

Economics of Teledermatology—Does the Math Add Up?

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Teledermatology has the potential to improve timely access to care.¹ This technology-enabled delivery of dermatology care has evolved over the past 2 decades, with increasing evi-



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clinical outcomes are equivalent between patients who were treated online and those treated in person.³

The progress of teledermatology has been accelerated by restrictions on in-person practice associated with the coronavirus disease 2019 (COVID-19) pandemic. Regardless of the pandemic trajectory, teledermatology will likely remain a growing model for delivering dermatological care.^{3,4} The viability of teledermatology depends on economic, technological, and medicolegal considerations. In this Editorial, we discuss factors associated with the sustainability of teledermatology from various economic perspectives.

When performing a cost analysis, one must first identify an economic perspective from which such evaluations are performed because an intervention may save costs from one perspective but not another. Most economic analyses adopt a societal perspective because this recognizes that public health seeks to improve the well-being of the entire population. The societal perspective typically accounts for all direct costs (such as costs associated with visits, medications, and procedures) and indirect costs (such as patients' lost work productivity). Other economic perspectives include the health care system, individual clinician, and the patient.

In an informative article in this issue of *JAMA Dermatology* by Zakaria et al,⁵ the authors compared the costs of teledermatology triage with a conventional dermatology care model from a health care system perspective. Specifically, this health care system is a large safety-net hospital paid through managed care agreements where more than half of the patients were receiving Medicaid. Based on decision-tree cost modeling using actual costs, the authors found that, in this safety-net setting, a teledermatology system to triage and treat patients produced significant cost savings compared with conventional care. Sensitivity analyses showed that the teledermatology model would need to be 3 times more expensive for the triage and conventional models to be cost neutral. The authors discussed several study limitations that affected the generalizability of the findings, including (1) not accounting for revenue generated from billing and (2) exclusion of costs associated with rent, utilities, and nonpersonnel overhead. Thus, while it is instructive to learn how teledermatology saves costs in this safety-net managed care setting, it is also important to explore cost-effectiveness in other capitated settings,

as well as in settings where revenue derives mostly from fee-for-service billing.

The literature has shown mixed results regarding the cost-effectiveness of teledermatology in other capitated settings. For example, from the perspective of the Veteran Affairs hospital, the cost of asynchronous teledermatology model was comparable with that of conventional care.⁶ In a US Department of Defense setting, asynchronous teledermatology was more expensive than conventional care when only direct costs were considered and not when lost productivity was also considered.⁷

Furthermore, for individual practitioners in a capitated system, even if the system gains cost savings from teledermatology, these savings may not necessarily translate into increased payment to dermatologists because the health system may choose to invest these savings in other endeavors. Additionally, dermatologists may also be expected to see more patients because of the perceived efficiency of teledermatology, but their workflow efficiency may be hampered by limitations in technology or infrastructural support.

Because many dermatologists in the US still practice primarily in a fee-for-service model, we next consider the economics of teledermatology from the perspective of the individual clinician in a primarily fee-for-service setting. First, the policies and procedures set forth by the US Center for Medicare and Medicaid Services (CMS) on teledermatology reimbursement have changed markedly since the start of the COVID-19 pandemic.⁸ Overall, the trend has been toward easing restrictions for telemedicine reimbursement. Specifically, CMS (1) now allows any health care clinician who is eligible to bill Medicare to bill for telehealth services regardless of where the patient or clinician is located; (2) waived requirements that out-of-state telehealth clinicians must be licensed in the patient's state; (3) added more than 100 temporarily allowable codes for telehealth services; and (4) allows patient-initiated electronic visits and check-ins for new and established patients. These changes in CMS telemedicine reimbursement policies has resulted in a significant increase in the adoption of telemedicine among dermatologists since the start of the pandemic.

Aside from Medicare reimbursement, the willingness of private payers to reimburse for telehealth services is also critical to sustain the practice of teledermatology. However, the challenge regarding commercial coverage for telehealth services has been that reimbursement varies widely among insurers and states.

