

## Tele-consultations in the wake of COVID-19 – Suggested guidelines for clinical ophthalmology

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While telemedicine has been around for a few decades, it has taken great importance and prominence in recent times. With the fear of the virus being transmitted, patients and physicians across specialties are using consultation via a telephone call or video from the safety of their homes. Though tele-ophthalmology has been popular for screening, there are no clear guidelines on how to comprehensively manage patients seeking advice and treatment for a particular eye condition. Some major barriers to diagnosis and management are compromised detailed examination, no measurement of the visual acuity or intraocular pressure and a retinal evaluation not being feasible. Despite these limitations, we do need to help those patients who need immediate care or attention. Hence, this article has put together some guidelines to follow during such consultations. They are important and timely due to the medicolegal and financial implications.

**Key words:** COVID-19, medicolegal, tele-consultation, Tele-ophthalmology, video consultation

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The early 90s saw the introduction of telemedicine in ophthalmology. The most common conditions it has been popular for are diabetic retinopathy (DR), glaucoma and retinopathy of prematurity (ROP), but more so as screening tool. Images of patients were sent for physicians to determine the presence or absence of disease, rather than a direct interaction. The COVID-19 pandemic has presented an unexpected task to the healthcare community the world over. This highly contagious virus can affect the elderly adversely, as well as those with pre-existing medical/comorbid conditions. For this reason, social distancing and lockdowns have been in place across the world for the past few months. This has resulted in a steep rise in the need and demand for telemedicine platforms. These restrictions have been in place in India since March 25<sup>th</sup>, 2020. During this period, we have probably received messages, emails, audio and video calls from patients seeking advice. These are all informal ways of care with no records of time spent or interaction with the patient and also not in real-time, which is preferable for emergencies.

To empower and enable doctors, the Ministry of Health and Family Welfare, Government of India had released a set of telemedicine guidelines once the lockdown period was initiated.<sup>[1]</sup> Video consultation is preferable as we can see the patient directly, look for general and eye signs, and can enquire to determine if the patient has been exposed to COVID-19. This also allows us to establish the provisional diagnosis, advise the patient on management, counsel them to adhere

to therapy, and clarify all their queries with reassurance.<sup>[1]</sup> A tele-consultation may be initiated by the patient or the doctor, with the patient's consent being implicit in the former, while an explicit consent is required in the latter. After a review of reports uploaded to the app or server by the patient and/or those in the electronic medical records of the hospital, the video consultation begins with a self-introduction by the doctor, followed by an external eye examination using the front facing camera of the patient's phone or computer.<sup>[1]</sup> For the purpose of tele-consultation, the scope of the 'first' and 'follow-up' consultations have been defined.<sup>[1]</sup> The first consultation refers to a patient consulting a doctor for the first time, or consulted the same doctor more than six months ago, or consulted for a different health condition. Follow-up refers to consulting the same doctor within 6 months of his/her previous in-person consultation for the same condition. However, it will not be considered a follow-up if there are new symptoms that are not in the spectrum of the same health condition and/or the doctor does not recall the context of the previous treatment and advice. While deciding the algorithms of care, it would become important in several chronic conditions to differentiate between first and follow-up sessions.

Pre-requisites for such consultations have been suggested by the All India Ophthalmological Society.<sup>[2]</sup> These include

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verification of identity, consent, documentation of any available investigation, documentation of findings, and prescription in the approved format. It is to be noted that tele-consultation does not grant immunity from medico-legal liabilities. Tele-consultation is primarily to determine whether a physical visit is required and to offer advice in the interim. The external appearance of the patient's eye/eyes, a relevant history, and available investigations such as blood tests or imaging, need to be taken into consideration during a video consultation. There are several platforms available now for tele-consultation and can be customized for one's requirement in a fairly short time period.<sup>[3]</sup> The financial implications differ based on the type and volume of the practice, which we have briefly touched upon in subsequent paragraphs. Even though the consent is implied as patients themselves seek a video consultation, the important medicolegal aspects of tele-consultation to be considered are enumerated. Irrespective of the medium used, below are suggested guidelines, specialty-wise, for effectively managing ophthalmic care via telemedicine.

## Cataract

Even before this pandemic, the use of telemedicine for cataract screening, especially in low- and middle-income groups of remote areas, had shown a significant increase in referrals for cataract surgery.<sup>[4]</sup> Though an elective procedure, delay in diagnosis and treatment may convert cataract surgery into an emergency procedure. Although tele-consultation can never replace a good clinical examination, it can be used as a tool to triage patients. Assessment of vision can be done by asking the patient to occlude one eye and assess for finger counting at various distances with the help of a relative. A close look for any visible opacities in the visual axis is also possible with the help of a smartphone [Fig. 1]. It also aids in effective counselling as patient is face to face with the doctor. A tele-consultation for the below conditions helps determine immediate/early visit to the hospital

1. Phacolytic glaucoma – Along with patients' complaints of a short duration of acute pain and congestion, a cloudy cornea, turbid anterior chamber and in certain cases, a hypermature cataract may be visible<sup>[5]</sup>
2. Intumescent mature cataract - Patients present with a white reflex that is easily visible on tele-examination. A delay in surgery in this stage may result in symptoms similar to phacolytic glaucoma, corneal edema, and uveitis among other conditions<sup>[6]</sup>
3. Unilateral or bilateral visually significant cataract
4. Subluxated natural crystalline or intraocular lens, with history of sudden decrease in vision with or without associated history of trauma
5. Post-operative uveitis in patients complaining of pain and visible circumciliary congestion<sup>[7]</sup>
6. Traumatic cataracts (along with other departments).

Post-operative follow-ups can be managed temporarily with tele-consultation to assess the patient's general well-being and satisfaction with visual recovery, counselling and lifestyle adaptations. Medicolegal aspects of concern, specifically in cataract, could be due to inadequate diagnosis or missed diagnosis in cases of visually significant cataracts, leading to potential delay in treatment.

## Cornea

Since the cornea can be visualized on a video consultation, a gross examination in various gazes can help make a tentative

diagnosis. However, for potentially visual threatening conditions like a corneal ulcer or trauma, an in-person consultation is mandatory for appropriate treatment. A thorough history for any deterioration of vision, pain, redness or discharge is a must. Obvious changes like congestion of the eye and periorcular skin or lid changes will have differential diagnoses.

