

Next Generation House Call

By Jamie L. Adams, M.D., Christopher G. Tarolli, M.D., and E. Ray Dorsey, M.D.

Editor's Note: Just as online shopping is supplanting visits to the mall, and distance learning is part of the new wave in higher education, so is health care coming to a computer or mobile device near you. In the next few years, telehealth will increasingly become part of psychiatric and neurological care. Still to overcome is an unwieldy health care system that will need to adapt to practices that have the potential to lower costs and improve care.

Not long ago, doctors routinely made house calls. In fact, 40 percent of patient-physician encounters took place in the home as recently as the 1930s.¹ But with the advent of the automobile and the development of new diagnostic testing (e.g., x-rays, ECGs), care transitioned to clinics and hospitals. Today—in a gradual paradigm shift—broadband connectivity and point-of-care testing (e.g., glucometers) are fueling the rise of virtual visits.^{2,3} By the 2030s, this next generation house call could be the dominant means of providing care to patients (Figure 1).⁴⁻⁶

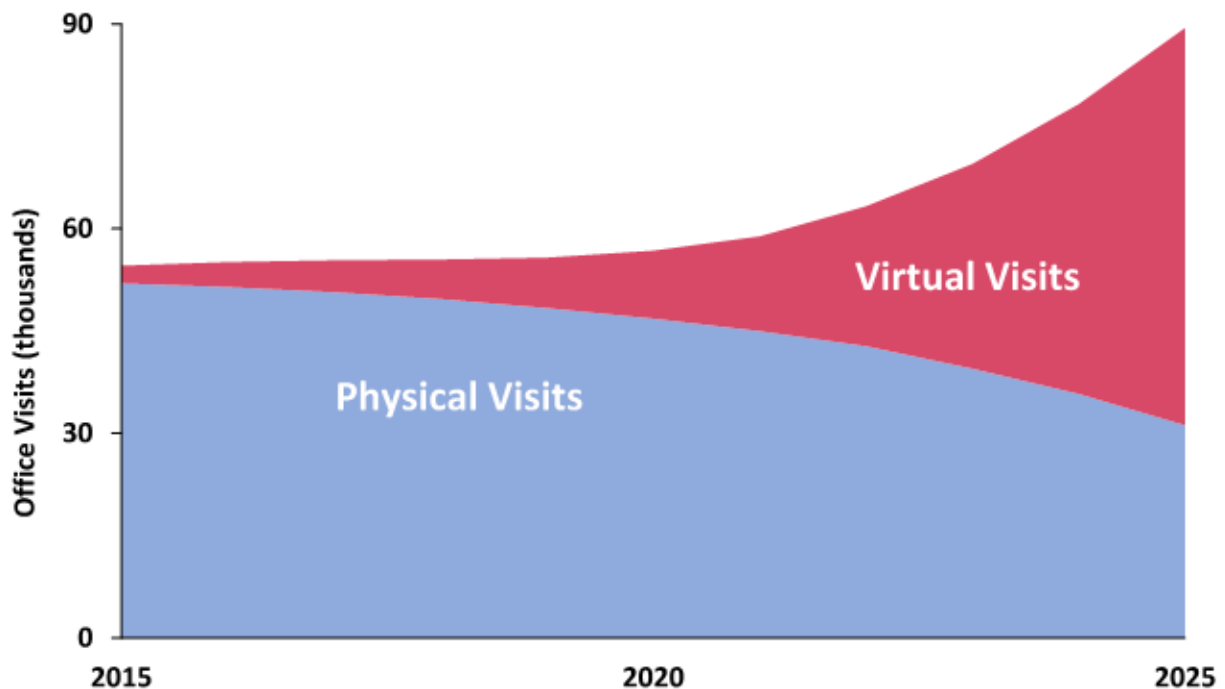


Figure 1. Projected number of in-person and virtual psychiatry and neurology office visits, 2015–25.

