Conversations about COVID-19 For Eye Care Professionals

Personal Protective Equipment, Therapies, and Contact Lenses

Presenting sponsor

CooperVision™
Live Brightly™

April 14, 2020
CooperVision® is here for you
For everyone at CooperVision, our values of partnering, and being inventive, friendly and dedicated do not just apply during the best of times, they’re even more critical in challenging times like these. Our teams are examining every area of our business to identify opportunities to support you, mindful that many of you as small business owners are seeking additional resources to support your practices and your contact lens-wearing patients.
CooperVision’s Resources to Support Eyecare Practices

CooperVision has instituted the following in an effort to support your practices and your contact lens-wearing patients.

- Free shipping for direct-to-patient orders
- Modified consumer rebate policies
- Extended payment terms
- Continued manufacturing & shipping
- E-commerce contact lens services
- Supporting patient education
- CooperVision customer-facing team
- Continuous communication

*For more information, reach out to your sales representative or visit [ECP Viewpoints](#).*
Additional Resources

• The U.S. Centers for Disease Control and Prevention (CDC) has issued guidance for contact lens wear and disinfecting. Here’s the link and you’ll find the two relevant tabs toward the bottom of the How to Protect Yourself section: [https://www.cdc.gov/coronavirus/2019-ncov/faq.html#How-to-Protect-Yourself](https://www.cdc.gov/coronavirus/2019-ncov/faq.html#How-to-Protect-Yourself)

• A new paper published in Contact Lens & Anterior Eye authored by some of the world’s most respected experts concludes that there is no evidence to suggest an increased risk of contracting COVID-19 through contact lens wear compared to wearing prescription spectacles.

• Everyone at CooperVision wants to make sure that unbiased, accurate information is being communicated. With that being said, here are links to additional resources regarding COVID-19 and the safety of contact lens wear [here](#).
Infection Prevention and COVID-19

Marlene L. Durand, M.D.
Physician, Division of Infectious Diseases, Massachusetts General Hospital
Director, Infectious Disease Service, Massachusetts Eye and Ear
April 14, 2020
Disclosures

• Stockholder, Pfizer
Coronaviruses

- Enveloped, single-stranded RNA viruses
- “corona” = crown, formed by spikes of glycoproteins on the envelope
- These spikes allow viral entry into cells
- Coronaviruses can cause mild illnesses such as the common cold or severe illnesses such as MERS, SARS, or COVID-19
- COVID-19 (illness) is caused by SARS-CoV-2 (virus)

From NIAID
Coronavirus = enveloped RNA virus

Image credit: Scientific Animations
Viruses: non-enveloped vs enveloped, RNA vs DNA

**NON-ENVELOPED VIRUS**
- RNA virus examples: rhinovirus, norovirus
- DNA virus examples: adenovirus

**ENVELOPED VIRUS**
- RNA virus examples: influenza virus, coronavirus, HIV, hepatitis C
- DNA virus examples: herpes simplex virus, herpes zoster virus

Both enveloped and non-enveloped viruses have protein “shells” or “capsids”

Non-enveloped viruses are more resistant to environmental degradation.

Enveloped viruses have a “greasy” lipid bilayer envelope that can be destroyed by soap and water

Modified from Reddy, Sansom, researchgate.net; creative commons
Infection Control and viruses

• Non-enveloped viruses (compared with enveloped viruses): generally harder to kill and survive longer in the environment
Non-enveloped viruses

- **Example**
- **Norovirus** = most common cause of acute gastroenteritis in U.S.
- Each year in U.S.: 20 million cases, 56,000-71,000 hospitalizations, 800 deaths
- Highly contagious (requires <100 viral particles), spread by direct contact with infected person, eating/drinking contaminated food/liquids, or hand-mouth contact with infected surfaces (fomite transmission)
  - Infected person contagious during symptoms but ALSO for several days after symptoms resolve
  - Wash your hands with soap and water
  - Norovirus survives on surfaces for **weeks** (CDC.gov/norovirus) without disinfection
  - Relatively hard to disinfect: use dilute (1000-5000ppm) bleach solution (CDC: e.g. 5-25 Tbsp household bleach/gallon water) or other norovirus-approved disinfectants (see CDC list)
Enveloped viruses

