

# Using Telemedicine in a Private Allergy Practice



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As technology improves and telehealth companies continue to innovate, the ways in which physicians can provide care for their patients are constantly expanding. Providing quality health care is no longer constrained by local commutes and a brick-and-mortar footprint, but instead can be provided at a local, regional, and national level in ways that were not feasible in the past. The possibilities are endless as we enter a brave new world where medicine and technology meet. But what exactly is telemedicine and how can it be incorporated into a busy clinical allergy practice? What are the barriers to entry and how can telemedicine be used to enhance patient care by providing more options and driving revenue all at the same time? At its core, telemedicine is simply the remote treatment of patients using telecommunication tools such as telephones, smartphones, and computers. Of course, the implementation of this basic concept is much more nuanced and complex, with virtual visits acting as the sounding board for a host of additional synergistic health applications including wearable devices and mobile apps. This new model of health care delivery has the potential to uproot but at the same time enhance the conventional doctor-patient relationship, and if used correctly address many of the challenges that have historically plagued health care. Telemedicine and telehealth technologies can be used to strengthen medical services and overcome many of the barriers that have previously existed by providing safe, accessible, cost-effective, and convenient health care at the touch of a button. © 2019 American Academy of Allergy, Asthma & Immunology (J Allergy Clin Immunol Pract 2019;7:2560-7)

**Key words:** Telemedicine; Telehealth; Private practice; Remote patient monitoring; Wearable tech

## HISTORY OF TELEMEDICINE

In April 1924, the cover of *Radio News* magazine predicted the future of medicine in its depiction of a “radio doctor” providing remote care for a patient linked by sound and a live picture. Although this futuristic vision of health care was not too far off from the truth today, the concept of telemedicine was not

realistically explored until the 1950s and was mainly relegated to rural areas where access to health care was limited. In 1959, the University of Nebraska established a 2-way television to transmit information to medical students across campus and eventually linked with a state hospital to perform video consultations.<sup>1,2</sup> Providing low-cost care to rural populations interested the government as well, and in the 1960s multiple government institutions including the US Department of Health and Human Services, the National Aeronautics and Space Administration, and the Department of Defense allocated funds to better understand potential applications of telemedicine.<sup>1,2</sup> Because of the technological limitations of the time and the high costs of transmitting data, scalable applications of telemedicine health care platforms were limited and remained so only until recently.

With improved technologies and lower costs, telemedicine is rapidly expanding. The global telehealth market is forecasted to reach \$19.5 billion by 2025, according to a report from market intelligence company Transparency Market Research. In the United States, the telehealth market is predicted to grow 14.8% during this time period to reach \$2.8 billion.<sup>3</sup> The trend toward telehealth will be driven by several factors including the rise in the prevalence of chronic diseases such as diabetes and cardiovascular diseases, the increase in the geriatric population, looming doctor shortages, and a surge in demand for self-care devices. Several major hospital and health care systems have recognized the potential capabilities of telemedicine and have integrated these services into daily operations. Used properly, remote care can reduce overall costs for these institutions, especially in rural settings where access to health care is limited.<sup>4-6</sup>

## DEFINITIONS

To gain a better appreciation of how remote care can be used to enhance an allergy practice, a better understanding of the basics of telemedicine is required. *Telehealth* refers to a broad range of remote services and technologies that attempt to improve patient care, surveillance, health promotion, and health care delivery. Telehealth also includes nonclinical services including provider training, administrative meetings, and continuing medical education. *Telemedicine* encompasses electronic communications and software that provides remote clinical services to patients without an in-person visit and can include follow-up visits, management of chronic conditions, medication management, and specialist consultation.

Telemedicine is generally defined as synchronous or asynchronous, with synchronous programs occurring in “real time” as in a 2-way video consultation between a patient and their distant medical provider. Asynchronous or “store-and-forward” applications are delayed communications in which health care providers share patient medical information such as diagnostic images, laboratory reports, or videos from one site to another for viewing in preparation for a consult. The way in which

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*Abbreviations used*  
*eConsults*-Electronic consultations  
*EHR*-Electronic health record

telemedicine is implemented in a clinical practice can take various forms and can be divided into 3 main subtypes.<sup>7</sup> The examples of telehealth companies provided herein are just a sampling of available options and should not be viewed as the author's preference for one company over another.

