

# Unlocking the Potential of Physician-to-Patient Telehealth Services

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Imagine a world where patients in rural areas far from a nearby doctor can easily find a health care provider to consult with online from the comfort of their own homes; where doctors living in Pennsylvania can help reduce the backlog of patients waiting to see doctors in Mississippi; and where patients can connect to a doctor over the Internet for routine medical purposes with a few clicks of the mouse—like they do when ordering a book on Amazon. Fortunately, this vision could soon become reality, but only if the federal government and the states work quickly to remove regulatory barriers that limit the deployment and adoption of provider-to-patient telehealth capabilities.

Within the past five years, a combination of advancements in information technology (IT), including electronic health records, high-definition video conferencing, remote patient monitoring, mobile devices and networks, and ubiquitous broadband networks, has created an opportunity to leverage telehealth services to improve our national health care system. Health care workers can use telecommunications technology to provide clinical services to patients, to monitor patient health, to consult with other health care providers, and to provide patients access to educational resources. Importantly, the technology has reached the point where, in many situations, health care providers can use IT to offer a comparable quality of clinical health care services remotely as they could in person. For example, the widespread adoption of mobile devices like the iPad and iPhone, as well as the deployment of mobile broadband networks, means that a large number of Americans have access to low-cost, high-quality video conferencing capabilities. While telehealth services will certainly not replace all in-person clinical visits, they have the potential to be an important alternative in many cases, while also saving money and increasing convenience.

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However, the regulatory and policy environment has not kept pace with the technology, and several barriers must be overcome before patients and doctors in the United States can fully enjoy the benefits of telehealth. Steps needed include: establishing common standards of care for patients; simplifying inter-state licensing requirements for health care providers; and creating reimbursement policies that support telehealth services. This report describes the new telehealth opportunity, analyzes the benefits from telehealth, examines the barriers to widespread adoption in the United States, and proposes a number of recommendations for government. In particular, policymakers should:

- Adopt a standard definition for telehealth;
- Establish a single, national license for telehealth providers;
- Create technology-neutral insurance payment policies;
- Promote interoperability among state prescription drug monitoring programs; and
- Fund research to continually improve the quality and lower the cost of telehealth programs.

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## THE TELEHEALTH OPPORTUNITY

There is no widely accepted definition of telehealth or telemedicine, and these terms are sometimes used interchangeably. In this report, telehealth refers to health care services provided directly to patients using telecommunications technology, including the Internet and the telephone. Health care providers can use telehealth to remotely diagnose, treat, and manage the care of their patients.<sup>1</sup> Patients can be seen remotely by physicians in their homes, places of work, or at a dedicated telehealth center, and physicians can treat patients remotely from a hospital, medical facility, or other places of work including their own homes or even while on vacation, as long as they have access to the Internet. The ability to connect physicians and patients without regard to their respective locations is one of the most compelling benefits of telehealth services.

While also important, telemedicine services such as teleradiology, where a radiology specialist provides a service to another physician, or consultations provided remotely by specialists to patients in a hospital or other medical facility are not a focus of this report. Nor are other beneficial health care technologies, like mobile apps, smart pill bottles, and other Internet-connected devices that help consumers manage their care, send them alerts, and provide them educational resources. While these related technologies do offer insights on the potential benefits of telehealth, this report focuses primarily on physician-to-patient services whereby patients receive physician care from home, a place of work, or any location other than a doctor's office.<sup>2</sup>

There are multiple types of telehealth services including:

- Real-time services: Health care providers interact with patients in real time to provide clinical services as a substitute for in-person encounters. These encounters use communication tools like interactive, two-way video conferencing, online text-based chats and messaging, and the telephone. For example, patients may use their home computer to connect to a doctor using a telehealth service, sharing

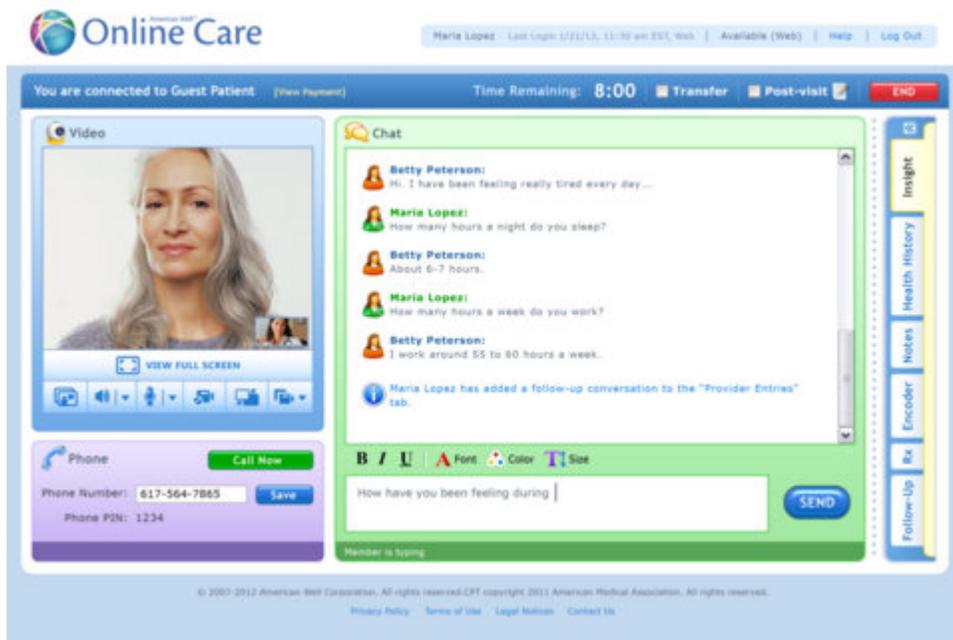
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their medical records and communicating with the doctor in real time via video conferencing.

- “Store-and-forward” services: Health care providers analyze clinical data after they have been collected using asynchronous communications tools such as email. For example, teleradiologists may interpret radiological images or ophthalmologists may read retinal images that are sent to them from another facility.
- Remote monitoring services: Health care providers use IT to remotely monitor and collect data on the health of patients while in their residence or care facility. For example, remote monitoring has helped reduce mortality and hospital readmissions in patients with congestive heart failure.<sup>3</sup> In one study, patients who used in-home monitoring to track indicators such as their weight, blood pressure, and heart rate, had hospital readmission rates that were 44 percent lower than those receiving standard care.<sup>4</sup>

Telehealth represents an opportunity to not only improve clinical encounters, but also the entire patient experience. Using telehealth services, patients wanting to see a provider will be able to go online, perhaps to a website provided by their health insurer, and quickly find physicians who can see them immediately. Patients will have the opportunity to review the profiles of the physicians, including their medical degrees, board certifications, and patient ratings. Once patients choose a provider, they will be able to make their electronic health records available to the physician. The patient will then be immediately connected to their physician (see Figure 1). After the encounter, physicians will send any prescriptions electronically to the patient’s preferred pharmacy and add clinical notes to the patient’s electronic health record. Payment will be handled automatically, and patients will be able to leave feedback for other users.

