



Preventing SARS-CoV-2 Eye Exposures and Infection

Eye protection is essential to protecting workers from exposure to SARS CoV-2. The virus is transmitted from an infected person's respiratory system (when they cough, sneeze or talk) to another person's nose, mouth, or eyes (mucus membranes). While there has been a great deal of focus on mask and respirator use to protect a worker from inhalation of the virus, the importance of preventing exposures to the eyes is often overlooked.

How It Is All Connected

Technically, mucus membrane exposures are classified by infection prevention and control and occupational health agencies (CDC, NIOSH, OSHA) to include exposures to the eyes, nose, and mouth. When people have illnesses, like a cold or the flu, they tend to think more about symptoms like a runny or stuffed up nose, sneezing, and coughing, and less about symptoms related to the eyes.

It may seem more obvious that respiratory bugs enter through our nose and mouth, then our respiratory tracts into the lungs. However, the mucus membranes in the head and neck are all connected.

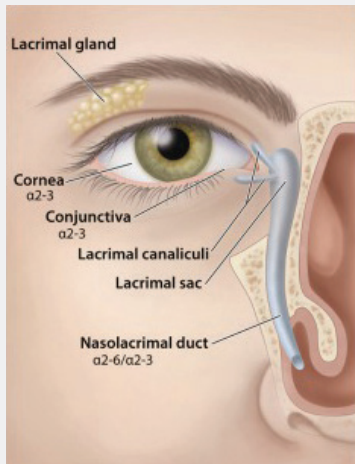
Think about what happens when people cry. The tears flow and suddenly mucus is pouring out of their noses. Because tissues in the tear duct and nasal cavity are connected, tears can drain into the nose. They can drain through the front of your nose or through the back of your nose through the paranasal sinus, air-filled spaces surrounding the nasal cavity. From there, tears can drain into the back of your throat and into the trachea, bronchus, then into the lungs.

Ultimately, the eyes and respiratory tissues are connected and are an important pathway in the spread and development of infectious diseases like COVID-19.

Eye-Related Symptoms and Exposures

Clinical researchers have documented that patients with COVID-19 symptoms often present inflamed eyes or conjunctivitis. The conjunctiva is the tissue that lines the eyelids and the front surface of the eye. It can become inflamed because of allergies, dryness, high air flow, contact lens use, environmental irritants, and more. When the conjunctiva is inflamed, it has a lesser capacity to fight off any intruders, increasing the risk of developing an infection.

According to International Safety Center's [Exposure Prevention Information Network](#) (EPINet®), a national occupational incident surveillance system capturing blood and body fluid exposures in healthcare – 57.6% of all incidents reported were to the eyes. Additionally, only 6.4% of employees indicated they were wearing any kind of eye protection during the incident such as eyeglasses with sideshields, goggles, or faceshields.



Eye Protection Use

Prior to the pandemic, lack of attention to eye protection had several causes:

- Limited provision and accessibility of eye protection compared to other personal protective equipment like gloves and gowns.
- Inadequate education about the risks associated with eye exposures.
- Inadequate selection of eye protection types, including disposable, reusable, prescription, etc.

Given shortages in respiratory protection, such as disposable N95s, and the temporary need in some facilities to disinfect and reuse respirators, there has been growing

focus on the need to use face shields to prevent gross contamination and preserve the longevity of respirators. While this may be an important factor today in the reuse of respirators, it is a critically important in protecting the eyes from exposure to SARS-CoV-2 and other infectious diseases every day.



Steps Forward

Unfortunately, there has historically been little occupational infection prevention guidance on when and where to use eye protection in healthcare. Standards from CDC, NIOSH, OSHA, and professional organizations like APIC and AORN provide loose guidance on wearing eye protection. Hopefully, given what we know now about the rapid spread of COVID-19, it will encourage more directive recommendations and requirements to protect the eyes from infection and the body from illness.

What You Can Do Now

- Assess protocols, procedures, and policies in place to measure and control eye exposure risks.
- Assess inventory and availability of eye protection.
- Determine that eye protection is accessible when and where it is needed.
- Ensure that there is a variety of eye protection available based on frontline employee feedback such as disposable, reusable, full face, and prescription options.
- Evaluate training and educational materials to identify if eye exposure hazards are adequate.
- Collaborate with medical device and PPE manufacturers, suppliers, and distributors to build and stock your program.

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References

- American Academy of Ophthalmology. Eye Care During the Coronavirus Pandemic
- Belser JA, Rota PA, Tumpey TM. Ocular tropism of respiratory viruses. *Microbiol Mol Biol Rev.* 2013;77(1):144-156. doi:10.1128/MMBR.00058-12
- International Safety Center. EPINet Blood and Body Fluid Report, 2018.
- OSHA Bloodborne Pathogens Standard. 29 CFR 1910.1030
- Wu P, Duan F, Luo C, et al. Characteristics of Ocular Findings of Patients with Coronavirus Disease 2019 (COVID-19) in Hubei Province, China. *JAMA Ophthalmol.* Published online March 31, 2020. doi:10.1001/jamaophthalmol.2020.1291