• Example
• SARS-CoV-2 (COVID-19 virus). Per CDC, the major mode of transmission is via close contact (within 6 feet) of infected person due to respiratory droplets (>5 μm) landing on face/mouth/nose/eyes. Fomite transmission (touch infected surface then touch face, mouth, nose, eyes) may also play a role but is thought to be less important
  • Hand hygiene essential – all surfaces and between fingers
  • Can survive on surfaces for up to **hours to 3 days**: 4 hrs copper, 24 hrs cardboard, 2-3 days plastic or stainless steel (van Doremalen, NEJM 3/2020)
  • Disinfect: EPA-registered disinfectant for SARS-CoV-2 (370 listed, see EPA), or dilute bleach (per CDC, 5 Tbsp household bleach per gallon water) – see CDC.gov/coronavirus/2019-ncov
Quiz: Do you think this virus is enveloped or non-enveloped?

- Originally isolated from adenoids (1953)
- Can survive on surfaces several weeks to 2 months (e.g. doorknobs x 2 months)
Adenovirus: non-enveloped

• Non-enveloped, dsDNA
• Broad range of infections, mild to severe
• Examples: upper respiratory tract infections, conjunctivitis (and keratoconjunctivitis), bronchiolitis, pneumonia – which can be very severe
• Outbreaks from failure to follow infection control practices

From Cha et al, Korean J Radiol 2016;17:940-949
Outbreak of Adenovirus in a Neonatal Intensive Care Unit: Critical Importance of Equipment Cleaning During Inpatient Ophthalmologic Examinations.


Abstract

PURPOSE: Outbreaks of adenovirus in neonatal intensive care units (NICUs) can lead to widespread transmission and serious adverse outcomes. We describe the investigation, response, and successful containment of an adenovirus outbreak in a NICU associated with contaminated handheld ophthalmologic equipment used during retinopathy of prematurity (ROP) screening.

DESIGN: Epidemiologic outbreak investigation.

PARTICIPANTS: A total of 23 hospitalized neonates, as well as NICU staff and parents of affected infants.

MAIN OUTCOME MEASURES: Routine surveillance identified an adenovirus outbreak in a level IV NICU in August 2016. Epidemiologic investigation followed, including chart review, staff interviews, and observations. Cases were defined as hospital-acquired adenovirus identified from any clinical specimen (NICU patient or employee) or compatible illness in a family member. Real-time polymerase chain reaction (PCR) and partial- and whole-genome sequencing assays were used for testing of clinical and environmental specimens.

RESULTS: We identified 23 primary neonatal cases and 9 secondary cases (6 employees and 3 parents). All neonatal case-patients had respiratory symptoms. Of these, 5 developed pneumonia and 12 required increased respiratory support. Less than half (48%) had ocular symptoms. All neonatal case-patients (100%) had undergone a recent ophthalmologic examination, and 54% of neonates undergoing examinations developed adenovirus infection. All affected employees and parents had direct contact with infected neonates. Observations revealed inconsistent disinfection of bedside ophthalmologic equipment and limited glove use. Sampling of 2 handheld lenses and 2 indirect ophthalmoscopes revealed adenovirus serotype 3 DNA on each device. Sequence analysis of 16 neonatal cases, 2 employees, and 2 lenses showed that cases and equipment shared 100% identity across the entire adenovirus genome. Infection control interventions included strict hand hygiene, including glove use; isolation precautions; enhanced cleaning of lenses and ophthalmoscopes between all examinations; and staff furlough. We identified no cases of secondary transmission among neonates.