### Store-and-forward telemedicine or electronic consultations

The typical specialist consultation referral process involves several steps and potential hurdles for both the patient and the physician. Successfully completing a consultation requires navigating multiple record-keeping systems including paper notes, faxes, electronic health records (EHRs), and any other electronic platforms, all increasing the risk for miscommunication among members of the care team. Electronic consultations (eConsults) offer a simplified approach that can eliminate the complex process of specialty referral, especially for a system caring for patients with multiple chronic illnesses.

eConsults provide a platform for primary care providers to gather all relevant patient information, which is then sent through a secure email or messaging service to a cloud-based platform where allergists and other specialists can analyze the data. This modality offers a convenient way for specialists, primary care providers, and patients to collaborate on difficult cases with a care team that might be composed of providers in different locations or time zones. Although not suitable for emergency care, store-and-forward technology offers a simplified approach that can eliminate the complex process of specialty referral, especially in areas where local specialists might not be available.

Example: AristaMD provides specialist eConsult platforms that allow primary care providers to consult with specialists to reduce unnecessary referrals, improve care coordination, reduce costs, and increase patient satisfaction

### Remote patient monitoring (telemonitoring)

Remote patient monitoring platforms allow providers to track their patients' vital signs and activities in real time without the inconvenience and cost of frequent health care visits. High-risk patients are ideal for this type of monitoring, such as the elderly and those with diabetes or cardiovascular disease. This modality is especially helpful for those patients who have recently been released from the hospital where close monitoring can help to reduce readmission rates.

Example: Care Innovations provides intuitive and easy-to-use technology and devices to monitor patients from the comfort of their own homes. From blood pressure cuffs and glucose monitoring to smart sensors placed in patients' homes that passively monitor activity patterns, such as sleep, movement, and bathroom usage, helps to establish trends to better inform clinicians of significant changes in activities.

### Real-time (live video) telemedicine

Providers interact with patients over real-time video visits using Health Insurance Portability and Accountability Act-compliant videoconferencing software. Applications such as Skype and Facetime are not appropriate for these encounters

**TABLE I.** Examples of real-time (live video) telemedicine options

#### Telemedicine carts

Typically used by hospitals and other large health care systems, this piece of telemedicine equipment provides everything required for a real-time video visit, all in one convenient, mobile package. Carts come equipped with cameras, a computer, and applicable mobile medical devices. Health care providers can wheel these carts from room to room as they meet with patients and need to either record and transmit a patient's medical data or include a consulting physician from another location in the patient visit.

#### Telemedicine kiosks

Enclosed and freestanding modular units similar to a photobooth, kiosks are increasingly being used by large companies and retail clinics who want to offer their employees and customers telemedicine options. Units are typically supplied with a touchscreen video interface that allows face-to-face interaction with providers along with integrated biometric and remote monitoring devices necessary to complete a general physical examination such as an otoscope, stethoscope, and blood pressure cuff.

#### Telemedicine cloud software

Telemedicine cloud-based software allows physicians to connect with their own patients for routine appointments over secure video visit. The applications provide comprehensive support for both patients and physicians and include stand-alone platforms, electronic health record integration options if applicable, as well as billing and reimbursement tools.

#### Direct-to-consumer telemedicine providers

Telemedicine companies provide patients, health systems, and self-insured employers on-demand consultations with board-certified physicians via video, phone, or mobile app. These visits are intended to replace emergency room or urgent care visits for nonemergency issues connecting patients with a random health care provider. Additional services can include behavioral health therapy, dermatology skin checks, and specialist consultation. Physicians are paid employees of the telemedicine company and are reimbursed per consultation.

because these do not meet the strict patient protections required by law. These visits attempt to maintain the concept of the doctor-patient relationship patients are accustomed to by enabling face-to-face examination and treatment. Providers are able to see the patient, conduct a limited examination, and engage in a conversation similar to an office visit. There are several software options and devices that enable real-time telemedicine visits. Some examples are listed in [Table I](#).

