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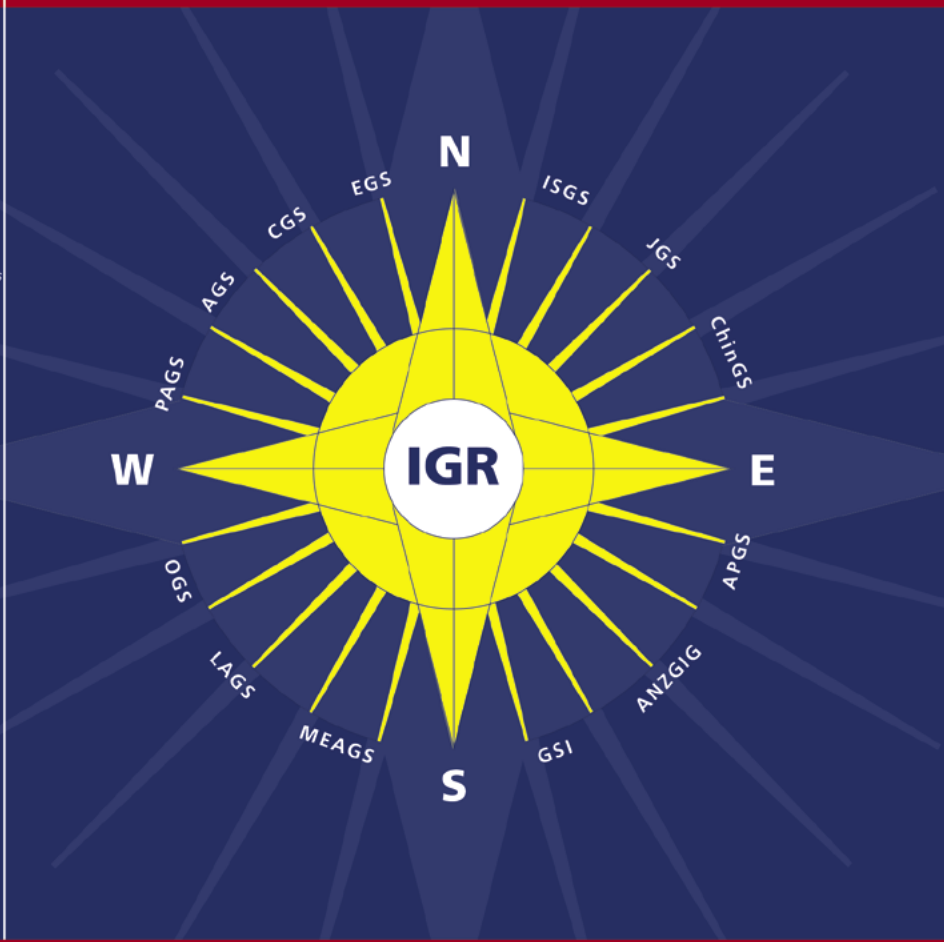

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Contact Information

All correspondence on copies, supplements, content, advertising, etc. should be directed to:

WGA Executive Office
c/o Schipluidenlaan 4
1062 HE Amsterdam
The Netherlands
Tel: +31 20 570 9600
E-mail: info@worldglaucoma.org

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Glaucoma Dialogue

Comments on:

Review of hygiene and disinfection Recommendations for outpatient glaucoma care: A COVID era update

Shabto JM, De Moraes CG, Cioffi GA, Liebmann JM
Journal of Glaucoma: June 2020 - Volume 29 - Issue 6 - p 409-416
DOI: 10.1097/IJG.0000000000001540

READ ARCTICLE

Comment by Ningli Wang and Chunyan Qiao, Beijing, China

Currently, the world is faced with severe challenges brought by COVID-19, and healthcare workers are at the frontline of this war against the pandemic.