CONCLUSIONS: Adenovirus outbreaks can result from use of contaminated ophthalmologic equipment. Even equipment that does not directly contact patients can facilitate indirect transmission. Patient-to-patient transmission can be prevented with strict infection control measures and equipment cleaning. Ophthalmologists performing inpatient examinations should take measures to avoid adenoviral spread from contaminated handheld equipment.
EKC (epidemic keratoconjunctivitis)

• Usually adenovirus serotypes 8, 19, 37 but also others (most large outbreaks have been caused by type 8)

• Eye pain, redness; corneal findings can persist for months and affect vision
A news article you do NOT want about your clinical eye practice

The News Feed
Published February 11, 2020 • RO Staff
CORNEA, NEWS, PRACTICE MANAGEMENT

Lax Prevention Efforts Caused EKC Outbreak
A survey highlighted a handful of concerns regarding transmission-based precautions.

The Los Angeles County Department of Public Health investigated an outbreak of epidemic keratoconjunctivitis secondary to adenovirus linked to an optometry clinic in the summer of 2017.

From Review of Optometry
The team identified suboptimal infection prevention practices, including hygiene policies that are not well enforced, personal protective equipment that is not appropriately used while examining potentially infectious patients, eye drop vials that are not consistently discarded if contaminated with eye secretions and tonometers that are inadequately disinfected.

This study analyzed the results of a 17-question survey on infection prevention practices that yielded 42 responses from a sample of optometrists in Los Angeles.

Of the respondents, 58.5% had no written hand hygiene policy, 46.2% did not wear gloves while examining patients with eye drainage and 48.6% did not use droplet precautions for patients with respiratory symptoms.

While 92.5% used multidose eye drop vials, 41.6% did not discard the vial if the tip came into contact with the patient’s skin or a conjunctival or environmental surface. To ensure a clean tonometer for each patient, 68.4% used 70% isopropyl alcohol, 47.4% used noncontact tonometers, 23.6% used disposable tips and none used bleach.
EKC – major modes of transmission in eye clinics

• Hands of healthcare providers (HCP)
  • in half of reported outbreaks, a HCP has become infected
  • adenovirus can be recovered from the hands of 50% of EKC patients so hands of HCPs can also serve as source of transmission
  • Per CDC, person is contagious from a few days prior to symptom onset to 14 days after onset

• Ophthalmic instruments (tonometer tips, slit lamps)

• Ophthalmic solutions from multidose vials

• Environmental surfaces
Infection Control – the goal is to prevent transmission of ALL infections (not just COVID-19)

“An ounce of prevention is worth a pound of cure”.

• Benjamin Franklin, 1736
Infection Control in office practice

- Follow CDC guidance for Infection Control. Have a written clinic policy and follow Standard Precautions for ALL patients, transmission-based precautions for those with particular infections.

- Standard Precautions – for all patients.

- Transmission-based Precautions – use as 2\textsuperscript{nd} tier in addition to Standard Precautions:
  - Contact precautions (e.g. for MRSA) – gown and gloves
  - Droplet precautions (e.g. for the flu) – single room, door closed, mask on patient, HCP wears mask. Droplet precautions for COVID-19 also includes eye protection.
  - Airborne precautions (e.g. TB) – negative pressure room, patient wears surgical mask outside of room, HCP wears N95 mask.
# CDC: Standard Precautions

