

Second sight

The potential of smart glasses in IR

By **Melanie Padgett Powers**



Imagine slipping on a pair of glasses before a procedure and immediately seeing in your line of sight your patient's chart and imaging scans. As you begin to access a vein or biopsy a liver, instead of looking back and forth at scans, the images will appear right in front of your eyes, superimposed over the patient's anatomy.

This is the future of wearable technology known as smart glasses. Google Glass is the best-known brand, but numerous companies are developing their own versions.

"The concept is bigger than the device," says Tammam Beydoun, DO, a pediatric IR fellow at Phoenix Children's Hospital. "Google Glass is an early iteration in the spectrum of wearables, so incorporating them into medicine will greatly evolve over the next 10 years."

Dr. Beydoun and other interventional radiologists have been experimenting with Google Glass to determine how smart glasses can be used in IR. Challenges such as lag time, ease of connectivity and HIPAA concerns remain, but smart glasses have the potential to make procedures more efficient, improve training and reduce patient radiation exposure.

Sarel Gaur, MD, a fourth-year resident at Stonybrook University Hospital in New York, has been testing Google Glass's IR applications. "The most exciting thing for Glass for IR is you can view images in real time and align the images with the procedure. That's where the real value lies," says Dr. Gaur, who presented a Google Glass poster at the SIR 2015 Annual Scientific Meeting.

Instead of images being tied to a monitor, Dr. Gaur believes that, in the future, images will be sent wirelessly to wherever you want. With smart glasses, no more going into another room to check the monitor throughout the procedure. No more looking back and forth at an ultrasound monitor. And no more multiple CT scans throughout a procedure, which will reduce a patient's radiation exposure.

Dr. Gaur points to a lung biopsy as an example. "We're trying to find a 3D structure in a 3D structure, and we're interrupting the procedure and thinking of it in our mind," he says. "If I had the images in my line of sight, I could reference that in real time and it could help guide my needle."

A more efficient process could shorten procedures, decreasing the time a patient is under anesthesia and allowing physicians to schedule more procedures in the same amount of hours.

Smart glasses could improve training, too, according to Dr. Beydoun. Residents could wear the glasses and never have to take their eyes off the patient. Dr. Beydoun presented a poster about Glass and the future of residency education at the SIR 2016 Annual Scientific Meeting.

Dr. Beydoun also sees a lot of potential in the ability to record a procedure from the physician's point of view. IRs could record and review their own processes or remind themselves about small details to include when dictating. They could look for trends and patterns in a particular procedure and review complicated cases.

"Once you are more efficient and accurate with your reporting, you can do a lot more data mining," he says.

Once smart glasses become more commonplace in IR, a next step might be to use them with fiducial markers, according to Edward Yoon, MD, a third-year radiology resident at Stonybrook and a co-presenter with Dr. Gaur last year.

"The way we do it right now, especially with CT-guided biopsies, is that you put in the needle and then you advance it, and you take another picture to see where you are and then you advance it a little more," he says. "You need to keep taking pictures in sequences to track where a needle is going, [but with fiducials] you would only need to take one image. Then you use that original image to see where the needle tip is going using the navigation."

Google Glass received a lot of hype when it was sold as a prototype in 2013–2014, but many consumers didn't see much practical use. Google stopped selling Glass to consumers but continued to work with businesses. Just this past December, Google filed an application with the Federal Trade Commission to produce an updated version.

"Today's Google Glass is good," Dr. Beydoun says. "Tomorrow's is going to be better." 

Have you evaluated smart glasses in your practice?



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