Red Eye [Fig. 2]: Relevant associated symptoms to ask include pain, blurring of vision, burning, itching or irritation, discharge, and trauma. Based on the history, symptomatology and external eye examination on video, conditions that can be ruled out are conjunctivitis, corneal ulcer, subconjunctival hemorrhage, dry eye syndrome, filamentary keratitis, recurrent corneal erosion, corneal abrasions, episcleritis, and scleritis. Most commonly seen is conjunctivitis secondary to bacteria,<sup>[8]</sup> viral or allergic etiology. Purulent discharge and stickiness of the eyelids helps us to differentiate bacterial from other infections. Penza *et al.* noted that antibiotic prescriptions for conjunctivitis did not differ between eVisits and face-to-face consults. However, consultation on phone calls did have a significantly higher rate of antibiotics being prescribed than the other 2 encounters.<sup>[9]</sup> Patients with allergic conjunctivitis will complain of itching and irritation along with excessive redness towards the end of day. With increased use of sanitizers and aerosols generated, more patients are now complaining of redness and irritation of the eye. Cautious and safe practice needs to be explained on the tele-consultation (article in press). Differentials for non-corneal causes of red eye like angle closure glaucoma, neovascular glaucoma and uveitis need to be ruled out. For suspected conjunctivitis, topical antibiotic drops and lubricating drops is preferred.<sup>[10]</sup> Unless absolutely essential, it is better to avoid topical steroids due to its potential side effects and unmonitored usage. Those with altered vision, severe eye pain or worsening, despite treatment, will require immediate referral to the clinic.<sup>[11]</sup>

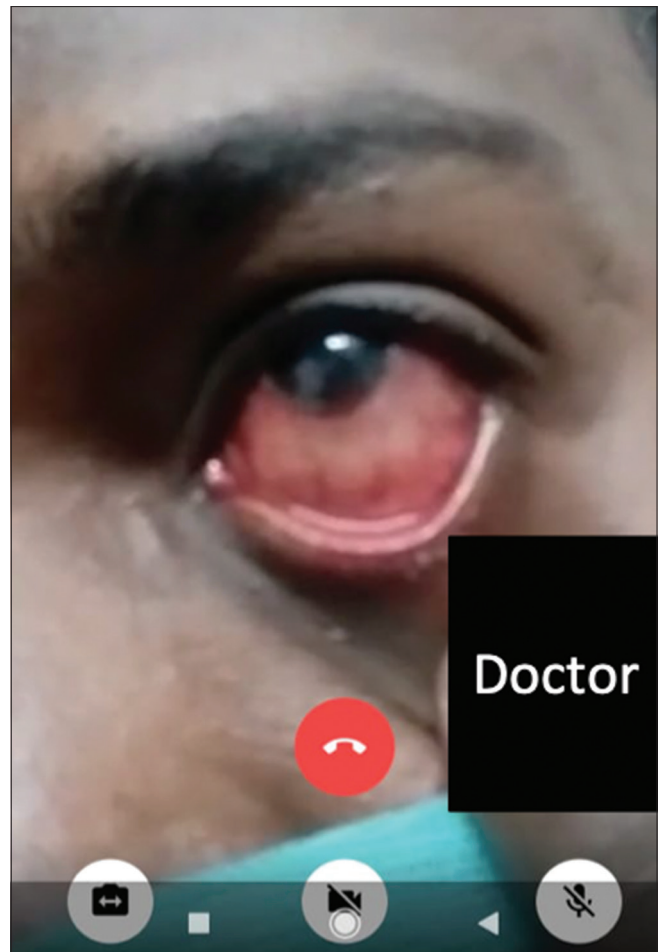
For patients with trauma to the eye, blunt or penetrating trauma or chemical or thermal injury, a detailed history is very important. Though a gross evaluation of the eye and adnexa is possible, the true extent of involvement of the cornea, angle, lens and posterior segment is not possible and needs an immediate referral. Since many of these are medicolegal cases or require emergency surgical intervention, documentation and management at a hospital is mandatory. Those who have undergone corneal transplant, corneal tear repair, pterygium surgery or even minor procedures like corneal foreign body removal can opt for tele-consultation for queries regarding continuation of medications, dosage or the next follow-up visits. Due to the lockdown, there has been increased exposure to digital media and computer use. Many patients present with complaints like watering, itching of eyes, eye strain and redness. They need to be educated about Computer Vision Syndrome and advised lubricating drops, if need be.

## Glaucoma

The accurate diagnosis of glaucoma depends on an optic disc assessment and visual field examination (perimetry).<sup>[12]</sup> Additionally, accurate intraocular pressure (IOP) measurement is important since IOP reduction remains the mainstay of treatment. Devices which can be used by patients to measure these parameters are still undergoing development and refinement.<sup>[13,14]</sup> Hence, "home-tonometry" and "home-perimetry" is still a work in progress. The inability to acquire information regarding IOP,



**Figure 1:** The image is a representative of tele-consultation with an elderly gentleman with complaints of diminution of vision in his left eye. The white arrow indicates a visible whitish opacity in the visual axis. The patient was advised to visit the clinic at the earliest



**Figure 2:** An elderly patient presenting with redness and discomfort

Patient Name : ██████████ Patient Mobile Number : ██████████ Patient Gender : Male
<b>Complaints :</b> Redness, watering and irritation of both eyes since 2 weeks
<b>Findings :</b> Conjunctival congestion in both eyes
<b>Provisional Diagnosis :</b> Dry eye (Both eyes)
<b>Treatment Plan :</b> Carboxymethylcellulose 0.5% eye drops four times a day in both eyes for 2 months
<b>Remarks :</b> To continue Anti-glaucoma drops as before in both eyes To report to hospital if there is worsening of symptoms or development of pain / discharge / loss of vision in either eye.
Dr. ██████████ (Reg No: ████████) Date: ██████████
This is an e-prescription given by Dr. ██████████ under the appointment ref. no. A90JKIB1 and does not require any signature. This is a teleconsult without a physical examination. If the treatment doesnot result in desired effect, please visit the hospital/doctor.

**Figure 3:** A representative prescription of a tele-consultation highlighting the disclaimer

optic disc or visual field changes through a tele-consultation highlights the futility of this interface for the management of chronic glaucoma. Despite these limitations, there is a small subset of glaucoma patients who present with an acute rise in IOP, which may be associated with symptoms such as pain and redness of the eye, blurring of vision, headache and vomiting. Based on the history, a physician may be able to determine if this is a primary acute angle-closure glaucoma or an acute secondary glaucoma (neovascular glaucoma in a patient with pre-existing ischemic retinopathy, acute angle-closure glaucoma in an eye with chronic uveitis, traumatic glaucoma). Irrespective of the cause, all these cases who have been diagnosed on a tele-consultation require urgent referral to a hospital for management.

The vast majority of chronic glaucoma patients may develop problems related to their ongoing treatment. Around 60% of glaucoma patients develop ocular surface disease (OSD) due to the long-term use of IOP-lowering eye drops.<sup>[15]</sup> This may be diagnosed with the help of a video tele-consultation if increased conjunctival congestion (predominantly in the inferior fornix) along with dry-eye symptoms is noticed in a glaucoma patient.<sup>[16]</sup> After acquiring a detailed history of eye drops used, the addition of lubricants or a switch to preservative-free anti-glaucoma formulations may be advised.<sup>[15]</sup> However, the drug prescription should contain a



disclaimer that the treatment was advised based on the history alone and a clinical examination was not performed as shown in Fig. 3. Occasionally, an allergic reaction to the active ingredient may occur such as follicular conjunctivitis or drug-related lid allergy secondary to long-term use of brimonidine, which warrants substitution of the medication. For lost or misplaced prescriptions, in those with documented stable glaucoma based on a review of the medical records, the same drops can be prescribed through tele-consultation to ensure that patients can procure the medications till their next review in the clinic.