Example: Chiron Health uses Health Insurance Portability and Accountability Act-compliant telemedicine software that integrates with preexisting EHRs to provide secure video visits for preexisting clinic patients.

Of all these options it is the author's opinion that telemedicine cloud software that integrates with preexisting EHRs provides the best opportunity for meaningful patient-physician interaction because the patients requesting video appointments are typically established patients who are known to the practice. Telehealth technology can be overwhelming, especially for providers with limited technological acumen, so incorporating software that seamlessly operates with an EHR system that a practice is already familiar with provides the best opportunity for successful integration. Using a combination of in-person and mobile care visits provides the foundation with which to build a successful health care relationship with patients seeking convenience as well as quality care. It is always important to remember that remote care

**TABLE II.** Advantages of offering video visits in a private allergy practice

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
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| Advantages of telemedicine for providers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>• Generate incremental revenue by converting unpaid patient phone calls and emails into fully billable visits               <ul style="list-style-type: none"> <li>- Instead of answering complicated follow-up emails and phone calls for free, direct patients to schedule an online appointment</li> </ul> </li> <li>• Cut down on no-show rates and fill empty slots in clinic schedules</li> <li>• Improve clinical outcomes with easier access to providers, thereby improving compliance with treatment plans</li> <li>• Set your practice apart by offering mobile health services that other specialists in the area do not               <ul style="list-style-type: none"> <li>- Be the first to offer telemedicine services and gain valuable experience and reviews</li> </ul> </li> <li>• Grow your practice by attracting new patients and increasing catchment               <ul style="list-style-type: none"> <li>- Mobile applications allow providers to deliver more services without increasing overhead and tap into underserved markets and rural areas that were previously inaccessible</li> </ul> </li> <li>• Offer weekend/after-hours appointments for established patients in the comfort of your own home</li> </ul> |
| Advantages of telemedicine for patients                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>• Less time away from work: reduced employee absenteeism               <ul style="list-style-type: none"> <li>- Employers favor tech that can replace a 2-h doctor's office visit, resulting in improved employee productivity</li> </ul> </li> <li>• No travel expenses and less interference with child or elder care responsibilities</li> <li>• No exposure to potentially contagious patients</li> <li>• Prevents unnecessary emergency room/urgent care visits</li> <li>• Ensures continuity of care, extended provider access</li> <li>• Increased patient satisfaction and retention by providing more options and more convenience</li> <li>• More affordable</li> <li>• Increased specialty access</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

does not replace face-to-face encounters. These visits should augment the doctor-patient relationship, not take away from it. The other options provided, especially direct-to-consumer telemedicine visits, have the potential to lead to fragmented care, a weakened physician-patient relationship, poor follow-up, conflicting treatment plans, incomplete medical record access, and limited communication with other care providers.

### WHY PROVIDE TELEMEDICINE

Armed with a more comprehensive understanding of the various telemedicine options, the next step is to appreciate why offering telemedicine in a private allergy practice is an investment in the future. Spurning or underusing these services disregards overwhelming health care trends over the last decade demonstrating telemedicine's staying power. As with the advent of the EHR, many physicians, especially private practice allergists who are not part of a major hospital system, are hesitant to adopt new technology that is unproven and expensive. It is important to recognize that modern health care consumers, especially millennials, are increasingly more engaged, cost-conscious, tech-savvy, and convenience-driven. Training programs are recognizing these trends and according to Association of American Medical Colleges (AAMC) data, 58% of medical schools in the 2016 to 2017 academic year included telemedicine as a topic in required or elective courses.<sup>8</sup> That appetite for convenience and quick service is affecting the delivery of health care because a significant number of young adults are rejecting the standard doctor-patient relationship in favor of walk-in treatment centers. Proliferation of urgent care and retail clinics highlights patients' desire for convenience over personal care, so why not provide both by using digital health tools and technology in a more meaningful way. If used appropriately, telemedicine is a practical tool that can provide important benefits to patients including increased access to health care, expanded use of specialty expertise, rapid availability of patient records, and potential reductions

in the cost of patient care. Table II provides a more detailed synopsis of how telemedicine brings value to a private allergy practice.