Even if we achieve universal private payer parity and universal payment by CMS, the practice of teledermatology will have substantial association with the economics of our

specialty in other important ways. From the individual practitioner's perspective, the amount of time necessary to conduct a successful teledermatology visit is an important consideration. Specifically, one must account for the time spent obtaining adequate history and images from patients. For example, in asynchronous teledermatology, poor-quality images, incomplete sets of images, and insufficient history often require the clinician or staff to spend additional time obtaining accurate and complete information. In synchronous teledermatology in which dermatologists communicate with patients via online video conference, some patients may lack adequate audiovisual equipment, internet connectivity, or computer competency to enable efficient care. In these instances, dermatologists and their staff need additional time to troubleshoot technological difficulties. Therefore, practitioners must account for the extra time needed to address these unique challenges of teledermatology, which may increase its costs.

To reduce the time spent by dermatologists to help patients troubleshoot technology-related issues, future efforts should be focused on improving technology associated with image capturing, autocorrection of images, or instantaneous rejection of poor-quality photos and recommendations for patients to retake images (akin to how banks use image capture to enable online deposit of checks) and standardized and adaptive protocols for history submission. Another economic impact of teledermatology is the individual practitioner's inability to bill for services that would otherwise occur in an in-person setting. Because most asynchronous teledermatology visits entail directed examinations based on patient-submitted photos for specific concerns, the dermatologist often does not have the opportunity to uncover incidental but clinically important findings that would otherwise be discovered during an in-person, full-body skin examination. For example, for a patient presenting with acne as the chief concern for an asynchronous teledermatology visit, the dermatologist may not have photos of other body areas and therefore may not discover an atypical nevus on the thigh that may warrant further evaluation.

In addition, an individual practitioner is unable to perform various procedures, such as cryotherapy, biopsies, and surgical procedures, during a teledermatology visit. Because procedures account for approximately 75% of Medicare payments to dermatologists,⁹ the practitioner's inability to perform procedures may be associated with a reduced average payment per teledermatology visit compared with in-person visits.

While the foregoing factors may have a negative economic association with dermatologists practicing teledermatology, one should also consider the economic advantages of teledermatology from the dermatologist's perspective. With teledermatology, the dermatologist does not need to maintain a brick-and-mortar office for the sole purpose of conducting teledermatology visits. Furthermore, because dermatologists can practice teledermatology from their homes currently, they save time by not having to commute to the office.

The practice of teledermatology is likely to increase in the near future. The economics of teledermatology differ depending on the economic perspective. Most cost analyses demonstrating the cost-effectiveness of teledermatology are performed from the societal perspective, in which patients' reduced transportation costs and regained work productivity constitute a main driver for cost-saving benefits. Zakaria et al¹⁵ substantially improved our understanding of cost savings of teledermatology from the perspective of a safety-net capitated model. In comparison, from the perspective of individual dermatologists working primarily in a fee-for-service setting, the economics of teledermatology may be variable and may depend on CMS and private payer reimbursement policies, time needed to obtain complete and accurate images and address technical difficulties, and the inability to perform procedures. In certain settings, even if teledermatology may be associated with increased costs, those costs may be justified by the benefit of timely diagnosis, management, and improved patient outcomes. Overall, as the adoption of teledermatology increases, it is important to ensure high-quality care for patients and fair compensation for the dermatology workforce practicing teledermatology.

ARTICLE INFORMATION

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Published Online: November 18, 2020.
doi:10.1001/jamadermatol.2020.4067

Conflict of Interest Disclosures: Dr Armstrong reported grants and personal fees from AbbVie, Bristol Myers Squibb, Dermavant, Dermira, Eli Lilly, LEO Pharma, Novartis, Regeneron, Pfizer, and UCB Biopharma; grants from Galderma and Kyowa Hakko Kirin; and personal fees from Celgene, Genentech, Boehringer Ingelheim, Modernizing Medicine, Ortho Dermatologics, Sun Pharma, Sanofi Genzyme, Valeant, Beiersdorf, and Janssen outside the submitted work. No other disclosures were reported.

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