



Becoming a Certified Telemedicine Professional

Here's how to take telemedicine to the next level.

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Telemedicine has reached critical mass: 48% of all physicians are actively using telemedicine to communicate with their patients.¹ The use of telemedicine has increased significantly since March 2020 when CMS waived requirements that limited telemedicine to distant site communication between patients and physicians and permitted it to include all patients who have Medicare and Medicaid. In addition, CMS has agreed to compensate physicians for virtual visits at the same rate as person-to-person visits.

It is now possible for physicians to provide safe and effective care without the necessity of examining the patient. We estimate that nearly 60% of primary care physicians' patients can be managed using telemedicine (Neil Baum, unpublished survey). However, limited physical interaction with the patient will require both professional regulation and protection against the potential for liability and litigation.

Physicians and other allied healthcare providers may feel compelled to increase their presence online for reasons of efficiency, increased demand from patients for

tance communication for both military and medical purposes using fires, smoke signals, light reflection, drums, and pigeons. Native American tribes also used smoke signals to

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virtual visits, and ability to compete with other physicians who offer telemedicine services.

Brief History of Telemedicine

The forerunner of telemedicine actually was used in ancient times. The history of telemedicine closely parallels the history of communication and information technologies. The key technical feature of telemedicine is being able to communicate medical data over a distance. The history of remote medicine actually begins around 500 BCE, when ancient Greeks and Romans used long-dis-

relay medical calamities and health events.

Telemedicine technically has been around ever since the invention of the telephone. The first article about telemedicine in a medical journal was published in *The Lancet* on November 29, 1879. It discussed how the "new" telephone could be used by doctors to reduce unnecessary office or home visits.²

Modern telemedicine was jump-started with the inventions of the electrical telegraph and the telephone. During the U.S. Civil War,

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the telegraph was used for ordering medical supplies as well as communicating deaths and injuries on the battlefield.³ With the telephone, the era of the connected world arrived.

Major city hospitals and doctors' offices installed telephones. Within a few years, many city residents also had telephones in their homes. Now physicians could talk over the telephone to their patients and give medical advice directly. Unfortunately, until recently, there was no business model for compensation for telemedicine for doctors who communicated with their patients over the phone. Doctors gave advice, diagnosed medical conditions, and prescribed medications using their cognitive skills but received no compensation for this level of communication. Also, the doctor was held legally responsible for the decisions that were communicated to their patients over the telephone.

With the rapid rise of the use of telemedicine in many areas of medical practice, doctors will be able to increase their communication with their patients and be compensated appropriately.

Some of the earliest uses of tele-

the Internet as a communication tool. Many private practices and healthcare systems are in the process of allowing patients the choice of seeing their medical provider either through telemedicine or in person. Kaiser Permanente has reported that in 2017

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medicine came in the 1960s and the 1970s, providing access to healthcare in rural areas and for medical emergencies in urban areas. The rise of the Internet in the 1990s provided support for practically all information and technology needed for telemedicine.⁴

Telemedicine has fully embraced

more visits were conducted via telemedicine than face-to-face.⁵

Birth of Modern Telemedicine

The recent development of telemedicine has been facilitated on two fronts: 1) advances in electron-

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ic methods of communication; and 2) the pioneering efforts of a few organizations and individuals. The former generally represented the interests of high-tech ventures, such as the manned space-flight program of the National Aeronautics and Space Administration (NASA).

A major step in the development of telemedicine was the introduction of television. By the late 1950s, developments in closed-circuit television and video communications were being used by medical personnel who began to employ them in clinical situations. As early as 1964, a two-way closed-circuit television system was set up between Nebraska Psychiatric Institute in Omaha and the state mental hospital in Norfolk, 112 miles away.⁶

The system permitted interactive consultations between specialists and primary care physicians, and facilitated education and training at the distant site. Another early example of television linking doctors and patients, established in 1967, was at Massachusetts General Hospital/Logan International Airport Medical Station.⁷

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This facility used a two-way audiovisual microwave circuit and permitted healthcare to be provided to passengers and airport employees 24 hours a day by nurses, supplemented by physician expertise using an audiovisual link. More recently, the wide availability of video-conferencing has led to major growth in telemedicine. This has been made possible because of improvements in digital communications and introduction of low-cost computing, with many of the video-conferencing systems now based on personal computers and even on smartphones.