### REDUCING COSTS WHILE INCREASING ACCESS TO CARE

In an ideal world, a patient should be able to get in to see a specialist within a few days of receiving a referral. Unfortunately, with shortages in certain specialties, the overall wait time for a new patient appointment can vary from a few days up to a few months. Add on 1 to 2 hours in the waiting room and a rushed 15-minute time slot with the physician and it's not hard to imagine why patients are frustrated with the current state of health care. Naka et al<sup>9</sup> attempted to demonstrate how telemedicine improved access to care in a large-scale primary care network. Before the implementation of eConsults, access to dermatology was limited; only 139 (11%) of 1258 referrals resulted in a confirmed appointment, with a median wait time of 77 days. Postimplementation, 499 of 1127 consults (44%) were sent electronically, and of those, 16% required a face-to-face visit, with a median wait time of 28 days.<sup>9</sup> This retrospective cohort study clearly demonstrated that eConsults increased access to care while reducing wait times.

Patients are not the only ones who are frustrated with the current models of providing care. A growing number of day-to-day administrative and work-related responsibilities leave physicians feeling increasingly dissatisfied. Add to that the increased pressure to see more patients in the current fee-for-service model, and loss of income from no-shows and cancellations, and the hits keep on coming. The total cost of missed health care appointments yearly in the United States continues to climb and at last estimate was around \$150 billion, with each open, unused time slot costing physicians around \$200 on average.<sup>10</sup> With no-show rates estimated to be about 30% nationwide, addressing this systemic problem by supplementing office visits with

**TABLE III.** Examples of current and future wearable devices and their applications

|                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Smartwatches (Fitbit, Apple Watch)                                                                                                                                                                                                                                                                                                                                              |
| - Growing market with lots of options. Fitbit is one of the most popular brands and is poised to break into the health care market, partnering with Google to improve accuracy of data and the ability to share data with medical professionals. FDA-approved Empatica smartwatch, called Embrace, is designed to monitor for seizures, sending instant alerts to caregivers.   |
| Health and fitness data repository (Apple HealthKit)                                                                                                                                                                                                                                                                                                                            |
| - Curating a complete, personalized health and fitness experience is difficult when using multiple apps and devices. Applications such as HealthKit serve as a central database for health and fitness data on iPhone and Apple Watch, allowing users to analyze and visualize their health metrics in real time and share these data with their health care provider.          |
| Continuous glucose monitors (Dexcom G6)                                                                                                                                                                                                                                                                                                                                         |
| - Uses a tiny sensor inserted under the skin that tests interstitial glucose levels every few minutes and sends this information to a monitor or smartphone. Patients receive alerts when their glucose levels need to be adjusted, allowing users to make more informed choices about the types of food, physical activities, and medications they require throughout the day. |
| Crowdsourcing environmental data (Air Louisville)                                                                                                                                                                                                                                                                                                                               |
| - GPS-enabled sensor attached to rescue inhalers tracked the weather and pollutants in the air at every use. The data identified “hotspots” of respiratory distress in the community, which were used to inform policy on air pollution and better understand how environmental drivers are influencing these patterns.                                                         |
| Tracking heart health (KardiaMobile, Zio Patch, Eko digital stethoscope)                                                                                                                                                                                                                                                                                                        |
| - Smart bands and watches can monitor the heart rate, but more advanced devices can detect atrial fibrillation or other concerning abnormalities and are marketed as a diagnostic alternative to a heavy holter or vest monitors. Digital stethoscopes remotely record and share heartbeat sounds.                                                                              |
| Adherence to medications (Propeller Health)                                                                                                                                                                                                                                                                                                                                     |
| - Small sensors attach to previously prescribed inhalers and track medication usage, creating a report that helps patients and physicians to better understand disease control and adjust medications accordingly.                                                                                                                                                              |
| Smart contact lens (Google and Novartis)                                                                                                                                                                                                                                                                                                                                        |
| - Solar-powered contact lens that is capable of collecting biological data about the wearer and local environment, possibly sensing allergens such as grass or tree pollen.                                                                                                                                                                                                     |
| Early detection of anaphylaxis (AIBI)                                                                                                                                                                                                                                                                                                                                           |
| - An armband with light-sensitive photodiodes measures histamine levels to constantly track allergies. The wearable signals adult caregivers in the earliest stage of anaphylaxis before severe symptoms.                                                                                                                                                                       |
| Detecting food allergen levels in foods (Allergy Amulet)                                                                                                                                                                                                                                                                                                                        |
| - Necklace or bracelet with chemistry-based strips stored in the amulet that is sensitive enough to detect allergen levels down to part per trillion, providing additional information to the consumers about the food they are about to eat.                                                                                                                                   |
| The ADAMM (Automated Device for Asthma Monitoring and Management)                                                                                                                                                                                                                                                                                                               |
| - A rechargeable adhesive patch that sticks to the front or back of the wearer’s torso and monitors for early breathing issues and sends an alert to a smartphone, and so action can be taken before a more severe asthma attack. The accompanying app also provides medication reminders.                                                                                      |

