Technology Trends

By John Glaser, PhD

Tipping Point
The Arrival of Connected Health

Connected Health involves the use of information technology to deliver care outside of the hospital or doctor's office. Connected Health encompasses a wide array of applications, including personal health records, remote blood pressure monitoring, wound management and online second opinions.

Areas of Connected Health

Connected Health is not a new idea. Telemedicine and telehealth applications and demonstrations have been part of the healthcare landscape for several decades. Connected Health efforts fall into four general areas which reflect different core intents. Considerable overlap can exist across these areas.

Management of chronic disease. Connected Health applications can support the management of chronic disease by gathering information about a patient's health status (often using sensor and other measurement technologies), transporting those results to a care provider and providing the patient with a summary of data, health education information and the ability to converse with their care team.

E-visits. E-visits enable a patient to seek diagnostic and therapeutic advice and ask their providers general health questions. E-visits can take the form of an online second opinion: a structured, guided description of a health problem that a patient forwards to a physician, an interactive mental health consultation and an e-mail exchange focused on altering a medication regime.

Post-hospitalization management. Information and telecommunications technologies can be used to monitor the recovery of patients post hospitalization. Cell phone cameras can be used to take and transmit pictures of post-operative wounds. Post-hospitalization situations that involve urosepsis, neonatal apnea and myocardial infarctions can all be monitored and managed remotely.

Personal health records. Personal health records (PHRs) provide patients with the ability to view data from their medical records, engage in healthcare transactions such as prescription renewal and searches for healthcare information.

Factors Driving the Arrival of Connected Health

Connected Health is not widely adopted. However, there are multiple factors that are likely to accelerate adoption leading to the arrival of Connected Health.

Concerns with the Cost and Quality of Healthcare

There are significant healthcare cost and quality issues in the United States. Within these overall issues, Connected Health adoption will largely be driven by efforts to manage chronic disease.

There are 100 million people in the United States with a chronic disease. More than 50 percent of Medicaid and Medicare patients have a chronic disease or disabling condition. These numbers will grow as people live longer and the healthcare system becomes more effective at helping people live with these diseases.

In addition to costs, the oft-cited RAND study noted that the chronically ill receive appropriate care only half of the time.

The growing prevalence of these diseases, their mounting contribution to the costs of healthcare and the uneven quality of chronic disease care have led to heightening interest in leveraging information technology to deliver monitoring and educational services to patients.

While focused on these patients, Connected Health will not be confined to the chronically ill. Pressure to reduce length of stay and hospitalization costs have
resulted in earlier discharges of patients. To ensure that patients are recovering well, Connected Health can be used in situations that are diverse as post-operative wound management and congestive heart failure management.

Reimbursement mechanisms that reward care coordination and care quality may accelerate Connected Health adoption. For example, reimbursement that leads to a reduction in hospitalizations may increase the use of Connected Health for fragile, home-based patients.

TECHNOLOGY PREVALENCE AND CAPABILITIES

There have been extraordinary advances in the ability to deliver networked computing anywhere. Wireless networks are becoming ubiquitous. Fifty-four percent of U.S. households have a broadband connection and this is expected to increase to 77 percent by 2012. In 2008, there were 190 million mobile devices in North America. These advances provide the capabilities needed by many Connected Health applications. Of particular importance is the fact that these networked technologies support a high degree of consumer mobility. This proximity to the person opens up possibilities that are much harder to achieve when the networked device is at a fixed location.

The widespread availability of these technologies significantly reduces the costs of providing Connected Health applications and services. An organization that wants to offer, for example, a service that assists with diabetes management can leverage a very large base of cell phone/PDA users and broadband connections.

PUBLIC ACCEPTANCE OF CONNECTED HEALTH

The Deloitte 2008 Survey of Health Care Consumers found that consumers are beginning to support Connected Health:

- Three out of four consumers want expanded use of in-home monitoring devices and Internet-based methods that would reduce the need for provider visits.
- Twenty-five percent of consumers say that they would pay more for online access to records, e-mail access and same-day visits.
- Thirteen percent of consumers report using a medical monitoring device and 72 percent of consumers are very interested in using self-monitoring devices at home.

These findings are coupled with and reflect the growing consumer comfort with and use of the range of technologies available.

