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The case for “connected health” at home

■ ABSTRACT

Communication and health monitoring technology and devices will enhance the potential for improved home health care services over the next decade. The technology exists to improve patients' access to specialized care, to monitor in-home risks for patients who have dementia or limitations in activities of daily living, and to minimize annoyances such as delays and long waiting times. Certain barriers must be addressed, however, such as third-party reimbursement restrictions, regulatory issues, and technologic limitations. Innovative clinicians will find ways to use these technologies to improve care while lowering costs and increasing value.

Many technologies have emerged to monitor, interact with, and support patients at home and change home health care delivery.¹⁻⁵ This trend coincides with the explosion of consumer digital and mobile products such as “smartphones” and has brought with it many different names, such as telehealth, telemedicine, e-medicine, remote monitoring, “virtual” care, digital health, mobile medicine, interactive health, and distance health. Many of these terms and concepts raise concerns for those who value traditional expressions of caring, physical diagnosis, touch, and presence in health care. However, these new technologies may present opportunities to find ways to enhance humanism in home health care. This potential may be most evident among patients with serious chronic illness and their families, who often struggle 168 hours a week but find their access to help limited to brief visits at times convenient for the provider.

While our health care system offers heroic acute-care treatments for hundreds of life-threatening maladies, we seem to fall short in helping those with serious ongoing needs whose care must be coordinated over time and across health care venues. Thinking in terms of “connected health” may provide a more

holistic nomenclature that suggests the bond between technology and the opportunity for closer personal relationships.⁶⁻⁸

■ OPPORTUNITIES

Can technology better connect our home health patients and families to care during the “white space,”⁹ between our visits? Can we use new mobile and digital technologies to improve care for the seriously chronically ill? We have the technology to turn many challenges into opportunities in the next decade. For example:

1. Can we change our visit-based model of home health care to a model that provides 24/7 “inbound” multichannel access to home health care teams along with proactive “outbound” support between visits in the form of multimedia health education and virtual encounters? Can this free up time for longer visits targeted toward higher-risk and higher-complexity scenarios that require extensive team leadership and care coordination?

2. Can “smart” home monitoring be integrated into home-based long-term care for patients who have dementia, fall risks, other safety issues, or unaddressed limitations in activities of daily living to increase independence and quality of life and reduce institutionalization while decreasing cost of care and accommodating workforce constraints?¹⁰

3. How do we apply clinician-to-clinician and clinician-to-patient videoconferencing and other connected health approaches to increase home health patient access to specialized, but hard-to-find, clinicians for consultative and direct-care services?

4. Can emerging technologies accelerate the shift in care whereby most acute care for exacerbations of chronic illness and other common acute scenarios move from hospitals into home-based models of acute care, such as “Hospital at home”?¹¹

5. To what extent can apps and other technologies provide self-management support to truly deliver the home health care version of the automatic teller machine? For example, diabetes self-management support tools provide patients feedback about their

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disease based on information input into mobile devices.¹² Can this be expanded in a way that dramatically increases access, especially for vulnerable groups that have been hard to reach, while also decreasing costs?

6. Can we improve the home health care experience by using connected health concepts to improve transparency, minimize common scheduling delays and annoyances, and empower patients while they are receiving care?

■ REAL-WORLD BARRIERS

Despite the opportunities, barriers remain for innovative providers. With few exceptions, there is no direct third-party reimbursement for care that comes through a device rather than the front door. Medicare does not reimburse home health providers for services outside of a visit, but specific guidance has been issued that clarifies some of the opportunities:

An HHA (Home Health Agency) may adopt telehealth technologies that it believes promote efficiencies or improve quality of care. . . . An HHA may not substitute telehealth services for Medicare-covered services ordered by a physician. However, if an HHA has telehealth services available to its clients, a doctor may take their availability into account when he or she prepares a plan. . . . If a physician intends that telehealth services be furnished while a patient is under a home health plan of care, the services should be recorded in the plan of care along with the Medicare covered home health services to be furnished.¹³

Thus, there is no reimbursement for telehealth services, but if telehealth is part of a physician-directed plan of care, it may be included if it promotes home health quality and efficiency. Beyond reimbursement, there are other regulatory barriers. If monitoring or other digital or virtual services are provided across state lines, the clinicians involved in a regional or national “command center” likely must meet the licensure requirements (or obtain waivers) for every jurisdiction in which their patients reside. Providers should seek counsel regarding the extent to which new devices and software need to be approved by the US Food and Drug Administration before being deployed. And, as with all health-related communication, it is essential that information transmitted in nontraditional ways be secure, private, and compliant with all mandated standards for privacy. Finally, if the technology or service is rolled out in a fashion that could be construed as a “gift” or “freebie” for marketing purposes rather than a tool to improve clinical outcomes and health care value, then there may be

a risk that the approach runs afoul of laws to prevent undue inducements.

