California HealthCare Foundation

Delivering Care Anytime, Anywhere: Telehealth Alters the Medical Ecosystem

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About the Foundation

The California HealthCare Foundation is an independent philanthropy committed to improving the way health care is delivered and financed in California. By promoting innovations in care and broader access to information, our goal is to ensure that all Californians can get the care they need, when they need it, at a price they can afford. For more information, visit **www.chcf.org**.

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I. Executive Summary

Telehealth is becoming prominent on the national health care landscape as providers and insurers look for ways to improve the quality of care, create better access for the underserved, and reduce costs. Sometimes referred to as e-health, e-medicine, or telemedicine—telehealth encompasses applications as diverse as electronic medical record (EMR) systems, e-prescribing, and the emerging Health 2.0 social media functions.

This report examines the current state of telehealth use, with particular focus on applications that deliver health care services directly to consumers (patients) at a distance, on demand, and via any electronic means.

Despite the proven and potential benefits of telehealth, widespread adoption has been slow due to a number of challenges: low consumer awareness; provider concerns over liability; complex licensing and regulatory restrictions; and misaligned provider reimbursement practices. Nevertheless, there are business drivers currently pointing to a potential acceleration in telehealth adoption.

II. Background and Methodology

The California HealthCare Foundation engaged Forrester Consulting to examine the ways that telehealth applications are being used across the United States. The purpose of this research was to depict the current state of telehealth adoption and also to identify emerging uses with the potential to increase access to care, reduce costs, and improve outcomes. While a great deal of the telehealth activity in the country is taking place in academic medical centers and in grant-funded demonstration projects, there is increasing activity in the commercial sector. For this report, key insurers, providers, and technology vendors were interviewed to find out which telehealth applications they are using and their impressions of those applications. The organizations are shown in Table 1.

Table 1. Interview Subjects

Health Insurers	Health Care Providers	Technology Vendors	Other
■ Blue Shield of California ■ Hawaii Medical Service Association ■ Health Care Services Corporation ■ HealthNet ■ Inland Empire Health Plan ■ Kaiser Permanente ■ LA Care ■ WellPoint, Inc.	■ Beth Israel Deaconess Medical Center ■ The Center For Connected Health, a division of Partners Healthcare ■ Healthcare Partners	■ American Well ■ Kryptiq Corp. ■ MEDSEEK, Inc. ■ Microsoft Corporation ■ RelayHealth ■ TelaDoc, Inc.	■ Mercer

To augment the stakeholder interviews, several examples of Forrester's North American Consumer Technographics® data from 2007 and 2008 are used. These data highlight specific demographic profiles and technology adoption behavior of U.S. consumers and medical professionals.

III. An Overview of Telehealth

Telehealth is the use of telecommunications and information technologies in any area of health care, including medical intervention, prevention, care management, education, administrative tasks, and even health advocacy. It can also be used for health care administrative and educational functions. It is a broader term than "telemedicine," which is generally understood to refer to direct medical interaction through telecommunications channels.

This report focuses on telehealth applications that are used to deliver care directly to consumers, at a distance, on demand. The most common of these are:

1. **Live videoconferencing.** Audio and video feeds are used to connect two or more geographically dispersed health care facilities to enable patients, physicians, and specialists to consult in real time.
2. **Store-and-forward systems.** Digital images and other clinical data are captured at the point of care; they are temporarily stored and, later, forwarded to another location. These applications are common in specialty areas such as radiology and dermatology, in which images are especially useful.
3. **Remote patient monitoring.** Home-based monitoring devices are used by patients to easily capture and transmit clinical data such as blood pressure or glucose levels over the Internet. These applications are becoming more prominent, especially in the care of chronically ill patients.
4. **E-visits/e-consults.** Evolving from secure email or phone-based encounters, e-visit capability is offered by many health insurers through a secure Web portal. Such "virtual house calls" are moving toward real-time interactions that can combine videoconferencing and store-and-forward systems.

A variety of technologies and services are used to enable or complement telehealth applications: satellite networks; phone services (such as 24x7 call centers); high-speed Internet (such as physician-patient portals); streaming media (such as health education videos); and wireless communications (such as mobile devices and RFID—radio frequency identification).