Advice regarding eye drops remains the main utility of tele-consultation in glaucoma, wherein patients can be reminded about the correct dosage, the technique of instillation, and identification of possible side effects. However, differentiating OSD from other causes of a red eye is not always possible from a video tele-consultation and the patient may be required to visit the hospital for a detailed slit-lamp examination. Also, any change in the drug prescription requires a follow-up visit to ensure resolution of symptoms and control of IOP. The other sight-threatening condition which could be identified during a video tele-consultation with a patient who has undergone prior glaucoma surgery is bleb-related infections. Blebitis usually presents as a necrotic bleb (white) surrounded by intense congestion (red) associated with symptoms of pain, redness and drop in vision. Such patients must be urged to come into the hospital as soon as possible for further management. Therefore, the diagnosis of glaucoma and monitoring progression is heavily dependent on instruments that are currently only available in hospital settings. However,

the few clinical situations where tele-consultation may be useful have been discussed above.

## Neuro-Ophthalmology

Neuro-Ophthalmology lends itself to tele-consultation as several common conditions can be assessed remotely and triaged. It must be emphasized that this may be the first point of contact for patients with life threatening conditions and lifesaving emergencies. Hence, these cases must be evaluated with a high index of suspicion to improve the likelihood of reaching a diagnosis in the shortest possible time. The aim would be to determine which of these patients require urgent neuroimaging and/or a consult with a neurologist or neurosurgeon. Three common scenarios – sudden loss of vision [Fig. 4], headache [Fig. 5], and diplopia [Fig. 6], that can be managed on tele-consultation.

## Oculoplasty and Oncology

Ophthalmic plastics is uniquely positioned in that a large proportion of patients can be diagnosed, treated and reviewed via tele-ophthalmology.<sup>[18-21]</sup> The use of photographic or video consultation ranges from 68-100% of patients,<sup>[19,21]</sup> with a good agreement between the provider partner at a remote location and the consulting doctor,<sup>[20]</sup> leading to a management decision in 87% of patients with urgent oculoplastic and trauma conditions.<sup>[21]</sup> Tele-consultation for aesthetic procedures can result in up to 25% of new patients coming for a consult in person, and in interventions for 80% of this segment.<sup>[19]</sup>

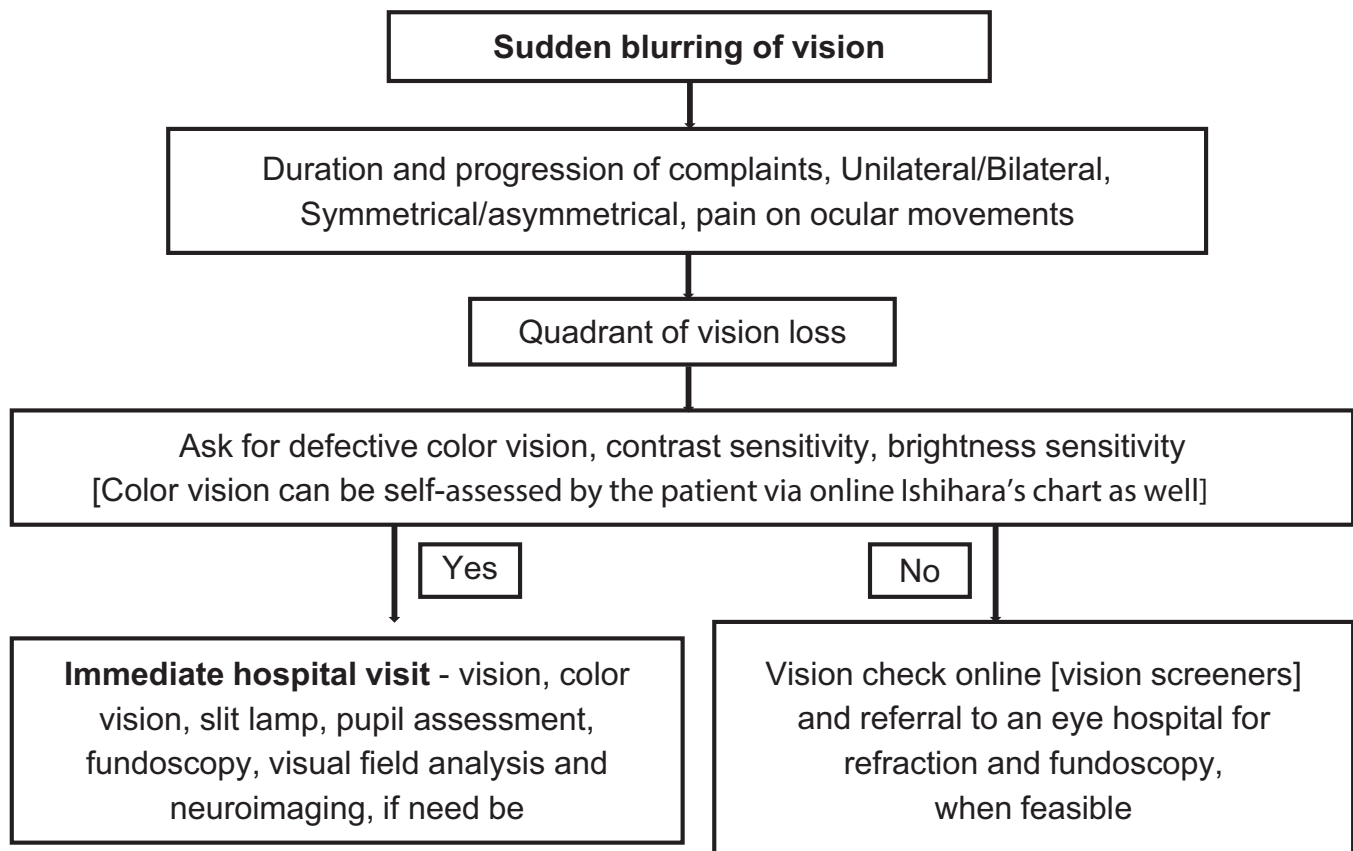


Figure 4: Suggested algorithm for a patient complaining of sudden blurring of vision