The recent developments of cellular phones, tablets, personal computers, and satellite communications have made mobile telemedicine possible. Early examples of such programs were the Alaska ATS-6 Satellite Biomedical Demonstration, in effect from 1971 to 1975, which assessed the viability of improving village healthcare in Alaska using satellite-mediated video consultation.⁸

The Value of a Telemedicine Certificate

This is an exciting time to be in healthcare. The landscape is changing dramatically, and the rules and regulations are changing almost daily. Physicians and other healthcare providers must embrace new technology to assist in taking care of patients. The COVID-19 pandemic

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quickly brought telemedicine to the point where doctors and patients embraced the technology. This is due in no small part to CMS waiving HIPAA restrictions and allowing reimbursements that were equivalent to those for in-person visits to the doctor's office.

Is There a Way to Provide Care to Patients Without Accidental Exposure to COVID-19 or Other Communicable Diseases?

Telemedicine seems to offer an answer regarding the safety of office staff and providers. The World Health Organization defines telemedicine (also called telehealth) as the "the delivery of healthcare services, where the distance between the provider and the patient is a critical factor for the exchange of valid information for diagnosis, treatment and prevention of disease and injuries."⁹ Basically, telemedicine is using technology to evaluate and treat patients who are at a location separate from the physician.

Before the COVID-19 pandemic, telemedicine was more of a niche practice. Most insurances, including Medicare and Medicaid, made it difficult to facilitate telemedicine visits between a patient and their doctor, and most of these physician interactions were uncompensated. With the onset of the pandemic, it was quickly realized that allowing physicians to provide care via telemedicine might help "flatten the curve."¹⁰

Physicians can interact with patients using telemedicine in several ways. Some are synchronous, whereas others are asynchronous. Synchronous platforms are live, audiovisual communication directly with the patient. Examples of this include Zoom, Hale Health, Google Hangouts, Dox.me, and Doximity. Asynchronous platforms do not take place in real time. Examples include email and patient portal interactions.

Why Should Healthcare Professionals Be Trained and Certified in Telemedicine?

Patients have quickly adapted to this new technology. Patients de-

sire, and expect, quick access to their physician. Many patients have multiple, complex medical conditions; for them, getting out of the house, to the office, and then back home is a tremendous burden. They nervously sit in a waiting room, waiting to hear their names called, while surrounded

and ECG monitoring to actually see and hear the patient's lungs, oropharynx, tympanic membranes, and heart rate and rhythm.

Along with knowing what can be done via telemedicine, it is just as important to learn what cannot be done through telemedicine. If there is a

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by coughs, sneezes, runny noses, and stomach bugs. If they can receive adequate, effective, and professional care in their homes, much of their fear and worry can be attenuated. Perhaps their long-term outcomes will improve as well.

As physicians, we are used to regularly updating our skills with reading, attending live or virtual conferences, and direct "hands on" training. In truth, by taking a good history, we can get most of the information we need to direct a patient's care. And, although there are limitations, you can perform a physical exam through the use of telemedicine. Using audio-only communication (like routine phone calls), we can listen to the patient's speech patterns to tell if they are in distress (e.g., extremely dyspneic, unable to speak more than a few words at a time); depressed (e.g., slow, unemotional or suicidal talk); or manic (e.g., pressured speech, grandiosity, rapid change in topics); and whether they have proper insight into their disease process.

It is possible to use audiovisual communication to perform a very thorough exam. For example, you can watch the patient get up from a chair and walk across the room, look at their rash, see if they have pitting edema, move a painful extremity, and watch many of their cranial nerves function as they smile, laugh, raise their eyebrows, and so on. In fact, as technology improves, it is becoming easier to use interactive, connected, medical equipment such as stethoscopes, ophthalmoscopes, otoscopes,

poor connection, a physician may not be able to see the rash. Inadequate cell phone reception can make it difficult for the doctor and the patient to hear each other. And some problems, such as chest pain or abdominal pain, still need a trained, in-person physical exam. Furthermore, we must not forget that healthcare providers are more than just technicians. No matter how good an Internet connection you have, you may not be able to console the grieving parent or spouse with a gentle touch of the hand; people still need a shoulder to cry on in times of distress.

