

## Coronavirus Disease 2019 and ophthalmologists: introducing a simple protective shield for slit-lamp biomicroscopic examination

Mohsen Pourazizi; MD, Alireza Peyman, MD

Spreading of severe acute respiratory syndrome Coronavirus 2 (SARS-CoV-2), known as the COVID-19 virus via respiratory droplets has been confirmed<sup>1</sup>. People who are in close contact with others, are at risk of contamination with respiratory droplets. Airborne transmission possibly occur in the setting of medical procedures with aerosol generation<sup>2,3</sup>. COVID-19 might spread by touching a surface or object that has the virus on it, but this is not thought to be the main way the virus spreads<sup>2,3</sup>. The World Health Organization (WHO) recommends contact and droplet precautions, with eye or face protection to prevent the transmission of the disease<sup>4</sup>. Regrettably the Chinese whistleblower ophthalmologist has passed away due to Coronavirus infection, after visiting infected patients<sup>5</sup>. Ophthalmologists should be careful about personal protection during slit-lamp examination due to close contact with patients breath. As stated by American Academy of Ophthalmology “Coronavirus Eye Safety” article<sup>6</sup>, the virus can spread through the eyes and limiting eye exposure can help. Ophthalmologists should take care to protect themselves with goggles and a respiratory protective mask during the slit-lamp examination of the patients with transmissible disorders; unfortunately, signs and symptoms of the COVID-19 infection is not evident in all infected subjects. The built-in protective slit-lamp breath shield could impede some airborne droplets, but the efficacy might be limited due to small size of the shield. We prepared a wide flexible breath shield as a simple device to enhance the personal protection of ophthalmologists

during slit-lamp biomicroscopy. The protective shield to interpose between the ophthalmologist and patient can be fashioned in the following steps:

Equipment: a nylon-based polyvinyl chloride (PVC) plastic sheet (we used A4, 210x297mm, and 0.3mm thick PVC film) (Figure 1-a), pair of scissors, and a pen.

1. Use the original slit-lamp breath shield as a guide to draw the cut line (Figure 1-b).
2. Cut the sheet to create a semicircular part to match with the slit-lamp biomicroscope (Figure 1-c)
3. Pierce the sheet to create a hole for screw (Figure 1-d)
4. Mount the new wide breath shield for more protection (Figure 2)

We used this shield on a Topcon SL-3D Slit Lamp, and it should fit to the similar instruments. Otherwise it is possible to custom cut a compatible shield for any slit-lamp using the built-in breath shield as a model. The wide PVC sheet breath shield, could increase the protection level for both the examiner and the patient. According to recent report, the COVID-19 virus survive on plastic surface up to about 72 hours<sup>7</sup>, the virus might remain viable on both built-in breath shield and wide protective shield discussed in this manuscript for a while. It is recommended to follow protocols for safe examination, and not to touch the shield before spraying it with an effective disinfectant solution. We use 70% ethanol to clean the chin rest and forehead strap after each visit, and spray ethanol on the shield and other parts of the slit-lamp, after visiting any high risk patient, the safety instruction might vary according to the workplace policy and the severity of the epidemic. It looks to limit the usage of the applanation tonometer, but the flexibility of the sheet allow the tonometer to swivel over the shield. The maximum protection is the first step to prevent the current COVID-19 epidemic transmission to healthcare personnel. In this preliminary report we describe the wide PVC sheet breath shield as a simple and inexpensive tool to enhance protection.

**References:**

1. Li Q, Guan X, Wu P, et al. Early Transmission Dynamics in Wuhan, China, of Novel Coronavirus-Infected Pneumonia. *The New England journal of medicine* 2020.
2. Phan LT, Nguyen TV, Luong QC, et al. Importation and Human-to-Human Transmission of a Novel Coronavirus in Vietnam. *The New England journal of medicine* 2020.
3. Liu YC, Liao CH, Chang CF, Chou CC, Lin YR. A Locally Transmitted Case of SARS-CoV-2 Infection in Taiwan. *The New England journal of medicine* 2020.
4. World Health Organization. Infection prevention and control during health care when novel coronavirus (nCoV) infection is suspected. January 25, 2020. [vbs://www.who.int/publications-detail/infection-prevention-and-control-during-healthcare-when-novel-coronavirus-\(ncov\)-infection-is-suspected-20200125](https://www.who.int/publications-detail/infection-prevention-and-control-during-healthcare-when-novel-coronavirus-(ncov)-infection-is-suspected-20200125) (Accessed on February 04, 2020).
5. Lee KJ. Coronavirus kills Chinese whistleblower ophthalmologist. February 10, 2020. <https://www.aao.org/headline/coronavirus-kills-chinese-whistleblower-ophthalmol> (Accessed on March 29, 2020).
6. Mukamal R. Coronavirus Eye Safety. March 10, 2020. <https://www.aao.org/eye-health/tips-prevention/coronavirus-covid19-eye-infection-pinkeye> (Accessed on March 29, 2020).
7. van Doremalen N, Bushmaker T, Morris DH, et al. Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1. *The New England journal of medicine* 2020.

**Legends:**

Figure 1-a: Equipment to prepare the wide protective breath shield.

Figure 1-b: Marking with a pen. The original breath shield is the guide.

Figure 1-c: Cut the sheet to create a semicircular part to match slit-lamp biomicroscope.

Figure 1-d: Pierce the sheet to create a hole for screw.

Figure 2: Mount the new wide breath shield for more protection.

Mohsen Pourazizi; MD, Alireza Peyman, MD

Department of Ophthalmology, Feiz Hospital, Modares St., Isfahan, Iran.

; ORCID ID: [orcid.org/0000-0002-9714-8209](https://orcid.org/0000-0002-9714-8209)m.pourazizi@yahoo.comE-mail:

Tele-fax: +983134450016

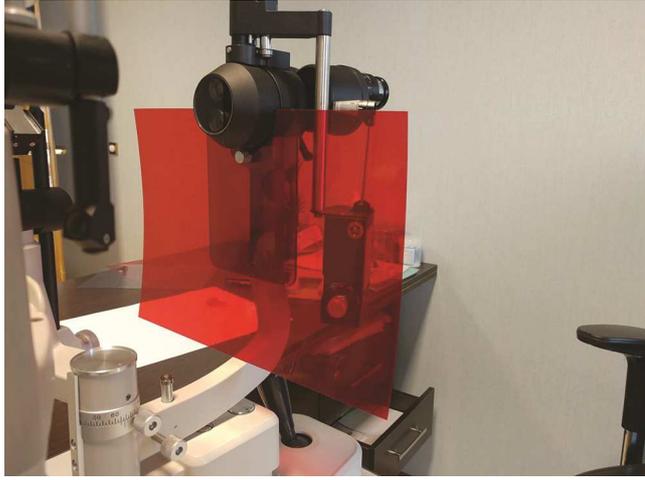
Phone: +98912-653-2785

We hereby transfer, assign, or otherwise convey all copyright ownership, including any and all rights incidental thereto, exclusively to the journal, in the event that such work is published by the journal. I have full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis as well as the decision to submit for publication. Authors declare that there is no conflict of interests regarding the publication of this paper.

ACCEPTED



ACCEPTED



ACCEPTED