

# A fundus camera in your

by Lauren Lipuma Staff Writer

## *New device turns a smartphone into a portable retinal imager*

**A** new lightweight, affordable device transforms a smartphone into an ophthalmoscope and fundus camera in one, allowing physicians to perform mobile eye exams anywhere, anytime.

The D-EYE Portable Retinal Imaging System (D-EYE, Padova, Italy) uses a smartphone's existing camera to take high-definition images and video of a patient's retina that can be stored and shared from any location.

As a completely portable and low-cost system, the D-EYE imager is an ideal tool for the growing field of telemedicine, with the potential to bring vital retinal screenings to patients who lack access to an ophthalmic specialist.

"It's a game-changing type of technology," said Jim White, vice president of marketing and communications for D-EYE. "We feel it is going to open up access to critical eye screenings to a lot of people today who aren't getting them."

With the D-EYE imager in their pockets, healthcare professionals can detect a variety of conditions in just a few seconds, from glaucoma to diabetic retinopathy. While the D-EYE will not replace a traditional ophthalmoscope or fundus camera, it is designed to supplement these devices, serving as a vital frontline screening tool for optometrists, general practitioners, and other healthcare providers.



The D-EYE imager attaches to a smartphone with a sleek bumper that positions the lens over the phone's existing camera and light source.

### **Concept and design**

The D-EYE system is the brainchild of **Andrea Russo, MD**, an ophthalmologist in private practice and a PhD-candidate researcher at the University of Brescia, Italy.

After finishing his residency program, Dr. Russo saw the need for a way to perform quick retinal screenings on the go and to take and share images with other specialists. Dr. Russo quickly realized that the connectivity, computer processing power, and photo and video capabilities he needed already exist in today's smartphones. With an ophthalmoscope already in his pocket, all he needed to do was to combine them into one device.

Dr. Russo addressed this challenge by designing the D-EYE's magnifying lens to fit over the smartphone's camera and LED light and attach to the phone with a lightweight bumper. The D-EYE's simple, ergonomic design doesn't affect the functionality of the smartphone and

makes it easy to learn and easy to use.

### **Tech specs**

The D-EYE imager is currently available for the iPhone 5, 5s, and 6 and the Samsung Galaxy S4 and S5. The retail price is \$450.

The D-EYE lens has a field of view up to 20 degrees, requires no external power or lighting, and eliminates corneal glare. It is ideal for the patient's pupil to be dilated for the exam, but the D-EYE imager can be used without dilating drops.

The D-EYE system offers:

- Easy viewing of the optic nerve head for detecting glaucoma
- Age-related macular degeneration (AMD) screening
- Screening and grading of diabetic retinopathy and hypertensive retinopathy
- Detection of neurological disorders, hemorrhages, arteriolar constriction, blood vessel abnormalities, maculopathy, cotton wool spots, exudates, neuritis, and more

# pocket

The D-EYE smartphone app provides step-by-step instructions for taking and recording images and video and archives all exams on a patient information file for convenient data management.

Last month, D-EYE partnered with TreVia Digital Health (Overland Park, Kan.), a leader in healthcare management software, to develop ImageVault, a HIPAA-compliant cloud-based storage service. Powered by TreVia's industry-best data management platform, ImageVault will enable users to store and share D-EYE images while keeping patients' protected health information secure. ImageVault will be available later this year.

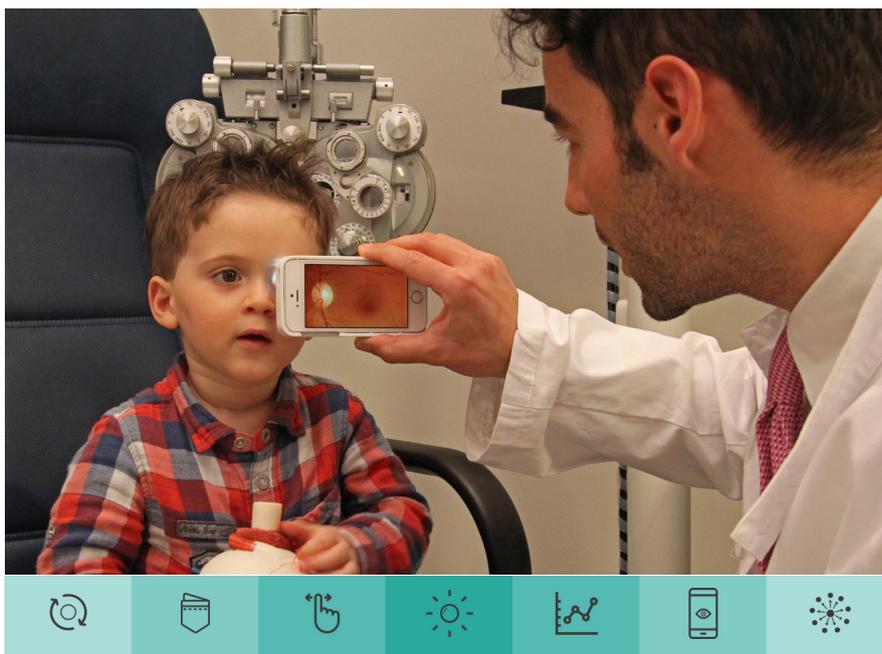
To get started, users simply need to download the D-EYE app, attach the mounting bumper and D-EYE lens to the phone, set up a patient file, focus the camera, and begin recording images.

## Mobile technology for mobile healthcare

With the interest in telemedicine on the rise, there is a large unmet need in the medical world for portable, affordable technologies such as the D-EYE imager.

While ophthalmologists have sophisticated eye exam equipment in their offices, other medical professionals often don't have access to those large, expensive technologies. Optometrists, neurologists, family and general practitioners, nurses, emergency medical technicians, and even veterinarians can take advantage of this technology.

The D-EYE imager is an excellent tool for hospital rounds or out-of-office visits; the simple design makes it perfect for bedridden and elderly



The D-EYE imager is the perfect tool for examining children, who become familiar with smartphones at a young age.

Source: D-EYE

patients. Physicians have found it particularly useful for examining children who may not be able to sit still long enough for traditional slit lamp exams and fundus photography.

The D-EYE system is ideal for practicing medicine in rural regions or remote parts of the world where sophisticated eye equipment—or even basic health services—are not available. Healthcare providers in these areas can use the D-EYE system to perform basic screenings and send images to a specialist who can review them remotely.

Physicians also enjoy using the D-EYE to share retinal images with patients or caregivers.

“It helps take some of the mystery out of what's being done and puts patients and their family right

up front with the doctor to see what has to be done,” Mr. White said.

## Find out more

The D-EYE imager is available for direct purchase on the D-EYE website and through Wilson Ophthalmic (Mustang, Okla.), its U.S. distributor.

The D-EYE imager will be showcased at the upcoming meetings of the European Society of Cataract & Refractive Surgeons (ESCRS) in Barcelona from September 5–9 and the American Academy of Ophthalmology (AAO) in Las Vegas from November 14–17. For more information, visit [www.d-eyecare.com](http://www.d-eyecare.com). **OB**

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