## Appendix A: Table 4.

<table>
<thead>
<tr>
<th>Component</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hand hygiene</td>
<td>After touching blood, body fluids, secretions, excretions, contaminated items; immediately after removing gloves; between patient contacts.</td>
</tr>
<tr>
<td>Personal protective equipment (PPE) Gloves</td>
<td>For touching blood, body fluids, secretions, excretions, contaminated items; for touching mucous membranes and nonintact skin</td>
</tr>
<tr>
<td>Personal protective equipment (PPE) Gown</td>
<td>During procedures and patient-care activities when contact of clothing/exposed skin with blood/body fluids, secretions, and excretions is anticipated.</td>
</tr>
<tr>
<td>Personal protective equipment (PPE)</td>
<td>During procedures and patient-care activities likely to generate splashes or sprays of blood, body fluids, secretions, especially suctioning, endotracheal intubation. During aerosol-generating procedures on patients with suspected or proven infections transmitted by respiratory aerosols wear a fit-tested N95 or higher respirator in</td>
</tr>
</tbody>
</table>
Hand Hygiene is very effective in preventing infection transmission.

Images from CDC
Hand hygiene

• Very important in preventing transmission of infections, including COVID-19

• Hand hygiene (soap and water x 20 seconds, or alcohol-based hand sanitizer).

• Always perform hand hygiene immediately before and immediately after contact with the patient.
Glove Use

When and How to Wear Gloves

- Wear gloves, according to Standard Precautions, when it can be reasonably anticipated that contact with blood or other potentially infectious materials, mucous membranes, non-intact skin, potentially contaminated skin or contaminated equipment could occur.

- Gloves are not a substitute for hand hygiene.
  - If your task requires gloves, perform hand hygiene prior to donning gloves, before touching the patient or the patient environment.
  - Perform hand hygiene immediately after removing gloves.

- Change gloves and perform hand hygiene during patient care, if
  - gloves become damaged,
  - gloves become visibly soiled with blood or body fluids following a task,
  - moving from work on a soiled body site to a clean body site on the same patient or if another clinical indication for hand hygiene occurs.

- Never wear the same pair of gloves in the care of more than one patient.
- Carefully remove gloves to prevent hand contamination.
PPE -- Glove use

• Use gloves for patients with conjunctivitis or other infections (e.g. MRSA, COVID-19), but use gloves **FOR ONE PATIENT ONLY.**

• Perform hand hygiene before putting gloves on **and** after taking gloves off.

• Why? Exam gloves are “leaky” and you cannot disinfect them.
  • They become even more leaky with application of alcohol-based hand rub – never try to “disinfect” your gloved hands, always remove them after use on a single patient.
Examination gloves are “leaky” including to viruses

• 1990 study of virus penetration polyethylene and polyvinyl gloves had failure rates of 40% and 22%, respectively. Following exposure to 70% alcohol, failure rates increased to 94% and 56%. Latex gloves are better but rarely used due to latex allergies in HCPs and patients. (Klein et al, Biotechniques 1990; 9:196-199.)

• 2004 study of viral (bacteriophage φ174) penetration of gloves: When 2 brands of non-latex (e.g. nitrile) examination gloves were “stressed” (e.g. after handling instruments) then tested, virus penetrated 29% and 36% of the gloves (O’Connell et al, Clin Micro Infect 2004;10:322-326)
Office disinfection – disinfect all pathogens, not only COVID-19

• Tonometer tips (prisms)
• Disinfection of surfaces
Tonometer tips (prisms)

- Follow manufacturer recommendations for disinfection or reusable tonometer prisms, and in accordance with CDC guidance
- Example: 5-10 minute (timed) soak in dilute bleach solution followed by prolonged rinsing in water – but follow manufacturer IFU (instructions for use) EXACTLY
- Alternative: single use, disposable tonometer prisms
In summary, studies suggest that elimination of adenovirus is best achieved by using sodium hypochlorite (1:10 dilute bleach). Use of 70% isopropyl alcohol (e.g., alcohol wipes) is not sufficient to eliminate adenovirus (especially in desiccated form or at high concentrations) and has been associated with adenovirus outbreaks.\textsuperscript{21}
Disinfect surfaces – example of spread of EKC due to inadequate eye clinic disinfection

