

Smartphone approach examining diabetic eye disease offers comparable results to traditional method

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A smartphone-based tool may be an effective alternative to traditional ophthalmic imaging equipment in evaluating and grading severity of a diabetic eye disease, according to a study released today at AAO 2014, the American Academy of Ophthalmology's 118th annual meeting. The results of the research indicate the lower-cost method could be useful for bringing the service to patients in isolated or underserved communities.

Approximately 7.7 million Americans have [diabetic retinopathy](#), which is caused by elevated blood glucose (sugar) levels and can lead to vision loss and blindness. The traditional [method](#) for monitoring the progression of the disease is through retinal slit-lamp biomicroscopy, which enables ophthalmologists to look at the back of the eye's interior. This kind of examination requires a large piece of specialized equipment found only in clinical settings, posing a significant challenge for monitoring patients living in rural or low resource communities.

In order to find a solution for addressing this challenge, researchers from the University of Brescia, University of Molise and "Federico II" University of Naples, Italy, developed a small optical adapter called D-Eye which could attach magnetically to an iPhone® 5, creating a smartphone ophthalmoscope. They then used the iPhone ophthalmoscope as well as a slit-lamp biomicroscope to perform dilated retinal digital imaging on 120 patients with diabetes who were scheduled to have a routine dilated eye exam. After comparing the results of the

smartphone method to the traditional one, an exact agreement between the two methods was found in 85 percent of the eyes and an agreement within one step (or grade of disease progression) was found in 96.7 percent of the eyes. In most of the one- and two-step disagreements, the severity level was graded higher by biomicroscopy grading.

In the smartphone ophthalmoscopy results, nine eyes were not gradable due to small pupil or cataract. In the biomicroscopy results, the number of not gradable images was four. Therefore, while biomicroscopy is still found to be the more accurate method for grading diabetic retinopathy, researchers believe [smartphone](#) ophthalmoscopy shows great potential for use in rural or remote communities who would normally receive little to know testing at all.

"Using the iPhone method is thousands of dollars cheaper than using traditional equipment," said lead researcher Andrea Russo, MD. "The affordability of this option could make it much easier to bring eye care to non-hospital remote or rural settings, which often lack ophthalmic medical personnel."

Provided by American Academy of Ophthalmology

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