Adoption of telehealth in the United States is still relatively low, although demand appears to be high. The Pew Internet and American Life survey found in 2013 that a majority (59 percent) of U.S. adults has looked online for health information in the past year.<sup>5</sup> When asked what they did the last time they were sick, 70 percent of individuals responded they sought treatment or information from a healthcare provider; however, only a small fraction of those individuals used telehealth services. Only 1 percent of all respondents reported exclusively receiving care or information from a physician or other health care provider online; 8 percent reported receiving care from a health care professional both online and offline.<sup>6</sup>



**Figure 1: User interface for American Well, a telehealth provider.**

Data about health care providers similarly reflects the low level of adoption of telehealth services. A recent review of Medicare claims data from 2009 (the most recent year for which data has been made available) found that only 369 health care providers had provided ten or more telehealth services in the previous year.<sup>7</sup> In addition, only approximately 40 percent of U.S. hospitals have implemented telehealth services.<sup>8</sup>

## THE BENEFITS OF TELEHEALTH

Telehealth services overcome a number of barriers in traditional health care practices and offer patients and providers multiple benefits, including improvements in health care quality, more convenience, and lower costs. Many of the benefits overlap. For example, lower costs and greater convenience encourage patients to see a doctor sooner, which can often lead to better health care outcomes.

### Quality

Telehealth has shown the potential to connect doctors with patients without diminishing the quality of care the patients receive, and in some cases, even improving it. Many physician-to-patient interactions that used to be conducted face-to-face can now be completed over the Internet using videoconferencing or store-and-forward technology without sacrificing the quality of care. In addition, remote monitoring serves as a complement to traditional in-person treatment and has the potential to improve quality of life and health outcomes for those with chronic diseases.

Telehealth consultation using videoconferencing technology can improve efficiency without diminishing the quality of care provided. Depending on the nature of care being provided, benefits of using telehealth technology can be substantial. In specialties where most of the interaction with the patient is verbal, such as psychiatry, neurology, or genetic

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counseling, research has found that telehealth services can be just as effective as traditional face-to-face visits.<sup>9</sup>

One provider of telehealth services in the United States is Teladoc, which provides patients 24/7 access to a doctor by phone or Internet. It provided 120,000 patient consultations in 2013.<sup>10</sup> A study of the Teladoc service found that the most common conditions for which patients sought treatment were acute respiratory illnesses, urinary tract infections, and skin problems. While there has not been an extensive review of the quality of care, one study found that patients using Teladoc were less likely than patients receiving in-person treatment to need follow-up visits for the same condition.<sup>11</sup>

An area where telehealth has had particular success is in dermatology. Dermatologists often make diagnoses based on conversations with patients and visual examinations, and so videoconferencing has proven remarkably effective. Multiple studies have found that dermatologists can diagnose patients just as reliably at a distance as they can in person using either store-and-forward technology or live video conferencing.<sup>12</sup> Patients can easily snap a picture and send the digital image to their doctor and have a virtual face-to-face conversation. Kaiser Permanente Northern California reports that its dermatologists have been able to diagnose and treat 80 percent of the cases they see using only a virtual encounter.<sup>13</sup>

Telehealth is also useful for managing chronic diseases. Chronic diseases, which are prolonged in duration and unlikely to go away, include diabetes, asthma, conditions of the circulatory system, heart disease, and mental illness. These diseases, once diagnosed, are best treated with continual care. Traditional office visits leave much to be desired. Treating a chronic illness can be expensive and time-consuming for a patient, who often must take off time from work to travel to and from the doctor's office, wait to be seen, and then spend time at the appointment. Gaps in care can lead to unnecessary hospital stays and contribute to morbidity. Telehealth programs can help place remote monitoring systems in patients' homes to track vital statistics and generate daily reports on their condition; such information is then relayed to caregivers. In addition, when they do need to consult a caregiver, they can often do so remotely.

The Veterans Health Administration (VHA) became the largest user of remote monitoring in the United States after it implemented a national program in 2003. The Care Coordination/Home Telehealth program uses telehealth technology to monitor and care for over 92,000 veterans with chronic diseases or recovering from recent hospitalization.<sup>14</sup> The majority of these patients (85 percent) use messaging and monitoring devices to track vitals and provide daily reports on their condition. Fifteen percent use either video telemonitors or videophones that allow doctors to communicate audio-visually with the patient.<sup>15</sup> Nurses are able to track changes in vitals and conditions remotely and have the ability to intervene before negative trends become serious enough to require hospitalization.

The main benefits reported by the VHA come from reducing unnecessary hospitalizations. The VHA reported that its post-cardiac-arrest care program resulted in a 51 percent reduction in hospital readmission for heart failure and a 44 percent reduction in

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readmission for other illnesses. Patients reported high levels of satisfaction with the quality of care they received, were better educated on their condition, and reported feeling more motivated to improve and more involved with their treatment.<sup>16</sup> The VHA also reported significantly lower hospital readmission rates for patients using remote monitoring at home to track chronic obstructive pulmonary disease, and diabetes.<sup>17</sup>

The largest controlled experiment of telehealth in the world, conducted by the British Department of Health, found that telehealth patients spent around 14 percent less time in hospital beds and emergency rooms than other patients. More strikingly, the study found a 45 percent reduction in mortality rates among patients using remote monitoring systems.<sup>18</sup> The study concluded that up to three million British citizens with chronic diseases could experience life improvement with remote monitoring systems. While many different studies on telehealth programs produce a wide array of results, the existing literature supports the hypothesis that telehealth can reduce hospital visits and mortality.<sup>19</sup>

Telehealth also has the potential to improve the level of care patients receive in intensive care units (ICUs). ICUs in the United States serve six million patients per year at the cost of a full 1 percent of GDP.<sup>20</sup> The use of electronic intensive care units (eICUs) allows physicians who specialize in intensive care to serve multiple patients in different locations using telecommunications. Having an intensivist on call is important for improving health care outcomes, but it is an expensive proposition for smaller hospitals. The University of Massachusetts Memorial Medical Center found in a limited study that use of eICUs reduced mortality by 20 percent, and estimated that a state-wide eICU initiative would save 350 additional lives and \$122 million per year.<sup>21</sup>

### Convenience

Using videoconferencing and remote monitoring can increase efficiency and convenience for both physicians and patients. Patients who can be seen by a doctor remotely will not have to spend as much time traveling and waiting to be seen by a doctor. Even with appointments to see doctors, patients usually spend considerable time in waiting rooms reading three month old magazines. In fact, nationwide patients spend an average of 23 minutes in the waiting room before seeing a doctor.<sup>22</sup> Using the average hourly wage in the United States as the lost opportunity cost of that waiting, if 25 percent of primary care office visits were done using telehealth instead of in person, Americans would save \$1.2 billion per year, and if we assume that the average travel time to and from the doctor is 70 minutes, the total cost savings would exceed \$5 billion.<sup>23</sup>

Appointments can take place in a home or office setting, reducing absenteeism from work and school. In addition, telehealth can make it easier for patients with limited mobility or patients who do not have access to transportation to see a health care provider.<sup>24</sup> Elderly individuals unable to drive, for example, can see their doctor without having to leave home.

