Opinion

Virtual Visits in Ophthalmology: Timely Advice for Implementation During the COVID-19 Public Health Crisis

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Abstract

Virtual visits (VVs) are necessitated due to the public health crisis and social distancing mandates due to COVID-19. However, these have been rare in ophthalmology. Over 3.5 years of conducting >350 ophthalmological VVs, our group has gained numerous insights into best practices. This communication shares these experiences with the medical community to support patient care during this difficult time and beyond. We highlight that mastering the technological platform of choice, optimizing lighting, camera positioning, and "eye contact," being thoughtful and creative with the virtual eye examination, and ensuring good documenting and billing will make a successful and efficient VV. Moreover, we think these ideas will stimulate further VV creativity and expertise to be developed in ophthalmology and across medicine. This approach, holds promise for increasing its adoption after the crisis has passed.

Keywords: *telemedicine, telehealth, ophthalmology, COVID-19*

Introduction

Virtual visits (VVs) decrease patient cost,[1] increase satisfaction,[2,3] and allow ophthalmologists to care for patients efficiently.[3] With massive disruptions in health care caused by COVID-19, interest in VVs for ophthalmology and across medicine is increasing. Numerous national and state agencies recognize telehealth as vital during this emergency,[4–7] lifting regulatory boundaries such as utilizing Health Insurance Portability and Accountability Act (HIPAA)-non-compliant audiovisual platforms for VVs[7] and adding temporary pay parity between in-person and telehealth visits to facilitate social distancing while simultaneously maintaining access to health care. Prior to the COVID-19 outbreak, we had already conducted hundreds of VVs dating back to 2016 leading to an understanding of best practices that are transferrable to other subspecialties beyond pediatric ophthalmology and strabismus. We hope that these best practices will be helpful to others, and we believe that this dialogue will spur innovation among colleagues.

Technological Platforms

We use a commercially available HIPAA-compliant platform that integrates with our scheduling software. This platform provides a virtual waiting room that scrolls through a series of customizable screens, which we use to inform patients of best practices to optimize their VV and their estimated wait time. Disadvantages are that it requires a software download by the patient and a link within an e-mail to access the virtual waiting room. The aforementioned regulatory changes now allow ophthalmologists to use prevalent and intuitive audiovisual platforms that are not compliant with HIPAA. Although use of these systems may need to cease after the state of emergency, in the interim they may allow some providers provide services quickly.

Etiquette and Best Practices

Many interpersonal skills and procedures providers have mastered do not translate intuitively to best practices in virtual encounters. *Table 1* outlines best practices for VVs. As with any appointment, it is vital to first obtain explicit permission to conduct the visit. This permission is built into commercial systems as a requisite for entrance into the virtual waiting room. If an *ad hoc* system is used, informed consent must be obtained and documented.[8]

Second, the provider must find a private space with a professional backdrop and attire. The provider must also make the patient aware of all of the parties present to ensure the right to privacy.

Table 1. Best Practices for a Successful Virtual Visit

TIP	SPECIFICATIONS AND REASONING
Position the device on a stable surface at eye level	Maximizes resolution
	Stabilization minimizes the number of pixels that need to refresh continuously
	Improves viewing angle and contrast
Have good lighting	Natural lighting on the face and eyes is ideal
	Accurately represents coloration and contrast of the skin and conjunctiva
	Maximizes resolution
	Indoor lighting and flashlights on mobile devices can substitute
	Provide natural lighting on the face and eyes, avoiding backlighting
Speak slowly and clearly	Transmission to patients and guardians will be most clear
Look at the camera when counseling	Gives the patient and guardian the impression that you are making eye contact
Positioning	Infant/toddler: parent's lap or high chair
	Child: lap, chair, or seat
	Teenager/adult: table, chair, or couch

Third, VVs are most successful when the audio–video feeds are of high quality. Video feeds are optimized by ensuring that the computer, tablet, or phone is stabilized on a flat surface at eye level on each side. The patient should be stable as well (setting babies on laps and toddlers in highchairs is ideal). Most critical is good lighting on the face without backlighting; natural light from windows is ideal. Not only is good lighting critical for the patient but also important for the provider side. Well-lit providers allow patients to ascertain nonverbal facial cues during conversation. Also, placing the video feed of the patient close to the camera or looking slightly below the camera during discussion facilitates "eye contact."

