



## Original Research Article

## COVID-19/SARS CoV-2 Infection – Its implication and safe practice pattern in ophthalmology

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## ABSTRACT

**Purpose:** To meet the need for safe practice guidelines for doctors that can be made available at the earliest to minimize the transmission of 2019 Novel Corona Virus (2019 n CoV) as among others, doctors, paramedical staff and health care workers are the ones at higher risk of acquiring this disease.

The emergence and spread of 2019 novel corona virus (2019 nCoV) or the Severe Acute Respiratory Syndrome Corona Virus 2 (SARS CoV-2) has threatened the world and created a major new public health crisis.

**Methods:** Analysis of available literature, guidelines issued by various professional societies and practice patterns being followed by our colleagues and fellow hospitals has been reviewed and concise recommendations have been formulated.

**Results:** Most people infected with the Corona Virus Disease 2019 (COVID-19) virus experience mild to moderate respiratory illness and recover without requiring special treatment. Older people above 60 years, with co-morbid are more likely to develop serious illness. Best way to prevent and slowdown transmission is by washing your hands, using an alcohol based rub frequently and not touching your face. At present, there is no specific vaccine or treatment for COVID-19. Among all the medical specialties, ophthalmology is one of the branches which involve very close contact with patient.

**Conclusion:** This review is concerned regarding the safe practice pattern guidelines for the Eye Care Organizations (ECO) so as to safe guard themselves, their staff and other patients from the point of entry to exit.

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### 1. Introduction

The 2019–20 corona virus pandemic is an ongoing pandemic of Corona Virus Disease 2019 (COVID-19), caused by Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2).<sup>1</sup> The outbreak started in Wuhan, Hubei province, China, in December 2019. The World Health Organization (WHO) declared the outbreak to be a Public Health Emergency of International Concern on 30 January 2020 and recognized it as a pandemic on 11 March 2020.<sup>2,3</sup> As of 4<sup>th</sup> April 2020, more than 1,140,000 cases of COVID-19 have been reported in more than 200 countries and territories,<sup>4</sup> resulting in more

than 60,900 deaths.<sup>5</sup>

The virus mainly spreads during close contact, and by small droplets produced during coughing, sneezing, or talking.<sup>6,7</sup> These small droplets may also be produced during breathing, but rapidly fall to the ground or surfaces and are not generally spread through the air over large distances.<sup>7,8</sup> Effective human-to-human transmission even by asymptomatic and/or pre-symptomatic carriers has been major a reason underlying the rapid worldwide spread of the disease.<sup>9</sup> People may also catch COVID-19 by touching a contaminated surface and then their face.<sup>7</sup> The virus can survive on surfaces up to 72 hours.<sup>10</sup> The presence of the virus in faecal swab, blood and tears or conjunctival secretions indicates that other modes of transmission are

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also plausible.<sup>11,12</sup> It is most contagious during the first 3 days after symptom onset, although spread may be possible before symptoms appear and in later stages of the disease.<sup>8</sup> Though the incubation period was reported to be between 1 to 14 days, it has been found to be contagious even during the latency period.<sup>13</sup>

COVID-19 manifest as flu like illness, with common symptoms like fever, cough, shortness of breath, occasional diarrhea, vomiting. Complications may include pneumonia, acute respiratory distress syndrome resulting in multi organ failure & mortality. High morbidity has been observed among the elderly, those with additional co morbidities and those under immunosuppression.<sup>14</sup> At this time, there are no known vaccines or any specific antiviral treatments for COVID-19. Primary treatment is symptomatic with supportive therapy. Preventive measures like hand washing, covering one's mouth while coughing & sneezing, social distancing, monitoring and self isolation of the suspected people are the key factors to minimize the transmission.

## 2. Methods

After analyzing the literature, guidelines issued by various professional societies and practice patterns being followed by our colleagues and fellow hospitals, Safe Practice Patterns (SPP) have been formulated for fellow ophthalmologists and Health Care Workers (HCW) (Table 1).

Every HCW is at high risk of getting viral infection from one or other. There are many safety guidelines recommended by concerned societies for every country and every specialty but in our study, we are highlighting the SPP compiled after review of literature. These SPP can be administrative, engineering controls, use of Personal Protective Equipments (PPE), policy making and patient management.

Basic SPP is 4M's: Minimal patients, Minimal stay at hospital, Minimal exposure, Minimal revisits.