Long wait times to see a doctor are a problem in cities across the United States. The average wait time for a new patient to see a doctor is 18.5 days, and in some cities like Boston, the average wait time to for a new patient to see a family doctor is 66 days.<sup>25</sup> Because telehealth allows patients to access doctors throughout the entire nation, not just

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those nearby, telehealth represents an opportunity to decrease the wait time for patients to consult their doctors, leading to faster diagnoses and answers to time-dependent inquiries and concerns. Even in cases where the condition cannot be diagnosed using telehealth, virtual consultations can help patients quickly learn when it is important for them to see a doctor in person immediately and when they can wait. In health care areas where early identification of illnesses is a key component to successful treatment, the efficiency promoted by these technologies can potentially be life-saving.

Telehealth services allow health care professionals to be more productive, an increasingly important goal given the shortage of health care workers available to meet the needs of an aging population and the millions of additional Americans who now have health insurance under the Affordable Care Act. Seeing patients online allows physicians to see more patients in a day with less paperwork to complete. In addition, doctors have the freedom to consult with patients from their own homes or even when they are on vacation, expanding the time they are available to provide care. Most importantly, doctors using telehealth systems can treat more patients. After Kaiser Permanente implemented a teledermatology program, they were able to handle 50 percent more cases than was possible with face-to-face interactions.<sup>26</sup> In addition, such a system allows easy access to specialists in the field and the potential to conference in more than one doctor to help make a diagnosis or answer specific questions.

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The benefits of virtual doctor-to-patient interactions are particularly pronounced in rural areas. Telehealth can help increase access to basic healthcare for underserved populations who may live far from a health care provider, who live in an area where there is a low number of physicians per capita, or who otherwise do not have affordable access to health care. Telehealth can increase patients' access to specialists. Specialists in a variety of fields including oncology, pediatrics, gynecology, and geriatrics, use telehealth services to provide care. Individuals living in more remote areas may otherwise have less access to some of these types of physicians.

The state of Arkansas has for the last ten years engaged in a major push to connect rural patients with its research hospital in Fayetteville. The state, which has a shortage of specialists in many of its rural areas, has used telehealth services to improve access to specialists such as neurologists and cardiologists.<sup>27</sup> Using a telehealth program to provide obstetrical advice so that women with high-risk pregnancies could be directed to hospitals with neonatologists on staff, Arkansas saw its sixty-day infant mortality rate decline by 0.5 percent.<sup>28</sup> The state has since expanded its telehealth program to include a variety of medical services previously unavailable to many of its residents.

While Arkansas' efforts were mostly limited to within that state, the potential for interstate or even international collaboration is high. In the future, rural Arkansans could be electronically linked to specialists in Massachusetts, New York, or even abroad. Telehealth can ensure that health care professionals are efficiently allocated where they are needed. A surplus of doctors in New York, for example, can help fill excess in demand in North Dakota. Telehealth can help better connect doctors and patients regardless of location,

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reducing wait and travel times for patients and ensuring higher productivity for health care workers.

### Cost

Telehealth programs can decrease health care costs by improving the quality of care and keeping those with chronic illnesses stable and out of hospitals. In addition, online health care providers able to identify and resolve health issues before such issues become dangerous, save money on future costly treatments by avoiding these through early detection. As discussed earlier, a number of largely unmeasured cost savings also exist, such as the travel time spent by patients and doctors traveling to in-person visits, as well as the lost work time spent on these appointments.

The overall economic impact of adopting large-scale telehealth programs has not yet been fully assessed; however, several case and observational studies have reported significant savings resulting from telehealth programs, especially from the use of remote monitoring systems to treat chronic illnesses. For example, many nursing homes use on-call physicians to provide services to residents after hours or on weekends. On-call physicians can recommend hospitalizing patients when clear health care problems arise, eliminating the need to travel to the nursing home to evaluate the patient. Using telehealth services, nursing homes could also reduce the number of avoidable hospitalizations.<sup>29</sup> In the VHA study noted earlier, hospitals saved \$9,655 per patient from reductions in hospitalizations. In comparison, the cost of the program was only \$1,600 per patient.<sup>30</sup> Other observational studies have reported similar results. Another study by the VHA reported significant declines in re-hospitalization among veterans with congestive heart failure, chronic obstructive pulmonary disease, and diabetes, which resulted in cost savings between \$1,000 and \$1,500 per patient.<sup>31</sup> A study on using in-home monitoring for congestive heart failure for 3,000 patients in Boston led to \$10 million in savings over six years.<sup>32</sup>

Not all studies found telehealth to be cost saving, however. While a 2010 review of statistically rigorous studies found that 61 percent of studies found telehealth to be less costly than the alternative, 31 percent did find telehealth to be more costly.<sup>33</sup> In addition, the British Department of Health found that costs for providing telehealth care were roughly comparable to traditional care.<sup>34</sup> Yet, given the substantial differences between the American and British health systems, this result may not be relevant to U.S. policy.

Cost savings are important in the light of predicted future incident rates of chronic diseases. Several trends have intensified the problem of chronic illnesses in the United States. Dramatic increases in life expectancy means seniors are living longer with chronic diseases and on average contracting more chronic conditions. Ninety percent of Americans over the age of 65 have been diagnosed with a chronic illness, and 75 percent have at least two.<sup>35</sup> Many of these diseases require constant monitoring and frequent care. Treating chronic diseases takes up the majority of the Medicare budget, and has contributed to skyrocketing spending on health care in the United States. The problem is set to get worse as the baby-boomer generation prepares to retire. For example, the number of patients in the United States treated for heart disease is expected to increase by 40 percent in the next ten years, and the number of patients treated for cancer and diabetes will increase by 50

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percent.<sup>36</sup> These trends help explain projected increases in U.S. health care costs, which are expected to reach almost 20 percent of GDP in the United States by 2022.<sup>37</sup> Needless to say, greater efficiency and lower health care costs are needed or else the United States could find itself making large sacrifices to care for elderly patients. Using telehealth to provide care for individuals with chronic diseases is a potent solution for reducing health care costs.