Telehealth in Psychiatry and Neurology

Telehealth is the use of telecommunications technology to provide health care at a distance. This includes care provision ranging from telephone calls and email to the use of web-based video conferencing technology (akin to Skype) via smart phone, tablet, or computer to virtually connect with a provider. It was initially implemented to increase access to care for individuals with acute conditions (e.g., trauma, stroke) in clinical settings, such as hospitals. Today's telehealth is focused on providing convenient care in the home to individuals with episodic conditions, such as rash or

headache. In the future, the goal will be to lower the cost of care for individuals with chronic conditions anywhere, through personal computers, mobile devices, and email. (Figure 2).⁷

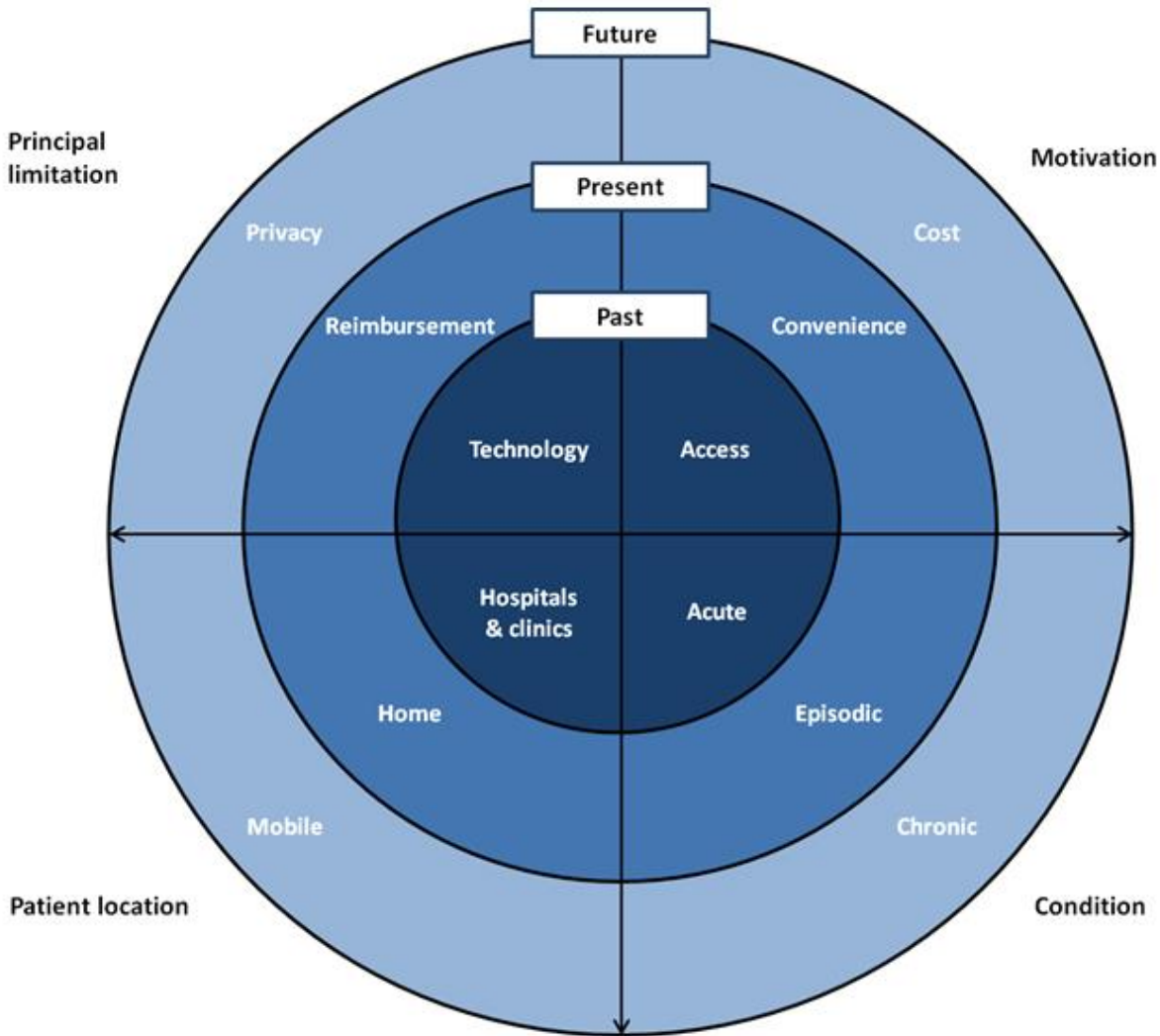


Figure 2. Past, present, and future of telehealth.