• 2016 EKC outbreak on U.S. Virgin Islands related to 2 eyecare clinics – 78 people affected. CDC investigated (MMWR Aug 4, 2017)
• CDC took samples from these 2 clinics, PCR testing
• Positive samples for adenovirus:
  • Door knob
  • eye occlude
  • Refractor
  • examination light
  • bathroom faucet
  • surface of multiuse eye drop bottle
  • waiting room chair.
Disinfect surfaces

• Adenovirus: use same disinfectants as for norovirus (see CDC list, under Adenovirus section)

• For SARS-CoV-2 (COVID-19 virus) – CDC says:
  
  • Routine cleaning and disinfection procedures (e.g., using cleaners and water to pre-clean surfaces prior to applying an EPA-registered, hospital-grade disinfectant to frequently touched surfaces or objects for appropriate contact times as indicated on the product’s label) are appropriate for SARS-CoV-2 in healthcare settings, including those patient-care areas in which aerosol generating procedures are performed.
    ◦ Refer to [List N](https://www.epa.gov/sites/production/files/2021-01/documents/list_n.pdf) on the EPA website for EPA-registered disinfectants that have qualified under EPA’s emerging viral pathogens program for use against SARS-CoV-2.
Infection Control for seeing COVID-positive in outpatient setting (see CDC.gov)

• Defer appointment if possible (unless urgent)
• Patient should wear a surgical mask; do not let patient wait in waiting room; place in a single exam room and the close door. After patient leaves, keep door to room closed to allow air exchange (e.g. 1 hour).
• To enter room, HCP wears gown, gloves, N95 mask, eye protection (face shield or goggles; glasses alone are NOT sufficient). Surgical mask may be used in place of N95 if N95 is not available and if no aerosol-generating procedures (AGPs, e.g. intubation, endoscopy) will be performed. AGPs should be performed in negative pressure room if available.
• N95 mask must be fit-tested to be effective
See CDC website for details

Interim Infection Prevention and Control Recommendations for Patients with Suspected or Confirmed Coronavirus Disease 2019 (COVID-19) in Healthcare Settings

Update April 13, 2020
COVID-19 Personal Protective Equipment (PPE) for Healthcare Personnel

**Preferred PPE — Use**
- N95 or Higher Respirator
- Face shield or goggles
- One pair of clean, non-sterile gloves
- Isolation gown

When respirators are not available, use the best available alternative, like a facemask.

**Acceptable Alternative PPE — Use**
- Facemask
- Face shield or goggles
- One pair of clean, non-sterile gloves
- Isolation gown

N95 or higher respirators are preferred but facemasks are an acceptable alternative.

cdc.gov/COVID19
N95 masks ("respirators"): you first need to be fit-tested

• OSHA requires “respiratory clearance” before fit-testing – list of questions, medical clearance by Occupational Health, records maintained for 30 years. Some people cannot wear an N95 mask due to medical conditions.

• Fit-testing: a mask that fits prevents the wearer from smelling the test substance (e.g. sweet or bitter).

• Without the appropriate fit and seal, leakage around sides of an N95 mask can occur and the mask will not perform as “N95”.
Fit-testing an N95 mask: there are several brands/styles, and a person may fit only one style.
Carefully remove PPE so you do not contaminate yourself (see CDC guidelines)

**Doffing (taking off the gear):**

More than one doffing method may be acceptable. Training and practice using your healthcare facility’s procedure is critical. Below is one example of doffing.

1. **Remove gloves.** Ensure glove removal does not cause additional contamination of hands. Gloves can be removed using more than one technique (e.g., glove-in-glove or bird beak).

2. **Remove gown.** Untie all ties (or unsnap all buttons). Some gown ties can be broken rather than untied. Do so in gentle manner, avoiding a forceful movement. Reach up to the shoulders and carefully pull gown down and away from the body. Rolling the gown down is an acceptable approach. Dispose in trash receptacle.*

3. **HCP may now exit patient room.**

4. **Perform hand hygiene.**

5. **Remove face shield or goggles.** Carefully remove face shield or goggles by grabbing the strap and pulling upwards and away from head. Do not touch the front of face shield or goggles.