The Current State of Telehealth

Telehealth can be traced back to the early 1960s when the National Aeronautics and Space Administration (NASA) began telemetering biometric statistics of the first astronauts during their missions.[1] NASA subsequently provided much of the early funding and development that led to some of the first telehealth/telemedicine initiatives. In the 1980s, for example, NASA led the first international telemedicine program after Armenia suffered a large earthquake.[2] The program used a satellite network to connect a medical center in Armenia with four medical centers in the United States, enabling one-way voice, video, and fax transmissions.

Today, the use of telehealth is widespread, with many insurers and providers offering services such as e-visits and 24x7x365 nurse call centers in nearly every state. The federal government is also a strong supporter of telehealth; in 2007, the Federal Communications Commission (FCC) dedicated $417 million for the creation of 69 regional telehealth networks across 42 states and three U.S. territories under the Rural Health Care Pilot Program (RHCPP).[3] Today, there are more than 200 telehealth networks connecting some 2,000 institutions across the country, according to the American Telemedicine Association (ATA).[4]

The benefits of telehealth are recognized by influential organizations like the American Medical Association (AMA) and the American Heart Association (AHA). The AHA recently collaborated with the American Society of Hypertension and the Preventative Cardiovascular Nurses' Association to release a joint scientific statement that advises all hypertension patients to use home monitors to routinely track their blood pressure.[5] Further, the AHA is developing a Blood Pressure Management Center (BPMC), which allows patients to automatically transmit their BP data from their home monitors to their BPMC account on the Web.[6] Enabled by Microsoft's HealthVault, this connectivity also allows patients to upload, store, and share other health-related information. Table 2 highlights some examples of telehealth use.

Table 2. Examples of Telehealth in Practice Today

Example	WellPoint (CA & GA)	Category	Live videoconferencing
Description CA legislation was a catalyst for WellPoint to provide funding for telehealth in the late 1990s. Today, the program consists of a network of about 60 sites in CA and 55 in GA using live VC. Use has grown to nearly 4,000 encounters per year in CA among Medi-Cal, CalPERS, CMSP, and Healthy Families beneficiaries. Similar use rates are seen in GA.		**Benefits** ■ Improved access to specialty care for rural and underserved patients ■ Earlier diagnosis and intervention for chronic conditions ■ Fewer redundancies in tests, lab work, and exams ■ Reduced the cost of care by 6% overall—but 42% for follow-up care[7]	

Table 2. Examples of Telehealth in Practice Today (continued)

Example	Kaiser Permanente (CA)	Category	Phone visits/e-visits/e-consults and store-and-forward systems

Description

Since 2003, KP has been rolling out patient EHRs via kp.org. One of the most popular online features is getting lab results. Phone-based consults and e-visits are also offered, and KP reports high satisfaction (77%) with phone consults. There are about 2.3 million KP members registered for the patient portal—about 40% of those eligible.

Benefits

- Improved access to care (e-visits) and personal health information (EHRs)
- Improved efficiency (most lab results available online within 24 hours)
- Decreased costly, unnecessary ER visits due to 24x7 nurse lines

Example	CIGNA, Aetna, and other national payers	Category	E-visits

Description

While many payers began offering e-visits as early as 2003, Aetna and CIGNA both started to expand their programs nationwide in 2008.[8] Aetna now includes all primary care physicians and about 30 specialties in the program. Some 150 types of minor health issues are handled in this way.

Benefits

- Improved convenience and accessibility for consumers
- Improved physician-patient communication
- Decreased use of office visits and physician phone calls

Example	Center for Connected Health (MA), a division of Partners HealthCare	Category	Remote patient monitoring

Description

The Center uses many forms of telehealth including e-visits, live VC with specialists, and remote monitoring of chronic conditions via devices connected to the Internet. About 50% of Partners' congestive heart failure patients are involved. There is also remote monitoring of hypertensive and diabetic patients.

