



Smart phone photography as a clinical tool in ophthalmology

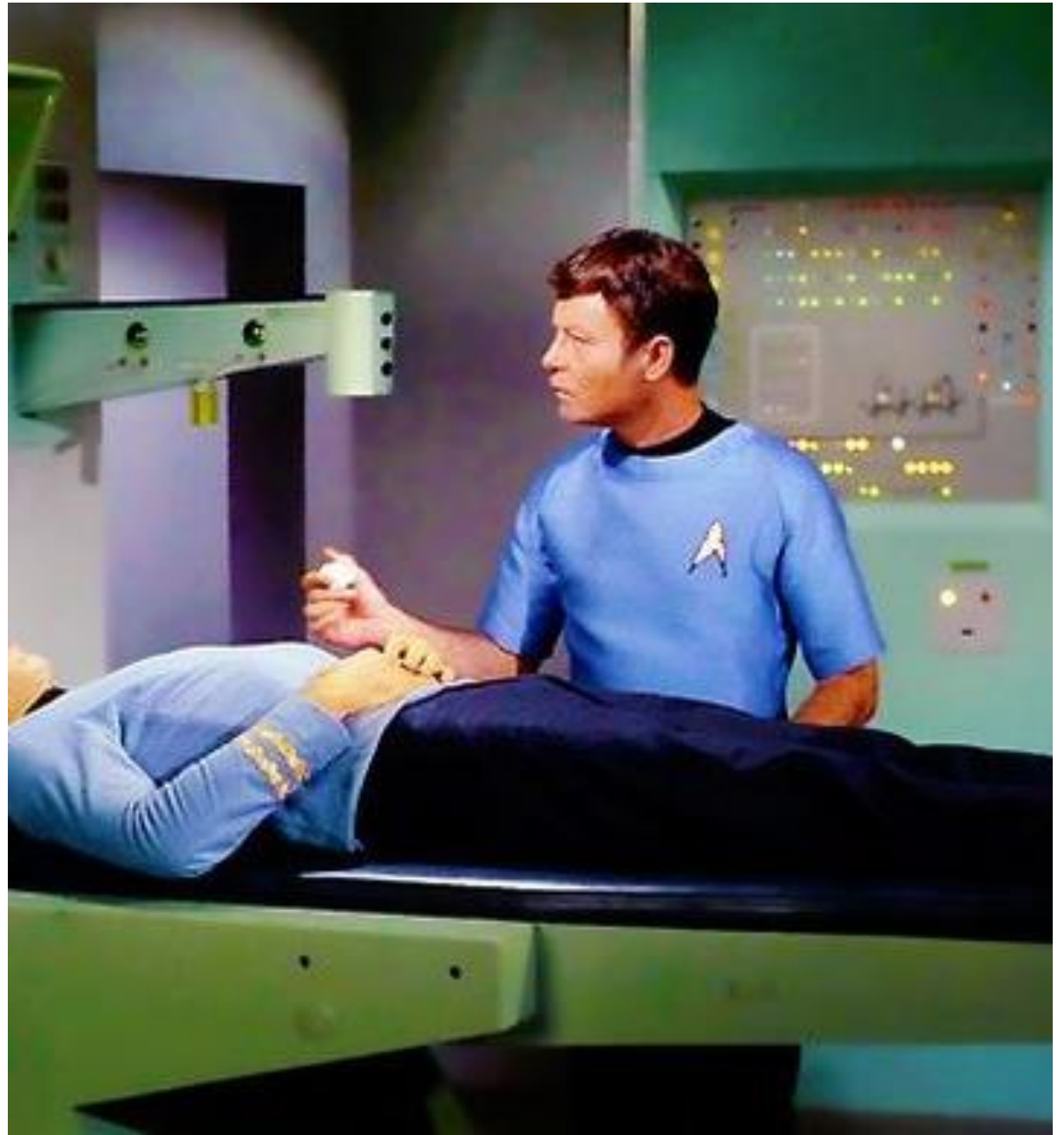
USING YOUR PHONE AS A DIGITAL
OPHTHALMOSCOPE