6. **Remove and discard respirator (or facemask if used instead of respirator).*** Do not touch the front of the respirator or facemask.
   - **Respirator:** Remove the bottom strap by touching only the strap and bring it carefully over the head. Grasp the top strap and bring it carefully over the head, and then pull the respirator away from the face without touching the front of the respirator.
   - **Facemask:** Carefully untie (or unhook from the ears) and pull away from face without touching the front.

7. **Perform hand hygiene after removing the respirator/facemask** and before putting it on again if your workplace is practicing reuse.

Laboratory-Confirmed COVID-19-Associated Hospitalizations
Preliminary cumulative rates as of Apr 04, 2020

From CDC
Percentage of visits to ED for COVID-19 and influenza-like illness (from CDC)
Thank you
Conversations about COVID-19 for Eye Care Professionals:
Personal Protective Equipment, Therapies, and Contact Lenses
Financial Disclosures

None

Boston Eye Group – Boston Laser
Massachusetts Eye & Ear Infirmary
Harvard Medical School, Boston
Corona Hot Topics

• Testing soup
• Miracle cures?
• Vaccine Saviors?
• How does it end?
Testing Soup

April 14th 2020

25 approved molecular tests
1 Saliva Molecular test (yesterday)
0 Viral antigen tests
1 approved antibody test (Cellex)
<table>
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<th>Hospital admitted</th>
<th>Age (years)</th>
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Apple, Google to Turn Smartphones Into Coronavirus Tracking Devices

In rare collaboration, tech rivals look to method used in some Asian countries to curb contagion; effort is likely to raise privacy concerns
Fears of 'Wild West' as COVID-19 Blood Tests Hit the Market

By The Associated Press

April 12, 2020
Coronavirus ‘Immunity Passport’ Stumbles in U.K.

Britain hoped an antibody test would help lift the country’s lockdown, but reliable tests aren’t ready.

Chris Whitty, the U.K.’s chief medical officer, says ‘we’re feeling our way to some extent’ in trying to develop immunity tests.
Testing Soup

Will Antibodies be protective?
What exposure level is protective?
How long do Antibodies last?
Are antibodies protective?

SEOUL (REUTERS) - South Korea reported on Monday (April 13) that at least 116 people initially cleared of the new coronavirus had tested positive again, although officials suggested that they would soon look at easing strict recommendations aimed at preventing new outbreaks.
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Therapies

Hydroxychloroquine
Remdesivir
Actemra (Tocilizumab)
Anticoagulants
How does it kill you?

Pulmonary and Cardiac Pathology in Covid-19: The First Autopsy Series from New Orleans

Sharon E. Fox,¹,²* Aibek Akmatbekov,¹, Jack L. Harbert,¹, Guang Li,³ J. Quincy Brown,³ Richard S. Vander Heide¹*
How does it kill you?

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Sharon E. Fox,1,2* Aibek Akmatbekov,1 Jack L. Harbert,1 Guang Li,3 J. Quincy Brown,3 Richard S. Vander Heide1*

The dominant process in all cases was consistent with diffuse alveolar damage, with a mild to moderate mononuclear response consisting of notable CD4+ aggregates around thrombosed small vessels, and significant associated hemorrhage. Important additional mechanisms that may have contributed to death in this initial series of autopsies include a thrombotic microangiopathy that was restricted to the lungs. This process may involve activation of megakaryocytes, possibly driven by cytokines produced by neutrophils and other inflammatory cells.
How does it kill you?