Before entry; Hospital should inform its patients in advance through mass communication means (website, mass messages, incoming phone calls, placards/posters at entry gate etc) that it will not entertain normal Out Patient Department (OPD) and elective procedures. Such patients can avail free telephonic consultation by doctors on the given hospital numbers during fixed hours. Old and chronic patients can collect medicines from the pharmacy through any messenger. If there is urgency to consult, patient should come alone or with minimum attendants. In case of rush at reception, patient should be motivated to wait in his own vehicle. Hospital administration should prepare a list of conditions in which, it will provide urgent care during COVID-19 epidemic considering patients' need and hospital resources and make it available to the staff and patients. Hospital should maintain visitors' register at the entry in which name and mobile number of each visitor

(staff, patient, attendant, vendor) should be entered by hospital staff. Strictly no handshake by any staff. Every patient and attendant must cover their mouth and nose with a mask and wash/rub their hands at the entry. At the reception, if possible, air flow should be from staff to patient and windows to be kept open. Safe distance must be maintained patient to patient and patient to staff (1 meter). Patient should fill the Covid-19 questionnaire cum consent Form 1 (Table 2). Thermal screening with non touch thermometers is a better choice. In case, a patient is in high risk group (any one or more positive response), he should be referred to a designated centre. Plastic money should be preferred. Limited staff should be posted for longer duty hours and in less frequency so that lesser number of staff is exposed to risk at a given time.

After registration, there should be minimal waiting time. Dilation of pupil should be avoided as far as possible. Needless to say that safe distance and face mask has to be followed at all levels. In doctor's room, air flow should be from doctor to patient. It can be easily maintained by air purifier or small exhaust/ table fan. Doctor must use proper face mask (N95 mask or 3 layered surgical mask, Cap & Gloves). Use hand sanitizer before and after every patient. Proper breath shield during slit lamp exam is a safer approach. You can cut a transparent file cover and put it in the eye pieces to make your own breath shield. Non Contact Tonometer (NCT) producing air currents should be avoided. Ask the patient not to talk during eye examination; all discussion should be after ophthalmic examination when doctor and patient are at safe distance. Patient should be given treatment and sent home quickly, emergency care/first aid may be with torch examination only if justifiable. Procedures like syringing and staining should be avoided. No elective procedures are to be scheduled. If there is an emergency such as fresh Retinal Detachment, Retinopathy of Prematurity, Perforating injury, Lens induced Glaucoma/ acute glaucoma/ sudden diminution of vision, basic SPP such as safe distance, minimum stay, hand sanitization and PPE must be followed. Ask for symptoms of COVID-19 as per questionnaire. Get X-ray chest done. Plan the emergency procedure as per COVID-19 Chart 1. No positive pressure in operation theatre during surgery of COVID-19 confirmed/ suspected patient during surgery & 20 minutes after. Same precautions (safe distance and face mask) should be followed at the pharmacy. In case, any exposure is suspected, refer to Chart 2 for Post Exposure Prophylaxis (PEP) for COVID-19 exposure.

Housekeeping should be done frequently. In addition, mopping of floors, door handles, walls and furniture surfaces with freshly prepared 1% Sodium Hypochlorite solution should be done frequently. All the PPE should be disposed off as per normal Bio Medical Waste (BMW) guidelines. Special BMW guidelines are applicable to hospitals who are dealing with isolation of COVID-19

patients and quarantine of COVID-19 suspects.

Sodium Hypochlorite is available as 5% solution or powder, commonly called as Bleaching solution/ bleaching powder. Stability of 5% solution is as per expiry date on the bottle. But stability of diluted 1% solution is only 24 hours so it should be diluted only when it is to be used. Sometimes in the market, it is available as Chlorine 10% which is equivalent to 1% Sodium Hypochlorite.

Following points should be taken care of while Donning & Doffing PPE:

1. Button your shirt/ gown
2. Use half sleeve shirts, bare below elbow
3. Don't use Mobiles, wrist watch, bangles & jewellery while on duty
4. Use N95/ 3 layered surgical mask & hand sanitizer
5. Eye shield and cap in lab
6. HIV kit in case of Operation Theatre, provided the patient is Non Covid-19
7. Full body protection suit if patient is Covid-19 positive/ suspect
8. Hand sanitizers: Alcohol based are better than others.