WEBINAR BEGINS AT 6PM

PLEASE MUTE YOUR MIC



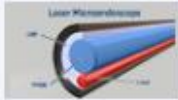
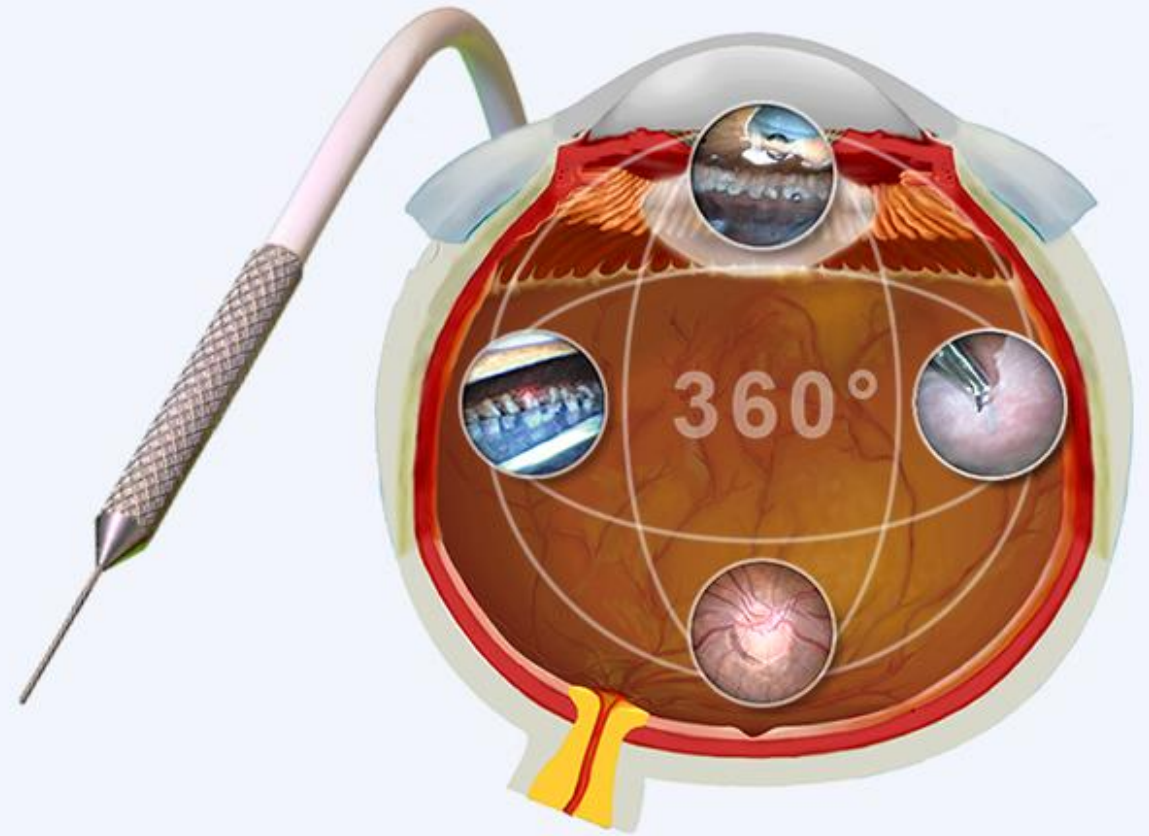