Our study, published in *Ophthalmology*[1], found that the overall incidence of symptomatic COVID-19 among eye professionals across Wuhan's ten hospitals was 2.52% at the early stage of the COVID-19 outbreak, similar to the incidence among other subspecialties health workers. Ophthalmologists face a similar risk compared with healthcare workers of other subspecialties. **Adequate personal protective equipment (PPE), hygiene and disinfection, are important in preventing disease transmission.**

Clinical practice in most Chinese hospitals has returned to normal now, including our own. We limited the number of registered appointments to avoid congestion in our hospital. Except forurgent cases, all outpatients are required to make an appointment in advance. In our department, the daily number of outpatients is about half of the pre-COVID-19 number.

Many extra protective measures became regular practices. These include protection for healthcare workers, environment disinfection and screening patients. Most of them are the same as the recommendations in this article, and many of them are mandatory in our hospital.

Every healthcare worker must wear PPE during practice, including medical surgical masks, gloves and protective goggles. The additional disposable protective gown and N95 mask are required for emergency service. Strict hand disinfection (wash hands with soap or alcohol sanitizer) after examination and treatment of each patient should be performed. Most doctors use cotton swabs to avoid direct contact with patient's eyes. Social (physical) distancing of one meter is also required, but is difficult to achieve in times of crowding.

A protective breath shield (self-made of used CT or X-ray film) is set up in front of every slit-lamp microscope to prevent splash of patient's secretions. The equipment touched by patients, such as mandibular rest, frontal rest and armrest of slit-lamp microscope are disinfected after examination of each patient. The ophthalmic instruments in contact with a patient's conjunctiva are fully and effectively disinfected before and after each examination to avoid cross-infection. The windows of consulting rooms are opened regularly to ventilate and let in fresh air every day, and the consulting room and corridor are disinfected twice a day.

Patients and accompanying persons are asked to wear masks in the hospital. Taking temperature is the first and mandatory step before they enter the hospital. The history is asked, particularly for travel, can be checked by personal smart phone before they enter the consulting room. Suspected COVID-19 cases are referred and reported as soon as possible.

For outpatient glaucoma care, in order to avoid close contact, we adopt alternative examination methods such as choosing hand-held indirect lenses before slit lamp, or fundus camera. Optical coherence tomography (OCT) for fundus examination is used instead of direct ophthalmoscopy, anterior segment optical coherence tomography (AS-OCT) for chamber angles examination instead of gonioscopy, and iCare for the measurement of intraocular pressure. We stopped using contact tonometry, and non-contact tonometry is still used in many Chinese hospital departments, including our own. Non-contact tonometers are placed in a well-ventilated room and disinfected with 75% alcohol after examination of each patient.

These practices have been implemented in our hospital since the outbreak of COVID-19. To date, neither staff nor faculty have been infected by SARS-CoV-2. In our experience, adequate PPE, strict hygiene and disinfection are necessary to limit exposure and transmission of infection in outpatient glaucoma clinics during the current COVID-19 pandemic.

Reference

1. Symptomatic COVID-19 in Eye Professionals in Wuhan, China; Qiao, Chunyan et al.; Ophthalmology, Volume 0, Issue 0; DOI: https://doi.org/10.1016/j.ophtha.2020.04.026

Comment by Luciano Quaranta, Pavia, Italy

I am living and practicing in Brescia and Pavia, two of the most affected towns in Italy by COVID-19, and for this reason I face the problem daily.

Life has changed for all of us, and also our way of visiting patients. The hygiene and disinfection of ophthalmological instruments (slit lamps, lenses, tonometers, OCT, Visual Field Analyzers…) needs to be particularly accurate and safe now.

