Pharmacy Automation and Technology

Potential Uses of Google Glass in the Pharmacy

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Technology companies are in a constant battle for consumers' interest in their products. This leads to rapid change and innovation. Google Glass is a recent innovation that will soon be available to the general public. In this article, we briefly describe our experiences with Google Glass and suggest ways we think it can be used in the hospital pharmacy setting.

Sometimes we just have to marvel at the technological advancements that are occurring around us. For example, Apple clearly revolutionized the cellular phone so that today's smartphones actually are *smart*. The competition has provided a significant challenge to Apple's iPhone, resulting in a better iPhone and other smartphones that provide great options. Clinical information systems are drastically changing the way knowledge-based and patient-centric information can be shared within a health system. Your patients have new tools (like portals) that allow them to engage the health system from their homes (and from their smartphones). Your patients can even collect health and wellness data at home and share it with the health system electronically. You can likely identify many other technological advancements that are changing the way we work.

We wonder, though, what opportunities Google Glass (also known simply as *Glass*) might offer pharmacy staff in health systems. While neither of us was selected to be a Glass Explorer (individuals given the opportunity to buy early releases of Glass for developing and testing), we have had the opportunity to experiment with a colleague's set. Before we get too deep into what Glass might offer in pharmacy, we should describe what Google Glass actually is. Glass is a wirelessly connected almost hands-free computer that you wear like glasses. The heads-up style display uses a prism and sits just in front of the user's eye, although there is not a set of traditional lenses. Users interact with Glass primarily through voice controls, with some controls being activated by users touching the frame. Sound is provided through bone vibration technology that vibrates the user's mastoid bone,

allowing only the person wearing Glass to hear what it has to say. Glass has picture and video capture capabilities, using the entire viewing area as the recordable field. Glass runs the Android operating system, includes GPS functionality, and has a 1-day battery life. The Google Glass Explorer program began in the spring, and a consumer version is expected sometime in 2014.

Very few apps exist for Glass as this time. At this point, efforts are focused on Glass as a navigation tool, a mechanism for social media notifications, and other augmented reality functions. What seems like an obvious selling point for Glass is that it frees up the user's hands while still providing functions similar to a smartphone. Because it is intended to be worn for extended periods of time, Glass is designed to not interfere with normal vision. It took a very short time for us to adjust to viewing the prism while performing other routine tasks. Some controls are provided through head movements, which did feel a bit odd initially but seemed less awkward over time. The audio function worked well and was comfortable. Overall, Google Glass felt a little different than normal glasses – primarily because the earpiece is larger and they do not have lenses – but it is comfortable.

Clinical services are the future of pharmacy, but the pharmacy department is still responsible for managing the medication dispensing process. In his blog, Dr. John Halamka suggests that nurses could wear Google Glass to document medication administration (<http://geekdoctor.blogspot.com/2013/07/the-healthcare-it-applications-of.html>). Similarly, we envision a future in which pharmacy staff could use Google Glass to support the dispensing process. With the wide variety of dispensing workflow in health

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systems across the country, the ideal use for Google Glass will vary by institution. In general, however, we see opportunities for Google Glass to be used as a wearable scanning tool, with the onboard camera providing scanning capabilities. The connectivity provided by Glass can support dispensing by providing information during scanning and documenting the verification process.

We envision other documentation opportunities, as well. A visual record could be created to document preparation of intravenous medications or other medications with complex compounding procedures. The record would consist of a recorded video showing each step as it was performed. This would not necessarily prevent a negative event, but it could be used in training efforts and to investigate medication misadventures. Alternatively, Google Glass could support medication compounding by walking the preparer through each step, using visuals that show exactly what should be compounded, how much should be used, and how the final product should look.

Moving out of the pharmacy and onto the patient care floor, Google Glass could serve as the medium to provide referential information. We have transitioned from carrying laminated sheets of paper and handbooks to almost exclusively relying on portable information appliances like tablets and smartphones. We see a clear opportunity for Google Glass to replace the smartphone and tablet as the tool of choice to house our drug compendia or to access these compendia online. Thinking about more robust referential uses of Google Glass, imagine standing outside a patient's room during rounds (or walking by their room

on your way to lunch) and receiving an alert to update you on the patient's latest labs. The GPS radio – possibly in combination with WiFi – recognizes the user's location, searches for the patient's most recent information, and presents it to the user. This would all occur without requiring active searching by the user.

There are a variety of other uses related to clinical decision support. A course at Auburn that has traditionally been known as “therapeutics” places considerable emphasis on evidence-based practice, specifically, the use of guidelines in medication-related decision making. Google Glass would be a valuable tool for presenting treatment guidelines and algorithms; the user would then evaluate these for application to their patient and apply the most appropriate ones for their specific situation.

We have described a few ways that we see Google Glass being used in pharmacy, but we must emphasize that these are potential uses. Currently, Google Glass is not publicly available, and few app resources are available. We wonder, though, if many people envisioned how smartphones would be used in health care when the first iPhone was introduced in 2007. We also must stress that there are clear privacy concerns that must be addressed. The use of voice commands raises questions about how to keep patients' information private. Also, the ease with which pictures and video can be created will clearly raise red flags for Health Insurance Portability and Accountability Act (HIPAA) officers. We do believe, however, that these challenges should and can be overcome. We welcome your comments via email to Brent (foxbren@auburn.edu) and Bill (felkebg@auburn.edu) or on our blog at www.pharmacy-informatics.com. ■

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