The COVID-19 pandemic has had an unprecedented impact on society, the economy, and medical practice. Medical and dental subspecialties were hit especially hard. More than 90% of dentists surveyed in the first week of April reported a reduction of 90% or more in patient volume compared to the week before.\(^1\) Decreases in ambulatory practice visits were greater than 60% in cardiology, orthopedic surgery, gastroenterology, head and neck surgery, general surgery, urology, and pediatrics. Ophthalmology was one of the hardest hit specialties with, a 79% drop in outpatient visits.\(^2\)

The negative impact is due directly to the highly contagious nature of the virus SARS-CoV-2. A large-scale meta-analysis of 172 observational studies including more than 25,000 patients found that physical distancing of 1 m or more and the use of masks and eye protection were associated with less infection.\(^3\) High-contact businesses such as hotels, restaurants, airlines, and medical and dental offices that are unable to maintain 1 m or more physical distancing are the most greatly affected and will continue to be at the most financial and economic risk. Estimates from the St. Louis Federal Reserve project say that demand in these businesses could decline by 51%.\(^4\)

A recent paper in *Cell* described at length the mode of transmission for SARS-CoV-2.\(^5\) The nose is the dominant initial site of infection via aerosolized particles, facilitated by the high concentration of ACE2-expressing nasal ciliated cells. Microaerosol inhalation and microaspiration results in progression from the upper nasal airway to the oropharynx and finally to the alveolar cells in the lower lung surfaces. Patients at a higher risk for microaspiration and thus more severe complications from SARS-CoV-2 include the elderly, diabetic patients, and obese patients.

This model supports the widespread use of masks as a barrier to aerosol and large droplets. In the discussion in the *Cell* paper, the authors recommend complementary therapies such as nasal lavage, use of topical antivirals, and immune

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**AT A GLANCE**

- The nose is the dominant initial site of infection with SARS-CoV-2 via aerosolized particles.
- A computational model showed transmission of respiratory droplets beyond 70 cm, even with the use of masks.
- During intravitreal injections, oropharyngeal droplet transmission poses a risk to the physician and to the patient receiving the injection.
modulation, in addition to the use of masks, to reduce the nasal viral load early in the disease as a means to decrease transmission.5

Use of nasal and oral decontamination with ethanol, chlorhexidine, and povidone-iodine (PVP-I) is receiving renewed interest during the COVID-19 pandemic.6 Patients undergoing elective orthopedic surgery with hardware implantation who received a chlorhexidine oral rinse and nasal PVP-I as a decontamination protocol the night before surgery experienced a statistically significantly lower surgical site infection rate than those who did not.7 Oral decontamination using oral PVP-I–based gargle is recommended by the Japanese Respiratory Society for the prevention of hospital-acquired pneumonia.

A study in 2006 showed PVP-I and ethanol to be effective in the inactivation of SARS-CoV after 2 minutes.8 Recent trials have shown rapid inactivation times against SARS-CoV-2 of 15 seconds for PVP-I in concentrations as low as 0.5% and 30 seconds for 70% ethanol.9 Hydrogen peroxide has not demonstrated virucidal activity against SARS-CoV-2, but it has been shown to be toxic to mucosal surfaces and oral keratinocytes.10,11

Masks are not enough.

One of the most common procedures in ophthalmology is the administration of intravitreal injections for conditions including wet age-related macular degeneration, proliferative diabetic retinopathy, diabetic macular edema, retinal vein occlusion, and uveitis. In 2016, approximately 5.9 million intravitreal injections were performed in the United States. The COVID-19 pandemic provides a particularly difficult challenge to ophthalmology not only due to the close proximity required to examine the patient, but also because many of our patients are at the highest risk for severe illness from SARS-CoV-2 due to age, hypertension, diabetes, and other comorbidities.12 Moreover, oropharyngeal droplet transmission is a factor during intravitreal injections, posing a risk not only to the physician performing the procedure but, more important, to the patient receiving the injection.

Masks are not enough. A multiphase computational fluid dynamics model found transmission of droplets beyond 70 cm even with the use of masks.13

Administration of 0.5% PVP-I to the nares and oropharynx should be considered in these high-risk patients. PVP-I concentrations in the range of 0.5% to 1.25% have been shown to be safe for intranasal or introral administration, with no adverse effects on the nasal or oral mucosa.14 Within this PVP-I concentration range, clinical studies have demonstrated a persistent bacterial decontamination effect for at least 1.6 to 4.0 hours.15,16

MODIFY, ADAPT

The COVID-19 pandemic has forced many businesses to modify and adapt practices to minimize transmission of SARS-CoV-2. Dentists, dental assistants, and dental hygienists are considered at the highest risk for exposure among all professions.17 Therefore, dental clinics are rapidly adapting to the use of oral decontamination protocols with PVP-I.18

Retina specialists should consider adopting similar practices. Before the COVID-19 pandemic, only 36% of retina specialists surveyed used masks during intravitreal injections.19 Since the onset of the ongoing pandemic, the use of masks has been deemed necessary, as specified in practice guidelines from the AAO and the US Centers for Disease Control and Prevention.20

This practice pattern shift, with both physician and patient wearing a mask during intravitreal injections, along with the implementation of oral and nasal antisepsis as a means to reduce viral transmission, may have the additional benefit of further reducing bacterial endophthalmitis rates.

The retina specialty is one of the most innovative in medicine. We have the ability to rapidly adopt new practices and routines to optimize outcomes and minimize adverse events. Now is the time to reconsider our safety protocols for intravitreal injections.


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