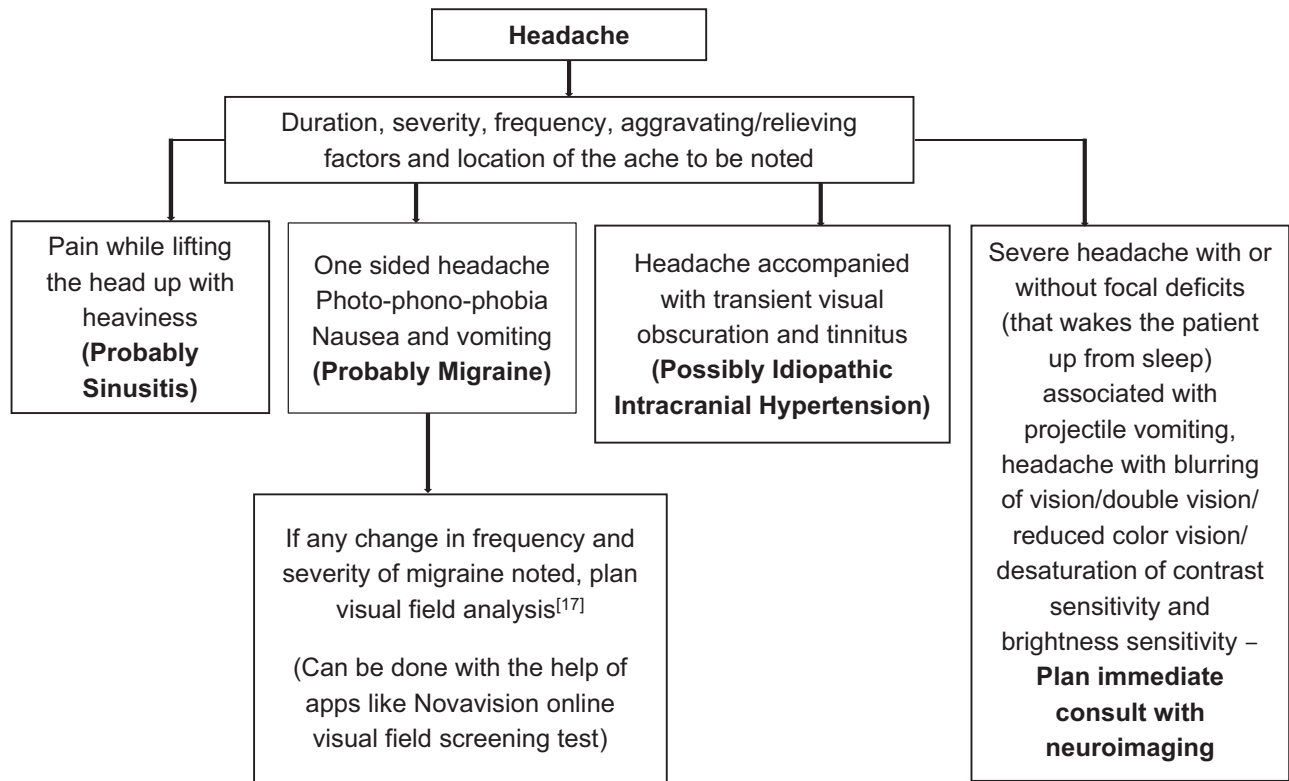


Figure 5: Suggested algorithm for a patient complaining of headache

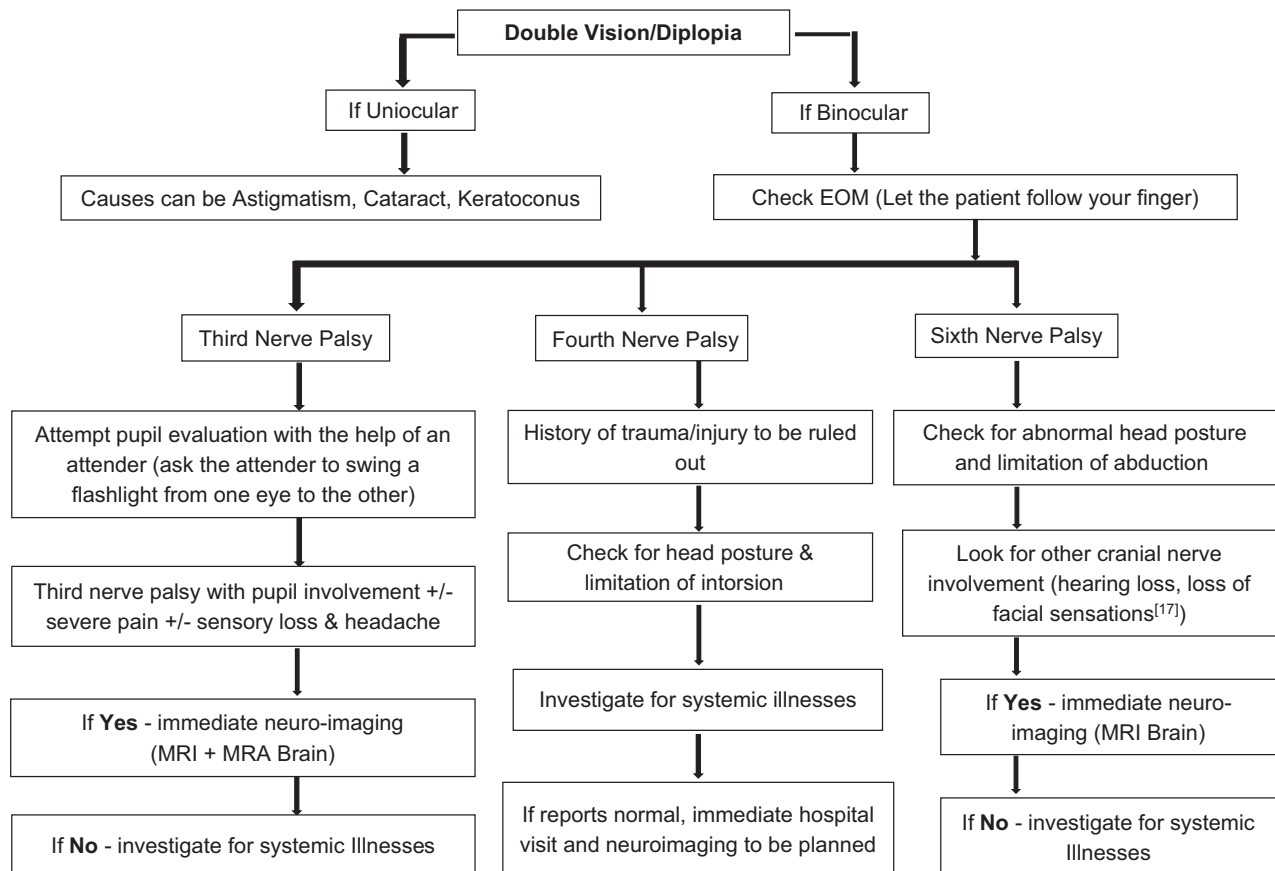
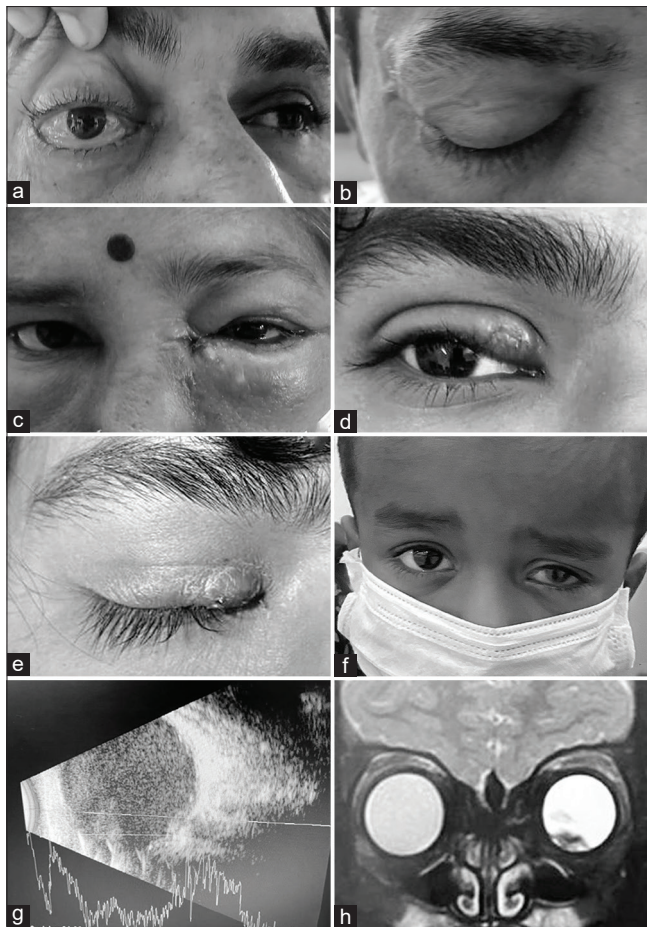