EMERGENCE OF ALTERNATIVE BUSINESS MODELS

Connected Health adoption will accelerate because individuals and organizations are willing to pay for its adoption. Connected Health has long been stymied by the lack of reimbursement for care delivery that utilized “telemedicine.” As a result, Connected Health use was largely restricted to demonstrations, federally funded programs for underserved areas and care delivered to prisoners.

However funding for Connected Health is becoming less reliant on traditional fee-for-service reimbursement. These emerging, alternative business models are a reaction to the factors discussed above and are being advanced by three major purchasers of care—self insured employers, consumers and traditional health insurance companies.

Self-insured employers. Self-insured employers have begun to experiment with and rollout targeted Connected Health initiatives. These employers are trying to reduce healthcare costs, improve employee productivity and enhance talent recruitment and retention.

Self-insured employers are rapidly becoming quite sophisticated about the strengths and weaknesses of various approaches to managing the care for their employees. They understand that their efforts to manage employee healthcare must be multifaceted and holistic. Premium structures must encourage awareness of healthcare costs. Disease and health management programs must be offered and incentives must be developed that encourage their use. Company sponsored health information Web sites need to be provided.

Connected Health applications will become part of this employer mix of initiatives. Employers are offering applications such as personal health records, remote monitoring of chronic conditions and online second opinions. While many of these offerings are in experimental stages it is highly likely that they will offer enough value to persist as offerings and become benefits expected by employees.

Direct to consumers. Consumers are directly purchasing some Connected Health offerings. For example, the adult children of elderly parents are beginning to purchase services that provide remote care and health monitoring; enabling their parents to remain in their homes. For similar reasons some elderly consumers are taking advantage of these services.

With the increasing awareness of their health and healthy behaviors, consumers with a chronic disease and health concerns can be expected to purchase Connected Health services that leverage their cell phone/personal digital assistant products and services.

An organization that wants to offer a service that assists with diabetes management can leverage a very large base of cell phone/PDA users and broadband connections.

In addition, patients are also becoming more demanding of convenience when they seek healthcare; an e-visit may be easier than traveling to a provider’s office. Hence, some patients may be willing to pay additional fees for convenient care just as they pay extra for convenience in many other aspects of their lives.

Companies that provide network services and communication/computer devices are finding their core business is becoming a commodity. Many of these organizations have begun to offer Connected Health applications in an effort to distinguish their products and services and improve margins. Clearly efforts to promote these new services will result in increased adoption.

Traditional health insurance organizations. Traditional managed care organizations and health insurance companies are gradually increasing their support of Connected Health.

A number of these organizations (e.g., Aetna, Cigna, Wellpoint and BlueCross...
BlueShield of Massachusetts and California) are experimenting with e-visits. Virtually all health insurers are providing some form of personal health record. While the utilization of e-visits and these PHRs is very low, there are enough early promising results that these offerings can be expected to continue.

Direct provider reimbursement for e-visits however may never be a significant driver of Connected Health. Efforts to alter reimbursement to forms based on care quality and efficiency and care coordination are likely to be a more significant factor in Connected Health utilization. The advent of these outcome oriented reimbursement strategies will result in provider organization adoption of these technologies and others such as electronic health records, disease registries and inter-provider interoperability.

The interests of self insured employers and consumers will add pressure to the efforts of traditional health insurers. The growing adoption of Connected Health also accelerates industry learning about which services and applications provide value and the holistic mix of incentives, promotion and other services that are needed to achieve value. These understandings make it easier (less risky) for more conservative organizations to adopt Connected Health.

**SUMMARY**

After decades of experimentation and demonstration, Connected Health is poised to arrive. Several powerful factors have become more pronounced and their convergence more potent.

Clearly there are issues and barriers that still need to be resolved. Healthcare providers are often hesitant to integrate Connected Health into their care practices. Reimbursement is still limited and uneven and under-powered. The value of several applications, such as the Personal Health Record, is unclear. Privacy concerns persist.

However, given its utility and the factors at work, Connected Health will become an integral and significant component of healthcare. **JHIM**

---

**REFERENCES**


---

**John Glaser, PhD**, is Vice President and CIO of Partners HealthCare in Boston, and Senior Advisor with Deloitte Center for Health Solutions.