

## Preferred practice guidelines for glaucoma management during COVID-19 pandemic

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The COVID-19 pandemic has threatened the humanity at a global level to a large extent by the burden of the disease with significant mortality and to a certain extent as a byproduct of the necessary efforts to contain the same. There is a significant impact on the health care system, as we not only have to contain pandemic, but continue to treat our non-COVID-19 patients in a safe and responsible manner. Ophthalmology practice in general and glaucoma in particular needs certain modifications and additional precautions while examining as well as managing these patients keeping their and our safety in mind. As the lockdown relaxations are in vogue we need to learn how to deal with our regular patients as well in addition to emergency care. This paper presents the consensus-based guidelines by an expert panel on how to restart glaucoma practice during this COVID-19 time. These guidelines will be applicable across the country and should help ophthalmologists and glaucoma specialist to restart their practices while safeguarding the patients and their own selves from getting infected.

**Key words:** Consensus, COVID-19, glaucoma, glaucoma guidelines, pandemic, preferred practice with COVID-19

We are all going through a complex and unique situation, where it is difficult to take decisions and manage the patients the way we used to do earlier. All across the world most of the cities have gone through the phase of complete lockdown and then gradually relaxations on the same. In India, the country was in complete lockdown since 25<sup>th</sup> March and then there has been a phasic opening up as we move toward the 4<sup>th</sup> phase of partial lockdown. The guidelines by All India ophthalmology society for ophthalmologists during COVID-19 were issued and published last month.<sup>[1]</sup> Now as we are learning to live with the pandemic, we need to device guidelines that allow us to take optimum care of the patients along with minimizing the threat of COVID-19 spread. It is important to prevent blindness from glaucoma on one hand and on the other hand it is equally important to safeguard public health and mitigate the spread of this virus. According to the guidelines issued by Ministry of Health and Family Welfare, the medical activities can be

carried out in the hospitals as deemed necessary except in the containment zone.<sup>[2]</sup>

### Methods

These guidelines are based on the available information about COVID-19 across the globe, existing literature, directives from Indian Council of Medical Research (ICMR), Government of India, and Ministry of Health and Family Welfare. Once the guidelines were devised, the inputs were invited from various senior experts across the country including heads of the teaching institutions, medical colleges, private practitioners, and corporate sectors. Further these were discussed with the All India Ophthalmology Society working committee for glaucoma and Glaucoma Society of India by conducting multiple online meetings and exchange of mails. The experts suggested changes in the documents that were incorporated, any conflicts were resolved and the final documents was created with consensus. These guidelines indicate about the

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practices and equipment that are specific to glaucoma, so that it would serve as a complementary document to general ophthalmology guidelines. However, these may evolve over time, as we keep getting wiser about handling the situation.

## Guidelines for Glaucoma Practice

To resume elective procedure and medically necessary procedures, following prerequisites need to be kept in mind as per World Health Organization (WHO) guidelines<sup>[3]</sup> and are common for all ophthalmology patients.

1. Authorization for resumption of elective procedures by state govt. guidelines
2. Hospital's preparedness for resuming facilities and updating infection control protocols and staff training in general and for COVID-19 in specific.
3. Arrangements for COVID-19 screening prior to surgery, social distancing, regular disinfection.
4. Patients coming for an appointment should be asked prior to entering the waiting room about respiratory illness/Fever and whether they or a family member reside or have travelled to the containment zone area in the past 14 days. If they answer yes to either question, they should be sent to COVID-19 care center or dedicated COVID-19 hospitals.<sup>[4]</sup>
5. Patients & attendant need to wear a three ply/ cotton mask throughout their stay in the eye care facility
6. All the instruments are well functioning and systems in place for sanitizing them in between the patients.
7. Doctors, optometrist, and para medical staff have adequate Personal Protective Equipment (PPE): like N95 or equivalent masks, Face/ Eye shields and gloves etc.
8. Availability of slit lamp breath shields and explaining patient about minimum talking during examination
9. To plan much lower patient load than pre-COVID-19 times to avoid crowding of waiting rooms.
10. Preferable to give appointments with staggered timings to patients to avoid crowding and prevent long queues and inconvenience to patients. To allow only one attendant per patient inside the premises

However, these can be adapted according to the requirement of the clinic/hospital/institution and state authority guidelines.

Prioritizing the care for outpatients is important to reduce the load on the clinics

1. Clinical prioritization into high risk, medium risk, and low risk using tele-triage, medical records, performa, etc., and then give appointments accordingly
2. Tele consult, virtual/video consultation, network of local ophthalmologist, opticians or optometrist's services can be used for low-risk patients to avoid crowding in the hospital/clinics.
3. Based on treating hospitals ability to deal with the number of patients and treating physician's discretion, the priorities for medical treatment and frequency of follow-up can be decided.

