

## Letter to the Editor

# Eye protection for preventing transmission of respiratory viral infections to healthcare workers

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*To the Editor*—A review of ocular tropism of respiratory viruses concluded, “It is evident that numerous respiratory viruses, of both human and zoonotic origins, are capable of using the eye as both a site of virus replication as well as a portal of entry to mount a productive respiratory infection.”<sup>1</sup> This route of infection may occur when a respiratory virus contained in a droplet or smaller particle is deposited in the eye and the virus is introduced directly into respiratory tract via the nasolacrimal duct or after replication in the nasolacrimal sac, duct, and/or ocular tissues. Human and avian influenza viruses preferentially bind to alpha 2–3-linked and alpha 2–6-linked sialic acid receptors, respectively. Alpha 2–6-linked sialic acid receptors are predominant in the conjunctival and corneal epithelia, whereas the nasolacrimal system contains both alpha 2–3-linked and alpha 2–6-linked sialic acid receptors.<sup>1</sup> Once deposited on ocular tissue, proliferation of respiratory viruses is suppressed by various substances in human tears.<sup>2</sup>

A classic article on RSV transmission noted, “Inoculation occurs mainly through the eye and nose.”<sup>3</sup> The same author subsequently recommended eye protection for prevention of RSV transmission but also stated that “gloves may be effective in the control of RSV because few persons will pick their noses or rub their eyes while gloved, and therefore the chance for self-inoculation is diminished.”<sup>4</sup> However, contamination of hands while removing PPE is well documented,<sup>5</sup> and this can lead to inoculation of the eyes. In addition, some strains of adenovirus can cause respiratory tract infection after ocular inoculation<sup>6</sup>; rhinovirus can cause human infection when contaminated hands come in contact with the conjunctiva<sup>7</sup>; and pandemic H1N1 and avian influenza, but not H3N2, replicate effectively when inoculated in corneal tissue.<sup>2</sup>

The Centers for Disease Control and Prevention (CDC) guidance regarding droplet precautions states, “Use personal protective equipment (PPE) appropriately. Don mask upon entry into the patient room or patient space” (<https://www.cdc.gov/infection-control/basics/transmission-based-precautions.html>). For standard precautions, the CDC guidance states, “Mask and goggles or a face shield... . Use during patient care activities likely to generate splashes or sprays of blood, body fluids, secretions, or excretions” (<https://www.cdc.gov/HAI/prevent/ppe.html>). However, healthcare workers may not interpret this statement as pertaining to patients that are coughing or sneezing. The 2007 Guideline for

*Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings* states, “RSV transmission is effectively prevented by adherence to standard plus contact precautions and that for this virus routine use of goggles is not necessary.”<sup>8</sup>

Although rigorous investigation of ocular inoculation of respiratory viruses leading to respiratory tract infection is limited, based on the evidence to date, it would be prudent to wear eye protection when caring for patients with suspected or proven respiratory viral infection. This protocol would err on the side of caution in an attempt to mitigate the risk of transmission to healthcare workers and others. Such an approach would be in addition to source control in which infected patients wear masks<sup>9</sup> as well as to contact and droplet precautions.<sup>10</sup>

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