FDA, Food and Drug Administration; GPS, Global positioning system.

telemedicine appointments has the potential to mitigate these potential losses and frustrations. Traditionally, telemedicine was viewed as a tool to improve access to care, but there is growing evidence to suggest that telehealth in general has the potential to reduce health care costs.

## INCREASED CONVENIENCE DOES NOT MEAN DECREASED QUALITY

Telemedicine skeptics often claim that virtual visits tend to be lower quality than in-person visits for several reasons including reduced care continuity and fewer in-person encounters, leading to the further erosion of the doctor-patient relationship. Increased technical training and equipment as well as navigating the complicated landscape of various health care laws, reimbursement policies, and privacy protection rules can also be daunting for new adopters of this technology. These concerns are mainly focused on the growing trend of on-demand telemedicine services that connect patients with a random health care provider. Although patients may like the convenience of direct-to-consumer telemedicine visits, with limited physical examination capabilities, poor continuity of care, and incomplete access to medical records, these transient providers run the risk of delivering lower quality care. This sentiment was demonstrated

in a recent study by Liaw et al<sup>11</sup> that found that patients who relied on live video visits for enhanced access were less connected to their primary care provider, leading to fragmented care. Another study by Ray et al<sup>12</sup> found that direct-to-consumer telemedicine may be leading to the overprescribing of antibiotics. This retrospective cohort study revealed that children with acute respiratory infections seen via telemedicine visits were more likely to be prescribed antibiotics compared with those seen via an in-person visit at a doctor’s office or urgent care clinic.

Despite these studies there are some encouraging statistics about telemedicine as well, especially when used to augment a previously established doctor-patient relationship. Portnoy et al<sup>13</sup> looked at a group of 169 children with asthma, 100 of whom were seen in-person and 69 via telemedicine. Telemedicine visits achieved similar degrees of asthma control compared with their in-person counterparts, thereby presenting telemedicine as a viable alternative to traditional in-person physician-based care. In a similar approach, Chan et al<sup>14</sup> took 120 children with persistent asthma and randomly assigned them to office-based or virtual visits. Virtual group patients achieved excellent asthma therapeutic and disease control outcomes and were more adherent to diary submission and had better inhaler scores compared with those who received standardized office-based care. In a more recent study, Chongmelaxme et al<sup>15</sup>

