



telemedicine

Broadband, telemedicine, and better health outcomes

Enhanced medical services, delivered via broadband networks, are rocking the medical world — both for patients and for healthcare providers.

E-Health, government-mandated electronic databases, wearables that measure vital body signs, Apple iOS-8 applications monitoring individual health records, assisted remote diagnostics, IBM Watson robots, and hospitals/ doctors/ diagnostic labs networking as part of government health plans are part of having our 21st century health records being automated and available anytime, anywhere and in any way.

Broadband is playing an integral role as the network backbone to facilitate all above transparently.

This growing movement — call it telemedicine or connected health — has its origins running back 40 years with such diverse enterprises as the monitoring of vital signs of NASA astronauts.

The nagging impediments on the networking side have been (1) too-slow data rates, (2) too-errant reliability and (3) no automated doctor patient platform. But today's maturing Broadband networks are addressing these shortcomings. Numerous working partnerships have been formed between healthcare professionals and technology solution providers well-funded entrepreneurial startups, and visionary, but solitary, app developers.

Gradually, the white papers and cheerleading of a nascent industry are giving way to reliable services platform performing life-saving tasks using any and all type of broadband connections and software platforms.



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Across the U.S., hospitals and clinics are deploying innovative, broadband-based technologies and methods to expand access to care and to deliver that care in cost-effective ways, breaking down geographic barriers and, in many cases, saving lives. Telemedicine systems are replacing office visits, keeping costs down, and empowering patients to take charge of their health and participate in their own treatment. For example:

- A hospital in Boston at night time can use the X-Ray professional in Sydney
- A surgeon in London can tab on a professor in San Francisco
- A researcher in Atlanta can collect data automatically from East Africa in real time
- A Doctor in the Middle East can collaborate with research in Switzerland on pharmaceuticals

Medical professionals benefit in numerous ways. With high-speed computers and gigabit-speed networks, doctors and nurses may rapidly access patient records and medical reference material. Doctors in rural areas may employ teleconferencing and data-sharing to seek diagnoses from far-flung specialists. At rural healthcare facilities grappling with doctor shortages, "telepresence robots" are becoming a common sight, remotely guided from room to room and giving remotely located physicians a way to observe, converse with, and evaluate patients almost as if they were in the same room.

Patients, too, are taking to telemedicine. People with chronic conditions such as diabetes, heart disease, hypertension and asthma — and patients recently released from hospitals — are sharing diagnostic data acquired from "wearable" sensors on their bodies via wireless or wireline links with healthcare providers, who can catch changes in patient condition as they develop. Personal emergency response systems (PERS) monitor at-risk homebound seniors. Network-connected pill boxes remind patients of skipped dosages and even auto-refill prescriptions. Increasingly, these devices employ "machine-to-machine (M2M)" connectivity that leaves error-prone humans out of the loop.

Recent surveys among healthcare consumers have revealed surprisingly high acceptance of such automated, remote healthcare technology, with highest acceptance among patients with the most life-threatening conditions such as heart disease, but also those with asthma, high blood-pressure and diabetes.

How prevalent is telemedicine? A 2012 *US News and World Report* article estimated more than 36 million Americans had used telemedicine, and the American Telemedicine Association estimates in 2015 that the number of existing telemedicine networks in the United States at roughly 200 providing connectivity to over 3,000 sites.



Demographic trends — growth of the Baby Boomer population, along with their longer life expectancy, growing techno-literacy, and embrace of smartphones and tablets — create increasingly fertile ground for telemedicine in the home. While benefiting from in-home monitoring, patients are also expanding their participation in “crowdsourced” websites and social media conversations devoted to the sharing of medical information and mutual support. People need no longer face their health problems so alone.

A major problem remains bringing advances in telemedicine to people who have traditionally been underserved by healthcare providers, whether due to geography, poverty or cultural barriers. These shortfalls hit hardest at two populations most in need: seniors and the disabled. It will be a particular challenge for broadband providers, along with med-tech providers and healthcare providers, to target and remedy such inequities.

Overall, though, broadband networking promises to help tame the ravaging costs of healthcare — estimated at 15 percent of total U.S. GDP — while bringing comfort to a populace still in need of affordable healthcare and successful medical outcomes.

To sharpen the point and sum it up, Hamadoun Touré, secretary-general of the International Telecommunications Union, was quoted in a May 2012 World Health Organization Bulletin:

“In a world with a growing and aging population, information and communication technologies will play a vital role in the provision and delivery of health care.”

“In terms of patient care, e-health technologies enable remote patient monitoring; better dissemination of information to patients; improved access to health advice; access to remote consultations and telemedicine and quicker access to emergency services. E-health technologies also help to deliver better training for health-care workers, and they improve disease surveillance, data collection and the management of patient records, thereby increasing transparency and accountability.”

Toure heads a United Nations specialized agency which aims to improve the standards of information communication technologies in underserved areas, including e-health.