Benefits

- Improved accessibility to specialist care
- Reduced hospitalizations, resulting in lower treatment costs for chronic patients
- Enables early, proactive intervention for follow-up care
- Enables caregivers to take a more active role in the care of family members
- Improves efficiency by enabling medical professionals to focus on patients who need them most

Example	Beth Israel Deaconess Medical Center	Category	Live videoconferencing

Description

The CareLink system connects interpreters to the clinical encounter via live VC. This capability is used by the ED, pain clinic, and other specialty sites. The same technology is used for a "simulation and skills lab" for the education of medical interns and also for specialty consults.

Benefits

- Reduced wait times
- Improved access to specialty care
- Improved training and education of medical interns

The Future of Telehealth: Real-Time Care on Demand

In addition to the more established forms of telehealth, some emerging applications are gaining ground. Building on the retail business model, e-visit encounters can now be delivered whenever and wherever consumers need them. This evolution fits well with today's on-demand culture, in which consumers purchase groceries, trade stocks, and book airline flights instantly from their home PC or mobile phone. Two technology companies are attempting to bring that level of immediate connectivity into the health care system.

- **On-demand, phone-based physician consultations.** TelaDoc—comprised of TelaDoc, Inc. and TelaDoc Physician Association—offers a 24x7x365 physician network and staffed call center service nationwide.[9] Today, 250+ physicians provide phone-based consults to a consumer base of about 1.6 million registered users. The total fee for a TelaDoc physician consult is $35—about the same cost as a co-pay or an e-visit through a major health plan. The cost to the consumer may be less depending on whether his or her employer or health insurer has a relationship with TelaDoc. Physicians may prescribe short-term medications or refills (but not DEA-controlled substances).

  To access the service, consumers register with TelaDoc and complete a health profile similar to that at the doctor's office. The TelaDoc physician accesses the member's health profile during the consultation. Members call a toll-free number or log into a secure Web site to be placed into a queue. Physicians log into the system at their discretion, indicating that they are available. TelaDoc matches a patient to a physician based on the information entered and guarantees a response from a physician within three hours. According to CEO Michael Gorton, the average response is about 30 minutes, and physicians in particularly active states compete for customers based on how quickly they respond. TelaDoc recently began licensing its doctors across multiple states to help balance the workload and increase consumer accessibility.

  For consumers, the phone-based encounter is comparable to a visit at a retail clinic: It's a low-cost, convenient way to access routine care for relatively minor conditions like sinus infections, flu symptoms, and headaches. According to Gorton, physicians benefit by eliminating the overhead associated with traditional office visits, allowing them to keep a bigger share of the visit fee. TelaDoc primarily offers the service through employer groups and third-party administrators. So far, utilization is about 20 percent, meaning that a company with 10,000 employees could expect about 2,000 encounters per year. TelaDoc is beginning to offer the service through health insurers as well; the first to sign up is Assurant Health.[10]

- **On-demand, Web-based physician consultations.** American Well recently launched a new platform that enables health insurers to provide real-time, online, or phone-based access to their provider network. This Web-based system includes but does not require live streaming video, which enables webcam-equipped consumers to see as well as speak to a physician during the encounter. Widespread adoption of this feature may take time; however, last year, Forrester found that only about 11 percent of U.S. online consumers have webcams connected to their home PCs.[11]

  Rather than license their own physicians, American Well relies on the existing provider network—already fully licensed and credentialed—of each participating health insurer. The business model is based on complete integration with each payer's IT environment,

including provider contracting systems, payer-based health records, and care management programs. This fully integrated approach can be difficult to achieve due to the complexities of health care data integration between payers and providers. To help address this challenge, American Well recently announced a partnership with Microsoft to use the software giant's HealthVault platform to facilitate data interoperability and portability.

The first health insurer to contract with American Well is the Hawaii Medical Service Association (HMSA), which plans to offer the service to the entire population of the state (approximately 1.3 million people) by January 2009.[12] Although high-speed broadband access has been difficult to provide in remote areas of the Hawaiian islands, consumers in these rural areas will soon be able to access a physician from their homes by using HMSA's service—whether via a broadband connection or a phone line.[13] Michael Stollar, HMSA vice president of marketing and communications, stresses the unique market of the island state and says that improving accessibility is a top priority for the insurer.

