

Accelerated Cure Project for MS

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Telemedicine – Revolutionizing MS Healthcare

The World Health Organization (WHO) refers to telemedicine as “healing from a distance.” It is the remote delivery of healthcare services, such as health assessments or consultations, using [telecommunications](#) technology. Telemedicine allows healthcare providers to evaluate, diagnose and treat patients remotely, without the need for an in-person visit. It can be used for a wide variety of health services, including MS care. Telemedicine is a growing trend in the healthcare industry. Many patients consider it an energy, time, and cost saving way to see a clinician for minor and non-urgent medical needs instead of going to a doctor’s office or emergency department. Healthcare providers see it as an efficient way to provide care to those who may live in rural areas, or have difficulty making it to an appointment. Despite these many benefits, there is much controversy surrounding the practice of telemedicine.



The concept of telemedicine began in the 1800’s with the invention of the telecommunications technology, including the [telegraph](#), the telephone and radio. Telemedicine was used as early as the Civil War, when things like medical consultations and ordering medical supplies were conducted via telegraph. In the 1950’s, the practice of telemedicine evolved further. Medical staff transmitted radiologic images by telephone between health centers in West Chester and Philadelphia, Pennsylvania. A Canadian doctor built a [teleradiology](#) system based on this technology that was used in and around Montreal. In 1959, doctors at the University of Nebraska were able to transmit neurological examinations to medical students across campus via a two-way interactive television. By 1964, they had built a telemedicine link that allowed them to provide health services at Norfolk State Hospital, 112 miles away from campus. With the rapid changes in technology over the last few decades, telemedicine has transformed into a complex integrated service used in hospitals, homes, private physician offices, and other healthcare facilities. Using modern technology and telecommunications, doctors can

visit their patients in a virtual manner, usually over live video or through still images captured and saved for their reference on a computer. Simple user-friendly medical devices that can take vitals, monitor glucose levels, or measure blood pressure enable individuals to gather needed medical information at home for a doctor's analysis. People are starting to use these devices, and a wide variety of mobile health apps to monitor and track their health. Physicians can gather essential medical information and make a diagnosis without patients stepping foot in a doctor's office.



Telemedicine was originally created as a way for physicians to treat patients located in remote places, or in areas with shortages of medical professionals. While telemedicine is still used in this way today, it's increasingly becoming a tool for convenient medical care. Virtual [healthcare kiosks](#) are available at some retail stores where a customer can

use a touchscreen computer to connect by a secure video link to a doctor. Physicians provide a wide range of healthcare services remotely, including sharing medical information, conducting follow-up visits and second opinions, chronic disease management, medication management and post-hospitalization care. Telemedicine is a valuable tool in disease prevention. Weight loss and smoking cessation are key to reducing heart disease and a host of other conditions. This new technology allows providers to connect with patients to make sure they get the support they need to be successful. Some innovative districts are using telemedicine to conduct remote visits for children that become ill at school. Telemedicine software is also used to provide support to assisted living facilities, where problems frequently occur off hours making hospitalization the only option even for less urgent issues. With the availability of telemedicine software, on-call doctors can more readily conduct a remote visit to determine if hospitalization is necessary. Telemedicine is used to divert patients from overcrowded emergency rooms by having them see a remote physician first, and proceeding to the ER, if necessary. Paramedics use this new technology to see the capacity of an ER in real-time instead of heading to the hospital and being diverted later. In the recent past, telemedicine has been used during disaster relief efforts. When hurricanes [Harvey and Irma](#) occurred in 2017, healthcare professionals provided both emergency and routine health video visits.



Often times, the terms “telemedicine” and “telehealth” are used interchangeably. However, there is a distinction between the two. Telemedicine refers specifically to remote clinical services. Telemedicine is considered a subset of [telehealth](#), which includes both remote clinical service delivery and nonclinical services such as continuing medical education, provider training, and administrative meetings.