By obtaining professional certification in telemedicine, we can show patients that we are staying abreast of the latest developments in healthcare. A formal certification in telemedicine is more than a diploma on the wall. Certification is a symbol of our sacred promise: *Primum non nocere*, or first, do no harm.

Telemedicine and tele-education in health science is gradually spreading across the country. Advancement in telecommunication, information science, and technology provides an opportunity to exchange knowledge and skill across geographically dispersed organizations by networking academic medical centers of excellence with medical colleges and institutes to practice distance learning using information and communication technology-based tools. These may be as basic as commonly used Web-based tools, such as blogs, discussion boards, online multimedia, and mobile technologies, or as

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advanced as virtual reality, simulation, and telepresence-based collaborative learning environments.

Various modules of telemedicine education are being offered at the University of Tennessee regarding the use of telemedicine for patient care and also as a tool for remote care physicians to use to develop their skills. The distance medical education modules that have been adopted include virtual clinical grand rounds, lectures, tele-CME, teleconsultations, telepathology, teleradiology, tele-follow-up, and telementoring. This distant education program has immensely benefited postgraduate students and physicians in enhancing their knowledge and keeping them abreast of recent advances in patient care and research in various specialties.

The Future of Telemedicine

Remote patient monitoring is going to be an important piece of the telemedicine puzzle in the near future. Remote patient monitoring involves using digital technology to collect medical data from a patient in one

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location and electronically transmitting that data to a healthcare team in a different location.¹¹ The healthcare team, consisting of physicians, nurses, and other medical professionals, can remotely monitor a patient's pulse rate, oxygen saturation levels, and blood pressure using digital technology. These patients otherwise might have had to remain hospitalized for their COVID infection or other medical issue; instead, they can spend more time comfortably recovering at their own home.

In addition to remote patient monitoring tech, other tools are being developed and used in telemedicine. Ultrasound machines have gone from room-sized devices to digital wands that can wirelessly connect to a smartphone, tablet, or computer. Everything from echocardiograms to focused assessment with sonography for trauma (FAST) scans can be taken with these devices. The images can then be sent to a cardiologist or radiologist at a remote location to be read in mere minutes. Companies like ButterflyNetwork, SonoSite, and Clarius are designing and building smaller and smaller ultrasound devices that can take advantage of telemedicine.

The future of telemedicine involves the evolution of simpler, widespread devices that physicians have been

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using for decades. Digital stethoscopes, otoscopes, and ophthalmoscopes are becoming ubiquitous. With some brief training, someone could potentially place a stethoscope to their spouse's chest to let a remote physician hear heart and lung sounds. Similarly, a provider at a great distance from the patient may be able to actually "see" a patient's

come a public utility, just like electricity, which will make the technology available to everyone, including those in rural areas.

Conclusion

Considering the limited health-care resources available in remote and rural regions, telemedicine has the potential to make optimal use of the few available resources. Universities are now demonstrating the

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tympanic membrane or tonsils, which leads to an accurate diagnosis without having the necessity to touch or examine the patient.

Chronic disease management represents an untapped market for telemedicine. Patients with chronic conditions often require frequent visits to the doctor. Telemedicine can target these patient populations, which has the potential to decrease the number of emergency room visits and hospital admissions, improve outcomes, and, ultimately, decrease costs.

The future of telemedicine also will include the model of the "hospital at home," where patients who meet the criteria for hospitalization but are otherwise stable are treated at home for diseases such as chronic obstructive pulmonary disease, pneumonia, and heart failure. Studies have shown that the hospital-at-home model, when used appropriately, is more cost-effective than hospitalization.¹²

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One of the obstacles is the need to expand the use of broadband Internet connectivity to all Americans. In order for telemedicine to become universal, everyone needs to have access to high-speed Internet service. Perhaps broadband Internet may be-

effectiveness of telemedicine training in the fields of patient care, training, education, and skill development. There are limitations in deployment and sustaining such initiatives, however, because they need commitment and the support of all the stakeholders. Now a certification for application and use of telemedicine is available for those who wish to take their interest in telemedicine to the next level. **PM**

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