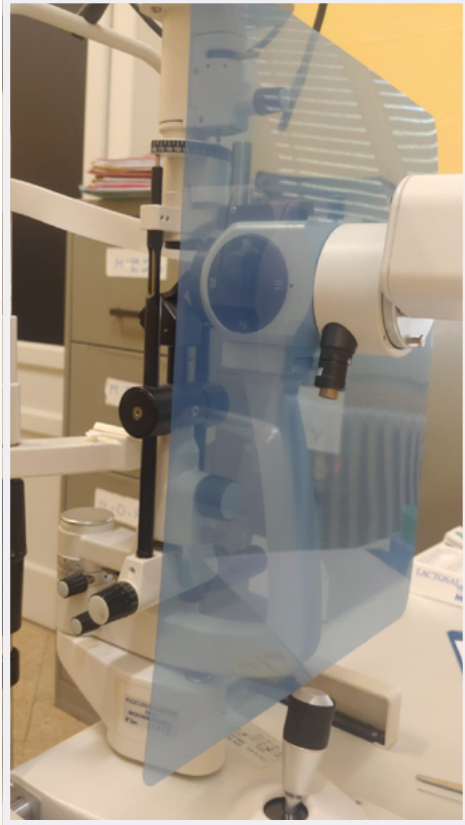

Fig. 1.
Slit lamp breath shield: x-ray film (11 x 13 inches).

For these reasons I think this paper gives extremely useful information for our practice.

I draw inspiration from this article to illustrate the situation in Northern Italy.

In order to avoid gatherings of patients in the waiting rooms, we have rescheduled all the appointments. We are visiting only urgent and non-deferrable glaucoma patients. At present, we are able to visit no more than two patients per hour (in the pre-COVID era we had a schedule of one patient every 15/20 minutes for routine glaucoma follow-up visits).

The majority of the suggestions proposed in the paper are almost similar to the ones I have applied in my outpatient practice at the University of Pavia, and in my private practice in Brescia.

During the pandemic lockdown (March 9-May 4) I faced the problem to continue to visit patients recently operated by filtering surgeries, and to give reassurances to glaucoma patients who needed to be operated in the near future. For this reason, special caution had to be taken when visiting patients to avoid contamination. For added security, we decided to perform applanation tonometry by single-use, disposable tonometer prisms.

Due to the shortage of breath shields for the slit lamps, we have adapted x-ray films for protection (Fig. 1).

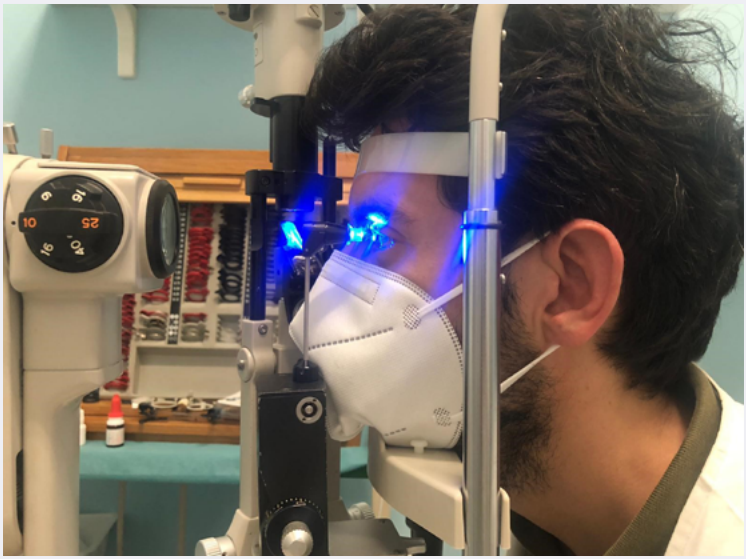

Fig. 2. Tonometer rod – mask contact.

Furthermore, I would like to add a simple personal observation related to the use of a mask.

In Northern Italy, patients frequently wear FFP masks in different shapes. Particular attention should be paid in order to avoid contact between the mask and the metal rod of the tonometer, in some cases preventing the approach of the prism to the cornea, but in other cases resulting in abnormal values of the IOP (Fig. 2). My personal suggestion is to recommend to patients to wear a surgical mask during an ophthalmological visit, or at least during IOP measuring.

I hope a cure for this disease will be found soon.