### 3. Results

Most people infected with the Corona Virus Disease 2019 (COVID-19) virus experience mild to moderate respiratory illness and recover without requiring special treatment.<sup>15</sup>

Healthcare workers face an elevated risk of exposure to infectious diseases including COVID-19. It is imperative to ensure safety of health care workers not only to safe guard continuous patient care but also to ensure that they do not transmit the virus. More than 100 HCW throughout the world have died from COVID 19 including the first doctor to raise the alarm about the Corona virus, Dr. Li Wenliang, MD, 33 yr old Ophthalmologist worked in Wuhan, China. Ophthalmologists are one of the more at risk medical specialties for this new pathogen due to close physical contact (that too near the face) nature of their work. Anecdotal reports suggest COVID-19 can cause conjunctivitis and possibly be transmitted through aerosols contact with conjunctiva, but this remains to be confirmed.<sup>13A</sup> Additionally, a medical expert, who visited Wuhan to investigate the COVID-19 outbreak, after returning to Beijing, initially exhibited conjunctivitis of the lower left eyelid before the appearance of catarrhal symptoms and fever.<sup>16</sup> The individual tested positive for COVID-19, suggesting its tropism to non-respiratory mucosal surfaces, thus limiting the effectiveness of face masks.<sup>17</sup>

It is important to understand that corona virus can spread through eyes (tears) just as it can through mouth or nose. When any COVID-19 patient coughs, sneezes or talks, micro droplets containing virus particles spray from their mouth or nose, on to others face or surfaces. These tiny

droplets can enter through nose mouth and also through eyes. One can become infected when he touching eyes after touching some surface that has virus on it.

There are studies which quote corona virus can cause conjunctivitis. But it is extremely rare.<sup>13</sup> For everyone's health and safety, ophthalmologists have been told not to see patients during the corona virus pandemic except for emergency care. It limits the contact between the doctor and patient thereby reducing the spread of virus. The evidences clearly states that sub clinical patients also transmit the virus along with known patients who can also shed high amount of virus and infect others even after recovery from acute illness. These conditions need aggressive measures (such as N95/ triple layered surgical masks, Eye Shields, Impervious gowns) to ensure the safety of health care workers during this COVID-19 outbreak as well as future outbreaks especially in the primary stages where no or partial information about the transmission and effective potency of the virus is available.<sup>17</sup>

### 4. Discussion

In conclusion, we illustrate the variety of SPP guidelines for our colleagues in the face of this incredible threat to human life. Most of the safety guidelines available are neither perfect nor applicable in toto to all the healthcare organizations especially the eye care organizations (ECO). We have compiled those which can be applied on most of the small & medium ECO. In the mean time, Ophthalmologists working in ECO must also prepare for the potential financial implications of COVID-19 as procedures in these ECO reduced drastically over the quarantine/ lockdown period in the region.

Also National Accreditation Board for Hospitals and Healthcare Providers (NABH) says in its logo: Safety & Quality; in every chapter, safety of staff & safety of patients is prime concern along with quality, same is required while dealing with patients during this pandemic. During NABH assessments, it was observed that it is very difficult to teach the staff use of PPE and hand wash and get it implemented, but now, this is the prime requirement and disease has taught all the 130 crore in India. Our purpose is to ensure that it is followed.

This pandemic has lead to severe global socio economic disruption, postponement/ cancellation of cultural, sporting events, elective medical procedures and other routine healthcare facilities leading to widespread fears & panic. Looking at the present scenario, every individual visiting the hospital should be considered as infective or asymptomatic carrier.

Although these safe practice guidelines are relevant to control the current health crisis but more high quality research and reliable ways are needed to manage this kind of health threatening emergency in both short and long term.

**Table 1:** Safe practice Pattern (SPP)

	<b>Administrative</b>	<b>Engineering</b>	<b>PPE</b>
General Entry	Minimal patient stay in hospital No routine out patient department (OPD) No Elective procedure Reduce revisits Telemedicine Reduce attendants Waiting in car Safe distance Corona Virus Disease 2019 (COVID-19) consent form Minimize currency handling Staff minimum in number Non Touch thermal screening Quick disposal Avoid dilatation Safe distance Safe distance Prefer torch light exam only		
Reception		Air flow -staff to patient	Mask, Hand sanitizer
Patient waiting			Mask
Doctor room		Air flow doctor to patient Air purifier	Mask, eye shield, gloves Breath shield for instruments Hand sanitizer Avoid Non Contact Tonometer(NCT), aerosol producing procedures
OPD procedures	Only emergency procedures as All India Ophthalmological Society (AIOS) guidelines Avoid invasive procedures Minimize currency handling Safe distance No elective procedures		
Pharmacy			
Operation Theatre	To formulate individual guidelines for patients for surgery: Retinal Detachment, Retinopathy of Prematurity, Perforating injury Lens induced Glaucoma etc. Floor & door handles to be frequently mopped with 1% hypochlorite PPE disposed as per BMW guidelines	Ventilation and air flow	Hand sanitizer, Mask All Personal Protective Equipments (PPE)
Housekeeping Bio Medical Waste (BMW)			