Pulmonary and Cardiac Pathology in Covid-19: The First Autopsy Series from New Orleans

Sharon E. Fox,¹,²* Aibek Akmatbekov,¹, Jack L. Harbert,¹, Guang Li,³ J. Quincy Brown,³ Richard S. Vander Heide¹*

The findings of our study have significant implications for the treatment of COVID-19 patients. We observed that the disease is characterized by a systemic inflammatory response, which may lead to multi-organ failure. Our analysis suggests that the mortality rate seen in affected cities with Covid-19 on the rise. Based on our findings, we believe that effective therapy for these patients should not only target the viral pathogen, but also the thrombotic and microangiopathic effects of the virus, and possibly a maladaptive immune response to viral infection.
Therapies

Hydroxychloroquine - Various
Remdesivir - Antiviral
Actemra (Tocilizumab) – Anti IL-6
Anticoagulants - Antithrombotic
Therapies

Hydroxychloroquine
Mechanism of action
Is it a miracle drug?
Retina toxicity
Prophylaxis?
Therapies

Hydroxychloroquine

1- Raises pH level of endosomes - entry
2- Increases intracellular Zinc - replication
3- Immunomodulator
4- Antithrombotic
Therapies

Hydroxychloroquine

1- No Randomized Clinical trial
2- Risks of Arrythmias w Azithromycin
3- Shortage
4- Retina Toxicity
Hydroxychloroquine

Malaria

Covid-19
Therapies

- Hydroxychloroquine - Various
- Remdesivir - Antiviral
- Actemra (Tocilizumab) – Anti IL-6
- Anticoagulants - Antithrombotic
Vaccines – The Savior?
Vaccines

Current stage: Development of vaccine candidates and pre-clinical testing

- RNA vaccines
- DNA vaccines
- Recombinant protein vaccines
- Vectored vaccines
- Inactivated vaccines
- Live attenuated vaccines
Vaccines

Current stage: Development of vaccine candidates and pre-clinical testing

- RNA vaccines
- DNA vaccines
- Recombinant protein vaccines
- Vectored vaccines
- Inactivated vaccines
- Live attenuated vaccines

Time frame unclear. 6-18 months. Maybe longer.

GMP process development
Clinical trials
Phase I → Phase II → Phase III
Licensure
FDA, EMA etc.
Large scale production and distribution
Administration
Immunity
Vaccines – The Savior?

HIV
Zika
Ebola
SARS
MERS

No corona viruses vaccines on market
Vaccines

Current stage: Development of vaccine candidates and pre-clinical testing

- RNA vaccines
- DNA vaccines
- Recombinant protein vaccines
- Vectored vaccines
- Inactivated vaccines
- Live attenuated vaccines
Vaccines
How does it end?

• Better drugs/protocols
• Extensive testing/tracing
• Better PPE/Hospital capacity
  • Social distancing
  • Vaccines
  • Herd Immunity
How does it end?

•

https://youtu.be/o4PnSYAqQHU
How does it end?

• Better drugs/protocols
• Extensive testing/tracing
• Better PPE/Hospital capacity
  • Social Distancing
  • Vaccines
  • Herd Immunity

• Respect – Not fear
Conversations about COVID-19 for Eye Care Professionals:

Personal Protective Equipment, Therapies, and Contact Lenses
COVID-19 & CONTACT LENSES

Anita Gulmiri, OD, FAAO
Disclosures: None
COVID-19 & Contact Lenses

• Conflicting and controversial information

• Ocular transmission of SARS-CoV-2 through tears

  Sun et al (2020): “The eye is rarely involved by human CoV infection, nor is it a preferred gateway of entry for human CoVs to infect the respiratory tract”

  Jun et al (2020): “The results from this study suggests that the risk of SARS-CoV-2 transmission through tears is low”

• To date, there have been no lab studies reported on the ability of coronaviruses to adhere to contact lenses
Contact Lens Use During a Pandemic

Contact lens use during this time is **SAFE** for healthy individuals

- Proper hand-washing must be conducted
  - If soap & water not available, use a hand sanitizer with at least 60% alcohol
  - Clinicians can suggest patients use disposable gloves, ethanol or alcohol wipes to disinfect their fingers before lens handling as an extra precaution