Comment by Poemen Chan, Hong Kong, P.R. China

Anecdotal reports have suggested that the virus could also be transmitted by aerosol contact with conjunctiva.[2] The proximity between ophthalmologists and patients during ophthalmic examination and the use of ophthalmic equipment (which could be a potential source of transmission if disinfection procedures are not performed properly), pose an infectious risk to eye care professionals and other patients in outpatient clinic.

This paper by Shabto *et al*. summarized a set of recommendations for the disinfection of instruments and devices that are commonly used in glaucoma practice. The precautions could be divided into two different categories: (1) disinfection of the waiting room and patient rooms; and (2) disinfection of equipment and other instruments. The first aims to minimize the risk of transmission via contact with contaminated surfaces or objects; hourly cleaning of waiting rooms, restrooms, exam lanes, and office furniture is recommended. This should be done with appropriate disinfectant agents (*e.g*., diluted household bleach with > 1000 ppm sodium hypochlorite, 70% alcohol solution and common EPA-registered household disinfectants). Careful disinfection of equipment is important in order to prevent viral transmission via contaminated devices, which could become a potential vector of transmission if proper disinfection precautions are not taken.

The authors also tabulated the cleaning and disinfection instruction from manufacturers of other instruments including visual field analyzer, optical coherence tomography (OCT) machinery, tonometers and lenses. Non-contact tonometry is not recommended because previous study demonstrated the formation of micro-aerosol on most eyes during air-puff tonometry.[3] Single-use disposable instruments could be considered instead of instruments that are frequently handled either in direct contact (*e.g*., applanation tonometer prism) or are used in proximity to the eye (*e.g*., hand-held indirect lens). They also pointed out that the perimeter bowl of the visual field analyzer could be an important source of respiratory droplet accumulation, since SARS-CoV-2 can remain viable up to 72 hours after application on different types of surfaces (more stable on plastic and stainless steel than on copper and cardboard).[4] It may be difficult to disinfect instruments such as the visual field analyzer. Therefore, routine investigation that involves these types of instruments should be deferred.

Indeed, apart from ensuring environmental control, infection control measures during the COVID-19 pandemic should also aim at minimizing cross-infection within the hospital, as well as providing adequate support and protection to hospital staff. For instance, our hospital has reduced 40% of the outpatient attendance and elective surgery, as well as 90% of the general anesthesia procedures. All patients are screened for fever, travel history, contact and cluster history, and COVID-19-related symptoms before they enter

the hospital. To support the hospital staff, we also ensure provision of adequate personal protective equipment (PPE) and clear guidelines on the level of PEE needed for different clinical situation. Other supportive measures include provision of work uniforms, easy access to alcohol-based hand rub, setting up new lunch areas, implementing a self-monitoring and reporting system, as well as regular updates and communication via an online education system.[5]

Eye care professionals are at high risk of acquiring COVID-19. Hygiene and disinfection precautions should be taken seriously, given that the pandemic has reached a scale that total eradication is unlikely and future recurrence of outbreak is possible.

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Comment by Brandon J. Wong, Los Angeles, CA, USA

In this timely review article, Shabto and coworkers describe disinfection practices relevant to the glaucoma clinic during the present COVID-19 pandemic, specifically practices concerning the clinic environment and commonly used equipment and instruments. The authors provide a comprehensive review of the varying manufacturer recommendations for disinfection of non-contact ancillary testing, such as perimetry and optical coherence tomography, and testing involving direct patient contact, such as applanation tonometry and gonioscopy. **Clinicians and staff should be familiar and attentive to the proper disinfection practices of the clinic and equipment, especially as clinics reactivate and patient volumes increase.** While different institutions may be at various stages of reactivation, our hospital-based academic glaucoma clinics are now re-opening with a limited clinic capacity to comply with local and state guidelines. Our approach to re-opening clinics includes adhering to all manufacturer recommendations for instrument disinfection as well as other environmental and engineering control measures.

We have converted to the use of disposable tonometer prisms which obviates the need to disinfect reusable tonometer tips and are transitioning to single use lenses for gonioscopy and laser procedures, such as laser peripheral iridotomy and selective laser trabeculoplasty. Anecdotally, we have not had issues with the lens quality or visualization for these procedures.