IV. Positive Signs of Technology Adoption

As the telehealth space matures and more success stories emerge, it is becoming clearer that technology can play an important role in reducing costs, increasing accessibility to care, and improving quality. These benefits are especially crucial for the 6.5+ million uninsured in California and tens of millions more across the United States. Fortunately, there are other signs that point to the potential for greater adoption of telehealth in the not-so-distant future. They are:

- **Increased ubiquity of Internet connectivity.** Although there are some regional and socioeconomic exceptions, Forrester finds that the majority (61-68 percent) of uninsured consumers in the U.S. use broadband Internet connectivity at home (see Table 3).[14] This finding bodes well for health IT and telehealth proponents.
- **Medical professionals show technology prowess.** Conventional wisdom holds that physicians, dentists, nurses, and other medical professionals are technology laggards. Forrester tested this theory and found that medical professionals—especially those younger than 45—are wired, mobile, and overall "technology optimists," as shown in Table 4.[15] Technology optimism is a measure that Forrester uses to assess consumers' attitudes regarding the role that technology plays in their lives.

Table 3. Uninsured Consumers across the U.S. Are Wired

	Chronically uninsured*	Recently uninsured*	Individual purchasers†	Average U.S. consumers‡
Age	39	36	50	43
Married or living with partner	56%	48%	64%	65%
Male	53%	49%	51%	49%
Online 10 years or more	26%	27%	31%	35%
Use broadband at home	61%	68%	69%	71%
Go online daily	80%	82%	83%	83%
Work outside home for employer	44%	48%	42%	55%
Self-employed	21%	8%	11%	9%
Retired	5%	3%	35%	16%

*Base: 631 U.S. online, uninsured consumers

†Base: 601 U.S. online consumers who purchased individual health insurance

‡Base: 4,476 U.S. online consumers

Source: North American Technographics® Healthcare And Online Survey, Q4 2007

Optimists believe that technology makes their lives more enjoyable while pessimists hold an indifferent or negative attitude about technology.

- **A shortage of physicians and nurses.** As several states experiment with health care reform designed to expand coverage, providers that are already stretched thin are feeling the pressure of increased demand. At the same time, new business models like retail clinics—which draw controversy in some areas—are emerging to address the need for increased accessibility and convenience for consumers. Telehealth solutions are providing new ways for providers to manage this increased demand more efficiently, enabling them to care for more patients within the same time and resource constraints.
- **Legislative pressure and payer-based incentives.** The U.S. Department of Health and Human Services (HHS), the Centers for Medicare and Medicaid Services (CMS), and commercial health insurers are increasing pressure on providers to adopt health IT such as e-prescribing and electronic medical record systems. This is beginning to affect reimbursement models and pay-for-performance (P4P) programs across the country. Several physicians interviewed for this report believe that the fundamental reimbursement structure of the health care system—including the capitated and fee-for-service models—will need to be reformed in order to accelerate the use of telehealth and other health IT applications. Some believe CMS will lead that charge.

Table 4. Personal Technology Adoption among Medical Professionals

Personal technology category	All U.S. adults	Medical professionals younger than 45*	Medical professionals 45 or older*
Have a PC at home	87%	94%	92%
Online at least monthly	82%	92%	87%
Regularly use a smartphone (e.g., BlackBerry)	63%	70%	56%
Technology optimist	54%	61%	46%
Online several times a day (from home and/or work)	40%	40%	36%

Base: U.S. adults

Source: North American Technographics® Benchmark Survey 2008

*Medical professionals include physicians, dentists, nurses, and other medical professionals

V. Persistent Obstacles

Despite the telehealth success stories, widespread personal technology adoption, and the proliferation of Internet connectivity, there are several key challenges that continue to hold back the adoption of telehealth. Many of these barriers are documented in a July, 2008 CHCF report, *Telemedicine in California: Progress, Challenges, and Opportunities*. The following examples demonstrate ways that barriers affect the adoption of telehealth:

