage such cases non-operatively wherever possible, reducing the training opportunity significantly [11].

There was a huge reduction in the number of cataract surgeries performed, with only 50% of the routine surgeries performed in March 2020 and 3% in April 2020. Most states in the US suspended the continuation of elective surgeries by May 20 [12].

Exposure to surgical practice was greatly reduced over the past year raising concerns regarding a significant loss of operative experience by the residents [13], particularly in a speciality like Ophthalmology which requires microsurgical training. Lack of training today would mean a deficiency of experienced trainers in the future. Further, the senior trainees who are on the verge of finishing their training will find it difficult to operate as standalone surgeons once they pass out. The generation of untrained residents now is likely to produce a generation of unskilled practitioners tomorrow, creating an enormous gap of experienced trainers in the future.

Redeployment of residents

A sudden rise in the number of COVID-19 cases led to an increased burden on the healthcare system. To cater for the same, trainee residents from all the specialities, including ophthalmology, were deployed for screening and critical care of COVID patients. The trainees were also deployed in COVID ICUs with insufficient training in ventilator management [14].

Rapidly developing protocols, inadequate training and unfamiliarity to the working environment clubbed with shortages of PPE in several set-ups add to the risk of trainees getting exposed to the infection. Also, deployment in a new area requires them to learn new skills, knowledge and team functionality in a brief period, creating contradictory presupposition of competence [15].

While the trainees of medicine and anesthesiology continued to gain knowledge of their speciality, the trainees of other specialities, including Ophthalmology, were posted to fill the

shortage of medical officers and thus lost a significant time from their training schedule.

Pandemic related anxiety

The surgical trainees need good exposure to the operating room to become proficient. However, with a dramatic reduction in operating room procedures in present circumstances, with no predictability of the future, the trainees are bereft of gaining surgical experience. Decreased operative volume is one of the greatest concerns of surgical residents [16]. According to a survey conducted by Rohan Hussain and colleagues to assess the views of residents on how COVID-19 has affected their training, cataract surgery remained one of the top concerns for those in the early stages of training. Senior trainees, on the other hand, are more concerned about the postponement of examinations [17].

Additional anxiety amongst residents is related to the risk of exposing their family members. Attempts to reduce transmission of infection to loved ones could lead residents to distance themselves from their families, which can capably add to psychological weigh down and anxiety [3]. Several other studies have shown that frontline healthcare workers rank the risk of infecting their family members as the chief cause of stress. The rising number of cases, depletion of personal protective equipment and deployment in COVID wards with overwhelming workload might lead to high levels of anxiety amongst trainees [18].

Telecommunication and online teaching

While the aid of multimedia, pictures, surgical videos etc. significantly reduced the loss incurred to training [8], we could not do much to make up for the lost time in operating room exposure. Virtual training and video conferences were excellent tools for academic exposure, but they still stand incapable of instilling practical knowledge to the residents [16].

We could nowhere achieve the amount of robust exposure that an ophthalmology resident requires in terms of surgical volume. And with the second wave of COVID rising, we have to realize the need for modification in our training, not just concerning academics but skill development in absence of the key element, the patient.

Virtual screens cannot replace OT tables. We have to come up with an effective alternative strategy of skill growth for our trainees. Despite the significant negative impact of the pandemic, we can realize the favourable role of alternative teaching methods, making the best of each learning opportunity.

Lim et al., proposed various strategies for conducting medical education during an epidemic during the spread of SARS in 2009 [16]. Approaches like the use of surgery simulators, virtual platforms, 3-D images and videos, use of dummies for examination and other pedagogical innovations which permit us to continue clinical and surgical teaching during the pandemic can be explored as possible options.

Resuming training post COVID

In a post-COVID setup resuming the training will be an enormous challenge. Thus, we need to develop an innovative, more sustainable approach. A culture with better communication between trainers and trainees has helped prevail the training during the pandemic and needs to be adopted as a routine to have better outcomes. We can continue online modes of teaching

even when the conventional training begins. The virtual platforms, videos, lectures, surgery simulators and online webinars etc., can still prove effective as learning aids. Our overall aim should be to generate a system of training that is sturdy enough to withstand current and future disruption in the system [16].



Figure 1: Factors impacting Ophthalmology training.

Table 1: Addressing individual challenges faced in resident training.

Challenge faced	Proposed solution
Clinical skill development during pandemic	<ul style="list-style-type: none"> Using proxy patients, virtual cases etc to inculcate clinical acumen in absence of real patients Case discussions of the patients previously attended along with relevant clinical photographs Routine webinars focused on approach towards management can be conducted
Surgical skill set development during pandemic	<ul style="list-style-type: none"> Utilizing simulation tools to train surgical skills Using goat's eyes/ similar materials for learning surgical steps Practicing suturing techniques on practice pads Utilizing previously recorded surgical videos to teach stepwise approach
Redeployment to COVID units	<ul style="list-style-type: none"> Planning a structured redeployment of residents Ensuring regular rotation of duties to avoid persistent exposure Promoting informal learning through online webinars, online group discussions amongst peer groups of residents while on rotation Promoting practice of communication with department even when posted to other units
Pandemic related stress	<ul style="list-style-type: none"> Provision of adequate PPE to minimize risk of infection Limit prolonged duty hours and exposure to patients Promoting frequent communications between trainers and trainees to identify individual trainee performance and psychological well being Foster a sense of community amongst peers Identifying burnout through regular communication
Training extension	<ul style="list-style-type: none"> Making a provision to place the new specialists under senior Ophthalmologists after course completion Trainees can utilize the lost time in training for research purpose and academic activities
Cancelled leaves	<ul style="list-style-type: none"> Short leaves, where possible can be permitted to ensure adequate balance of manpower, resources while minimizing physical and psychological burnout amongst residents

Conclusion

The training of residents in ophthalmology has witnessed a crisis like never creating a tremendous gap which is liable to cause unthought-of future implications lest we adapt and embrace the pedagogical innovations for training. Also, we need improved dialogues between trainers and trainees amalgamated with consistent efforts to analyze individual trainee gap and teaching videos, surgery simulators and online webinars to resurrect the trainees' learning curve.

During the pandemic, the UK Royal College of Ophthalmologists has come up with a creative solution of using video clips of patient examination to train their fellows. The American Academy of Ophthalmology has tried virtual examinations. Many of the international societies have switched over to the online platform for conducting routine webinars and conferences, thus showing us how important it is to adapt and develop during times of crisis. The current pandemic has taught us that only as long as we continue to adapt, we will continue to evolve as holistic surgeons and clinicians. Thus, we need to change, update and adapt. With persistent efforts, it will be possible to develop a system that withstands not just the present but is prepared for future pandemics.

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