Since the publication of this article, Zeiss has updated its recommended cleaning guidelines for the Humphrey Visual Field Analyzer to incorporate updated information regarding the perimeter's ventilation and guidance on how to clean the bowl, if deemed necessary. The HFA2, HFA2-i, and HFA3 perimeters have fans which circulate and exchange air in the bowl, and the HFA2-i, and HFA3 perimeters continuously push air out of the bowl and past the patient while the machine is powered on.[1] It is not known if viral particles or respiratory droplets that accumulate on the bowl could potentially be aerosolized due to this fan mechanism. The updated Zeiss guidelines recommend the use of 70% isopropyl alcohol and a fine misting sprayer to sanitize the bowl surface if necessary.[2] Importantly, the alcohol must dry (approximately 5-10 minutes) prior to the next test. For patients requiring perimetry, our clinic practice is to have all patients wear surgical masks for the duration of the test. Routine N95 masks for patients appears impractical given that the physical size of most N95 masks interferes with proper placement of the trial lens. The visual field technician in the room also wears a surgical mask, or N95 mask, if available. While Shabto and co-workers recommend deferring 'routine' perimetry, the risks and benefits of perimetry must be weighed with the individual patient and the stage of disease in mind, particularly if there is concern for disease progression.

In addition to clinic modifications for in-person visits, our institution has also actively moved to telemedicine visits to limit physical interactions between individuals. We are exploring 'testing-only' visits in which patients come for all ancillary testing with a technician (including an intraocular pressure check) with a subsequent follow-up telemedicine visit by the clinician. Satellite clinics may also employ drive-through intraocular pressure checks for certain high-risk patients or for those unwilling or unable to come for in-person visits. These drive-through visits could potentially incorporate even more clinical testing in the future, such as virtual reality visual field testing.

> The pandemic has created the opportunity for our specialty to advance new and innovative methods of health care delivery and accelerate research into making glaucoma care safer, more convenient, and more accessible to our patients than ever before

While increased attention and adherence to proper disinfection practices are critical to mitigating risk of acquiring COVID-19, successful strategies will incorporate these and other clinic environmental controls in an integrated approach to make the delivery of glaucoma care safer. Prior to COVID-19, thriving glaucoma clinics relied upon significant patient volumes, arrays of imaging and testing, and circuitous clinic throughput with multiple, in-person, interactions to function. We cannot anticipate a return to that clinic model any time soon. Nonetheless, the pandemic has created the opportunity for our

specialty to advance new and innovative methods of health care delivery and accelerate research into making glaucoma care safer, more convenient, and more accessible to our patients than ever before. The glaucoma clinic of the future will, and must, be different.

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Comment by Rahat Husain and Tin Aung, Singapore

The authors adopted a ‘common sense’ approach early on in the Covid-19 pandemic, such as using eye shields on slit lamps, and minimizing conversation between the patient and doctor while using the slit lamp. Whilst waiting for more robust data on how to reduce infection risk, many units around the world including our own, introduced such measures.

The possibility that bowl perimeter visual field testing (such as the Humphrey Visual Field analyzer) may be a particularly insidious source for infection spread was an immediate concern for glaucoma departments. Certainly, the postponing of such investigations, as the authors have suggested, will eliminate this risk but is not a sustainable solution. The advice on cleaning of the perimeter is welcome although cleaning of machines between patients will undoubtedly have an effect on the throughput of patients. Presently, there are no data to advise how long we should wait between patients, as droplets may persist in the relatively enclosed area of the bowl. Staff cleaning the equipment will need to wear gowns, gloves and appropriate masks, perhaps N95 or similar. These measures may have financial implications for clinic running costs.

As regards to measurement of intraocular pressure (IOP) using the Goldmann Applanation Tonometer (GAT), the risk of Creutzfeldt-Jakob prion transmission led some clinics to adopt the use of disposable tonometer tips for all patients. The Icare tonometer is a reliable instrument that minimizes contact between patient and practitioner and has

a disposable tip. The ease of use and size of the instrument make it an attractive alternative to both slit lamp mounted GAT and Non-Contact Tonometry, with the added bonus of being the least likely of the three options to transmit the COVID virus.