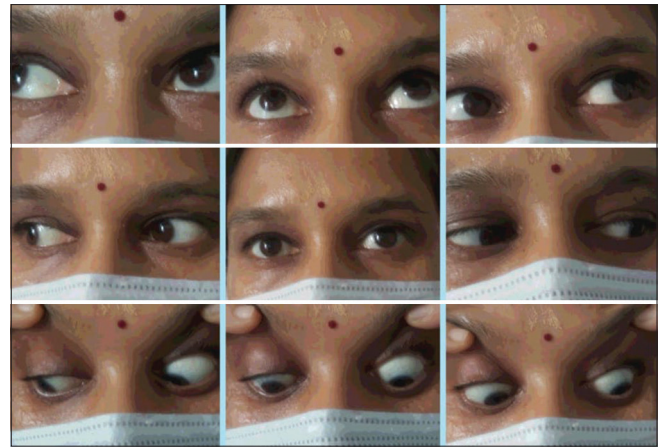
Figure 6: Suggested algorithm for a patient complaining of diplopia



**Figure 7:** Images taken on a phone and shared by the patient/partner ophthalmologist. The quality of the images permits diagnosis (a) Indicates proptosis, chemosis and ptosis, (b) Visible dilated vessels in the peri-ocular region indicating possible diagnosis of arterio-venous fistula, (c) Female patient with a swelling visible at the lacrimal sac area, (d) External hordeolum identified on tele-consultation and treated medically, (e) Follow up picture of 7D showing healing hordeolum on tele-consultation, (f) Child with an enophthalmic appearance, (g) Photo taken from a monitor of the B-Scan of the same child in 7F showing vitreous hemorrhage with a suspected retinal mass lesion, (H) MRI confirming retinoblastoma in case shown in 7F

There are standardized techniques for taking photographs for oculoplasty patients to allow optimal assessment of ptosis, proptosis and other conditions.<sup>[22,23]</sup> The following are examples of the different modes of tele-consultation suitable in particular conditions.

1. Consultation on Phone - explaining medicines already prescribed and planning the next review.
2. External photograph can be shared by patient with discussion
  - a. for follow up of patient already on medical treatment - example for pre-septal cellulitis
  - b. follow-up of post-operative patient
  - c. follow up of patient after eyelid/conjunctival tumor excision
  - d. for decision of surgery for eyelid malposition such as entropion and ectropion
3. External photograph shared by a partner ophthalmologist from a remote location to plan further investigations and



**Figure 8:** '9 Gaze' smartphone application used for self-evaluation of extraocular movements

treatment. Images and test results should be reviewed before making any final management decision. It is recommended that the doctor sees the CT or MRI image itself, not only the report.

4. Video consultation for dynamic assessment of ptosis, proptosis, peri-ocular dystonia, lagophthalmos, and ocular movements.

The findings and planning on tele-consultation have to be documented and saved as in a physical consultation [Fig. 7].

The doctor has to use his/her clinical acumen to determine if the information available on remote consultation is adequate to make management decisions. Assessment of compressive optic neuropathy in thyroid eye disease or orbital tumor, and assessment of any ocular trauma, is incomplete without assessment of vision and pupil. Any eyelid malignancy needs palpation for deep extension of tumor and for regional lymphadenopathy. Hence, it is best to err on the side of caution and request additional investigations and a personal visit as needed. Albeit these limitations, telemedicine has increased the scope for expanding oculoplastic service to areas previously lacking the sub-specialty service. Tele-ophthalmology is useful for follow-up of patients with ocular malignancies, who are on maintenance therapy or in remission.

## Pediatric Ophthalmology

In the traditional sense, tele-ophthalmology requires a healthcare technician, optometrist or orthoptist to do the initial screening examination of measuring visual acuity, refraction and then take images and/or videos and relay it to the pediatric ophthalmologist available in an urban center.<sup>[24-27]</sup> However, the pandemic has left no luxury of having trained personnel at the other end of the examination. We have to take the help of parents to examine the child. Tele-consultation is particularly important in pediatric-ophthalmology, since parents are extremely wary of hospital visits due to the increased risk of exposure to the virus.

The most common complaint during tele-consultations is the occurrence of a red eye. A history of itching/eye rubbing, discharge and an increase in congestion towards the evening is important.<sup>[28]</sup> In very young children, since examination of the conjunctiva on a video consultation is difficult, requesting the parents for photographs is preferable to allow differentiation





**Figure 9:** Smart phone app-based video tele-consultation between the retinal specialist and the parents of a child undergoing functional vision assessment using home-based toys

between allergic and infective conjunctivitis. In the presence of moderate to severe allergic conjunctivitis with limbal thickening and Horner-Trantas dots, the child would need to be started on topical steroids, in tapering dose and the parents have to be cautioned against repeated self-medication. Other inflammatory and infectious conditions of lid and adnexa, like internal or external hordeolum and blepharitis can be diagnosed during tele-consultation and appropriate advice given.

Consultations that show a white/grey reflex on the camera will need to be seen in the hospital without delay. The presence or absence of nystagmus noted on a video consultation can help in prognosticating pediatric cataracts. For children with strabismus the parents can be asked to perform basic eye movement examination or document eye movements using the '9 Gaze' application available on the Google Play Store [Fig. 8]. The Hirschberg test can be performed by asking the child to look directly into the camera. An abnormal head posture can also be easily noted on the camera. If the strabismus is not alternating, one may advise part time occlusion of the better eye, till the time that a hospital-based examination is possible. A strabismus examination can never be complete without visual acuity testing and a cycloplegic refraction. The use of web-based refraction systems in pediatric patients is unreliable due

to calibration and validation issues.<sup>[29,30]</sup> Tele-consultation can also be used to follow up patients who have undergone strabismus surgery, to check compliance to medications and help anxious parents calm their frayed nerves. Although video-based consultation for pediatric ophthalmology is still in its infancy, the pandemic will compel us to innovate towards more accurate and scalable home testing options for children.