For different reasons, psychiatry and neurology have been early adopters of telehealth. The psychiatric evaluation relies less on the traditional physical exam than on a directed patient interview. This, in combination with the geographic mismatch between the supply of psychiatrists and the demand for psychiatric care, makes telehealth an appealing option. For over a generation, mental health professionals have used telehealth to deliver care to individuals in rural and urban

locations, in clinics and in prisons.⁸⁻¹⁰ Numerous high quality studies demonstrate the benefit of such interventions for diverse psychiatric conditions, including anxiety, depression, and post-traumatic stress disorder.¹¹⁻¹⁵

Perhaps, more than any organization in the US, the Department of Veterans Affairs (VA) has embraced telehealth, especially for mental health care. In 2014, the VA had over two million telehealth visits, and mental health visits were among the most common. Most occur in community-based outpatient clinics in small communities that serve veterans, many of whom have significant mental health needs.¹⁶⁻¹⁸ In addition to the VA, several start-ups have developed innovative health care models that are addressing substantial unmet needs among those with mental illness. Both the VA and these start-ups have started moving some of their care directly into patients' homes.

Teleneurology began in earnest in 1999 with a landmark paper by Drs. Steven Levine and Mark Gorman introducing the concept of "telestroke."¹⁹ Motivated by the new clot-busting drug, tissue plasminogen activator (tPA), which has to be administered within hours of symptom onset, the idea was to enable timely, round-the-clock evaluation of individuals with suspected stroke by connecting stroke neurologists by video to local emergency rooms. Telestroke has improved stroke outcomes by increasing access to a time-sensitive medication, and studies have shown results comparable to in-person treatment.²⁰ In addition, telestroke has proven to be cost-effective, particularly since the benefits of improved acute stroke care include reduced long term health costs.²¹ The idea has rapidly gained traction and spread around the country and the world.^{22,23} Today, the largest single provider of acute stroke care is not a major medical center but a telehealth company, Specialists on Call, that cares for ten times as many individuals with stroke as any large stroke center.²⁴

While telehealth for acute stroke has spread rapidly, its diffusion to chronic neurological conditions has been slow.²⁵ A 2012 survey of top neurology programs in the US found that the use of telehealth in conditions other than stroke is still very much in its infancy, and randomized controlled trials of such applications have been few and small.²⁶⁻²⁸

Move to the Home

In many ways, current care for individuals with psychiatric and neurological conditions could not be designed worse. In autism, we ask children with impaired social skills to travel to foreign environments and interact with multiple strangers to receive care. We expect older individuals with Parkinson's disease, whose mobility, cognition, and driving ability are compromised, to be transported by overburdened caregivers to large, complex urban medical centers.²⁹

The need for patient-centered care is increasing. Neuropsychiatric conditions are now the leading cause of disability in the US and the third leading cause in the world.^{30,31} The prevalence of autism spectrum disorders among American children is nearly two percent; the number of Americans with Alzheimer's disease is projected to reach 7.7 million by 2030, and the number with Parkinson's disease will almost double over the next generation.³²⁻³⁴ In addition to those directly affected by such diseases, 40 million caregivers now help support adults with neuropsychiatric and other chronic medical conditions, including cancer, heart disease, and diabetes; telehealth has the potential to also increase their access to care and medical services.³⁵

Beyond simply connecting patients to physicians, the telehealth model provides a platform for creating a patient-centered medical environment in the home. Rather than trying to coordinate the schedules of multiple providers or, worse, asking a patient to do so, clinicians—from psychologists to therapists—can connect to patients based on their mutual availability, all without the need for transportation. By delivering patient-centered care to individuals with chronic neuropsychiatric disorders directly into the home, telehealth can help reduce caregiver burden.

While home video visits for episodic conditions (e.g., sinusitis) are widely available for about \$40 per visit, such access for chronic neurological and psychiatric disorders is still developing. Again, the VA is leading the way by studying and providing home telehealth care for depression, post-traumatic stress disorder, and Parkinson's disease.^{13,28,36}

Although still a foreign concept to most, the latent demand for at-home care from a psychiatrist or neurologist is likely high. As part of a recent national randomized controlled trial of "virtual house

calls” (video visits with a remote specialist in a patient’s home), over 11,000 individuals from every state and 80 countries visited the study’s one-page website. Of these, nearly 1,000 individuals with Parkinson’s disease expressed interest in participating in the study.³⁷ Participant satisfaction, as in nearly all telehealth studies, was high.³⁸ In addition, these visits were shown to save patients and their caregivers three hours of time and 100 miles of travel per visit.²⁷

