There’s an app for that (iPhone slit lamp photography)!

by David F. Chang, MD

Dr. Chang: What inspired you to try the iPhone to obtain ophthalmic pictures and videos?

Dr. Hester: I was practicing in rural Arkansas and traveling between satellite clinics. I wanted to take high quality slit lamp photographs and videos but did not have the money to purchase the necessary equipment. While I own a high quality SLR camera, it was difficult for me to obtain photographs using the various slit lamp illumination techniques that I use during my examination. As a result, I scoured the internet for options and decided to order an iPhone adapter made for a portable slit lamp. It took a long time to attach this to my slit lamp, and the pictures I obtained were average at best. Additionally, I could not find any instructions on how to take slit lamp photographs with an iPhone. Ultimately, I became quite discouraged.

Dr. Chang: Most of us would have given up at that point. What did you try next?

Dr. Hester: First, I experimented with every decent iPhone photography app. During this process, I learned the importance of controlling lighting for obtaining high quality photographs and videos. Second, I evaluated multiple adapters for my slit lamp and surgical operating microscope. Many were designed for purposes other than ophthalmology. Third, I tried various iDevices (iPhones, iPads, iPods) and found that you need at least a 5-megapixel camera.

Dr. Chang: You told me that the illumination source is very critical for slit lamp photography.

Dr. Hester: Yes. First, since most slit beams will not illuminate a wide enough area, you will need an external illumination source if you want to photograph the entire eye. You can purchase an external illumination source to attach to your slit lamp from your slit lamp manufacturer or from EyePhotoDoc. Alternatively, you can also use a handheld transilluminator, which is what I use 90% of the time. Second, you need to control for exposure, glare, color balance, etc. It sounds complicated, but don’t worry—there is an app for that. I prefer to use ProCamera by Jens Daemgen, which is available through iTunes. By simply moving a yellow circle around the screen you can visually optimize the photograph’s exposure within seconds.

Third, taking pictures with the camera app at home under different lighting conditions and watching my ASCRS tutorial videos on various illumination techniques will ease your transition into ophthalmic photography. Proper lighting is the cornerstone for high quality ophthalmic photography, and its importance cannot be overemphasized.

Dr. Chang: Can you get good quality photographs with any iDevice?

Dr. Hester: For the iPhone 4 and other devices with a 5-megapixel camera, the quality is OK. For the iPhone 4S and other devices with an 8-megapixel camera, the quality is good. If the rumors are true and the iPhone 6 will have a 12-megapixel camera with more advanced lens optics, the pictures will likely be great. But don’t take my word for it. Please visit my ASCRS web tutorial in order to judge the quality of pictures for yourself.

Dr. Chang: How is the quality of slit lamp or operating microscope videos taken with an iDevice?

Dr. Hester: For the iPhone 4S and higher models the quality of slit lamp videos is outstanding because you can record in 1080p high definition. I absolutely love that I can capture high quality slit lamp videos demonstrating dynamic exam findings. It really makes case presentations come alive. In the OR, the iPhone 4S videos are also excellent but because there are no adapters specifically designed for operating microscopes, it can take a few minutes to attach and align the adapter on the assistant’s ocular. Of course, the setup becomes faster with practice and it currently takes me less than one minute. If you already have a video camera and recording system for your microscope, it will still be easier for you to just hit the record button on your current system. However, if you do not have a video recording system or if you want to capture a specific surgery using a higher definition recording, you may find the iPhone useful.

Dr. Chang: There are many adapters available, which makes it confusing. Which one do you like best?

Dr. Hester: It depends on the slit lamp or operating microscope that I am using. For Haag-Streit (Koniz, Switzerland), Marco (Jacksonville, Fla.), and Topcon (Oakland, N.J.) slit lamps, I prefer Dr. Clifford Terry’s EyePhotoDoc adapter. His adapter is available for iPhones, iPads, and iPods, and it slides right over the slit lamp ocular in a matter of a few seconds. I am currently collaborating with EyePhotoDoc to evaluate adapter prototypes for use with other slit lamp models and smartphones. I am excited about their ongoing efforts to produce new adapters, and I should mention that...
I have no financial interests. For other slit lamp models, Zarf Enterprises (Spokane, Wash.) offers an adapter that slides into the barrel of the slit lamp’s ocular. For Zeiss (Jena, Germany) operating microscopes with f125 oculars, I prefer the Magnifi adapter. For Leica (Buffalo Grove, Ill.) M840 operating microscopes, I prefer the Orion SteadyPix Telescope Photo Adapter. A comprehensive list of available adapters, including Dr. Rajesh Fogla’s instructions on how to make an adapter for less than $5, can be found on my EyeWiki page on Smart Phoneography (Google “EyeWiki iPhone” to find the page).

Dr. Chang: Congratulations on winning the coveted People’s Choice Award at the recent ASCRS Film Festival.

Dr. Hester: It was a good meeting for my team at Baylor. During my fellowship, I have had an opportunity to work with an incredible group of ophthalmologists who have made many contributions to iDeviceography. The ASCRS film was the brainchild of the film’s first author, Dr. Weikert. I can’t applaud him enough for his creativity and video editing expertise. Everyone knows Dr. Pflugfelder’s research acumen is second to none. It was incredibly exciting to partner with him in order to incorporate iPodography into his dry eye research. We feel that our video techniques are allowing us to document dry eye disease with a higher degree of accuracy than ever before. Furthermore, by sending the videos with a few clicks to a centralized reading center, we will be able to eliminate inter-grader variability, which should be valuable in multi-center research trials. Finally, Drs. Douglas Koch, Bowes Hamill, Hart Moss, Elizabeth You, and Joe Hester all contributed to this work through their time, feedback, and support for which I cannot thank them enough.

Editors’ note: Dr. Hester is a fellow in cornea, anterior segment, and refractive surgery, Department of Ophthalmology, Baylor College of Medicine, Houston. In July he will join Little Rock Eye Clinic, Little Rock, Ark.

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