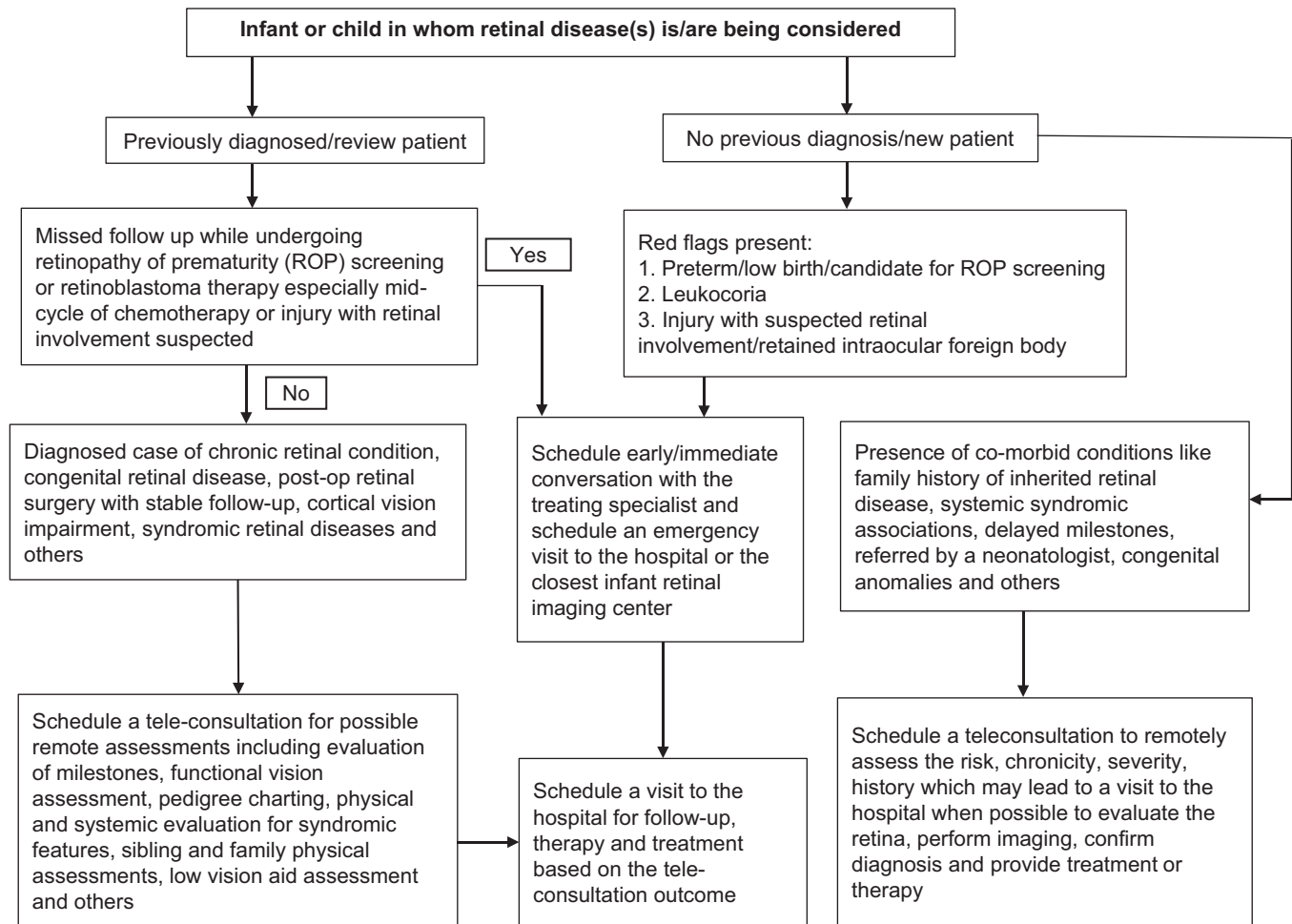
## Pediatric Retina

The role of tele-consultation in pediatric retinal diseases is limited by the inability to examine the retina of a remotely situated infant or child due to the unavailability of remote retinal imaging devices. Yet given the lack of pediatric retinal specialists, especially those involved in the care of retinopathy of prematurity, telemedicine in this subspecialty could help to bridge the unmet need.<sup>[31]</sup> Whereas it is intuitive to expect that all retinal conditions pre-suppose that onsite retinal examination is imperative, there are still several conditions that can be addressed (albeit temporarily) through tele-consultation. Red flag signs like premature infants requiring ROP screening, retinoblastoma patients undergoing therapy, trauma with possible retinal involvement and leukocoria require emergency retinal evaluation by the specialist or with an infant retinal imaging camera. ROP screening guidelines during pandemics like the COVID-19 were modified<sup>[32]</sup> to accommodate deviations from the standard screening guidelines.<sup>[33]</sup>

Potential touchpoints for the use of tele-consultation in pediatric retinal care are:

1. Review patients of chronic retinal conditions such as Coats disease, familial exudative vitreoretinopathy and inherited retinal diseases including syndromic retinal conditions especially during its stable course
2. Functional vision assessment and milestones can be assessed during video tele-consultation sessions by observing the child and prompting the parents to use home-based tools or toys [Fig. 9]. This is useful for children with cortical vision impairment and other retinal conditions with subnormal vision
3. Co-management of cases who have multi-system involvement with other specialties including pediatricians, neonatologists, neurologists, geneticists and therapists
4. Tele-monitoring of symptoms, including uneventful surgery, children undergoing therapy or medical management
5. Second opinion cases who have reports including fundus photographs, optical coherence tomography scans or others
6. Promoting positive health behavior and practices – several retinal conditions require modifications in lifestyle, diet and behavior which can be taught and monitored on tele-consultation.

Owing to the nature of the diseases affecting the retinae in children, the risk of misdiagnosis, delay in suggesting treatment, difficulty in eliciting the signs (even in a live examination), and possibility of impaired vision and blindness affecting a child, medico-legal considerations bear an even more significant role in tele-consultation for pediatric retinal conditions. Whereas tele-medicine in ROP has received sanctity and validation for its process when performed by certified non-physicians in remote locations,<sup>[34,35]</sup> tele-consultation does not have the luxury of



**Figure 10:** Suggested algorithm for pediatric retinal diseases

examining the retina and hence carries the risk of sub-optimal care. Furthermore, special legal considerations include, consents of a minor, incomplete parental disclosure of systemic details that may influence the diagnosis, issues relating to data encryption, file safety and prolonged periods of data archiving in the case of minors. Until regulations are available, it is prudent to enlist the limitations of tele-consultations in the disclaimer and obtain an online declaration or consent prior to the session and print the limitations in the disclaimer of the report, summary or prescription of the specialist following remote 'unexamined' assessments. A suggested algorithm for decision making on triaging pediatric retinal cases for tele-consultation is summarized in Fig. 10.

