

# Getting the most out of the Smart Phone Photo Masterclass.

Dear colleagues,

The photography master class will be using training models and human volunteers to practice smart phone photography techniques for imaging the eye.

To get the most out of the session please follow the instructions below **before the course** but don't worry if get stuck as we will help you on the day.

Any questions before or after the course please WhatsApp, message or ring Tim on +44 7782219868 or email at [timknott@equineeyeclinic.co.uk](mailto:timknott@equineeyeclinic.co.uk). Add Tim to your contacts as we will be asking you to send images to him for a competition on the day.

## STEP1: Charge your phone & maybe bring some of your old ones!

Bring a charger and/or battery pack with you if possible. Some phones are better than others for imaging the eye, your usual phone may not be the best. If you have an old iPod touch, an iPhone 4/s, 5/s, SE, 6/s, X or XS consider bringing it with you and putting an appropriate camera app on it before you get here as these are some of the easiest phones to image the inside of the eye with. We can help you decide which camera works best for you.

For android users, phones with cameras closer to the corner and where the light is close to the lens are best. If you're not sure, bring your old phone/s with you on the day.

I use an iPhone 13pro but always try and keep my iPhone XS available as it takes the best retinal images and I have a number of iPhone 4S's at the clinic.

## STEP 2: Download a camera app for imaging the eye

Which is the best changes regularly, I try to keep my favourites listed <http://www.theeyephone.com/what-app.html> however my current top apps are:

### Android:

1. **OpenCamera\*** (Free, Mark Harman, [www.opencamera.org](http://www.opencamera.org))

### iOS

1. **Procamera\*** (cocologics) -adjustable LED intensity coupled with manual focus and exposure and an excellent focus assist mode make this app one of the best apps I've found so far and is the one I use daily.
2. **Camera+: Pro camera & Editor** (Latenite apps)- the updated version of the original Camera + , an old favourite. Excellent but more expensive than Pro-Camera as you now need to pay a monthly subscription to access all its features – with it's most recent update this is currently the best app for your iPhone but it may not run well on older models.



3. **Camera+ legacy** (Latenite apps)– **useful if you have an older iphone** . Still the easiest app to use but as cannot adjust the LED brightness diffusing the LED with tape or paper is required

NB if you have an Android then the camera app which comes with your phone may already be able to take pictures in “torch mode” (this allows you to take photos whilst the LED is continuously on which is the key feature in allowing you to use your phone like a digital ophthalmoscope. For all phones your video mode will normally also allow you to have the LED on continuously, try and learn how to turn this on – this is your simplest tool for smart phone photography and the easiest to show clients.

## STEP 3 Optimise App settings

Available customisation settings vary between apps. Download the set-up instructions for your app from <http://www.theeyephone.com/what-app.html> however the following are useful to consider:

- For android phones using open camera – select Camera2 API to allow use of advanced camera functions (manual focus, lens selection etc.).
- File format - JPG (100%) and RAW or DNG if available
- Set maximum image capture resolution
- Save location - save to camera roll and not to app
- Manual focus - turn on, this will allow you to set your focus at infinity (for fundus) or at the minimum focal distance or MFD (for distant direct cornea and lens photography). This setting will stop the camera “hunting” for the right focal point.
- “touch/tap to focus” and “touch/tap to set exposure” - turn on
- “Volume snap” –turn on, this allows you to press the volume buttons to take images.
- “live exposure” – turn on, this will display your ISO and shutter speed and help you decide if your LED illumination needs to be altered
- Focus peaking - turn on
- Geotagging - turn on, always remember where you were when you took the image – a real help when trying to locate images if you work at different locations
- EXIF and social tags - turn on and put your name / clinic
- Shutter sound - turn off

## STEP 4: Understand your app. Learn how to:

### Control the LED

- turn on continuously using the “torch mode” also labelled as continuous flash mode in the open camera app. With ProCamera on iPhones you can also change LED intensity

### Focus

- control it (manual vs tap to focus vs autofocus)
- force the minimum focal distance, - this helps with “distant direct photography “ of lens and corneal lesions and usually can be selected using the “macro” setting indicated by a flower icon



- force focussing at infinity - this helps with fundus photography and is usually indicated either by a mountain or an infinity icon ( $\infty$ )
- adjust and lock focus manually - this helps with difficult image lesions such as KPs, small cataracts etc

### **Measure and alter sensitivity to light & amount of light entering camera**

As most smartphone cameras have a fixed aperture (or  $f$  stop) they can only alter exposure by changing shutter speed and/or altering the sensors sensitivity to light (ISO). Forcing your camera app to display both shutter speed and ISO will help you to get the very best images by helping you understanding why an image is suboptimal. High ISO settings will allow image capture in low light conditions e.g. when imaging a slit beam with your macro lens but will add grain and loss of fine detail. Low shutter speeds will lead to camera shake affecting your all-important focus.

In general aim for:

- the lowest possible ISO (usually 25) and try and avoid using ISO >400.
- a shutter speed of 1/50th second or faster

Check out the guides at <http://www.theeyephone.com/what-app.html> to help.

**Looking forward to meeting you all on the day.**

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*REMEMBER.....*

**<http://www.theeyephone.com/what-app.html>**

*for links to downloads for camera apps*

*and pdfs about "Setting up your camera app for ophthalmic photography"*

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