Prioritization plan for surgery is based on the discretion of the treating Ophthalmologist. As we are slowly resuming our normal practice, we should prioritize scheduling surgeries that require immediate attention, and then shift to urgent, semi-urgent, and routine surgeries based on health care facility situation and also state government guidelines.<sup>[5,6]</sup> However, the surgeries to be avoided in containment zones. Guidelines for

glaucoma management are in many ways similar to the general guidelines for ophthalmology patients.

The guidelines as regards specifics to glaucoma are mentioned below

### A. Clinical examination

When and how, this includes

#### General guidelines:

- Keep patient in the clinic for as minimal time as possible. Let the attendant into the examination or diagnostic area only if there is a need.
- Perform only one test in the diagnostic lab at a time.
- Receive the patient records with gloved hands and give them back after reviewing, do not place them on your tables.
- If you are using electronic medical records, ensure hand sanitization or sanitizing the gloves before touching the keyboard or mouse.
- Use gloved hands for cleaning of all the surfaces and equipments.
- Avoid bandage contact lens insertion or removal, suture removal if possible. If necessary to use, then avoid placing forceps on table and take necessary precautions.

#### 1. IOP measurement

- **Goldman applanation tonometer (GAT):** Use of single-use, disposable tonometer tips if available to prevent cross contamination; however, that is not cost effective.<sup>[7]</sup>

For disinfecting the GAT prism, the prism is to be kept in 0.5% bleach/sodium hypochlorite (1 Part of 5% Sodium hypochlorite: 9 Parts distilled water) or 3% hydrogen peroxide for 5 min, then washed with distilled water, dried, and then mounted on the slit lamp. This should be done at the beginning and at the end of the clinic on daily basis. However, bleach is available in various concentrations ranging from 2 to 10%; hence, dilution can be done accordingly to make it a 0.5% solution. The wipes dipped in 70% of the isopropyl alcohol (IPA) solution or alcohol wipes commercially available (with 70% IPA) can be used to clean the tips in between the patients. Since alcohol will not effectively sterilize the tip against adenoviruses and herpes simplex virus (HSV), additional use of sodium hypochlorite at the start and end of the day will help effective disinfection against adenovirus, HSV, coronavirus and other viruses commonly associated with nosocomial outbreaks in eye care.<sup>[8]</sup> However, according to Finnish Centre for Occupational Health Guideline for cleaning surfaces 0.1% sodium hypochlorite is also effective against coronavirus.<sup>[9]</sup> The chlorine solutions that are 0.25% and above have to be rinsed after the contact period for disinfection; otherwise, they can be detrimental for the instruments or surfaces. Hence, regular use of these disinfectants should be avoided for sensitive instruments.

- **Noncontact tonometers should be avoided** as they create micro aerosols that can disperse the virus and hence increase chances of spread of the virus.<sup>[5,10]</sup>
- **Icare:** For screening with disposable probe and use a fresh probe for each patient.

- **Tonopen:** Fresh sleeve to be used for each patient as it comes with a disposable sleeve.
- **Perkins:** To be used in pediatric patients, if tonopen and I-care are not available and should be used with adequate precautions and tip should be cleaned similar to the GAT.
- The **Schiotz tonometer** should be dipped in a 1:1000 merthiolate solution and rinsed in saline/distilled water prior to use.<sup>[11]</sup> Heating the base of the instrument with the flame of a spirit lamp for 10 seconds and allowing sufficient time for cooling before use.<sup>[11]</sup> Either of these procedures is followed at the beginning and the end of the clinic on a daily basis. Cleaning the foot plate and test cornea with alcohol swab (70% IPA allowing sufficient time for drying of chemicals) between the patients is recommended.

### 2. Gonioscopy

- To be done for patients as per discretion of ophthalmologist with appropriate precautions. Gonioscopes can be cleaned (Volk guidelines) in running water with soap solution, dried, and wiped with wipes or cotton or gauze soaked in 70% IPA, and dried after every use before placing them in the boxes.<sup>[12]</sup>
- 0.5% (5000 parts per million or ppm) household bleach. The lenses can be soaked for minimum of 10 min (1 Part of 5% Sodium hypochloride: 9 Parts distilled water in ambient/room temperature 62-72°F (16.67-22.22°C), then rinsed with distilled water and dried before use. (Volk guidelines)<sup>[12]</sup>

### 3. Fundus evaluation

- Using 90 Dioptre (D) or 78D with slit lamp bio microscopy, and fundus photographs.
- Indirect ophthalmoscopy using 20D in COVID-19 positive cases.
- Avoid using direct ophthalmoscopes as it requires very close proximity to patients face and mouth.
- Disinfection of lenses 90D/78D/20D/laser lenses – 0.5% (5000 ppm) household bleach in a similar fashion as mentioned above for gonioscopes. (Volk guidelines)<sup>[12]</sup>
- 2% Aqueous solution of Glutaraldehyde. To avoid surface damage to contact lenses, never clean the contact elements with alcohol, peroxide, or acetone. Koeppe and goniotomy lenses can be sterilized with ethylene oxide, prior to use in surgery.