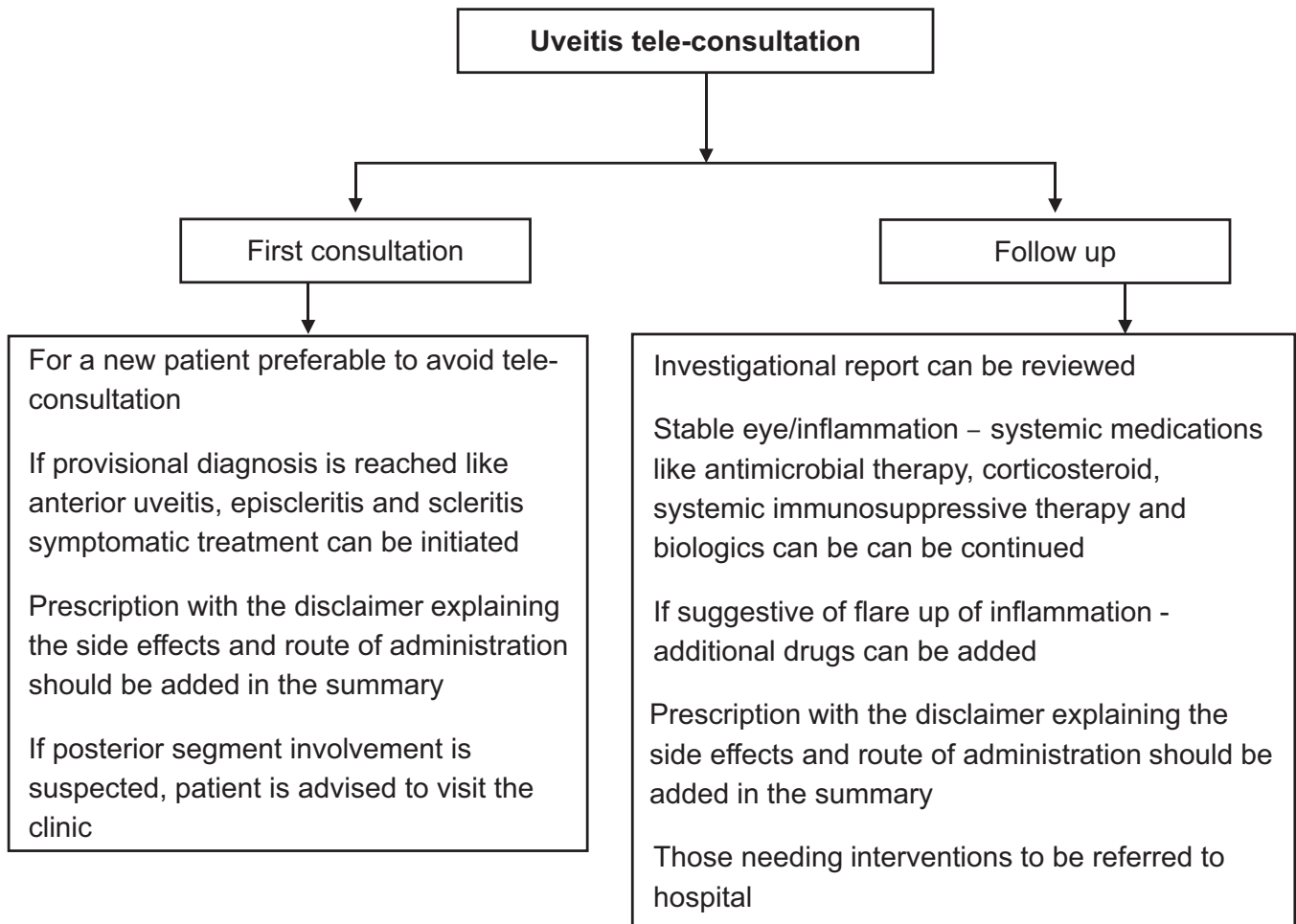
## Retina

With diabetes affecting over 425 million people worldwide,<sup>[36]</sup> telemedicine has been a screening tool for DR for several decades now. While tele-retina is a more cost-effective means of screening for DR than the standard of care in urban and rural under screened communities,<sup>[37]</sup> the same may not hold true for the 'diagnosis and/or treatment' of other retinal conditions, unless accompanied by non-mydratic wide field fundus imaging. Despite the limitations of not being able to do a dilated retinal examination on tele-consultation, in times like now with the pandemic looming large, we can still offer some care till it is logistically possible and safe for the patient

to visit us. Patients presenting with acute symptoms will need a careful history.

- Sudden drop in vision – by asking the patient to occlude the better eye and look at objects in the distance, a rough estimate of vision in the affected eye can be determined. Likewise, the visual field can also be assessed. Alternatively, by using appropriate mobile applications patients can perform a self-assessment.<sup>[38]</sup> Along with a relevant history, conditions that can be ruled out are retinal artery occlusion, retinal vein occlusion, vitreous hemorrhage and retinal detachment. A sudden onset of flashes with increase in floaters and loss of vision or reduced visual field may indicate a retinal detachment. Past history and any known systemic conditions along with the condition of the other eye will help further
- Deterioration of vision – those with pre-existing retinal conditions like DR, age-related macular degeneration and other macular conditions, retinal dystrophies, retinal vein occlusion and previous cataract surgery can present with gradual drop in vision. Previous records of the patient can be obtained from the hospital or the patient before planning treatment – topical, local or systemic control. For those needing intervention, laser or intravitreal injections or surgical, an urgent referral during non-peak hours is advised. Since many have coexisting ocular morbidities, leading questions to rule out other conditions like ocular





**Figure 11:** Suggested algorithm for patients with uveitis

surface issues, neuro-ophthalmology related and glaucoma need to be asked

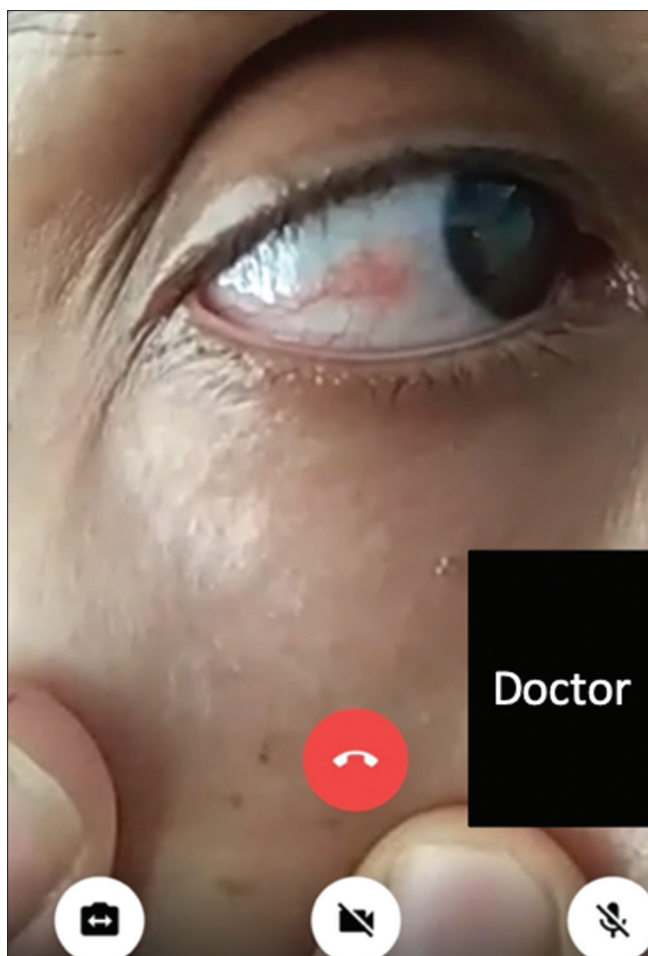
- Post-operative patients – concerns regarding continuation of medications or dosage or side effects, if any, can be addressed through tele-ophthalmology. However, if there is decreased vision, severe pain, discharge, lid edema, headache, vomiting and nausea, the patient should be asked to visit the hospital
- Trauma – trivial injuries can be addressed, but severe blunt or penetrating trauma needing multispecialty intervention will need a referral to the closest center. Cases secondary to a road traffic accident or assault will need detailed documentation for medicolegal purposes in the hospital.