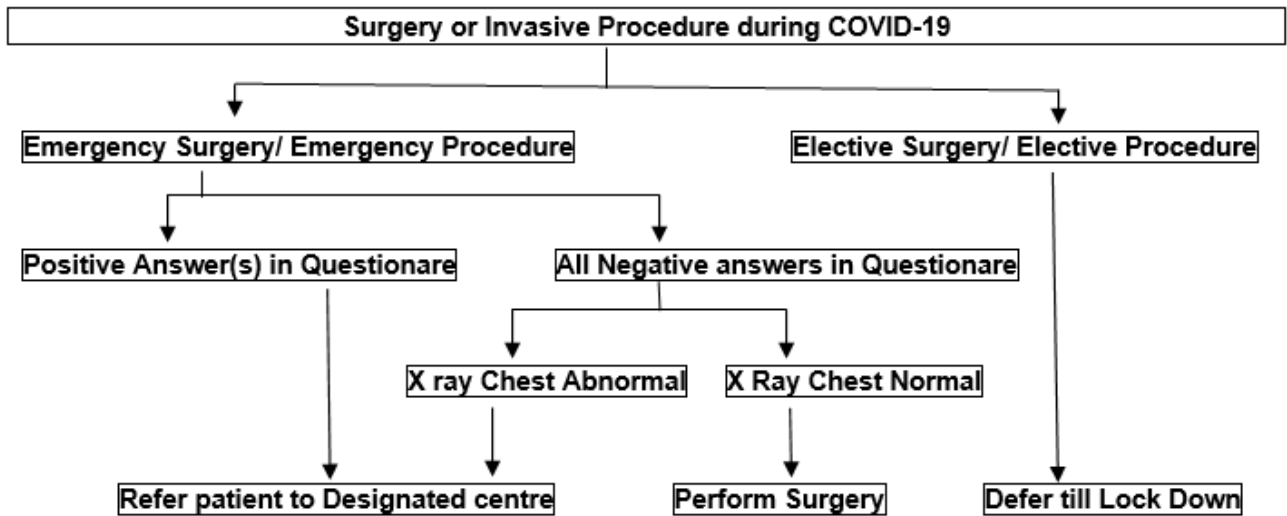


Chart 1: Flow chart for Surgery/ Procedures during Corona Virus Disease 2019 (COVID-19)

\*Flow chart adapted from Best of IDs(Infectious Diseases) with permission from Dr. D. Suresh Kumar.

