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COVID-19 and Use of Teleophthalmology (CUT Group): Trends and Diagnoses



The coronavirus disease 2019 (COVID-19) pandemic altered how clinicians care for patients. Ophthalmologists saw an estimated 81% drop in volume, the most of any specialty during the initial pandemic and public health restrictions.¹ Concurrently, the Centers for Medicare and Medicaid Services removed many of the regulatory restrictions (i.e., rural designation zones) on telehealth and began to reimburse for professional telehealth services at the same rates as in-person visits, with the goal of increasing patient access to care via synchronous methods of telehealth such as virtual visits.² Ophthalmologists may have difficulty with telehealth visits because much of the evaluation requires a slit lamp, tonometer, dilation, and advanced imaging such as OCT.

Evidence of the proportion of actual ophthalmic telehealth use volume beyond a single institution is lacking. Potential trends, such as the reduction in the use of telehealth after an initial surge or the use of telehealth more prominently by certain subspecialties within ophthalmology, are not confirmed with primary data. Our study is the first to demonstrate the characteristics of telehealth use in ophthalmology on a large scale with primary data before and during the COVID-19 pandemic.

This study was deemed “not regulated” by the University of Michigan’s Institutional Review Board, and the study adhered to the tenets of the Declaration of Helsinki. The requirement for informed consent was waived because of the retrospective nature of the study.

We used Blue Cross Blue Shield of Michigan claims data to identify ophthalmology encounters using a local specialty code, including all outpatient and professional fee claims from September 1, 2019, through September 1, 2020. A synchronous telehealth encounter was defined by the presence of specific procedure modifier codes (25 or GT). Store-and-forward retinal imaging claims (Current Procedural Terminology codes 92227 and 92228) were added to the analysis separately. Postoperative visits within the global postoperative period were not included because they are not billed regularly. Current Procedural Terminology code 99024 (postoperative follow-up visit) accounted for only 0.006% of total ophthalmologist claims in 2019 and 2020. Two proportion Z tests were completed for determining differences between telehealth use rates ($P < 0.001$ was considered statistically significant).

The most frequent 100 overall primary diagnosis codes and most frequent 100 telehealth primary diagnosis codes were determined after the onset of the state of Michigan stay-at-home order on March 24, 2020. Diagnoses were grouped into 13 subspecialty categories in accordance with diagnostic groups defined by the Clinical Classification Software, an organizational system developed by the Agency for Healthcare Research Quality (Table S1, available at www.aaojournal.org).

A total of 362 355 ophthalmology visits occurred from September 1, 2019, through September 1, 2020. Telehealth visits accounted for 91 of the 235 327 ophthalmic visits (0.04%) from September 1, 2019, through March 14, 2020, and 2031 of the 127 028 ophthalmic visits

(1.6%) from March 15, 2020, through September 1, 2020 ($P < 0.001$). The proportion of telehealth visits peaked at 17.0% of ophthalmic visits (4/5/20–4/11/20; Fig 1). A maximum of 84 (30%) ophthalmologists used telehealth (3/29/20–4/4/20). By September 2020, 228 of 610 ophthalmologists (37.4%) had used telehealth.

Chalazia, the most common telehealth diagnosis, accounted for 9.4% of telehealth claims. Dry eye disease (4.8%), conjunctival hemorrhage (2.1%), allergic conjunctivitis (1.9%), unspecified blepharitis (1.9%), and squamous blepharitis (1.3%) also were top 10 telehealth diagnoses categorized as cornea and external disease. Moderate primary open-angle glaucoma (2.8%), exudative age-related macular degeneration (2.2%), preglaucoma (1.3%), and mild primary open-angle glaucoma (1.3%) also were commonly used diagnoses (Table S2, available at www.aaojournal.org).

Cornea and external disease conditions accounted for 48.0% of the telehealth visits and 13.2% of in-person visits ($P < 0.001$). Retina and vitreous conditions and glaucoma accounted for 16.8% and 13.4% of telehealth visits, respectively, but 38.6% ($P < 0.001$) and 23.8% ($P < 0.001$) of in-person visits, respectively. Cataract and other lens disorders accounted for 3.1% of telehealth claims and 17.0% of in-person claims ($P < 0.001$). No difference was found for strabismus ($P = 0.407$) and neuro-ophthalmology ($P = 0.002$) conditions (Table S3, available at www.aaojournal.org).