## B. Investigations

1. **Visual fields:** Keeping in mind the lesser possibility of disinfecting the perimetry bowl, visual field test should be performed
  - Only if necessary for diagnosis, planning or changing management.
  - Tab-based perimetry or virtual reality (VR) perimetry can be used if possible/available.

**Disinfection of perimeter (Recommendation from Carl Zeiss)<sup>[13]</sup>**

  - Use 70% IPA to wipe all patient and technician interface surfaces, e.g., eyepatch, chinrest, headrest, trial lens holder, trial lens, patient response button.
  - To clean the bowl of perimeter, please follow manufacturer's guidelines as they vary with different

companies (Quick-start guide from Zeiss and Octopus).

- Chin rest and forehead rests can also have paper cover, which can be discarded after each patient. However, the manufacturer's guidelines should be followed for each perimeter. Also, three-layered masks to be worn by the patient and can be sealed by micropore/tape above the nose to prevent spread of aerosols from the patient's breath into the perimeter bowl.
2. **Imaging and fundus photography:** Imaging is preferable over visual fields for suspects and glaucoma patients, as it has lesser chances of cross contamination, sanitization is easier, and the test is faster. The patient should be wearing a three-layered mask with a tape while performing the test  
**Disinfection of optical coherence tomography, fundus photography machine, and other imaging machines:** Use 70% IPA to wipe all patient and technician interface surfaces, e.g. eyepatch, chinrest, headrest. The lens is to be wiped with soft cloth, nonfiber, using ethanol (according to manufacturer's advice in manuals) between patients to avoid contamination.
  3. **Ultrasound biomicroscopy (UBM):** to be used only if mandatory and required to decide the management of a condition that is vision threatening. Always use gloves while performing the UBM. Best is to use disposable tips where possible and dispose after every use. Otherwise, the UBM cups can be sterilized by ETO and should be changed after every patient. The probe can be cleaned with 70% IPA, or covered with a disposable glove that can be discarded after each use.

## C. Lasers

Indications for laser to be decided by the treating ophthalmologist. While performing lasers, use of gloves, three-layered masks with a tape on the nasal side, slit lamp breath shield, appropriate disinfection of Abraham lens (similar to gonio lenses), and laser console with slit lamp need to be kept in mind.

## D. Surgical Procedures

Level of urgency can be decided as per discretion of the treating surgeon/hospital/state authorities guidelines. It is preferable to operate under local anesthesia with day care and avoid general anesthesia. Further the procedures that require lesser postoperative follow up can be chosen based on the treating physician's discretion. General guidelines for operating room (OR) are similar to any ophthalmology OR for all glaucoma procedures.

## Conclusion

The amount of damage the COVID-19 pandemic has done all across the world is insurmountable. There are mandatory life style changes that need to be acquired to protect oneself as an individual and the community as a whole. The impact on the health care systems is huge and definitely requires a change in the way we examine and treat our patients. There have been reports of presence of the virus in conjunctival secretions.<sup>[14]</sup> Therefore, in ophthalmology practice, the chances of infectivity due to close contact with the patient and aerosol generating procedures are significantly high. However, the reports of infectivity through tears and spread

across the individuals show conflicting results.<sup>[15]</sup> Nonetheless, it is important to use the preferred guidelines so as to protect ourselves as well as provide optimal care to patients without increasing the risk of virus transmission. Also, it is imperative that the barrier and disinfection systems to be kept in mind at each step.

## Disclaimer

*The expert panel would like to declare that this document contains guidelines based on the information issued by various relevant organizations across the globe, existing literature, ICMR directives, state and central governments orders as on the date. The current outbreak is unpredictable and adherence to any recommendations included in this document may not ensure a successful outcome in every situation and may not have included every aspect. If community transmission occurs, the capacity and priorities of healthcare systems change due to changing situation and then these may not remain relevant or sufficient. These recommendations will be regularly updated to account for the changing epidemiology and new information regarding treatment and testing.*

*These guidelines are the suggestions for preferred practices and do not replace or override existing national/regional/local statutory requirements. The ultimate judgment regarding the management must be made by the treating physician and the patient considering all the circumstances presented by the individual patient, and the variability of the medical condition. This expert panel does not claim for the accuracy or completeness of the guidance and assumes no responsibility for any injury or damage to persons or property arising out of or related to any use of this guidance or for any errors or omissions. No suit or legal proceedings shall lie against any person for anything done or intended to be done in good faith based on these guidelines.*

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## Conflicts of interest

There are no conflicts of interest.

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