Telemedicine can be classified into three main categories. **Remote patient monitoring** (RPM), as the name implies, allows healthcare providers to track a patient's vital signs and other health data from a distance. This makes it easier for patients and physicians to maintain close communication and manage chronic diseases, like MS. The recent rise in [wearable technology](#) and mobile medical devices has made RPM easier. Patients have better, cheaper, more accessible tools at their disposal for tracking and reporting health information. **Store-and-forward, or asynchronous**, telemedicine enables healthcare providers to securely share patient medical data (lab results, images, videos, records) with a provider at a different location online. This type of remote care is typically used when a provider needs to consult with a specialist about a patient's diagnosis. The asynchronous term refers to the fact that the consulting specialist, patient, and primary doctor don't all need to be communicating at the same time. **Real-time (or synchronous)** telemedicine offers a virtual alternative to an in-person doctor's visit. It is a live interaction between either a health professional and patient, or between health professionals, using audio and video communication.

With telemedicine on the rise, an increasing number of [companies](#) now offer direct-to-consumer care via apps available on mobile phones and websites. These services make it possible to speak to a licensed, on-call doctor in a matter of minutes no matter where an individual might be (work, home or traveling). Many companies offer this convenient care on a 24/7 basis. Some companies offer hospitals and larger health centers access to extra clinical staff and specialists via telemedicine technology. Others provide a platform for physicians to use to have virtual visits with their own patients.

There are a number of pros and cons to remote healthcare, for both patients and physicians. On the plus side, it makes access to quality care much more convenient for patients. Virtual visits ease many of the hassles of going to see a doctor, such as time away from work, travel time/expenses, interference with child or elder care responsibilities, and exposure to other potentially contagious patients. People in rural or underserved areas, as well as those with mobility issues, can obtain healthcare services that they might not otherwise be able to get. Telemedicine engages patients by allowing them to conveniently connect with their doctor more frequently. This close communication may not only enable a stronger doctor-patient relationship, but patients may feel more empowered to manage their care. Telemedicine makes it easier for providers to follow-up with patients and make sure everything is going well. It also allows providers to encourage their patients to make healthy lifestyle choices, such as smoking cessation. This, in turn, leads to better health outcomes. With this advance in technology, a medical practice or hospital system can immediately expand access to consults from specialists. Providers enjoy fewer missed appointments and cancellations, and clinics run more efficiently. Overall, some people believe telemedicine has the potential to cut healthcare spending by reducing problems like medication non-adherence and unnecessary ER visits.



There is also a downside to telemedicine. Individuals without access to a smartphone or a computer with high speed Internet may not have access to it. As with any technology that involves transmitting personal information, like patient data, security is a concern. The required technology needs to be secure and [HIPAA compliant](#). Providers need to be trained on how to use the necessary equipment and software. Telemedicine

equipment involves some cost, as does the startup of implementing such a program. Many states require physicians caring for patients remotely across state lines to have a valid license in the state where the patient is located. This is a logistical nightmare for many doctors, and as a result some are advocating for cross-state medical licensing. Many states do not allow [online prescribing](#) without an established relationship between the physician and patient, which is presumed to be established during an in-person encounter. Critics of telemedicine argue it reduces [continuity of care](#). Patients may see a random doctor who doesn't know them, or their entire medical history. Some believe online interactions are impersonal. Others maintain, more often than not, physical exams are necessary to make a full diagnosis.



Guidelines

The American Medical Association (AMA) has a set of [ethical guidelines](#) for physicians practicing telemedicine. According to these guidelines, physicians are expected to follow the same standards they would for any in-person medical visit (code of ethics, HIPAA guidelines, documentation requirements, credentials and licensing). Specific to remote healthcare, physicians are expected to be proficient in the use of the relevant technologies and comfortable interacting with patients electronically. Providers should recognize the limitations of the technology and take appropriate steps to overcome them. They must ensure they have the information they need to make well-grounded recommendations when they cannot personally conduct a physical examination. In addition, clinicians are expected to provide patients with a basic understanding of how telemedicine technologies will be used in care, the limitations of those technologies, and what will be expected of patients for using them.