In our department in Singapore, the cleaning of equipment is undertaken by the nurses and cleaning staff using various chemicals depending on the area to be cleaned. All slit lamps/investigation machines are cleaned after every patient using alcohol wipes. The Goldmann Applanation Tonometers are cleaned with hydrogen peroxide solution. From our experience, the cleaning of the inside of the Humphrey Visual Field analyzer with 70% isopropyl alcohol in water causes staining of the bowl and hence may cause problems with the testing. Omitting testing is a short-term solution but eventually physicians will want to restart and this could be a real problem.

As the world adapts to the 'new normal' with the risk of recurrent epidemics breaking out and asymptomatic reservoirs of infection in the community, the approach to limiting disease spread needs to be holistic. The disinfecting guide in this article is essential but continuous adherence may be difficult once lockdowns are eased. As congested centralized specialist outpatient clinics for eye patients with long waiting times, multiple assessment stations and close contacts between patients and healthcare providers, may lead to an increase in COVID-19 infections, we need to think of new models of care to reduce this risk. Outsourcing of investigations in several locations in the community combined with telemedicine is one way of achieving this aim, whilst maintaining good, appropriate quality of care for glaucoma.

Comment by Pradeep Ramulu, Baltimore, MD, USA

We thank Shabto, De Moraes, Cioffi, and Liebmann for offering a timely and informative review of formal disinfection recommendations for equipment used in the glaucoma exam, and for describing how they have changed their clinic in the COVID-19 era. No doubt, this is an issue all of our readers have been dealing with. Here, we highlight some of the authors' ideas that others may not have considered, expand upon areas of potential controversy, and discuss some suggestions the authors may well be implementing, but did not mention. We offer advice with the caveat that infection rates differ by region and time, and it remains important to adhere to regulations from the governments, medical bodies, and local institutions where you work. Another important caveat is many recommendations involve balancing cost and burden with an unquantifiable benefit in safety; until further knowledge is gained, we must 'first, do no harm' and err on the side of safety.

With regards to keeping the office safe, the authors highlight the need for frequent (hourly) cleaning of waiting areas, and also other areas including check-in kiosks, doorknobs, and bathrooms. As a way to decrease time spent in the clinic, they suggest collecting any payments on-line instead of in person. We are also reviewing medications and changes in vision/symptoms one to two days before the visit and scheduling all follow-ups by phone, lowering time spent with technicians and allowing quicker exits. The authors are limiting patients to one companion to lessen the number of patients in the waiting room; Johns Hopkins is limiting companions altogether except when necessary (poor mobility, limited cognition). In cases where difficult decisions must be made, patients can call their family/friend so they may join discussions by speaker phone.

We highly recommend readers review the official manufacturer recommendations for cleaning glaucoma-related equipment detailed in the manuscript tables. These thorough tables cover products by multiple manufacturers, describe the agents suitable for disinfection, the company-recommended frequency of disinfection, and provide links to the product manuals. Notably, products are covered which we may not often think about how best/often to clean, including non-Goldmann tonometers (iCare, Tono-Pen) and lenses (gonioscopy, ophthalmoscopy, laser). While these recommendations predate COVID-19, it is important that they are now followed with greater diligence.

Two pieces of glaucoma equipment deserve special mention based on their design and critical importance to decision-making. Regarding applanation tonometry, the authors make no firm recommendations. Prior systematic reviews and review articles on the topic are referenced, as is a recent paper demonstrating detectable COVID-19 RNA in the tears of 2/38 eyes, including 2/12 eyes with ocular findings, but none of the 26 eyes without ocular findings (chemosis, hyperemia, epiphora). A second study in 17 COVID-19-positive patients without ocular symptoms also found no detectable RNA in tears (PMID 32291098). These studies suggest no critical need for re-evaluating current applanation tonometer disinfection processes, at least in eyes without ocular findings.