Our study identified the rapid increase and subsequent decrease in the use of telehealth by ophthalmologists during the initial phases of the COVID-19 pandemic and low levels of teleophthalmology use overall. Ophthalmology has been reported as the discipline with the lowest number of users of telehealth.^{3,4} Cornea and external diseases accounted for a significantly greater proportion of telehealth visits than they did for total visits, whereas retina and vitreous conditions, glaucoma, and cataract and other lens disorders constituted fewer telehealth evaluations.

Currently, conditions associated with corneal and external pathologic features are assessed best via telehealth, and use for these conditions may reduce in-person visits. Expansion of technology such as home tonometry and home OCT (which already have been developed) and further home-based innovation may allow for increased adoption of virtual visits for glaucoma and retina care, especially for established patients.^{5,6} Ophthalmology previously focused on asynchronous forms of telehealth, such as store-and-forward imaging to address workforce shortages, not to reduce in-person visits.⁷ Our study found that ophthalmologists were not well equipped to shift care from clinics to patients’ homes. A key limitation was the inclusion of data from only one payer (Blue Cross Blue Shield of Michigan) in only one state (Michigan).

The increase in telehealth adoption coincided with both the pandemic and new federal rules on telehealth. Each factor confounds the other as far as causality for the increase in ophthalmic telehealth. However, the percentage of telehealth use declined after April 11, 2020, whereas the COVID-19 pandemic and equivalent reimbursements continued. The decline likely is related to the need for in-person examination and imaging to assess patients accurately. Various procedures and higher-level office visits typically are not feasible, creating a financial disincentive to continue telehealth visits along with the

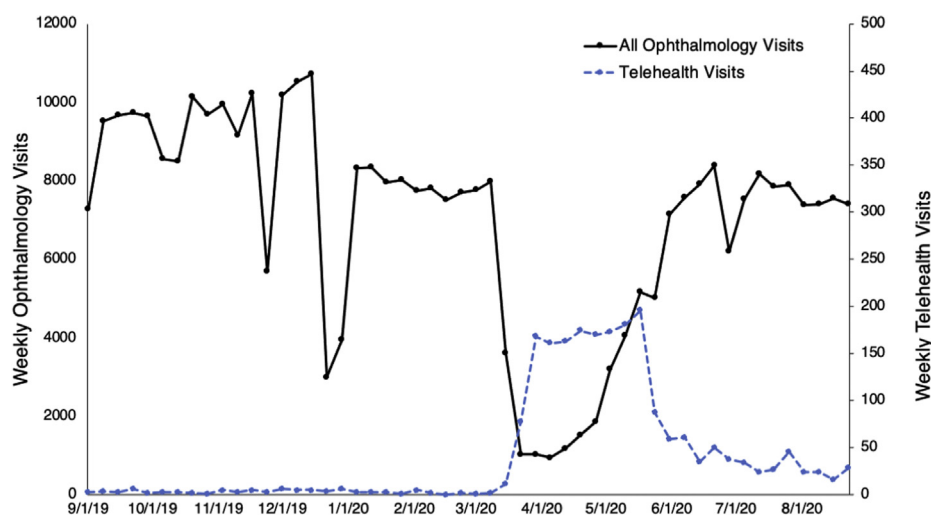


Figure 1. Line graph showing weekly ophthalmology visits by total visits and telehealth visits from September 1, 2019, through September 1, 2020. Over the course of the full period, telehealth accounted for 0.58% of total ophthalmic visits: 0.04% from September 1, 2019, through March 15, 2020, and 1.6% from March 24, 2020, through September 1, 2020. Total telehealth use peaked from March 29, 2020, through May 23, 2020. The minimum number of total ophthalmology visits occurred from March 29, 2020, through April 11, 2020. At its peak, telehealth accounted for 17.0% of total ophthalmology visits.

ethical, patient safety, and legal ramifications of an incomplete or inadequate evaluation. These challenges also must be balanced with patient perceptions of efficacy and convenience. Existing technology such as a home tonometry or home OCT could allow for more effective and frequent use of virtual visits. Until such technology is reimbursed and used further, patients with symptoms indicative of chalazia, blepharitis, conjunctival hemorrhage, and dry eye may benefit from an initial telehealth evaluation to reduce in-person visits.

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No animal subjects were included in this study.