- Proper wear & care
  - Disinfect every evening or dispose daily lenses

- Avoid touching face, mouth, nose, and eyes with unwashed hands

- Discontinue contact lens wear if sick
Contact Lens Disinfection

• **Hydrogen Peroxide Solutions**

  **CDC:** “Hydrogen peroxide-based systems for cleaning, disinfecting, and storing contact lenses should be effective against the virus that causes COVID-19”

• **Multipurpose Solutions/Ultrasonic Cleaners**

  **CDC:** “Not enough scientific evidence to determine efficacy against the virus”
# In-Office Disinfection

<table>
<thead>
<tr>
<th></th>
<th>Gas permeable</th>
<th>Hybrid and Soft</th>
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<tbody>
<tr>
<td>1.</td>
<td>Place 3% hydrogen peroxide with GP lens in a non-neutralizing case.</td>
<td>Place 3% hydrogen peroxide with soft or hybrid lens in non-neutralizing case for 3+ hours.</td>
</tr>
<tr>
<td>2.</td>
<td>Disinfect lens for 3+ hours.</td>
<td>Transfer soft or hybrid lens to a neutralizing case. Fill with fresh 3% hydrogen peroxide. Add neutralizing disc or tablet as recommended by manufacturer.</td>
</tr>
<tr>
<td>3.</td>
<td>Rinse GP lens with Multipurpose Solution (MPS). Pat dry, store dry.</td>
<td>Neutralize lens for 6+ hours, or as directed by manufacturer.</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>Rinse soft or hybrid lens with MPS. Store in a disinfected case with MPS.</td>
</tr>
</tbody>
</table>

- Multipurpose solutions are acceptable for rinsing.
- ISO recommends this process every 28 days for soft or hybrid diagnostic lenses if they have been opened and not re-used and subsequently re-disinfected in that time period.

These methods have been approved by the American Academy of Optometry Section on Cornea, Contact Lenses and Refractive Technologies and The American Optometric Association, Contact Lens & Cornea Section adapted from the Standard of the International Organization for Standardization (ISO; ISO 19979:2018(E)).

Created by Angelica Polizzi, 2020 OD candidate.
Eyeglass Use During a Pandemic

• **Eyeglasses safer than contact lens use?**
  
  **CDC**: “There is no evidence to suggest contact lens wearers are more at risk for acquiring COVID-19 than eyeglass wearers.”

• **Do Eyeglasses offer protection against coronavirus transmission?**
  
  **AOA**: “There is no scientific evidence that wearing spectacles or glasses provides protection against COVID-19 or other viral transmissions.”
  
  **CDC**: “Goggles or disposable face shields for eye protection” for any HCP caring for patients suspected to have COVID-19. **Personal eyeglasses are NOT considered adequate eye protection**

• **Recommend frequent disinfection of eyeglasses**
Contact Lens Renewals
During a Pandemic

- Fairness to Contact Lens Consumers Act
  AOA: “No federal laws related to the Contact Lens Rule prescription verification process have been suspended or waived.”

- Continue supplying your patients with contact lenses
  Ordering through your practice whether online or phone

- Reach out to patients who are due for renewal

- Telehealth Evaluations
Telehealth CL Evaluations

- Contact lens evaluations
- Emergency or Triage for CL wearers

- Photo and video consultations
  - High resolution photos
  - Back camera
  - Lighting
Further Research

• COVID-19 & contact lens materials
  • SiHY vs. Hydrogel
  • GP materials

• Disinfecting systems

• Tear film & transmission
References

- Fonn D, Jones L. Hand hygiene is linked to microbial keratitis and corneal inflammatory events. Contact Lens Anterior Eye. 2019;42:132-35.
Conversations about COVID-19 for Eye Care Professionals:
Personal Protective Equipment, Therapies, and Contact Lenses

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