- **Low consumer awareness.** While the ubiquity of personal technology adoption and Internet connectivity is apparent on a national scale, there are gaps. For example, safety-net organizations that provide services to the underserved in California, such as LA Care, often struggle with low literacy rates and limited Internet access among plan members. Dr. Elaine Batchlor, chief medical director with LA Care, says that over 50 percent of their members do not speak English, and Internet use is much lower than national averages. But even without such region-specific issues, low consumer awareness is an enormous obstacle across the country. In 2008, a Forrester Research survey found that more than half of U.S. online consumers never heard of Internet-based health monitoring services that help manage chronic conditions, or home-based monitoring solutions for aging, ill, or disabled family members. (See Table 5.)
- **Provider liability concerns.** This issue is raised most frequently within the context of physician participation in e-visits. Malpractice is a widespread concern among U.S. providers, even without the added exposure of technologies that go beyond the status quo. For that reason, many state regulations require that providers establish a patient-doctor relationship in person, before using electronic channels to deliver care.

  Different vendors handle the liability issue in their own ways. TelaDoc, for example, covers the cost of malpractice insurance for each provider per encounter. The company is able to do this through a relationship with CNA, a large medical malpractice carrier. American Well takes a similar approach, working with The Lexington Insurance Company (a member company of AIG) to integrate malpractice coverage into their online care model and covering all participating providers.

Both vendors cover the costs of malpractice as a part of the physician consultation fee.

- **State-specific licensing and regulatory requirements.** Because state legislatures typically oversee medical boards and practice policies, licensure fees and restrictions differ from state to state. Doctors who want to practice in more than one state must apply for licensure in each state. Getting over this hurdle requires collaboration among the key stakeholders of multi-state telehealth networks. New models are beginning to emerge in which some states allow licensed professionals from other states to obtain additional licenses through abbreviated means, but such initiatives are not yet commonplace.[16]

  Telehealth vendors address this issue in different ways. According to TelaDoc's CEO Michael Gorton, the company uses strict credentialing standards to recruit "pristine" doctors in order to avoid potential quality problems down the road. TelaDoc also started a "super-doc" program, under which the vendor does the administrative work and covers the expense of licensing a few of their physicians in up to ten different states. American Well takes a different approach, leveraging health insurers' existing provider networks.

- **Traditional provider reimbursement methods.** The vast majority of provider reimbursement is funded under standard fee-for-service models in which insurers and CMS set contracted rates for procedures. Today, providers can use a standard CPT code for e-visits (CPT code: 0074T). In most cases, reimbursement for teleradiology and other specific telehealth applications are covered. However some services, such as remote patient monitoring, do not fit neatly within the reimbursement models. Further, reimbursement rules can become muddy under capitated business models such as those within traditional HMOs, according Dr. Kate Christensen, a medical director with Kaiser Permanente. She notes the difficulty of distinguishing e-visits from other kinds of doctor-patient emails that are not reimbursable.

- **Data interoperability and portability.** Clinical data interoperability is not a challenge that is unique to telehealth. Nationally, less than one-third of physicians use some form of electronic medical records (EMRs) today, and less than half of those are actually using all of the features required to provide a fully functional EMR system.[17] Although there are notable exceptions, like Partners HealthCare System in Massachusetts and Kaiser Permanente, the national trend is not yet bearing the proverbial fruit that health information technology (HIT) pundits are hoping for. A major reason is that EMR systems tend to be cost-prohibitive for small, private practices. However, provider adoption of other HIT categories, like e-prescribing, are on the rise, thanks in part to payer subsidies, legislative incentives, pay-for-performance bonuses that are contingent on HIT adoption, and the emergence of low-cost software-as-a-service (SaaS) solutions for smaller practices.

Table 5. Low Consumer Awareness Plagues Telehealth Adoption

"Please indicate your level of familiarity with each of the following health-related services."