Limitations and Barriers

Physical, policy, and social barriers are preventing the next generation house call from taking root. One clear limitation of telehealth is the physical exam. Most psychiatric disorders can be diagnosed via telehealth through a detailed patient interview, with limited need for a dedicated physical exam; telepsychiatry is demonstrated to be as effective as in-person visits for the diagnosis of conditions ranging from generalized anxiety disorder to schizophrenia.³⁹ In contrast, the exam is essential for the diagnosis of such neurological disorders as multiple sclerosis and myasthenia gravis. Telehealth for these and other disorders may serve as a complement in the ongoing care of individuals who already have a diagnosis confirmed during an in-person visit.⁴⁰ For example, having an individual with known amyotrophic lateral sclerosis, who has impaired mobility and compromised respiratory function, come repeatedly to a major medical center for ongoing care is not only illogical but also potentially dangerous. Breakdown of an effective doctor-patient relationship due to the loss of face-to-face visits is also cited as a potential pitfall of telehealth.⁴¹ However, even in hospice care, a specialty where a strong doctor-patient relationship is paramount, telehealth has demonstrated benefit and been rated positively by clinicians, caregivers, and patients.⁴²

Policy barriers to telehealth are hindering its development. The two largest such obstacles are reimbursement and licensure. While the VA—an integrated financing and delivery health system—has widely adopted telehealth, other insurers have been slower to adopt. Forty-eight Medicaid programs now cover telehealth, but coverage is varied and coverage in the home is frequently limited. At least 30 states now mandate that private insurers cover telehealth to the extent they cover in-person care, but again, care delivered into the home is often excluded.⁴³ The real laggard is Medicare, which in 2015 spent less than 0.01 percent of its budget on telehealth.⁴⁴ Medicare only covers telehealth in areas of health professional shortage, and only when delivered into clinical

settings (e.g., medical offices, hospitals), which greatly limits access in a program whose fundamental purpose is to guarantee access.⁴⁵

In addition to reimbursement barriers, state laws generally allow patients to receive care only from clinicians licensed in the state where the patient is located. Effective January 1, 2017, an interstate medical licensure compact took effect that should facilitate cross-state licensure for physicians in 18 (primarily western) states, but its impact is still uncertain.⁴⁶ State licensing boards also have variable policies on what activities (e.g., prescribing of medications) can be done remotely.⁴⁷

The greatest barrier to adoption may be social. The fundamental purpose of telehealth is increasing access to care, but those who are least served and have the greatest need currently also have the least access to the internet and other technology necessary to take advantage of telehealth. These include individuals who are older, live in rural areas, and have lower incomes, less education, or more chronic conditions.⁴⁸⁻⁵⁰ Overcoming this barrier will mean increasing access to broadband communications and the necessary technology, improving “tech-literacy,” and providing support for those on the far side of the “digital divide.”

Future

In *Singularity*, Ray Kurzweil, the chief engineer at Google and a futurist, posits the “law of accelerating returns.”⁵¹ He writes, “[Technological] change advances (at least) exponentially, not linearly ... [and that] as a particular evolutionary process becomes more effective, greater resources are deployed toward the further progress of that process.” In medicine, exponential advances in imaging and genetics have profoundly altered and advanced our understanding of neuropsychiatric conditions. Similarly, telehealth will fundamentally alter and advance the way we care for individuals with chronic neuropsychiatric conditions.

Where barriers have been addressed, such as at the VA and in Canada, adoption of telehealth has expanded exponentially. From 2005 to 2013 the number of telehealth visits at a VA medical center in Vermont, which began with mental health, has increased 20-fold.¹⁸ From 2009 to 2014 the number of visits in the Ontario Telehealth Network has increased 10-fold.⁵² While initial applications were primarily rural, urban use of telehealth is now dominant (Figure 3).