## **WHAT ARE THE BARRIERS TO TELEHEALTH?**

Progress in implementing telehealth has so far been disappointingly slow. Despite the widespread availability of the necessary technologies and significant interest among patients, most individuals in the United States do not have routine access to telehealth services because of states and federal laws prohibiting or curtailing its use. In particular, to overcome existing barriers to telehealth, changes are needed in state and federal policies about when and how telehealth services can be provided, how out-of-state providers are licensed, and how telehealth services are reimbursed.

### **Standards of Care**

Each state medical board defines the standard of care that physicians must provide to patients. These state medical boards can decide whether physicians can provide telehealth services and the conditions under which they can provide it. If state medical boards do not properly outline what is allowed, physicians may be reluctant to provide telehealth services since they may be exposing themselves to potential malpractice lawsuits. For example, physicians may insist on seeing their patients in-person to avoid any potential liability arising from the differences in care provided from an electronic encounter versus an in-person one.

Some states have in fact created laws and regulations that impede the adoption of telehealth services. In particular, a number of states insist on a physical encounter to establish a physician-patient relationship. If this relationship is not established, physicians are not permitted to treat patients or prescribe them drugs thereby severely limiting what they can do.<sup>38</sup> Patients may be able to see physicians who they have a pre-existing relationship with, but they cannot see a physician who they have never seen before, is only seeing patients online, or is not local. These restrictions severely limit a patient's choices in telehealth providers thereby negating many of the benefits of telehealth. They also limit the viability of physicians providing telehealth services on a large geographic scale.

There are some exceptions to these policies. Some states, such as West Virginia, affirmatively allow providers to establish a physician-patient relationship using telehealth. In Texas, physicians can treat patients so long as they adhere to the same standards required for in-person clinical visits. This flexibility allows physicians to determine for themselves whether they have sufficient information to diagnose and treat a patient using telehealth. Other states allow online prescribing if certain conditions are met. Louisiana, Mississippi and New Mexico, for example, allow physicians to prescribe drugs online if they have verified the identity of the patient, conducted an appropriate exam, and established a proper diagnosis and treatment plan, among other requirements, but they do not specify that any of these activities must be done in person.

One concern with telehealth is that it will contribute to abuses of prescription drugs, so many states have restrictions to prevent abusive online prescribing behaviors. For example, some states have adopted policies to prevent physicians from prescribing drugs based solely on online questionnaires. This type of policy is especially targeted at preventing abuses of controlled substances and do not interfere with legitimate uses of telehealth.

Finally, since each state sets its own laws and regulations, there are no national standards for telehealth. This lack of uniformity creates a serious legal obstacle for physicians who wish to practice medicine in multiple states. As shown in Figure 2, states do not even have a consistent definition of what is considered telehealth. For example, some states may require telehealth to involve real-time communication whereas others allow asynchronous messaging between patients and providers. Or one state may consider telehealth to include phone-based interactions while another requires interactive video. These definitions may not even be internally consistent, as some states may have one definition for the general population and another set of rules for their Medicaid program. This complexity means that telehealth providers must research and adhere to different rules depending on where their patients are located and who is their insurer. Creating a consistent definition for telehealth among all states is a necessary step towards unlocking telehealth services that can scale nationally.

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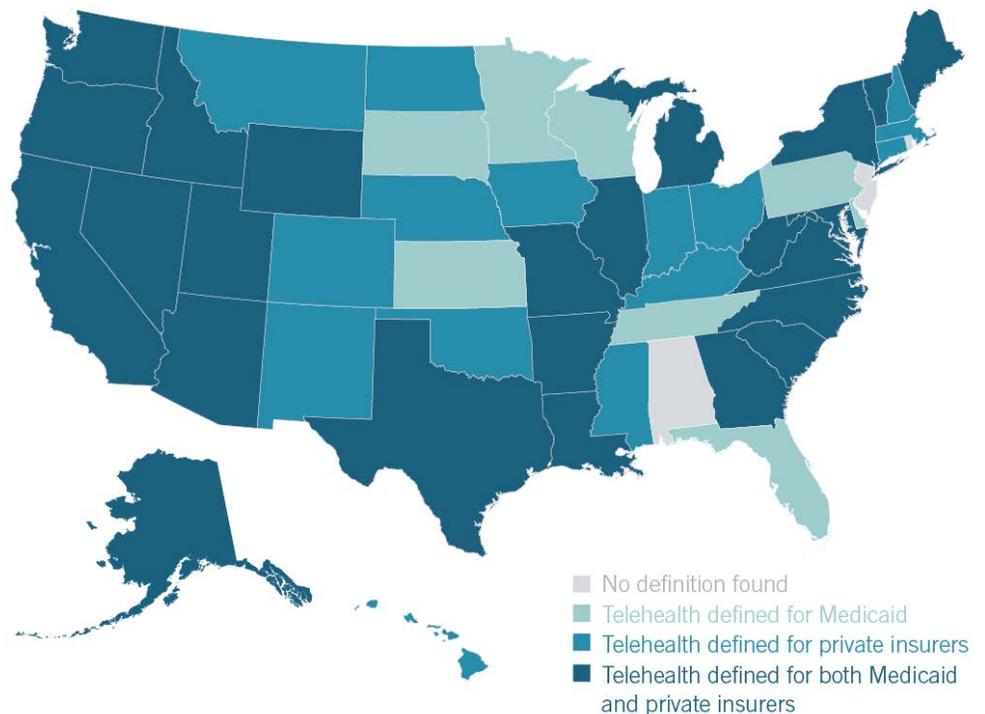


Figure 2: States with a definition of telehealth<sup>39</sup>

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## State Licensure Requirements

State licensing boards establish the conditions under which health care providers may practice within their state. In general, states require practitioners to be licensed in the state in which they practice medicine. Before the advent of telehealth, the state where practitioners worked and the state where patients received treatment were almost always the same. However, since telehealth allows practitioners and patients to be located in different locations—a patient in Florida may want to seek treatment from a doctor in New York—this condition is no longer necessarily true. This has raised legal challenges for providers wishing to provide telehealth services as the rules for licensing vary by jurisdiction. In addition, since health care providers cannot practice medicine without a proper license, a telehealth provider would potentially have to obtain a separate license for every state. These legal complexities create a costly and cumbersome process that impairs the widespread adoption of telehealth.

Although the purpose of state licensure is to protect patients from unqualified or unsuitable practitioners, there is generally little substantive difference between physicians licensed in one state versus ones licensed in another. Thus, it makes little sense to require doctors to obtain a new license for every state where they might see a patient. States can reduce the licensure burden associated with telehealth by recognizing the licenses granted to practitioners in other states. Different options to achieve this include: special purpose licenses, licensure by endorsement, reciprocal licensing, and mutual recognition of licenses. Each of these is explained below.

