

# iPhones for eye health: Capturing ocular images in difficult-to-photograph patients

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Smartphone technology is a widely available resource which may also be a portable and effective tool for imaging the inside of the eye, according to results of a study released today at AAO 2014, the 118th annual meeting of the American Academy of Ophthalmology. Researchers from the Ross Eye Institute at the University at Buffalo-SUNY are successfully using an iPhone® application as an inexpensive, portable and effective tool for imaging the inside of the eye, including in patients who are challenging to photograph by traditional methods.

Photography plays a critical role in documenting and tracking the progression of [eye](#) diseases. One of the most common types of ocular imaging is fundus photography. This requires a specialized low- power microscope with an attached camera to capture photos which can then be reviewed by specialists at another time or location and saved for medical documentation. The standard equipment is generally designed for the adult frame and typically stationed in specialized eye clinics. Therefore, it may not be accessible everywhere and be incompatible for those too young or too ill to maintain the required upright position. This could result in missed opportunities to document important changes in such patient subgroups.

To address this problem, the researchers used the iExaminer™ smartphone system (Welch Allyn) and an iPhone to image 28 clinic and hospitalized pediatric patients with a diverse range of retinal and optic nerve conditions. The system consists of a PanOptic Ophthalmoscope (a lighted instrument to examine the inside of the eye) and an adapter that

attaches the ophthalmoscope to an iPhone to enable taking photos and videos. It can image key structures of the back of the eye in a single view without necessarily requiring dilation drops. The associated app facilitates capture, storage, and transfer of data. This also makes it possible for real-time telemedicine consultation without violating patient identity as no external facial features are revealed.

"This system could be useful not only to ophthalmologists, but also emergency department physicians, hospitalists and general practitioners," said lead researcher Jiayi Ding, M.D. "Because it can instantly capture photos and videos of the back of the eye through an undilated pupil, there is potential for prompt telemedicine consultations with an ophthalmologist and getting preliminary triage answers to the patient more quickly than waiting for standard office referral."

The researchers did note some challenges of the smartphone method, which included limited view of the peripheral retina, battery life of the ophthalmoscope when consecutively imaging multiple patients, and a learning curve in maneuvering the system. Additionally, the current setup is only FDA approved and compatible with iPhone 4 and 4S, both of which have lower camera resolution than more recent models.

Provided by American Academy of Ophthalmology

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