■ 2008 □ 2007	Never heard of	Heard of, but not familiar	Familiar, but have not used	Have used, but not currently using	Currently using
TV-based personal health monitoring or coaching (e.g., Motiva)	67%	17%	12%	2%	0%
	69%	16%	13%	2%	1%
Internet-based personal health monitoring services (e.g., blood pressure, cholesterol, blood sugar monitoring)	55%	24%	17%	3%	1%
	58%	21%	18%	3%	1%
A wearable device that monitors and transmits data about the physical well-being of an aging, ill, or disabled family member	41%	30%	26%	3%	1%
	38%	30%	29%	2%	1%
A wearable device that monitors and transmits data you can upload to a computer about your personal well-being	52%	25%	20%	2%	1%
	49%	26%	23%	2%	1%
An in-home electronic or "smart" pill dispenser	60%	20%	17%	2%	1%
	60%	20%	18%	2%	1%
Automated home monitoring of an aging, ill, or disabled family member (e.g., motion detection, water usage, auto appliance shut-off)	53%	24%	20%	2%	1%
	54%	23%	20%	2%	1%

Base: 5,242 U.S. online consumers

(percentages may not total 100 because of rounding)

Source: Forrester Research North American Technographics® Healthcare Online Survey, Q2 2008

VI. Promising Use Cases for Telehealth

THERE CONTINUES TO BE MUCH DISCUSSION ACROSS the health care industry about what types of care are best suited for delivery via electronic channels. Some of the organizations interviewed for this report are engaged with third parties to conduct actuarial analyses to determine—at the level of diagnosis codes—which types of encounters are best suited to various telehealth applications.

It is helpful to categorize patient conditions at a high level to begin addressing the suitability of telehealth applications, as shown in Table 6.

1. **Acute-Minor:** Conditions in this category include routine care for ailments such as sinus infections, ear infections, sore throats, and headaches. These are the same types of conditions that retail health clinics generally target.
2. **Chronic-Minor:** This category offers a range of telehealth possibilities, such as home-based monitoring of glucose levels for diabetics and blood-pressure for hypertensive patients.
3. **Chronic-Major:** Fewer illnesses in this category can be treated via telehealth, but there are useful applications. For example, congestive heart failure patients can have their weight monitored with scales that use the Internet to transmit the information to the provider.
4. **Acute-Major:** Conditions in this category, such as head trauma and broken bones, would generally result in urgent or emergency care, and would not be suited to telehealth applications between patients and physicians. However, there are some very successful physician-to-physician programs that can address these kinds of encounters. For example, at the UC Davis Health System, a critical care specialist can provide guidance to a rural provider in the management of major trauma via telehealth.[18]

Table 6: Four Quadrants of Medical Conditions

	Minor	Major
Chronic	2	3
Acute	1	4

VII. Conclusion

TELEHEALTH IS PLAYING AN INCREASINGLY IMPORTANT role in the nation's health care ecosystem as payers and providers use technology to improve the accessibility, quality, and cost-effectiveness of care. Hundreds of formal telehealth networks are connecting thousands of health care institutions as well as scores of health insurers offering 24x7 services such as e-visits, nurse hotlines, and patient access to personal clinical information online. For all socioeconomic groups, these technologies promise to provide efficient, high-quality, and convenient ways to obtain care. For the underserved specifically, telehealth can facilitate access to affordable, high-quality health care services that would otherwise be unobtainable.

Despite the relatively widespread availability and valuable benefits of telehealth services, adoption progresses at a modest pace. Insurers report low utilization of these services among their membership, and many providers continue to struggle with concerns over liability, regulatory compliance, and reimbursement. To the extent that telehealth services are offered directly to consumers (e.g., e-visits, phone-based services, and remote monitoring), lack of awareness among the intended audience is an obstacle that many industry stakeholders are trying to address through increased marketing, communication, and education efforts.

Telehealth will continue to proliferate across the United States, driven largely by increases in state and federal funding as well as investment from payer and provider organizations. In the near term, the focus of these programs will be on improving access for the underserved and the management of chronic conditions at a distance. Over the longer term, as consumers become more engaged in their health care through incentives in insurance design and the emergence of highly accessible retail delivery channels, the general population will come to expect this level of connectivity across the health care system in much the same way that they do in other industries today.

Endnotes

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