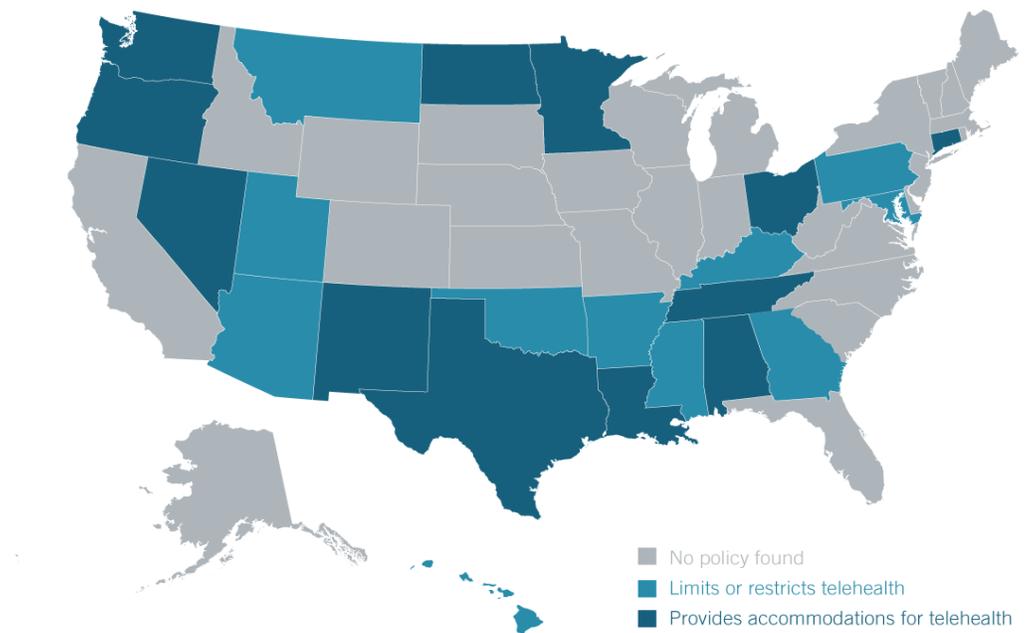
The most common option is for states to grant health care providers licensed in another state a special purpose or limited license to practice telehealth. To obtain this special purpose license, the provider must typically register with each state separately. In addition, states often have specific requirements to ensure that the telehealth license does not become a backdoor to allowing providers physically located within the state to avoid that state's licensing requirements. For example, Washington does not allow out-of-state doctors using the special telehealth license to meet with patients or make phone calls to patients while the doctor is within the state.

Another option is to allow licensure by endorsement whereby a state will grant a license to a provider who is already licensed by another state. States may restrict these licenses to certain states with similar testing requirements, require certain documentation, and require providers to meet additional requirements before granting the licensing. For example, Alabama allows doctors from any of the other fifty states and the District of Columbia to obtain a license by endorsement provided that they have passed their home state's licensing examination.

Reciprocal licensing occurs when two states recognize the license of each other and grant the other state's licensed providers the privilege to practice within their state. Unlike licensure by endorsement, providers do not have to have their credentials subjected to further review. Instead, their out-of-state license is accepted as sufficient. Some states, such as North Dakota, have given their state medical boards the authority to enter into

reciprocal licensing agreements with other states, and are actively exploring this policy, but this practice has not yet been adopted by states.<sup>40</sup>

Finally, mutual recognition of licensing occurs when states jointly develop an agreement to recognize one another's licenses. Typically, this requires states to harmonize their licensing requirements. This model has been successfully applied in nursing. In 1994, the National Council of State Boards of Nursing began developing the Nurse Licensure Compact, a model nurse licensure policy that allows a nurse licensed in one state to practice in others that are part of the agreement. To date, twenty four states have adopted the multistate license.<sup>41</sup>



**Figure 3: State licensing requirements for telehealth<sup>42</sup>**

Unfortunately, states have made little progress addressing these barriers. The Federation of State Medical Boards (FSMB), a non-profit organization representing the different state medical boards, has made multiple attempts over the past decade at increasing portability of licensing and streamlining the application process for physicians who wish to practice in multiple states. However, to date, it has had only limited success. As shown in Figure 3, only twelve states so far—Alabama, Louisiana, Minnesota, Montana, Nevada, New Mexico, North Dakota, Ohio, Oregon, Tennessee, Texas, and Washington—have put in place at least one type of policy to reduce the licensure barriers to telehealth.<sup>43</sup> An additional nine states have adopted some limited accommodations for telehealth providers, but these accommodations generally do not make it feasible for providers to offer telehealth services to a large number of patients. For example, Arizona, Mississippi and Kentucky allow telehealth providers licensed in another state to treat patients without a license if they are doing so in consultation with an in-state provider, and Utah allows out-of-state

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physicians to practice medicine within the state (such as by telehealth) so long as they do so without compensation. Other states have simply not participated in these efforts or have chosen not to adopt the recommendations of the FSMB.<sup>44</sup>

There is not one single explanation for why states have been slow to adopt reforms to make it simpler for physicians to obtain a license in multiple states, but one reason for this slow progress is that the medical community has not always embraced policies supporting telehealth reform.<sup>45</sup> Officially, the American Medical Association (AMA) now supports efforts to create uniformity in licensing requirements and improve portability between different jurisdictions; however, it has opposed efforts to create a single national system of medical licensing.<sup>46</sup> Moreover, some state medical boards may choose to use their authority to protect in-state physicians from competition from out-of-state providers.<sup>47</sup> Other professional associations have taken similar actions in the past. For example, the American Optometric Association fought to enact state laws and regulations that would keep patients from obtaining contact lenses online.<sup>48</sup>

### **Insurance Coverage and Compatibility**

One of the major barriers to the widespread adoption of telehealth has been lack of consistent reimbursement policies for telehealth services. Reimbursement policies vary from state to state. Each state determines whether its Medicaid program will reimburse for particular telehealth services and under what conditions. For example, some states only reimburse for telehealth services in certain geographic regions, such as rural or underserved areas within the state. Others restrict patients from obtaining telehealth services in their home, instead requiring them to be at a clinic.