> If remote perimetry/tonometry are ever going to become viable alternatives to in-clinic testing, now would be the time

Regarding perimetry, some manufacturers have issued new guidelines for disinfecting perimeter bowls with spray misting between patients (https://www.zeiss.com/content/dam/med/ref_international/corona/pdfs/hfa_covid_guidance_en_31_025_0408i_hfa.12415_final.pdf). However, multiple questions remain. Do aerosolized particles remain the bowl space after testing? For how long? Until better data are obtained on these issues, our service has limited visual field testing, encouraged the use of shorter (faster) testing algorithms, and rotated which machine is used to maximize time between tests. If remote perimetry/tonometry are ever going to become viable alternatives to in-clinic testing, now would be the time, and our group is exploring the potential of both.

We urge our readers to read this excellent piece to help formulate their thoughts on how best to keep their patients safe in this new era.

Comment by Michele C. Lim, Sacramento, CA, USA

Shabto and colleagues write an excellent summary of recommendations for hygiene and disinfection for outpatient glaucoma care in the COVID-19 era. So much has changed in our approach to the delivery of health care since the emergence of SARS-CoV-2 (Severe acute respiratory syndrome coronavirus 2) and this is a timely compilation of practical recommendations for any eye care practice. Many of the cleaning recommendations are easy to follow and most practices are well-versed in the disinfection of tonometer tips and of contact laser lenses but there are two items that are particularly challenging. One, how to clean the bowl of a visual field device and two, the practical implications of cleaning handheld lenses.

The recommendations for cleaning the bowl of the Octopus 900 perimeter and Humphrey visual field analyzers are different. Haag-Streit Diagnostics warns that the bowl of the Octopus is lined with a special paint that could be damaged with detergents but recommends wiping any residue with a soft cloth and soap-suds but they do not offer any evidence that this will eliminate SARS-CoV-2.[1] Carl Zeiss Meditech, Inc. provides updated information in which the bowl should be sprayed lightly with 70% Isopropyl solution should it become contaminated with respiratory droplets.[2] In our practice, to further protect against contamination, we have created an acrylic shield that creates a wall between the patient and perimeter bowl (Fig. 1).

Fig. 1. Acrylic breath shield designed for an automated visual field machine.

Now that patients wear masks to their visit, I notice that the condensation from their breath shoots upwards and may collect on my handheld lens and hand and Shabto and colleagues offer excellent recommendations for lens cleaning. But to do so, we must have duplicates in order to rotate lenses between patients and for large institutions this comes with a large cost. If I soak them in Cidex or hydrogen peroxide, is there a safe location near the exam rooms where patients or children can't access the cleaning solutions? Is it practical to use disposable lenses? Volk sells a disposable 28D handheld lens but at a cost of $14.50 per lens! Would UV light cleaning devices work well to disinfect handheld lenses? In our clinic, we use a UV light disinfection unit (which was intended for CPAP gear) (Fig. 2) to clean handheld lenses and it requires a short 5-minute cleaning cycle. Some studies suggest that one can eliminate SARS-CoV-2 with this methodology.[3,4]

Fig. 2. Ultraviolet light sterilizer.

Since the initial writing of this article, the United States is now in a period of health care restoration and this means the volume of patients will rise in the coming months making it even more essential to understand how to protect both patients and staff from SARS-CoV-2 exposure. The CDC issued recommendations to aid health care organizations in restoring routine patient care and they provide a "Framework for Healthcare Systems Providing Non-COVID-19 Clinical Care During the COVID-19 Pandemic.[5]

