mHealth and 2nd Generation Telemedicine: Making the Medical Home Mobile to Provide Care for the World's Population

Abstract

The global delivery of medical care remains one of the world's greatest challenges. Fiscal constraints, limitations in medical workforce capital, and disparate resource distribution affect governments equally—be they industrialized or developing. As cultures continue to integrate online communication and patient engagement in mobile technology matures, interactive mHealth technology offers to revolutionize healthcare by providing low cost, freely mobile health provider access and medical information.

A two-year pilot study investigated the application of e-Visits through a novel mobile platform. Cases were derived from a convenient sample of a rural Kentucky (USA) primary care practice, with 24-hour access made available to established patients for mild to moderate medical problems. Patients were asked to complete an Internet-based questionnaire providing a formatted history to the physician's mobile device with an option to add up to five photographs, if necessary. Physician reviewed history, completed assessment/plan, and contacted pharmacy for prescription. Unilateral option for the physician to contact patient by phone or video in real time was possible. Average encounter turnaround time was <3 minutes.

CASE STUDY

An efficient mobile platform (smartphone/tablet) applied to e-Visit technology yields the functional result of 2nd generation telemedicine, i.e. real-time audio and/or video between the patient and provider for no added cost. Telehealth care within the study required considerably less resources ultimately lowering the clinic's global per-capita costs 15%, with an equal 15% increase in capacity in a fee-for-service model. Substantive increases in these indices would be anticipated within capititated or single-payer systems. Patients were fully satisfied with this model (97%). The majority of study patients (81%) sought care after clinic hours avoiding the compounded expense of urgent/emergent care modalities. The geographic breadth for a single provider estimated at 4,000 sq mi, or about 10% of the land mass of Kentucky—inclusive of five federally-designated under-served counties in the remote, mountainous region of Appalachia. No quality problems affecting health or outcomes were observed.

The results of this pilot study suggest that mobile e-Visit technology improves the efficiency of primary care medicine; however, it is notable that the engineering of this particular system makes it amenable to medical specialties, dentistry and podiatry. Mobility added to online care dissolved geographic boundaries and allowed the Medical Home model to be preserved, thus releasing an indirect savings of efficient evaluation, treatment and care continuity. Mobility also strengthened patient engagement which encouraged patient to seek care early in the disease course, as well as, improving compliance with follow-up--this, minimized the expense of morbidity and complication.

From a practice management view, this augmentation to the traditional care model did not detract from routine clinic obligations or time with family after-hours. Care was provided between encounters, and over time, an amended workflow increased clinic availability, increased provider panels, and allowed providers to designate additional resources to those deemed necessary. The efficiency of a mobile platform increased the quality of experience for patient, provider and practice.

Geographic inroads with online access and mobile communication continue to evolve globally. Interactive mHealth initiatives, such as, 2nd generation telemedicine are posed to gain momentum and become ubiquitous within the general public and medical community. This is critical to developing a sustainable delivery model for nations with rural, under-served or a disparate populations. It reasons that distribution and scaling of the technology could be efficiently accomplished (downloadable apps with centralized IT). Critically, no
substantive infrastructure change would be necessary within medicine's clinical culture; likewise, regional communication systems with established 3G or 4G technology may adopt this augmented model of medical practice.

In summary, 2nd generation telemedicine promises to lower costs and increase access to medical care for the world's populace. Inexpensive virtual care leverages intellectual capital to provide an immediate solution to provider shortages. Interactive mHealth strengthens the Medical Home which augments savings; ultimately, it may herald further dissemination throughout medical specialties and other allied health fields. Most importantly, benefits apply without bias to all health systems and all geographic regions around the world. In one fell swoop, mobility in online care may open a new era of health delivery and help all nations meet the Triple Aim of improved patient engagement, lower per-capita health costs, and improved population health.