Overall, every state's Medicaid program except Iowa, Massachusetts, New Hampshire, New Jersey, and Rhode Island reimburses at least some telehealth services, such as live video encounters.<sup>49</sup> However, only seven states (Alaska, Arkansas, Hawaii, Illinois, Minnesota, New Mexico, and Vermont) allow Medicaid reimbursements for “store-and-forward” services such as tele-dermatology which happen asynchronously. Only ten states (Alabama, Alaska, Colorado, Kansas, Louisiana, Minnesota, New York, Texas, Utah, and Washington) offer Medicaid reimbursement for remote patient monitoring in the home.<sup>50</sup>

States also can determine whether private insurers will reimburse for telehealth services. As shown in Figure 4, twenty-one states have passed laws requiring private insurers to cover some form of telehealth.<sup>51</sup> For example, Montana and Virginia require insurers to cover telehealth services and reimburse at the same rate they would for in-person services. Other states, like Georgia, New Mexico, and Texas only require coverage, but do not require that the reimbursement rate be equal to in-person services. Reimbursement policies have an impact on telehealth adoption: hospitals are more likely to adopt telehealth if they are in states requiring private payers to reimburse telehealth services at the same rate as in-person services.<sup>52</sup>



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Interoperability is also necessary for electronic medical devices, particularly those used for remote monitoring, a key telehealth service.<sup>57</sup> An industry consortium, Continua Alliance, has been formed to facilitate medical device interoperability, but currently only 40 percent of devices are standards compliant.<sup>58</sup> As a result of the lack of standardization, a significant amount of the data produced by medical devices is not integrated into electronic health record systems. Developing interoperable standards for medical devices will be necessary to ensure that telehealth providers can use data from these devices to treat patients in the coming years.

## **RECOMMENDATIONS**

Telehealth services promise substantial benefits for patients, physicians, and payers. While there has been some growth in adoption, much more is needed. Policymakers at both the federal and state level can and should do more to accelerate adoption by providing a supportive regulatory environment, developing and promoting telehealth best practices, and reducing potential risks. These actions include:

### **Adopt a Standard Definition for Telehealth**

As noted earlier, states vary widely in how they define telehealth, and conflicting definitions create an unnecessarily complex legal environment for providers, payers, and patients. To address this issue, Congress should create a federal standard for telehealth that states should then adopt. H.R. 3750, the Telehealth Modernization Act of 2013, would do this by defining telehealth to include health care delivered by real-time video, secure chat, secure email, or telephone. It also specifies conditions under which health care providers licensed in a state should be allowed to provide telehealth services. These requirements include having access to patient records, fully documenting the medical encounter, and providing patients access to their professional credentials. In addition, the states adopting this guidance would be encouraged to limit telehealth providers from prescribing controlled substances (those listed on schedule II, III, or IV). These conditions are designed to give state regulators and patients the confidence that telehealth providers are using this technology appropriately.

While this legislation is an important step, its success will depend upon states voluntarily adopting the standard. If states have not adopted the standards within a reasonable period of time (e.g., two years), Congress may want to impose penalties on the non-adopting states. There is a precedent for such action from optometry. Optometrists long sought to limit competition from online sales of contact lens, and they were able to convince state professional boards and state legislators to pass rules and laws that limited patient access to equally safe, but more affordable, contact lens. It took an act of Congress to overcome these obstacles. The Fairness to Contact Lens Consumers Act of 2003 required the Federal Trade Commission to establish a set of rules that, among other things, required optometrists to provide contact lens prescriptions to their patients upon request thereby allowing patients to get their contact lens prescriptions filled online.

### **Establish a Single, National License for Telehealth Providers**

Complex state licensing requirements are preventing health care providers licensed in one state from providing telehealth services in another. States have had sufficient time to

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address this barrier but have so far failed to produce a widely-accepted solution. If states fail to adopt an interstate agreement within the next 18 months allowing health care providers with out-of-state licenses to practice medicine nationally, then Congress should adopt a uniform national license for telehealth that would be required to be accepted in all states. For those concerned about infringing on state's rights, the legislation could have a sunset provision if states later create a multi-state compact adopting a nationwide licensing standard. Since Medicare maintains a national record of certified physicians, the federal government would be able to easily maintain a list of state-licensed physicians.

One bill in Congress would circumvent the state licensing requirements for Medicare patients. H.R. 3077, the TELE-MED Act, would allow Medicare providers licensed in one state to provide services to Medicare beneficiaries in another. Given the potential for telehealth services to lower health care costs, and the importance of keeping costs down for Medicare, this legislation is also a good first step towards enabling national telehealth services immediately.

### **Create Technology- and Location-neutral Insurance Payment Policies**

Telehealth services should be covered by insurers if an equivalent in-person service is provided and they should be reimbursed at the same rates. Technology-neutral payment policies will encourage health care providers to provide patients health care services in the most economically efficient manner. In addition, insurers should abandon policies that limit telehealth to rural populations. To accomplish this, at the federal level, Congress should require Medicare to modify its reimbursement policies to meet these conditions, and at the state level, state legislatures should adjust their policies for Medicaid and private insurers.

### **Promote Interoperability Among State Prescription Drug Monitoring Programs**

Most states have implemented prescription drug monitoring programs that can help identify abuse among prescribers or patients; however, states differ in what they monitor and whether they share data.<sup>59</sup> To ensure these programs work effectively once telehealth is adopted nationally, and that aggregate data can be analyzed, states will need to be able to exchange data in a standardized format. To that end, HHS should work with the states to develop interoperable standards for these databases and require that the data be available for aggregate analysis.<sup>60</sup> This will help ensure that telehealth does not enable easier access to controlled substances.

### **Fund Research to Continually Improve the Quality and Lower the Cost of Telehealth Programs**

As noted earlier, because of the fast-paced progress in new technology and services, the evidence base for telehealth is compelling but still incomplete. As new telehealth services are offered to a wide variety of patients, it will be important to ensure that patients continue to receive a high level of care. In addition, it will be important to discover best practices for providing telehealth services and to education physicians about these practices. To ensure this happens, the federal government should continue to fund research to identify best practices in telehealth services, evaluate telehealth services and ensure patients

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receive the quality of care they expect, and recognize and leverage opportunities to use telehealth to reduce costs.

## **CONCLUSION**

Successful adoption of telehealth will require a number of regulatory and policy changes. Because health care is thoroughly regulated, largely at the state level and with significant involvement by health care professionals, even small changes can face substantial barriers. The health field is comprised of a number of distinct groups: patients, doctors and nurses, insurers, drug manufacturers, hospitals, and others. These different groups have distinct interests, and work within a maze of professional and market incentives that can be difficult to coordinate and that are sometimes in conflict. Moreover, because states are often reluctant to give up regulatory authority, even when their regulations favor producers over consumers and limit nationwide innovation, federal government interventions are necessary. However, the enormous opportunity from telehealth means that although challenging, the right policy changes will be worthwhile, especially for patients.