## Uvea

A uveitis work-up is incomplete without a dilated fundus evaluation. However, recent research by Xia *et al.* suggests transmission of COVID-19 through tears putting at risk ophthalmologists and their other patients.<sup>[39]</sup> There is complex and unknown dysregulation of innate and adaptive host immune responses following COVID-19 infection representing a major concern for those on systemic immunosuppressive therapies.<sup>[40]</sup> Ivan Seah *et al.* have reported anterior uveitis, retinitis, and optic neuritis in feline and murine models due to COVID-19 infection.<sup>[41]</sup> Uveitis patients particularly have

a compromised immune system either due to underlying infective etiologies or the systemic immunosuppressive therapy they are on, posing a high risk for contracting COVID-19 disease. This pandemic has therefore compelled us to consider tele-consultation as a safer option to monitor and treat patients with uveitis [Fig. 11].<sup>[1]</sup> Stable patients can be followed up with the known clinical background, relevant history and external eye examination, and advised on the appropriate line of management as per the IUSG guidelines.<sup>[42]</sup>

Conditions such as episcleritis [Fig. 12], scleritis, and certain anterior uveitis can be diagnosed and started on topical steroids and cycloplegic therapy. If investigations or specific interventions such as periocular or intravitreal injections are needed, patients may be asked to visit the clinic with prior appointments. Patient should be advised not to stop or reduce immunosuppressive therapy if there is no confirmed COVID-19 infection.<sup>[42]</sup> If the patient has uveitis and confirmed COVID-19 infection, the patient should be referred immediately to a treating facility with a multidisciplinary approach for further management.<sup>[43]</sup> It is preferable to avoid high dose of systemic steroids in severe cases of COVID-19.<sup>[2,44]</sup> Drugs like hydroxychloroquine,<sup>[45]</sup> interferons,<sup>[46]</sup> tocilizumab,<sup>[47]</sup> anakinra and JAK inhibitors<sup>[47]</sup> can be continued because they are also used in the management of COVID-19 infections.



**Figure 12:** A follow up patient of episcleritis presenting with redness and discomfort for two days was started on topical steroids and lubricants after tele-consultation

## Medicolegal Considerations in Tele-Consultation<sup>[1]</sup>

At the time of this publication, there are no clear medicolegal guidelines available for tele-consultation. These suggestions are not to be regarded as legal advice but need to be considered for future research and real-world validation as we evolve in the field. Some of these parameters are enlisted here: 1) Tele-consultation is now valid for those residing in India, but not for international patients. Geographical borders for this service may change in the future. 2) Digital or e-signatures on prescriptions are accepted for dispensing medication. The form and security of these are debatable and subject to change. 3) Most routine drugs can be prescribed by electronic prescriptions except medicines listed in the Schedule X of the Drug and Cosmetic Act and Rules. The scope of e-prescriptions is likely to undergo changes in the future with stronger validity of diagnosis and outcome. 4) While it was recommended by the Government of India to complete a tele-consultation online course prior to its practice, we are currently allowed to consult patients due to the ongoing pandemic. This may have regulatory changes as the pandemic subsides. 5) Compliance with regulatory bodies like the National Pharmacy Prescription Activity (NPPA)

and the National Centre for Disease Surveillance (NCDS) is required. The gamut of regulatory organizations and laws governing tele-medicine is likely to change. 6) Data storage, confidentiality, and data privacy is paramount. Rules on duration of storage and the format of archiving are constantly being modified by the regulatory bodies. 7) Tele-consultation for minor patients should ideally be done in the presence of an adult. The legal status of guardians in this regard is currently unresolved. 8) A detailed disclaimer about the limitations of tele-consultation should be mentioned on the prescription or report that goes to the patient along with an alert to visit the nearest physician if any worsening of symptoms.

## Financial Aspects of Tele-Consultation in Ophthalmology

Financial considerations must be evaluated against several variables, including fixed and recurrent costs, the estimated utilization of the service including projected estimates, future growth of the field, evolution and cost of the technology and the return on investment. Firstly, for legal and ethical reasons, it is imperative that a fee be charged for the service, unless it is being provided under special considerations. According to European law, for instance, telemedicine is a 'health service' and an 'information service' which accounts for an electronic service provided 'for a fee' at a distance.<sup>[48]</sup>

Other potential aspects to be considered before deciding the quantum of fee to be levied would be the nature of the disease being treated online. It has been shown that in the management of DR there is significant cost savings when compared with traditional clinic examinations. Similarly, glaucoma was more cost-effective compared to in-person examination indicating better cost saving with the increase in screening rates.<sup>[49]</sup> Other factors potentially influencing cost-effectiveness of tele-ophthalmology are age of the patient, proportion of regular screening and full utilization of the service.<sup>[49]</sup> Even in ROP screening, a small study from Canada showed that telemedicine was an economically attractive option and depended on the location and the number of infants screened.<sup>[50]</sup>

Given the large number of unknowns, it is best to charge a fee per session rather than bundle the fees into a package. One can waive charges if the patient reports to the hospital within the few days of the first tele-consultation or provide a follow-up tele-consultation session without an additional charge. Integration into the hospital's payment portals and maximizing digital payment, while keeping security concerns in mind, will be ideal. It remains to be seen how market economics, demand for telemedicine once physical restrictions are lifted and patient behavior, dictate the progress and evolution of tele-consultation in ophthalmology. Given the ease of use and gaining popularity, it will remain a viable option even in the future, especially for those from distant locations seeking urgent advice.

## Conclusion

Tele-consultation is probably here to stay beyond the pandemic and we will need to modify our practices as per recent or updated telemedicine guidelines. A thrust from the Government of India in this regard is already providing the appropriate impetus for its growth. As we continue to learn

and evolve in both process and technology there may be some important points we need to consider. Firstly, it is important to repeatedly stress the limitations of tele-consultations and make sure that patients are aware of the need to visit the hospital if required. Secondly, we must understand the issues of privacy and appropriate portals of transmission must be set up to ensure confidentiality of patient details. Thirdly, technology awareness and limitations must be recognized. Currently, some of these are resolution of the video and data including clinical images, difficulty in elderly patients using the phone or devices with impaired dexterity and vision, internet connectivity, storage and archiving of reports and video communication, and integrating the tele-consultation communication with the electronic medical records of the hospital. Finally, medicolegal considerations including legal and clinical disclaimers, consents, right to refusal (for both the patient and the doctor), monetization and its implications and scope of jurisdiction, especially when the patient is beyond the regional boundaries will have to be refined and learnt as we progress in the practice of tele-consultation.

#### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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#### Conflicts of interest

There are no conflicts of interest.

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