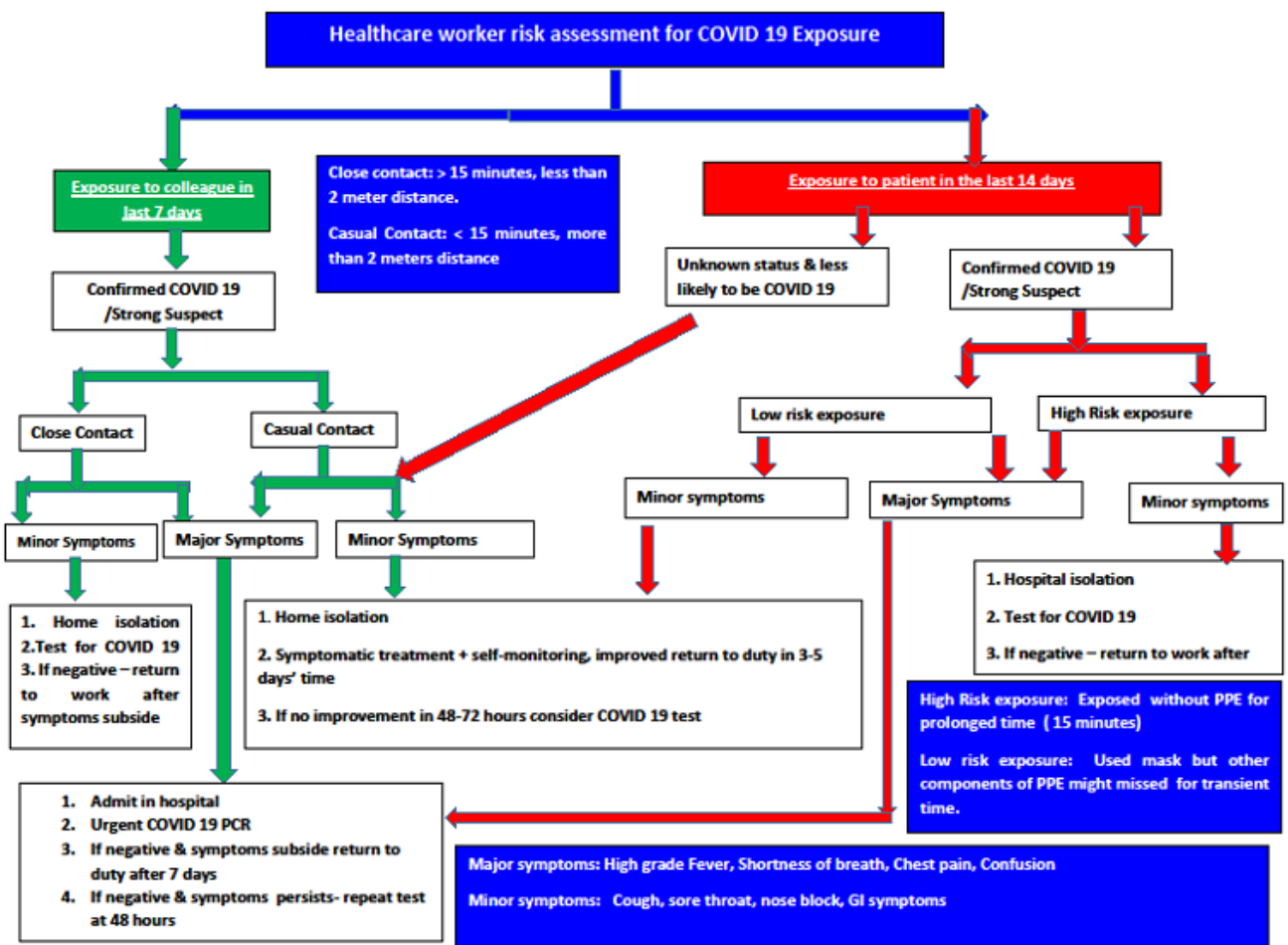


Chart 2: Post exposure prophylaxis (PEP) for Corona Virus Disease 2019 (COVID-19)

\*Flow chart obtained from Best of IDs (Infectious Diseases) with permission from Dr. D. Suresh Kumar.

**Table 2:** Corona Virus Disease 2019 (COVID-19) Declaration cum consent form

<b>Declaration/Screening form for COVID-19 Infection</b>			
Date:			
Name of the Patient:		Age/Sex:	
Address:		Email ID:	Contact no:
COVID 19 Questionnaire			
1	1 Do you have symptoms of Fever, Cough, Sneezing, Sore throat, Fatigue, Myalgia?	Yes	No
2	Do you have difficulty in breathing?	Yes	No
3	Have you travelled outside the country in past 30 days?	Yes	No
If Yes, Mention the countries.			
4	Have you travelled inside India to other cities in past 15 days?	Yes	No
If Yes, Mention the cities.			
5	Exposure to a confirmed COVID-19 case OR to Suspicious patient in last two weeks?	Yes	No
6	Have you visited a health care facility in the past two weeks?	Yes	No
The above information is true to the best of my knowledge. I understand that withholding/concealing the above information is unethical and against the interests of the global population fighting the COVID-19 pandemic. During this lockdown in the wake of the current COVID-19 pandemic, I have come to the hospital by myself voluntarily to avail Emergency Treatment/ Treatment. If I am an asymptomatic carrier or an undiagnosed patient with COVID-19, I suspect it may endanger doctors and hospital staff, and therefore, it is my responsibility to take appropriate precautions and follow the protocols prescribed by Government of India and other healthcare institutions. Despite all efforts taken by Hospital/Doctors/staff of Doctors to prevent COVID-19 which is explained to me, I understand that I may get an infection from the hospital or from a doctor, and I will take all precautions to prevent this from happening, but I will not hold doctors and hospital staff accountable if such infection occurs to me or my accompanying persons. If I hide my facts and relevant details and because of my intentional or unintentional behavior or action OR If any Healthcare personnel gets infected, I will be held responsible and appropriate legal actions shall be taken against me and my attendant.			
Patient's Sign/Thumb impression		<b>Details of Hospital Staff</b>	
<b>Details of Patient's Attendant</b>		Name & Signature	
Name & Signature		Employee ID	
Relationship with Patient			
Address & Phone Number			

\*Adapted from All India Ophthalmological Society(AIOS)

The world is closed for renovation. Grand opening expected soon.

## 5. Source of Funding

None.

## 6. Conflict of Interest

None.

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