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## ENDNOTES

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1. William R. Hersh et al., *Telemedicine for the Medicare Population: Update* (Rockville, MD, 2006), <http://archive.ahrq.gov/downloads/pub/evidence/pdf/telemedup/telemedup.pdf>.
2. Daniel Castro and Jordan Misra, “The Internet of Things,” Center for Data Innovation, November 2013, <http://www2.datainnovation.org/2013-internet-of-things.pdf>.
3. Sally C Inglis et al., “Structured Telephone Support or Telemonitoring Programmes for Patients with Chronic Heart Failure,” *The Cochrane Database of Systematic Reviews* no. 8 (January 2010): CD007228, <http://www.ncbi.nlm.nih.gov/pubmed/20687083>.
4. Joseph Kvedar, Molly Joel Coye, and Wendy Everett, “Connected Health: A Review of Technologies and Strategies to Improve Patient Care with Telemedicine and Telehealth.,” *Health Affairs (Project Hope)* 33, no. 2 (February 2014): 194–9, doi:10.1377/hlthaff.2013.0992.
5. Susannah Fox and Maeve Duggan, *Health Online 2013*, 2013, <http://www.pewinternet.org/2013/01/15/health-online-2013/>.
6. Ibid.
7. Matlin Gilman and Jeff Stensland, “Telehealth and Medicare: Payment Policy , Current Use , and Prospects for Growth,” *Medicare & Medicaid Research Review* 3, no. 4 (2013): 1–17, [https://www.cms.gov/mmr/Downloads/MMRR2013\\_003\\_04\\_a04.pdf](https://www.cms.gov/mmr/Downloads/MMRR2013_003_04_a04.pdf).
8. Julia Adler-Milstein, Joseph Kvedar, and David W Bates, “Telehealth Among US Hospitals: Several Factors, Including State Reimbursement And Licensure Policies, Influence Adoption.,” *Health Affairs (Project Hope)* 33, no. 2 (February 2014): 207–15, doi:10.1377/hlthaff.2013.1054.
9. Hersh et al., *Telemedicine for the Medicare Population: Update*.
10. Lori Uscher-Pines and Ateev Mehrotra, “Analysis of Teladoc Use Seems to Indicate Expanded Access to Care for Patients without Prior Connection to a Provider.,” *Health Affairs (Project Hope)* 33, no. 2 (February 2014): 258–64, doi:10.1377/hlthaff.2013.0989.
11. Ibid.
12. John S. Barbieri et al., “The Reliability of Teledermatology to Triage Inpatient Dermatology Consultations,” *JAMA Dermatology* (February 12, 2014), doi:10.1001/jamadermatol.2013.9517; John D White, “Teledermatology Research Review,” *International Journal of Dermatology* 45, no. 3 (March 2006): 220–9, doi:10.1111/j.1365-4632.2004.02427.x.
13. Robert Pearl, “Kaiser Permanente Northern California: Current Experiences with Internet, Mobile, and Video Technologies.,” *Health Affairs (Project Hope)* 33, no. 2 (February 2014): 251–7, doi:10.1377/hlthaff.2013.1005.
14. Andrew Broderick and David Lindeman, *Scaling Telehealth Programs: Lessons from Early Adopters*, New York: Commonwealth Fund, vol. 12, February 05, 2013, [http://www.commonwealthfund.org/-/media/Files/Publications/Case Study/2013/Jan/1654\\_Broderick\\_telehealth\\_adoption\\_synthesis.pdf](http://www.commonwealthfund.org/-/media/Files/Publications/Case Study/2013/Jan/1654_Broderick_telehealth_adoption_synthesis.pdf).
15. Ibid.
16. Andrew Broderick and Valerie Steinmetz, “Centura Health at Home: Home Telehealth as the Standard of Care,” *The Commonwealth Fund: Case Studies in Telehealth Adoption* 2 (2013), [http://www.commonwealthfund.org/-/media/Files/Publications/Case Study/2013/Jan/1655\\_Broderick\\_telehealth\\_adoption\\_Centura\\_case\\_study.pdf](http://www.commonwealthfund.org/-/media/Files/Publications/Case Study/2013/Jan/1655_Broderick_telehealth_adoption_Centura_case_study.pdf).
17. Ibid.
18. Catherine Henderson and Et. Al, “Cost Effectiveness of Telehealth for Patients with Long Term Conditions (Whole Systems Demonstrator Telehealth Questionnaire Study): Nested Economic Evaluation in a Pragmatic, Cluster Randomised Controlled Trial,” *BMJ* 346, no. f1035 (2013), <http://www.bmj.com/content/346/bmj.f1035>.
19. Allison Brettell et al., *Telehealth: The Effects on Clinical Outcomes, Cost Effectiveness and Patient Experience: A Systematic Overview of the Literatur* (Manchester), accessed February 20, 2014, [http://usir.salford.ac.uk/29392/1/Telehealth\\_v8\\_.pdf](http://usir.salford.ac.uk/29392/1/Telehealth_v8_.pdf).
20. Kvedar, Coye, and Everett, “Connected Health: A Review of Technologies and Strategies to Improve Patient Care with Telemedicine and Telehealth.,” February 2014.
21. Sheila Fifer et al., *Critical Care, Critical Choices: The Case for Tele-ICUs in Intensive Care*, 2010, [http://www.nehi.net/writable/publication\\_files/file/teleicu\\_critical\\_care\\_critical\\_choices.pdf](http://www.nehi.net/writable/publication_files/file/teleicu_critical_care_critical_choices.pdf).