Fourth, the virtual examination is most successful in pediatric patients if completed first when the novelty of the virtual encounter is in play. History and counseling may be addressed later when the child can "leave" the discussion.

Fifth, there are benefits to clumping VVs together at the beginning or end of the clinic day. This minimizes the mental effort of "task-switching" (and timing synchronization) between VV and in-person visits. Morning VVs also provide the option for a same-day clinic visit if a concerning element is identified.

Virtual Examination

Many providers express incredulity that an ophthalmic examination might be performed virtually. Our experience shows that much can be gleaned to facilitate medical decision-making and counselling.[3] *Table 2* describes the methods that we have found useful. This listing is not exhaustive and evolves with experience. Asking patients to provide videos, pictures,[9] and even home-based visual acuity measurements may be helpful, increasing efficacy of the virtual examination. If the history or examination is worrisome or unclear, we have a low threshold for a same-day clinic visit; this allows us to use VVs without concerns of jeopardizing patient safety. In some cases, VVs, by way of limiting our ability to examine, enhance the utility of a careful history, which can be very powerful from a diagnostic perspective.

Documentation and Billing

Each VV should be documented in the same manner as an in-person visit, with qualifiers that make the limitations clear. For example, we document "estimation via video observation during virtual visit" for various elements of the examination. We also describe exactly how we performed the examination (e.g., visual acuity in a baby: fixes and follows a toy moved side-to-side by parent). At the end of the note, we append that the VV was necessitated by the social distancing mandate, the location of the patient and provider, the individuals present, and the length of the visit highlighting the percentage time in face-to-face counseling. We bill VVs with Current Procedure Terminology evaluation and management codes, adding the GT modifier. We recommend checking with billing and compliance in your local environment to understand the appropriate approach.

Proposed Indications by Subspecialty

Our experience in VVs has been in pediatric ophthalmology and adult strabismus clinics, but we believe our breadth of practice translates well to other subspecialties. *Table 3* presents a list of suggestions that is certain to expand as the field of ocular telemedicine innovates. In some cases, a hybrid model where testing is performed in the office and history and review of results are performed virtually may limit exposures during a time of social distancing.

Table 2. Virtual Examination Maneuvers

ELEMENT	SUGGESTED VIRTUAL MANEUVER
Visual acuity	**Infant/toddler**
	Check fixate and follow with parent or sibling holding toy
	Screen share age-appropriate video and observe the child's fixation behavior
	Observe differences in response to occlusion
	Verbal child
	Ask child to describe items around the room with both eyes and each eye individually
	Older child/teenager/adult
	Ask patient to read items across the room and give a report of their relative visual acuity
	Screen share a visual acuity chart to determine relative acuity between eyes
	Downloadable American Academy of Ophthalmology recommends Verana Vision Test for adults
Color vision	Subjective red desaturation
Confrontational visual field testing	Best when the patient is using a computer rather than mobile phone for a wide display
	Attempt patient self-administration (subjective)
	Perform counting fingers or double simultaneous stimulation tasks
	Present of Amsler grid through video camera or screen share
Pupils	Observe
	Enhance with a flashlight if needed
	Relative afferent pupillary defect testing is difficult; findings can be confounded by accommodation to the screen
External examination	Observe under appropriate lighting
	Check for erythema, eyelid position and movement, margin-to-reflex distance, symmetry (or asymmetry) of skin folds
Eyelids and adnexa	Observe by bringing the eye close to the camera
	Ask the patient to lift the lids and look down to observe lacrimal gland
	Ask the patient to evert the lower eyelids by pulling down
Anterior segment	Observe
	Enhance observation with external lighting if needed; light reflex testing can show health of ocular surface
	Side illumination (as for Rizzuti sign in keratoconus) gives views into the anterior chamber and at the lens
Ocular motility	Utilize a parent or sibling to move a toy for young children
	Ask the patient to look in all directions of gaze
	Consider Doll's head maneuvers while the child views themselves or a movie on the video visit screen
	Ask the patient to conduct smooth pursuit and saccadic eye movements
Eye alignment	Observe the corneal light reflex in different directions of gaze
	Ask the parent or the patient to assist with cover–uncover and cross-cover testing and estimate the deviation
	Ask the patient to describe the relative separation in diplopic images in directions of gaze

