

ORIGINAL ARTICLE



## COVID-19: Limiting the Risks for Eye Care Professionals

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### ABSTRACT

After the outbreak of the disease COVID-19, it has reached pandemic proportions within a very short time. It is mainly transmitted human-to-human through direct contact with secretions from an infected person or through inhalation of droplets containing SARS-CoV-2. It is controversial whether the virus may be transmitted via tears. Exposed ocular surface can serve as a gateway in transmission and acquiring respiratory diseases. Considering the reported cases on healthcare workers indicating nosocomial transmission and the anatomical and physiological aspects it is perceived that ophthalmic healthcare professionals are at higher risk of contracting the virus by virtue of their job. In this narrative review we discuss current evidence around detection of SARS-CoV-2 in human tears and forms of transmissions reported to date. We also provide a comprehensive approach that may be implemented in an ophthalmic care facility to protect healthcare personnel, as well as patients, from contracting the virus.

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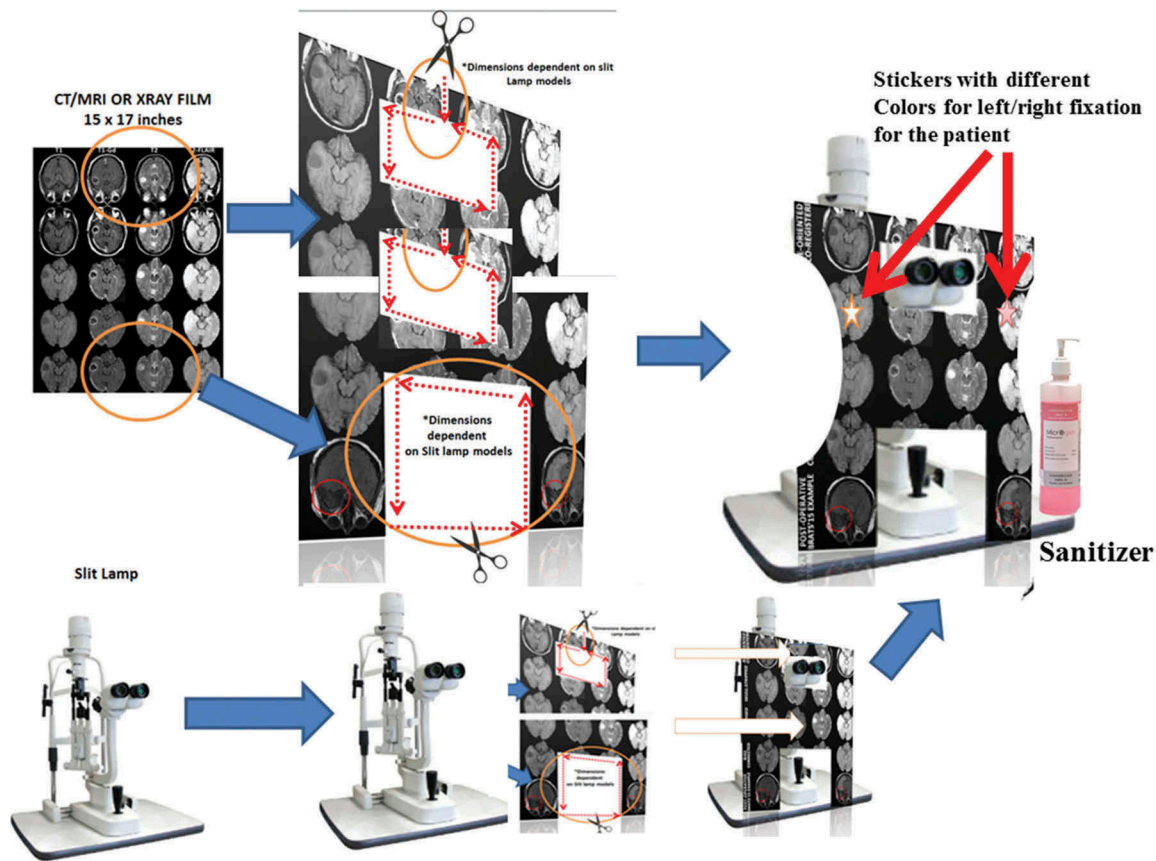
Coronavirus disease 2019; COVID-19; severe acute respiratory syndrome coronavirus 2; SARS-CoV-2; infection control

Coronaviruses (CoV) are a family of enveloped positive-sense single-stranded RNA viruses that are known to cause the common cold, influenza, and acute severe respiratory illness.<sup>1,2</sup> A new strain of the coronavirus family was identified in December 2019, causing severe pneumonia. World Health Organization (WHO) named the disease, coronavirus disease 2019 (COVID-19), and the coronavirus, Severe Acute Respiratory Syndrome coronavirus 2 (SARS-CoV-2).<sup>1,2</sup> In the 3 months following its identification, COVID-19 has spread across the globe reaching pandemic proportions. On March 14, the Director-General of WHO announced that Europe was the epicenter of the pandemic. By April 7, 2020, there were nearly 30,000 deaths in Europe caused by COVID-19. Most deaths occurred in Italy, with Spain a close second. On April 7, the number of cases in the United States has surpassed the reported numbers in China, despite limited testing.<sup>3</sup> Most developing countries were still anticipating the spread of the virus to their nations at this time. From the ocular perspective, there have been reports suggesting implications of SARS-CoV-2 and its ocular involvement.<sup>4</sup>

A study published in January 2020 indicated that the number of infections in health-care professionals has been increasing since the outbreak of COVID-19.<sup>1</sup> In one recent retrospective, single-center case series of 138 consecutive

hospitalized patients in China with confirmed COVID-19, 57 (41.3%) of infections were judged to be hospital-acquired, and 40 of 57 were in health-care professionals working in close proximity with patients who had attended the hospital.<sup>2</sup> This raises significant concern not only among ophthalmologists but among all the health-care professionals, and hence the use of appropriate personal protective equipment (PPE) in health-care facilities was strongly warranted.

The outbreak was first reported on December 30, 2019, by Dr. Li Wenliang, an ophthalmologist, who critically determined the significance of seven patients quarantined at his hospital. Unfortunately, Dr. Li himself contracted the virus, most likely from one of his patients, and possibly from one who was asymptomatic at the time and presenting for care of an unrelated eye problem. In early February Dr. Li passed away, and the ophthalmic community has paid tribute in many obituaries.<sup>5</sup> In a report by the World Health Organization (WHO) in early February 2020, the Director-General said that 1716 health-care workers had been infected with the SARS-CoV-2 virus and 6 had died.<sup>6</sup> In a previous observational study published in 2004, aimed at detecting coronavirus in the tears by PCR, the investigators emphasized that the virus could be transmitted in tears – putting the ophthalmologist at risk of acquiring the infection.<sup>7</sup> In this



**Figure 3.** A Do-It-Yourself (DIY) diaphragm can be easily made using a clean discarded X-ray, CT, or MRI film. A vertical slit of approximately 3 cm is made at the top center, and a rectangular opening is created with size dependant on the model of the slit-lamp biomicroscope. A similar opening is made in the bottom to allow comfortable toggling of the joystick. The film can be easily attached using a small piece of double-sided adhesive tape.

reported ocular complication of COVID-19 to date, and an association between conjunctivitis and SARS-CoV-2 is still unclear. Recommendations of WHO and CDC are important to ensuring protection of ophthalmic personnel and their patients. Ophthalmologists should pool resources and work collaboratively in a focused and scientific manner to address the current COVID-19 pandemic.

### Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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