**TABLE IV.** Detailed overview of the requirements for Medicare's telemedicine reimbursement policy

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| <ul style="list-style-type: none"> <li>• <b>Videoconferencing only:</b> Reimburse for telehealth services delivered over videoconferencing only (does not reimburse for the use of mobile communication devices).</li> <li>• <b>Restrictions on geographic location:</b> Telehealth should specifically target people in remote, rural areas; therefore, patients who can receive telemedicine are limited in location to what is referred to as a Health Professional Shortage Area (HPSA) outside of a Metropolitan Statistical Area (MSA) or in a rural census tract or in a county that is outside of an MSA.</li> <li>• <b>Restriction on facility type:</b> Even if a patient is in an HPSA, patients may not receive care from their home or office, because those are not eligible facilities. Facility requirements are applicable only to the patient. The treating physician can be located in a facility outside the approved list. Eligible facilities where a patient may receive telemedicine-delivered services are as follows: <ul style="list-style-type: none"> <li>- Provider offices</li> <li>- Hospitals</li> <li>- Critical access hospitals</li> <li>- Rural health clinics</li> <li>- Federally qualified health centers</li> <li>- Skilled nursing facilities</li> <li>- Community mental health centers</li> <li>- Hospital-based or critical access hospital-based renal dialysis centers</li> </ul> </li> <li>• <b>Appropriate billing practices:</b> Submit the appropriate Healthcare Common Procedure Coding System or CPT code along with the telemedicine Place of Service code 02. The Place of Service 02 indicates the location in which the services took place.</li> </ul> |
| <p>The <b>Medicare Chronic Care Management Program</b> is an exception to the aforementioned rules and sets no restrictions on practicing telemedicine. The program was adopted to provide more comprehensive monthly care to patients with 2 or more chronic conditions through telehealth services. Patients can be located anywhere (even in a metropolitan area) and may receive services from any facility, including their home or office.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

CPT, Current Procedural Terminology.

Adapted from The Medicare Learning Network, Centers for Medicare & Medicaid Services.<sup>19</sup>

determined the effects of telemedicine on asthma control and patients' quality of life by performing a meta-analysis of 22 studies (10,281 participants). Of these, 11 studies investigated the effects of single types of telemedicine, whereas another 11 studies investigated the effects of combined telemedicine ( $\geq 2$  types of telemedicine provided together). The authors concluded that combined telemedicine involving tele-case management or tele-consultation appear to be effective interventions to improve asthma control and quality of life in adults.

These studies and others like it highlight the strengths of telemedicine when used appropriately. These advantages are especially evident in areas of patient education, medication monitoring, and seeing medical conditions unfold in real time. Telemedicine allows for dynamic and timely educational opportunities for those in need of disease management, particularly those with poor compliance. Educational services provided on a more regular basis encourage reinforcement of good habits and can be run by a physician or nurse. Interactions with patients in their homes give more insight into possible barriers and other factors contributing to poor control. Medication monitoring is essential for patients with chronic conditions that require long-term treatment but may not seem worth an office visit, especially if everything seems to be going well. A quick video check-in is the perfect way to ensure that the treatment is effective and that any side effects are under control. Seeing medical conditions unfold in real time provides unique insight into reactions that were once attainable only through detailed clinical history and vague patient recall. Drug or food reactions, acute and/or chronic urticaria and angioedema, asthma exacerbations, hereditary angioedema attacks, and immunotherapy reactions are all opportunities for patients to connect with an allergist while the condition is actively flaring. Real-time video assessment can increase the accuracy of documentation and provide important information for the treating physician when patients are unable or unwilling to come into the office.

## WEARABLE TECH

To further enhance the telemedicine experience for both the patient and the provider, it is important not to disregard the power of wearable tech. Traditionally, basic physiological data are collected 1 to 2 times per year during a doctor's office visit. Although these data represent a very limited snapshot of a person's overall health, these values are often used to make important decisions about the patient's care plan, disease status, and treatment course. Wearable tech allows for 24/7 health data collection, which provides key insights into a patient's activity in daily life that can better inform treatment plans and give providers feedback on what takes place outside the doctor's office. Roughly a quarter of US adults (56.7 million) will use a wearable device (mostly commercial fitness trackers and smartwatches) at least once a month in 2019, with an additional 3.8 million US children and teens adopting this technology.<sup>16</sup> Advancements in this arena have revolutionized health monitoring, allowing patients and physicians to track various metrics in real time. Modern health tech is smaller in size and greater in scope than its predecessors. Wearable devices such as fitness trackers and smartwatches are entry-level examples of mobile health tools that track patients' vital data; however, this is just the tip of the iceberg. More advanced health monitoring tools are gaining traction, allowing comprehensive physical examination equipment to affordably and reliably be in the hands of patients. Smartphone-enabled otoscopes, continuous glucose monitoring devices, and personalized electrocardiogram machines are increasingly available in telemedicine toolkits and will likely become the standard for telehealth visits and in-office appointments in the future. Wearable tech provides the ultimate in personalized medicine, allowing physicians to implement device recommendations on the basis of individual needs and health concerns of the patient. In addition to personalization, wearable tech is poised to increase adherence to medications, improve patient-physician communication, and potentially save health