Table 3. Suggested Scenarios Across Ophthalmology Where Virtual Visits May Be Utilized	
COMPREHENSIVE OPHTHALMOLOGY	
Blepharitis	Triage, diagnosis, and initiation of conservative therapy in a patient with eye irritation
	Evaluation of response to conservative therapy
Chalazion	Triage, diagnosis, and initiation of conservative therapy
	Evaluation of response to conservative therapy
Dry eye syndrome	Triage, diagnosis, and initiation of conservative therapy in a patient with eye irritation
	Evaluation of response to conservative therapy
Conjunctival laceration	Diagnosis and determination of necessity of repair
	Follow-up evaluation to monitor resolution of pain, redness, irritation, and healing
Corneal abrasion	Evaluate for corneal opacification that might signify infection
	Follow-up evaluation to monitor resolution of pain, redness, irritation, and healing
	Follow-up evaluation of corneal light reflex to see whether it is sharp (and abrasion healed)
CORNEA	
Stable post-penetrating keratoplasty patient	Evaluation of medication adherence and subjective vision
Allergic, viral, or bacterial conjunctivitis	Triage, diagnosis, and initiation of treatment
	Follow-up evaluation to monitor response to treatment
GLAUCOMA	
Stable glaucoma patient	Evaluation of symptoms with self-administered confrontation visual fields
	Evaluation of medication adherence and subjective vision
Counseling of active glaucoma patient	In-person visit for intraocular pressure check and visual field evaluation followed by review of results virtually to minimize contact
Eye redness	Evaluation of adverse medication reaction
	Counseling of how to change administration
NEURO-OPHTHALMOLOGY	
Cranial nerve palsy/diplopia	Triage, diagnosis, and initiation of next steps in treatment
Idiopathic intracranial hypertension	Follow-up evaluation for adherence to treatment plan and recurrence/worsening of symptoms
Optic neuropathy	Follow-up evaluation of subjective visual function including acuity, color, and visual field
	Review ancillary testing including fundus photography, OCT, and automated perimetry
Nystagmus	Triage, diagnosis, and initiation of next steps in evaluation and treatment
Anisocoria	Triage, diagnosis, and initiation of next steps in evaluation
Strabismus	Triage, diagnosis, and initiation of next steps in evaluation and treatment
	Follow-up evaluation of treatment efficacy (prism glasses or strabismus surgery)
OCULOPLASTICS	
Preseptal cellulitis	Triage, diagnosis, and initiation of treatment
	Follow-up evaluation of treatment efficacy
Orbital cellulitis	Follow-up evaluation of treatment efficacy after discharge
Eyelid lesion	Triage, diagnosis, and initiation of treatment
	Postsurgical evaluation of healing and review of pathology

continued →

Table 3. Suggested Scenarios Across Ophthalmology Where Virtual Visits May Be Utilized *continued*

OCULOPLASTICS	
Ptosis	Triage, diagnosis, and initiation of treatment plan
	Postsurgical evaluation of healing
Thyroid eye disease	Follow-up evaluation of ocular motility and proptosis
RETINA	
Flashes and floaters	Triage to understand the nature and suggest in-person evaluation if needed
	Consider patient-administered confrontation visual field testing
Macular degeneration	Review ancillary testing including fundus photography, OCT, and FA
	Amsler grid testing done through a screen share to the patient
Diabetic retinopathy	Review ancillary testing including fundus photography, OCT, and FA
	Counsel on blood glucose monitoring and control
UVEITIS	
Iritis	Follow-up to evaluate for redness and photophobia

FA, fluorescein angiography; OCT, optical coherence tomography.

Conclusions

The current public health crisis necessitates innovation and shared development of best practices to allow for safe and efficient implementation of VVs. We hope this collation of experience inspires further creativity, and we believe that our field will emerge with new skills to deliver better care for our patients.

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