Policies for reimbursement of remote healthcare services are complicated and vary from state to state. Many have [parity laws](#) that require reimbursement for telemedicine visits the same way as if the service was provided in-person. In order to be reimbursed for telemedicine services, some states require providers to obtain patient consent beforehand. [Medicare](#) will only reimburse for certain remote healthcare services and providers. Medicare restricts the eligible locations for reimbursement to rural areas and those designated as having a shortage of health providers. Interestingly, according to Medicare, a patient's home is not currently an eligible site from which to receive care. In addition, Medicare will only pay for certain facilities to provide services, such as a doctor's office, hospital or rural health clinic. [Medicaid](#) reimbursement varies for each state, but most states offer some form of coverage for telemedicine services. Similar to Medicare, there are reimbursement limitations for patient settings and facilities. A summary of reimbursement policies by state can be found [here](#).

Remote medical services are an increasing component of healthcare delivery in the United States. Recent advances in technology hold great potential for the future growth.

[Smart glasses](#) and [smart watches](#) are now able to monitor patients' health data and transmit them in real time to health professionals. [Face tracking technology](#) allows computers to read facial expressions, which may be used to monitor mental/emotional health. These technological innovations make the collection and transference of medical data easier and faster. Researchers are studying ways telemedicine can benefit people

living with MS. As mentioned in our [April 2019 newsletter](#), the Patient-Centered Outcomes Research Institute (PCORI) has funded three studies to determine the effectiveness of telemedicine in helping people with MS



improve their level of physical activity and deal with fatigue. [Researchers](#) at the University of Michigan are conducting a study using a wrist-borne sensor to measure the effects of two different treatments for fatigue: cognitive behavioral therapy delivered by phone and the wakefulness-promoting drug, Modafinil. Another fatigue [study](#) at Case Western Reserve University is evaluating the effectiveness of three different forms of fatigue management: in-person instruction during medical visits, online instructions and a telemedicine platform using video visits. [Investigators](#) at the Shepherd Center in Atlanta are comparing traditional exercise therapies at a gym or rehab center with a telerehabilitation therapy available to patients at home.

A [recent study](#) from UCSF demonstrates many benefits of telemedicine for MS providers and patients alike. Five physicians at a large MS practice and their patients were surveyed about their experience following both in-person and televideo visits. The vast majority of MS providers (96%) were satisfied with patient evaluations conducted remotely. One third of patients with MS didn't need to take time off from work and over half didn't need to arrange for childcare for their remote visit. Patients strongly agreed (86%) that they had achieved their goals for their televideo visits. The care received remotely and in-person was perceived as similar on all but one quality measure, which was eye contact (84% reported "extremely good" eye contact during their remote visit compared 99% for in-person visits).

[Dr. Mitchell Wallin](#) has overseen a number of clinical studies on the use of telemedicine in MS care. One [study](#) suggests a visit conducted via telemedicine is comparable to an in-person visit. Specifically, data showed the difference between neurological exams conducted remotely and in person are comparable to those conducted by different neurological examiners directly assessing the same patient. In Dr. Wallin's words, "We used high end cameras with large plasma screens so you could see really well. We did the study in two separate clinics, one was in Washington, DC and one was in Baltimore. We had a nurse practitioner or physician's assistant doing the exam. They were the tele-presenter. I was one of the people at one end and another MS neurologist was on the other end. An independent person did a live EDSS and we did the remote one. We correlated all of the functional systems. Bottom line is it correlated pretty well... We did the same thing with lower end cameras that mocked the home environment. There was a tech that helped with the exam. Obviously we can't do every single aspect of the exam, but we did get pretty good correlation there, too. With some help, you can actually do pretty well in the home. It's not the same as being live, but I think it gives you much more than a telephone call." [Researchers](#) in Israel have also shown that telemedicine is an effective way to monitor people with MS at home. Dr. Wallin's research team has also [studied](#) the feasibility of using home telehealth monitoring to improve clinical care and promote symptom self-management among veterans with MS. Data indicate telemedicine monitoring is both feasible and well received (87.5% of subjects rated their experience with telemedicine as good or better).



A recent [commentary](#) concluded telemedicine has the potential to transform the future of medicine in both rural and urban settings by improving access to medical care and providing a more affordable way to deliver it. Authors suggest low reimbursement rates and lack of interstate licensing are the main obstacles limiting its widespread use in the United States. In spite of this, demand for telemedicine will likely continue to rise. When asked if he thinks telemedicine is the future of MS patient care, Dr. Wallin states, "The short answer is yes. I