**TABLE V.** Examples of rules governing telemedicine in the state of Ohio

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Training of staff           | <ul style="list-style-type: none"> <li>• Staff involved in a telemedicine visit should be trained in the use of the telemedicine equipment and be competent in its operation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Doctor-patient relationship | <ul style="list-style-type: none"> <li>• Physicians using telemedicine should have some means of verifying that the patients seeking treatment are in fact who they claim to be</li> <li>• A diagnosis should be established through the use of accepted medical practice               <ul style="list-style-type: none"> <li>- ie, a patient history, mental status examination, physical examination, and any appropriate diagnostic and laboratory testing</li> </ul> </li> <li>• Ensure the availability for appropriate follow-up care</li> <li>• Maintain a complete medical record that is available to the patient and other treating health care providers</li> </ul> |
| Examinations                | <ul style="list-style-type: none"> <li>• Provide an appropriate examination before diagnosing and/or treating the patient</li> <li>• Examination does not need to be in-person if the technology is sufficient to provide the same information to the physician as if the examination had been performed face-to-face</li> </ul>                                                                                                                                                                                                                                                                                                                                                |
| Prescribing                 | <ul style="list-style-type: none"> <li>• Physicians have an obligation to document that a comprehensive history and physical examination took place before prescribing a medication</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Medical records             | <ul style="list-style-type: none"> <li>• Maintain a complete record of the patient's care according to prevailing medical record standards</li> <li>• The record must reflect an appropriate evaluation of the patient's presenting symptoms, and the electronic professional interaction must be documented as with any other encounter</li> <li>• Maintain the record's confidentiality but disclose the records to the patient consistent with state and federal law</li> </ul>                                                                                                                                                                                              |
| Licensure                   | <ul style="list-style-type: none"> <li>• The practice of medicine is deemed to occur in the state in which the patient is located. Therefore, any licensee using telemedicine to regularly provide medical services to patients located in Ohio should be licensed to practice medicine in Ohio</li> <li>• Physicians need not reside in Ohio, as long as they have a valid, current Ohio medical license or telemedicine certificate</li> </ul>                                                                                                                                                                                                                                |

Information provided in this table is adapted from the State Medical Board of Ohio Position Statement on Telemedicine. Please refer to your local state telehealth-related laws and regulations for more information.

care costs.<sup>17,18</sup> Table III provides a brief sampling of currently available and future wearable tech that has the potential to change the way health care is provided, including a focus on companies that are competing in the allergy space.

## BILLING

One of the main obstacles preventing the implementation of telemedicine in private practice is understanding how to bill appropriately. Navigating the nuanced telemedicine reimbursement policies for Medicare, Medicaid, and commercially insured patients can be overwhelming and a barrier to entry for many physicians. National telehealth policy sets various restrictions on patient location, services provided, and facilities at which patients can receive these services. Table IV provides a detailed outline of Medicare's telemedicine reimbursement policies.<sup>19</sup> Apart from a few states, most offer some type of live video reimbursement in their Medicaid program; however, each state may restrict reimbursement on the basis of various factors including type of service provided, medical specialty type, location of the patient, and location of the provider.<sup>19</sup> Check your state Medicaid program site or your state policy page at the National Telehealth Policy Center<sup>20</sup> for a more detailed synopsis of local policies. Unfortunately, reimbursement and billing for telemedicine is not well described in the literature, and rules for Medicare, Medicaid, and private payers are all different and can vary from state to state. To avoid the hassles of poor reimbursement, many offices have established a simple self-pay rate for telemedicine appointments for insurances that are ineligible for telemedicine or if patients decide to pay out-of-pocket.

One of the main limitations of telemedicine is the inability to perform a comprehensive in-person physical examination. Even though these appointments are done through video, the provider can still physically assess the patient using their eyes and ears.