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Changes in Medicare Reimbursement for Commonly Performed Ophthalmic Procedures



On December 27, 2020, the Centers for Medicare and Medicaid Services (CMS) announced modifications to the 2021 Medicare Physician Fee Schedule as part of the Consolidated Appropriations Act. The act prevented substantial Medicare payment cuts to nearly all surgical subspecialties. Before the update, all cataract surgery reimbursement was slated to diminish by 9% in 2021 after previously sustaining a 15% reduction in 2020. These reimbursement reductions would have occurred during a time when physician practices are reporting financial hardships because of the coronavirus 2019 pandemic.¹

By law, Medicare must maintain budget neutrality for physician reimbursement. The Centers for Medicare and Medicaid Services is required by statute (Section 1848(c)(2)(B)(ii)(II) of the Social Security Act) to ensure that changes to service relative value units do not change aggregate fee schedule spending by more than \$20 million. In compliance with this policy, when CMS seeks to increase payment for a given service, the increase must be offset by decreases in payments for other services. Potential cuts in reimbursement for surgical specialties such as ophthalmology are used to offset higher payments for primary care services. This study did not require approval by the Vanderbilt Institutional Review Board and complied with the tenets of the Declaration of Helsinki. Informed consent was not required as no patient data were needed for the analysis.

The American Academy of Ophthalmology, along with multiple physician and allied health groups, urged Congress to waive the budget neutrality requirements in anticipation of cuts to Medicare reimbursement. In the context of rising expenses, performing vision-saving procedures may become economically unsustainable with future payment reductions. Analysis of reimbursement changes over time was conducted to assess the significance of these economic pressures.

We explored changes in Medicare physician reimbursement over time for the 15 most commonly performed ophthalmic procedures in 2018, the most current year for which data are available. The Medicare Physician Fee Schedule national allowed payments were tabulated over the past 10 years (Table S1, available at www.aaojournal.org). Payments were calculated as nominal (unadjusted for inflation) and real (adjusted for inflation using the entire Consumer Price Index [CPI] and the health care-specific portion of the CPI to 2020 United States dollars, from the United States Bureau of Labor Statistics). We assessed trends in national payment amount for each procedure using linear mixed regression

with year as the independent covariate (Stata/IC 16; StataCorp LP, College Station, TX) with 2-sided significance testing and statistical significance set at a level of 0.05. A complete methods section is available in Appendix 1 (available at www.aaojournal.org).

Reimbursement allowed by CMS for the most common procedures in ophthalmology has experienced a significant decline from 2011 through 2020 (Table S2, available at www.aaojournal.org). Without adjustment for inflation, a 6.2% reduction overall in national payment amount has occurred. After accounting for inflation, the average reduction ranges from 17.7% (CPI) to 25.7% (health care-specific CPI) over the previous decade. Several procedures have seen reimbursement cuts of 30% or more, with a maximum of 46% before making any inflation adjustments.

When considering raw National Payment Amounts over time, many ophthalmology procedures demonstrate small increases in reimbursement. After accounting for inflation, all procedures studied showed a reduction in reimbursement during the study period. Thirteen of the 15 most commonly performed ophthalmic procedures showed statistically significant reductions in reimbursement (Table S3, available at www.aaojournal.org). Figure 1 demonstrates the inflation-adjusted change in reimbursement over time for complex cataract surgery (Current Procedural Terminology code 66982), cataract surgery (Current Procedural Terminology code 66984), and vitrectomy for macular hole (Current Procedural Terminology code 67042).

Payments by CMS are made based on the effort, risk, and expense needed to furnish the service through relative value units. Because of budget neutrality adjustments, the proposed 2021 Physician Fee Schedule included a 10.2% reduction in the conversion factor for relative value units. After efforts by the American Medical Association and other organized physician groups, the Physician Fee Schedule's conversion factor reduction was modified to 3.3%.

The Medicare Physician Fee Schedule is updated annually to account for projected increases in costs. Without direct reporting on practice expenses to the Medicare program, CMS is left to infer payment changes using a set of secondary measures. These include commercial insurance rates, compensation levels across specialties, and changing input prices using the Medicare Economic Index. The index's cost categories and weights are based on physician expense data from 2006. Moreover, volume growth in services provided has resulted in payment updates lagging behind cumulative Medicare Economic Index increases. From 2000 through 2016, reimbursement updates increased cumulatively by 10% compared with a 32% cumulative increase in physician input costs.

Budget neutrality payment adjustments are meant to control rising health care costs and to offset physician productivity increases while facilitating introduction of allowable services and promoting diffusion of new technologies. Part of the rising cost of outpatient care arises from a rapid growth in Part B drug spending, for example, anti-vascular endothelial growth factor agents for retinal disease.² Some data on the subject demonstrate the existence of payment-volume elasticity. An inverse relationship seems to exist between procedural volume and reimbursement, although this is not uniform across all Medicare procedures.^{3,4} Ophthalmologic surgical efficiency also factors into the reduced reimbursement, because CMS aims to keep payments equitable across physician services of similar time and intensity.

The societal value gained as surgical technique and operative times have improved should warrant increasing, not decreasing,