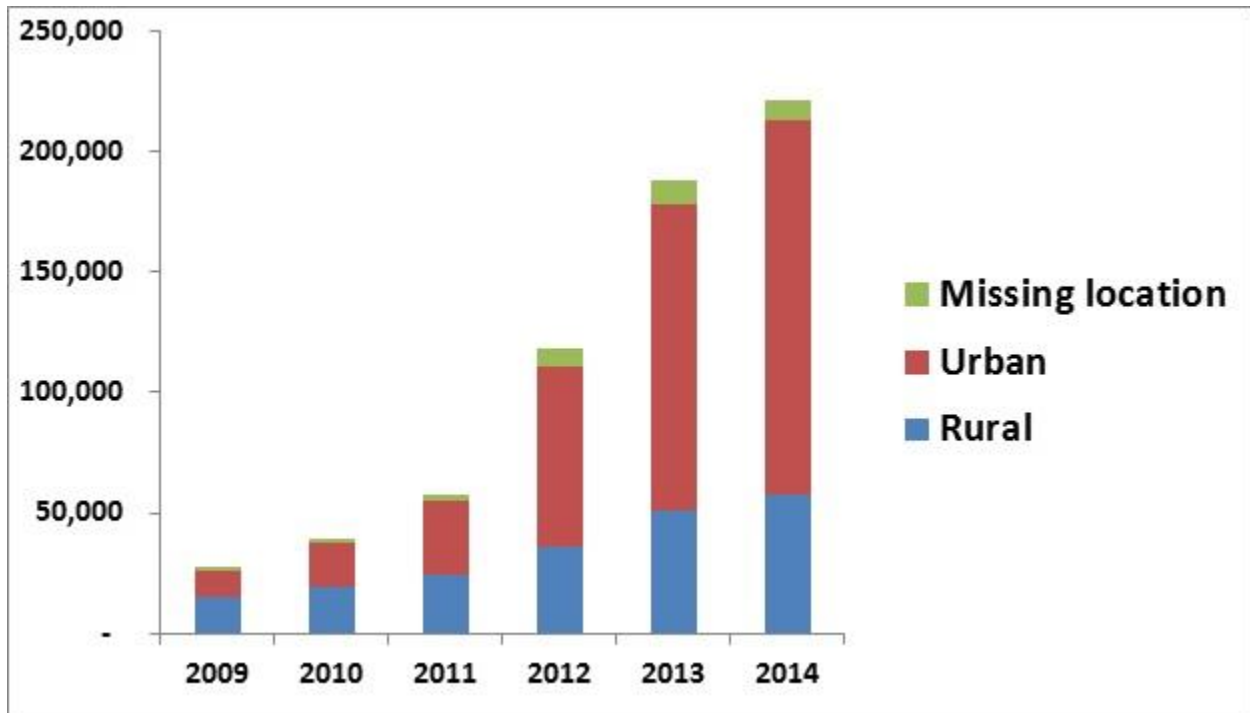


Figure 3. Number of telehealth visits by Ontario Telehealth Network, 2009-14. Source: O’Gorman LD, et al. *Telehealth and e-Health* 2016;22:473-9⁵²

As telehealth brings care into the homes of individuals with psychiatric and neurological conditions, three changes are likely to occur. First, the use of telehealth will rise exponentially. The exact timing and rate of adoption will be determined by policy changes, especially in Medicare’s coverage of telehealth. However, even absent such change, adoption will occur in other settings, either as a result of economic incentives for the use of telehealth, or simply by immense social forces (e.g., the mobility of the nuclear family, the aging of the population, geographically dispersed caregivers, broad adoption of internet for other services) driving demand.^{7,53}

Second, the aggregate number of patient visits will increase. Few patients feel they are receiving too much care, and empirical evidence suggests when barriers to access are reduced, utilization increases. Last year Kaiser Permanente in Northern California had more virtual (phone, email, and video) than in-person visits, which have remained relatively stable.⁵⁴ The US Congressional Budget Office is concerned that by increasing visits, telehealth will lead to higher costs.⁵⁵ However, those concerns are short-sighted and misplaced. Large, high-volume, and centralized health systems that

are most at risk for increased utilization, such as in Canada or at the VA and Kaiser, have been the largest adopters of telehealth; they realize that such patient-centered care is far less expensive than institution-delivered care. Indeed, in Parkinson's disease, more visits to a neurologist are associated with fewer hospitalizations and lower overall Medicare expenditures; telehealth offers a mechanism to facilitate and bear this increase in specialty neurological care through improving access, while limiting the economic burden.⁵⁶

Third, the number of in-person office visits will slowly decline. Currently, over 50,000 psychiatry and neurology office visits occur annually in the US.⁵⁷ This is unlikely to change in the near term, but virtual visits in the home will eventually replace some office visits, which are costly to patients in terms of time and travel (the average 20-minute doctor's visit takes two hours of time and travel) and to clinics in terms of labor, space, waiting rooms, and parking lots.⁵⁸ The future implications for this change will be profound, just as they have been in the retail sector, where stores from Walmart to Macy's are closing, shopping malls are disappearing, and home delivery volumes are rising.⁵⁹⁻⁶² For psychiatry and neurology clinics, space and labor needs will decrease and beyond the increase in virtual visits, demand for traditional in-person home visits (e.g., for support, relationship development) will likely increase as care convenience becomes a priority. Mutually beneficial relationships with local clinicians will need to be cultivated to ensure proper oversight of care and to address emergencies. For clinicians, training for digital medicine will have to begin.

For now, as the burden of neuropsychiatric conditions rises along with the demand for convenient, patient-centered care, telehealth is poised to deliver care where it has always been needed most—at home.

Bios

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