Restoring health care in our busy ophthalmology practices will require unique solutions to maintain physical distance between patients once the volume of visits begins to 'ramp up'. At the UC Davis Eye Center, we began reinstating routine patient visits on 5/4/2020 and are currently scheduling at 50% volume to ensure that we can maintain proper patient physical distancing. We allow one person to accompany a patient if needed and we have employed restaurant-style 'pagers/buzzers' to allow patients to wait in their car

or elsewhere so as not to overload waiting rooms. We have created a Saturday imaging (OCT, fundus photos, slit lamp photos) and procedures (visual fields) clinic to decompress the Monday to Friday work week. This Saturday clinic also helps sustain video visits. Video visits have been a challenge to ophthalmology because of its inability to capture the details of an eye exam. We are embarking on a workflow in which patients who come for Saturday imaging or procedures may also have their vision and intraocular pressure measured by technical staff. This can then be followed by a video visit with the physician to discuss diagnoses and treatment plans. Separating the physician-patient visit from imaging/procedures can help decrease the amount of time patients spend in the office. We have also piloted drive-up visits (Fig. 3) in which vision and pressure are checked while the patient remains in their car and this is followed by a video visit with the physician. As we look to the future, most of us realize that life will never be the same again, at least until a SARS-CoV-2 vaccine is created, and we must continue to employ out-of-the-box ideas to sustain our practices.

Fig. 3. Drive-up glaucoma visit with intraocular pressure measurement.

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Comment by Andrew Camp, San Diego, CA, USA

On March 11, 2020 the World Health Organization declared the novel coronavirus disease 2019 (COVID-19) outbreak a pandemic. On March 18, 2020 the American Academy of Ophthalmology recommended that ophthalmologists limit patient visits to urgent and emergent cases in order to decrease virus transmission and conserve medical supplies. Proper hygiene and disinfection protocols became a focal point of interest for safely seeing high risk patients during the early outbreak and for safely increasing patient volume as restrictions began to relax. The authors of this review focus on hygiene and disinfection recommendations for outpatient glaucoma care, although many of the basic principles may be applied broadly across general ophthalmic care as well as for other specialties that require close patient interaction.

A general goal in all care is to decrease or prevent person-to-person viral transmission. Ophthalmologists represent a particularly high at risk physician group for contracting COVID-19.[1] Recommendations include screening patients for COVID-19 symptoms, social distancing when possible by limiting patient numbers in waiting areas, minimizing speaking while in close proximity, and barrier methods such as breath shields. The AAO has updated recommendations since this review was published to include suggesting face coverings for patients and providers as well as eye protection for providers. The use of face masks may decrease transmission of COVID-19 in public settings, but their utility in closer encounters is not yet known.[2] The use of face masks and large breath shields in conjunction appears to be particularly effective at reducing particle transmission.[3]

Exam rooms, waiting areas, and any other place patients congregate should be disinfected between patients. The Environmental Protection Agency maintains a frequently updated list of products that can be used to disinfect surfaces.[4] Offices should have multiple disinfection products available as there is high risk of intermittent shortages of individual products.[5] Any device used during a patient exam should be thoroughly disinfected after use. Slit lamps, lenses, and ocular coherence tomography machines are relatively easy to clean because potentially contaminated surfaces are easily accessible.

Visual field analyzers present a challenge because respiratory droplets may accumulate within the perimetry bowl, but the bowl may be degraded by frequent application of disinfection products. Both Zeiss and Haag-Streit have suggested their respective perimetry bowls may be disinfected with atomized isopropanol or ethanol, but the long-term impact of these products is unknown. Contact tonometer tips should be disinfected with particular caution due to the risk of virus transmission between patients. Non-contact tonometry should not be performed due to the risk of tear aerosolization. However, it should be noted that the rate of viral shedding in tears remains controversial and may be lower than initially thought.[6]

Recommendations regarding the COVID-19 response are frequently changing as more is learned about transmission and infection by the virus. Many of the principles learned during the current pandemic will play a role in the response to future pandemics. There are many opportunities to update and improve glaucoma care as a response to this crisis. **Tele-ophthalmology will likely be increasingly explored as a way to minimize patient exposure and transmission risks.7** Many products such as home tonometry and home perimetry will likely take an increasingly central role in the future of glaucoma care as we adapt to this shifting clinical environment.

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