Wearable Computing Comes of Age in Healthcare

A Game Changer for Clinicians Enabling Interaction with Data to Drive Positive Outcomes

Vocera Communications, Inc.
August 2014
Wearable Computing Comes of Age in Healthcare

Connected wearable computing technology, now carving major inroads into healthcare settings with smartglasses like Google Glass,™ and other mHealth devices, is quickly gaining an enthusiastic following as a game-changer for clinicians. Wearable computing devices hold the promise of completely unshackling clinicians from workstations and improving workflow, quality of care, access, and health outcomes in hospitals, and enabling virtual and remote care.

Smartphones and tablets have already established themselves as clinical essentials providing instant communication, secure texting, image capture and viewing, immediate access to critical alerts and alarms, and the capture and entry of data into electronic health record (EHR) systems—all in light, easy-to-carry devices. Wearable tech takes those capabilities to the next level with the potential to significantly transform clinical workflow and by enhancing the ability to receive and act on information. Improved communication and collaboration facilitated by wearables, such as hands-free communication badges, have been shown to make hospitals more efficient by streamlining workflows and reducing alarm response times by as much as 93 percent (Beaumont Hospital, Troy, MI).

Adding “augmented reality” to wearable devices further enhances communication by offering wearers a view of the real world overlaid by computer-generated information. Like a smartphone, smartglasses can run apps, and have both camera and audio capabilities. However, smartglasses go a step further by accessing and making information available right in the wearer’s visual field where it remains private and confidential, a critical consideration in a healthcare setting.

According to a recent Northwestern Medicine study, when physicians spend too much time looking at the computer screen in the exam room, nonverbal cues get overlooked, which affect their ability to pay attention and communicate with patients (International Journal of Medical Informatics, Volume 83, Issue 3, Pages 225–234, March 2014). Wearables, on the other hand, allow for a more natural interaction. Similar in weight and appearance to a pair of conventional eyeglasses, Google Glass enables a physician to converse with a patient without breaking eye contact. In addition, voice activation makes use of the device relatively hands free, eliminating the need for a keyboard or touchscreen, and mitigating concerns about hand-to-device pathogen transfer.

Refocussing on the Patient

The most logical use of wearable augmented reality devices in healthcare is to display information when needed and to input data into the EHR system. According to several time management studies, physicians spend an estimated 40 to 50 percent of their day on a computer (Journal of General Internal Medicine. 28: 1042-1047; Methods of Hospital Medicine. 5: 353-359). Connected wearables can help reallocate that time to treating patients.

Furthermore, live streaming via Google Glass from the operating room has allowed surgeons to engage in remote two-way consultations with distant colleagues and beneficial data sharing during procedures. As the patient care team becomes increasingly distributed across the hospital and associated care facilities, this ability to perform remote consultations will become increasingly important.

A number of companies are already working with smartglasses to develop applications relevant to healthcare, and that number is certain to grow exponentially as developers explore the capabilities of the device and clinicians raise their expectations.

“The role of Glass as a surgical and teaching tool is tremendous. And this is only the beginning. New applications — some we can’t even imagine yet — will help transform surgery and the surgical experience.”

Dr. Rafael Grossmann, first surgeon to live-stream surgery using Google Glass, Eastern Maine Medical Center, Bangor, Maine. Forbes, June 21, 2013

“Think of wearables as devices that deliver alerts precisely when consumers need them, in sync with their other devices. For example, a shopping list is automatically sent to the phone of a consumer who is passing the grocery store, because the consumer is low on vegetables. Similar scenarios exist in healthcare, in which a wearable device leverages lifesaving hyperawareness.”

Gartner
Instant Wearable Access a Plus for Nurses

While wearable computing devices show promise across many aspects of healthcare, the advantages for nurses are particularly apparent. With wearable devices, such as smartglasses, nurses working in hospitals and other medical facilities could access instant vitals by simply walking up to a patient’s bed. Wearables could be used for alerts and alarm management, scanning QR and barcodes, and for integrating with clinical systems throughout the hospital to streamline workflow. Two-way communication through the device to the EMR system would allow nurses to input and retrieve information and to identify and avoid potential drug interactions when scanning a prescription.

The instant access to information provided through wearables could be instrumental in greatly reducing the number of medical errors and, overall, in improving a nurse’s ability to provide quality patient care. With patient profiles accessible and updated live through the device, nurses could instantly confirm the right patient is getting the right medication at the right time.

There are considerable benefits to wearable technology for home health nurses and others working remotely outside of a healthcare facility as well. With wearables, remote workers are able to capture images, record video, and live stream footage of a patient back to the physician and the EHR, saving time and greatly increasing their effectiveness and accuracy in the field.

Revolution Has Just Begun

Modifications are continuing to be made to Google Glass, and while it is considered the most well-developed wearable device at the moment, it won’t be long before other smartglasses find their niche in the healthcare setting. First responders, for example, may soon be outfitted with gloves with built-in sensors and glasses with heads-up displays and live stream video capabilities that could provide direct, and possibly life-saving feedback from the back of an ambulance to the hospital ED, prior to arrival.

However, much like an actual clinical interaction in which a physician and patient exchange information about the reason for a visit and then discuss the actions to be taken as a result, a wearable augmented reality device that is successful in a healthcare environment requires that it be an interactive or “two-way” product in order to be effective. There is limited value in a one-way communication device that allows for display only. The device must be able to access data that is contextually relevant and actionable and then enable the physician or nurse to easily interact with that data to drive specific outcomes.

As with any device, the wearable computer must be built on a platform that can provide rich content and interactivity, and have the ability to aggregate, process, and deliver data to the device. No matter the final use, wearable augmented reality devices, like Google Glass and the Vocera® Communication Badge, represent an opportunity to provide clinicians with the ability to focus on patients and outcomes, rather than on the mechanics of the process and data gathering.

About Vocera

Wearable augmented reality devices can join the portfolio of devices that seamlessly interact with the Vocera Communication Software Platform, Collaboration Suite, and Care Experience to enable communications across the continuum of care, outside of hospital walls and into communities. The Vocera® software platform can run on any smart device, including Google Glass, or on the wearable Vocera Badge, inside and outside the facility. The software platform contains the system intelligence, including user profiles, groups, call management, and call connections, as well as the ability to interface to existing telephony, alarm and alert systems to expedite communication of today’s mission-critical hospital data.

“I actually believe wearable computers are going to be a very significant part of healthcare in the near future.”

Dr. John Halamka, CIO, Beth Israel Deaconess Medical Center, Boston
Modern Healthcare, March 21, 2014