Inspection of the general appearance and psychological state of the patient as well as evaluation of the head and neck, skin for rashes, and constitutional elements such as height and weight can be accomplished during a video visit. Telehealth companies are developing in-home medical examination toolkits to better inform a telemedicine visit, closely replicating what happens in the doctor's office. These toolkits include interactive thermometers, stethoscopes, otoscopes, and tongue depressors for examining the heart, lungs, abdomen, ears, nose, and throat. Just because the patient is not physically in the office does not mean that the examination should be incomplete. Despite improved technology to help bridge the deficiencies of the remote physical examination, there is still confusion on how providers can code telemedicine visits. Typically, the provider can charge a 99121 or 99213 depending on the level of decision making involved. Time can be used as a billing factor for these visits as well. Billing a 99214 for an established patient requires at least 2 of these 3 key components with around 25 minutes of face-to-face time with the patient and/or family:

1. A detailed history
2. A detailed examination
3. Medical decision making of moderate complexity

At least for the state of Ohio, a detailed examination does not need to take place in-person according to the State Medical Board of Ohio Position Statement on Telemedicine.<sup>21</sup>

Licensees using telemedicine technologies to provide care to patients located in Ohio must provide an appropriate examination prior to diagnosing and/or treating the patient. However, this examination need not be in-person if the technology is sufficient to provide the same information to the licensee as if the exam had been performed face-to-face. Other examinations may also be considered

appropriate if the licensee is at a distance from the patient, but a licensed health care professional is able to provide various physical findings that the licensee needs to complete an adequate assessment. On the other hand, a simple questionnaire without an appropriate examination may be a violation of law and/or subject the licensee to discipline by the Board.

For any new offering it is important to be transparent; therefore, offices should consider sending patients an advance beneficiary notice form to be signed, stating that if insurance does not cover the visit the patient will be responsible for paying.

## MAINTAINING COMPLIANCE

It is important to review the rules and regulations set forth by local state medical boards to make sure your telemedicine practice is compliant. The American Telemedicine Association developed quality standards and guidelines for telemedicine encounters that provide an excellent framework for implementing quality remote care.<sup>22</sup> The American College of Allergy, Asthma, and Immunology has encouraged similar quality metrics in its recently published position paper on the use of telemedicine for allergists.<sup>23</sup> These recommendations include using software that has appropriate verification, confidentiality, and security parameters as well as use of high-quality cameras, audio, and related data capture and transmission equipment. It is important to note that telemedicine visits must abide by the same standards of care for in-person visits (Table V). Failure to conform to these standards may subject the care provider to potential discipline by the Medical Board. Physicians intending to treat or diagnose patients via telemedicine outside of the state they are licensed should check with appropriate state licensing boards. Most states require physicians to be licensed, and some have enacted limitations to telemedicine practice or require or offer a special registration.<sup>21</sup> For more detailed information regarding telemedicine practice details specific to your state, please refer to the Federation of State Medical Boards website.<sup>24</sup>

## CONCLUSIONS

The implementation of remote health services has been through a striking evolution over the last decade, becoming an increasingly important part of the health care infrastructure. There has been a very slow but steady push to move health care delivery from the hospital or clinic into the home. Although there is no denying the fact that telehealth and telemedicine will play a major role in the future of private practice medicine, there are several significant policy barriers, including a fragmented reimbursement system, that prevent telemedicine from gaining mainstream acceptance. Major hurdles still exist, especially with Medicare, which tends to reimburse for telemedicine services only if they occur in areas with physician shortages. Despite these obstacles, telemedicine will continue to have a role to play as health care attempts to distance itself from the fee-for-service model and embrace value-based care, especially for the underserved, older, and rural patient populations. Providing care for this subset of patients who traditionally have lower incomes, less education, and spotty internet access using mobile health applications can be inherently challenging however. It is important to remember that telemedicine should not replace or replicate traditional in-office visits because providing

comprehensive and compassionate care for patients cannot take place without the human components of touch and empathy, which is impossible when providing care solely through a computer screen. Despite its potential misuses, telemedicine has sparked a health care revolution that is likely to usher in ever more rapid technological advances. For those with reservations it is not a question of *whether* telemedicine will become part of the standard of care but *when*. If properly channeled, remote health will enable private practice providers and health systems to meet the growing burden of chronic diseases and increase access to convenient and affordable care.

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