22. Lesley Alderman, "The Doctor Will See You... Eventually," August 1, 2011, *New York Times*, [http://www.nytimes.com/2011/08/02/health/policy/02consumer.html?\\_r=0](http://www.nytimes.com/2011/08/02/health/policy/02consumer.html?_r=0).
23. Mean hourly wage: "May 2013 National Occupational Employment and Wage Estimates United States," Bureau of Labor Statistics, [http://www.bls.gov/OES/current/oes\\_nat.htm](http://www.bls.gov/OES/current/oes_nat.htm) (accessed on April 30, 2014); Number of office visits: "Table 1. Annual number and percent distribution of ambulatory care visits by setting type according to diagnosis group. United States, 2009-2010," Centers for Disease Control and Prevention, [http://www.cdc.gov/nchs/data/ahcd/combined\\_tables/AMC\\_2009-2010\\_combined\\_web\\_table01.pdf](http://www.cdc.gov/nchs/data/ahcd/combined_tables/AMC_2009-2010_combined_web_table01.pdf) (accessed April 30, 2014).
24. Francesca Timpano et al., "Tele-Health and Neurology: What Is Possible?," *Neurological Sciences* 34, no. 12 (December 2013): 2263–70, <http://www.ncbi.nlm.nih.gov/pubmed/23430169>.
25. "In Cities, the Average Doctor Wait-Time Is 18.5 Days," accessed February 24, 2014, <http://www.washingtonpost.com/blogs/wonkblog/wp/2014/01/29/in-cities-the-average-doctor-wait-time-is-18-5-days/>.
26. Kvedar, Coye, and Everett, "Connected Health: A Review of Technologies and Strategies to Improve Patient Care with Telemedicine and Telehealth.," February 2014.
27. Curtis L Lowery et al., "Distributing Medical Expertise: The Evolution and Impact of Telemedicine in Arkansas.," *Health Affairs (Project Hope)* 33, no. 2 (February 2014): 235–43, doi:10.1377/hlthaff.2013.1001.
28. Ibid.
29. David C Grabowski and James O'Malley, "Use of Telemedicine Can Reduce Hospitalizations of Nursing Home Residents and Generate Savings for Medicare.," *Health Affairs (Project Hope)* 33, no. 2 (February 2014): 244–50, doi:10.1377/hlthaff.2013.0922.
30. Andrew Broderick, *Partners HealthCare: Connecting Heart Failure Patients to Providers Through Remote Monitoring*, vol. 3, 2013, [http://www.commonwealthfund.org/-/media/Files/Publications/CaseStudy/2013/Jan/1656\\_Broderick\\_telehealth\\_adoption\\_Partners\\_case\\_study.pdf](http://www.commonwealthfund.org/-/media/Files/Publications/CaseStudy/2013/Jan/1656_Broderick_telehealth_adoption_Partners_case_study.pdf).
31. Broderick and Steinmetz, "Centura Health at Home: Home Telehealth as the Standard of Care."
32. Broderick, *Partners HealthCare: Connecting Heart Failure Patients to Providers Through Remote Monitoring*.
33. Victoria Wade et al., "A systematic review of economic analyses of telehealth services using real time video communication," *DMC Health Services Research* 10:233 (2010), <http://www.biomedcentral.com/1472-6963/10/233>.
34. Henderson and Et. Al, "Cost Effectiveness of Telehealth for Patients with Long Term Conditions (Whole Systems Demonstrator Telehealth Questionnaire Study): Nested Economic Evaluation in a Pragmatic, Cluster Randomised Controlled Trial."
35. Steven H. Landers, "Why Health Care Is Going Home," *New England Journal of Medicine* no. 363 (2010): 1690–1691, doi:10.1056/NEJMp1000401.
36. Joseph Kvedar, Molly Joel Coye, and Wendy Everett, "Connected Health: A Review of Technologies and Strategies to Improve Patient Care with Telemedicine and Telehealth.," *Health Affairs (Project Hope)* 33, no. 2 (February 2014): 194–9, doi:10.1377/hlthaff.2013.0992.
37. *National Health Expenditure Projections 2012 - 2022*, 2012, <http://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/downloads/proj2012.pdf>.
38. State Telehealth Laws and Reimbursement Policies, 2013.
39. Ibid.
40. Federation of State Medical Boards, "Interstate Compact for Physician Licensure Moves Forward with Consensus Principles," 2013, [http://www.fsmb.org/pdf/nr\\_interstate\\_compact.pdf](http://www.fsmb.org/pdf/nr_interstate_compact.pdf).
41. Nurse Licensure Compact, National Council of State Boards of Nursing, n.d. <https://www.ncsbn.org/nlc.htm> (accessed May 2, 2014).
42. State Telehealth Laws and Reimbursement Policies, 2013.
43. Ibid.
44. "Health Licensing Board Report to Congress," U.S. Department of Health and Human Services, 2013, [http://telehealth.org/wp-content/uploads/2013/11/HEALTH-LICENSING-BOARD-Report\\_Final.pdf](http://telehealth.org/wp-content/uploads/2013/11/HEALTH-LICENSING-BOARD-Report_Final.pdf).
45. See, for example, a 2012 resolution from the AMA's New York Delegation, "Web-Based Tele-Health Initiatives and Possible Interference with the Traditional Physician-Patient Relationship," 2012, <http://www.ama-assn.org/assets/meeting/2012a/a12-711.pdf>.

- 
46. American Medical Association, “AMA MedEd Update,” June 2013, [http://www.ama-assn.org/ams/pub/meded/2013-june/2013-june-top\\_stories1.shtml](http://www.ama-assn.org/ams/pub/meded/2013-june/2013-june-top_stories1.shtml).
  47. Stephanie Baum, “Telemedicine policy wrangling underscores national adoption challenge,” MedCity News, May 2, 2014, <http://medcitynews.com/2014/05/telemedicine-policy-wrangling-underscores-national-adoption-challenge/>.
  48. Robert Atkinson, “Public Versus Private Restraints on the Online Distribution of Contact Lenses: A Distinction Without a Difference,” Information Technology and Innovation Foundation, July 10, 2006, <http://www.itif.org/files/contactlens.pdf>.
  49. State Telehealth Laws and Reimbursement Policies, 2013
  50. Ibid.
  51. 2014 State Telemedicine Legislation Tracking (American Telemedicine Association, February 4, 2014), <http://www.americantelemed.org/docs/default-source/policy/state-telemedicine-legislation-matrix.pdf?sfvrsn=102>.
  52. Julia Adler-Milstein, Joseph Kvedar, and David W Bates, “Telehealth Among US Hospitals: Several Factors, Including State Reimbursement And Licensure Policies, Influence Adoption.,” *Health Affairs (Project Hope)* 33, no. 2 (February 2014): 207–15, doi:10.1377/hlthaff.2013.1054.
  53. “Medicare Benefit Policy Manual, Chapter 15 – Covered Medical and Other Health Services,” Centers for Medicare and Medicaid, March 21, 2014, <http://www.cms.gov/Regulations-and-Guidance/Guidance/Manuals/Downloads/bp102c15.pdf>.
  54. “Use and Characteristics of Electronic Health Record Systems Among Office-based Physician Practices: United States, 2001–2013,” Centers for Disease Control and Prevention, January 2014, <http://www.cdc.gov/nchs/data/databriefs/db143.htm>.
  55. Don Fluckinger, “EHR Interoperability Issues Plague Some Telemedicine Providers,” Search Health IT, May 31, 2013, <http://searchhealthit.techtarget.com/news/2240185137/EHR-interoperability-issues-plague-some-telemedicine-providers>.
  56. HealthIT.gov, “Interoperability Whiteboard,” (animation) accessed February 20, 2014, <http://www.healthit.gov/providers-professionals/video/interoperability-whiteboard>.
  57. Rajib Ghosh and Theo Ahadome, “Telehealth’s Promising Global Future,” *Analytics Magazine*, February 2012, <http://www.analytics-magazine.org/januaryfebruary-2012/508-telehealths-promising-global-future>.
  58. Ghosh and Ahadome, 2012.
  59. Kristin M. Finklea, Erin Bagalman, and Lisa N. Sacco, *Prescription Drug Monitoring Programs*, 2013, <http://www.fas.org/sgp/crs/misc/R42593.pdf>.
  60. “State Prescription Drug Monitoring Programs,” *U.S. Department of Justice, Drug Enforcement Administration, Office of Diversion Control*, 2011, [http://www.deadiversion.usdoj.gov/faq/rx\\_monitor.htm](http://www.deadiversion.usdoj.gov/faq/rx_monitor.htm).

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