In addition to reimbursement and regulatory concerns, there are technical barriers to fully realizing the connected health opportunities in home care. Even if patients are provided with devices, there is variability in internet connectivity or bandwidth in any given home. Providing devices with built-in cellular capabilities can reduce these barriers, but cellular data coverage varies across different geographies. High-quality health care videoconferencing tends to require more bandwidth than that provided in the typical “3G” connection. Use of existing cable television connections, which are almost ubiquitous, is another option, but it typically requires a more customized set-up than consumer mobile devices with cellular and wireless capabilities. If the services were delivered or coordinated by the cable provider, some of these inconveniences might be resolved.

As with most innovation, there is no “cookbook,” and there is limited and conflicting evidence in the clinical sciences literature to guide best practices. Organizations that commit to using technology to improve the quality and efficiency of care will experience fits and starts before they find the right types and “doses” of technology in their new care models. The home health community should beware of these frustrations leading to undue skepticism, like that of *Newsweek* author Clifford Stoll, who in 1995 infamously wrote about the developing internet:

. . . today, I'm uneasy about this [trend]. . . . Visionaries see a future of telecommuting workers, interactive libraries and multimedia classrooms. They speak of electronic town meetings and virtual communities. Commerce and business will shift from offices and malls to networks and modems. And the freedom of digital networks will make government more democratic. Baloney. Do our computer pundits lack all common sense? The truth is no online database will replace your daily newspaper . . . no computer network will change the way government works.¹⁴

Like the internet of 15 years ago, mobile and digital technologies are now changing how people live and relate to one another and how businesses function. It is unlikely that the impact of these technologies on health care will be fully elucidated by controlled trials that consider incremental changes to existing care models and workflows. Rather, innovative providers and the next generation of clinicians that “grew up,” with mobile devices as part of their lives will create new home care workflows and care realities. Home health providers can use these technologies to better

connect their patients and find new ways to reduce suffering, increase health and independence, and improve the care experience while lowering costs and increasing value. The individuals and organizations that seize the moment and “answer” these key questions in connected health with successful new approaches to care will be the winners of the future. There is such an opportunity to make a difference.

REFERENCES

1. **Chen HF, Kalish MC, Pagan JA.** Telehealth and hospitalizations for Medicare home healthcare patients. *Am J Manag Care* 2011; 17(6 Spec No.): e224–e230.
2. **Gellis ZD, Kenaley B, McGinty J, Bardelli E, Davitt J, Ten Have T.** Outcomes of a telehealth intervention for homebound older adults with heart or chronic respiratory failure: a randomized controlled trial [published online ahead of print January 11, 2012]. *Gerontologist* 2012; 52:541–552. doi:10.1093/geront/gnr134
3. **Baker LC, Johnson SJ, Macaulay D, Birnbaum H.** Integrated telehealth and care management program for Medicare beneficiaries with chronic disease linked to savings. *Health Aff (Millwood)* 2011; 30:1689–1697.
4. **Franko OI, Bhola S.** iPad apps for orthopedic surgeons. *Orthopedics* 2011; 34:978–981.
5. The smartphone will see you now: “apps” and devices are turning cell phones into tools for health. *Harv Heart Lett* 2011; 22:3.
6. **Barr PJ, McElnay JC, Hughes CM.** Connected health care: the future of health care and the role of the pharmacist [published online ahead of print August 4, 2010]. *J Eval Clin Pract* 2012; 18:56–62. doi:10.1111/j.1365-2753.2010.01522x
7. **O'Neill SA, Nugent CD, Donnelly MP, McCullagh P, McLaughlin J.** Evaluation of connected health technology. *Technol Health Care* 2012; 20:151–167.
8. **Ziebland S, Wyke S.** Health and illness in a connected world: how might sharing experiences on the internet affect people's health? *Milbank Q* 2012; 90:219–249.
9. **Dobson A.** Personal communication. 2011.
10. **Dreyfus D.** Smart-home technology for persons with disabilities. *Am Fam Physician* 2009; 80:233.
11. **Leff B, Burton L, Mader SL, Naughton B, et al.** Hospital at home: feasibility and outcomes of a program to provide hospital-level care at home for acutely ill older patients. *Ann Intern Med* 2005; 143:798–808.
12. **Quinn CC, Shardell MD, Terrin ML, et al.** Cluster-randomized trial of a mobile phone personalized behavioral intervention for blood glucose control [published online ahead of print July 25, 2011]. *Diabetes Care* 2011; 34:1934–1942. doi:10.2337/dc11-0366
13. Medicare Home Health Agency Manual. Section 201.13, Telehealth. Centers for Medicare & Medicaid Services Web site. <http://www.cms.gov/Regulations-and-Guidance/Guidance/Transmittals/downloads/R298HHA.pdf>. Published January 22, 2002. Accessed September 18, 2012.
14. **Stoll C.** The Internet? Bah! *Newsweek* 1995; 125(February 27):41.

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