Published in final edited form as:

JAMA Ophthalmol. 2016 November 01; 134(11): 1228–1229. doi:10.1001/jamaophthalmol.2016.3087.

Improving Ocular Telehealth Outcomes

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It has now been well established that a nonmydriatic camera located well outside the ophthalmologist or optometrist office can be used to capture images of the retinal fundus for remote interpretation. In the setting of diabetic retinopathy, this “store-and-forward” paradigm has been validated against clinical examination and as well as the research gold standard 7-field Early Treatment Diabetic Retinopathy Study images¹; it has been demonstrated that remotely acquired images can allow clinicians to reach the same diagnosis and management plan as these more traditional methods. While there have been questions about the possible role for ultrawidefield imaging¹ and optical coherence tomography in ocular telehealth paradigms,² monoscopic photographic imaging has become the foundation of large diabetic retinopathy screening programs.³

The ideal of telehealth, as stated by Silva et al, is “the physician’s examination room is brought to the patient within a culturally adaptable context at little additional or no cost to the patient.”⁴ Telehealth should therefore overcome traditional impediments to care such as geographic distance, direct and indirect costs, and intimidation by the medical system. Unfortunately for ocular telehealth, we are not (yet?) in a paradigm where the telehealth encounter can serve all the same functions as a live clinical encounter, though some envision such a future for medicine.⁵ Therefore, in mature systems such as the UK National Health Service the outcome of an ocular telehealth encounter is either repeated screening within the system or referral into live ophthalmic care.

Keenumet al⁶ have powerfully demonstrated that this step back outside of telehealth cannot be taken for granted. In their study of 949 predominantly African American, predominantly uninsured individuals with diabetes mellitus being seen at a county internal medicine clinic in Alabama, only 38.2% adhered to the recommended live follow-up schedule. While their 1-week follow-up requirement for individuals with “R2” or “background retinopathy” was much more stringent than both the American Academy of Ophthalmology and National Health Service guidelines, follow-up outside the specific windows was also poor. Factors such as older age and knowledge of one’s hemoglobin A_{1C} level were positively associated with attending appropriate follow-up. Interestingly, expressing interest in assistance in scheduling an ophthalmic appointment (present in 85.9%) was correlated with nonadherence. Perhaps even more interestingly, many of the traditional barriers to care

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Conflict of Interest Disclosures: The author has completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest.

should have been neutralized in the study setting; out-of-pocket costs were nil or negligible in this county clinic, the eye clinic was in the same physical location as the medical office, and assistance with appointment scheduling was available.

Perhaps the most alarming finding of this study was that although 65.5% of participants reported a dilated eye examination in the 2 years prior to this study, only 49.1% had evidence of an examination within the 2 years after their telehealth screening visit. While these 2 figures were measured in different ways, and there was no control population who did not receive the study intervention, this finding is provocative enough to encourage investigators to ensure their telemedicine interventions do not have an overall deleterious effect. As the investigators point out, their funding expired within 7 months of starting screening, thus requiring the study population to return to live screening after having been introduced to the theoretically easier and more convenient telehealth option.

Now that it has been well demonstrated that ocular telehealth works as a screening test, Keenum et al appropriately bring our focus back to the actual patients at hand. When judging telemedicine research and clinical care delivery, we must demand both diagnostic accuracy and outcome measures of clinical relevance. Researchers and program managers must demonstrate that individuals are receiving appropriate care, and not just on processes of care such as accurate identification of retinopathy. Again, quality assurance and improvement are critical in any system, and telemedicine systems need to weigh the potential value of new technologies such as ultrawidefield field imaging and optical coherence tomography, but the focus must be on patient outcomes.

In their specific study population, Keenum et al highlight patient education as a possible avenue to improve adherence to follow-up recommendations. Considering poor adherence as a deleterious health behavior may encourage more researchers and clinicians to use techniques from the literature on behavior change as others have already done.⁷ The indirect costs of clinical encounters are also noted as a possible challenge not mitigated in the present study, and some groups have explored financial incentives for retinopathy screening.⁸ What is clear is that while finding diabetic retinopathy is a great start for ocular telehealth, it is far from sufficient to prevent vision loss.

Acknowledgments

Dr Brady is supported by National Institutes of Health National Center for Advancing Translational Sciences award KL2TR001077.

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