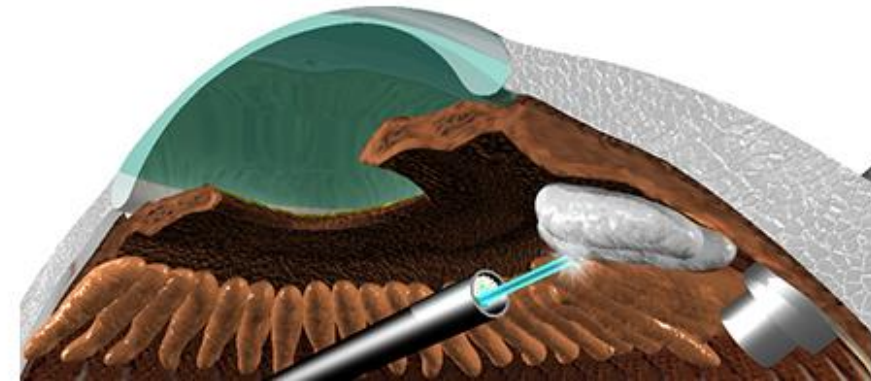
Ophthalmic Laser Microendoscopy

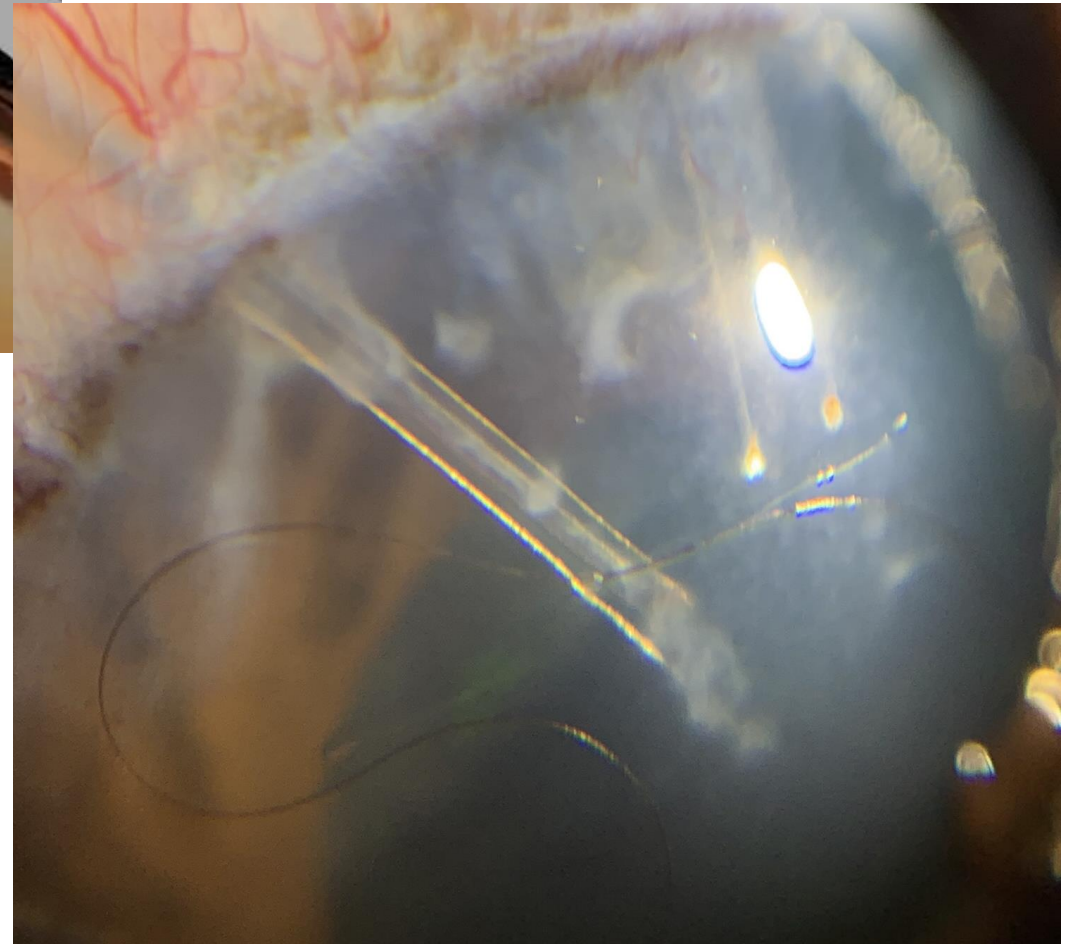
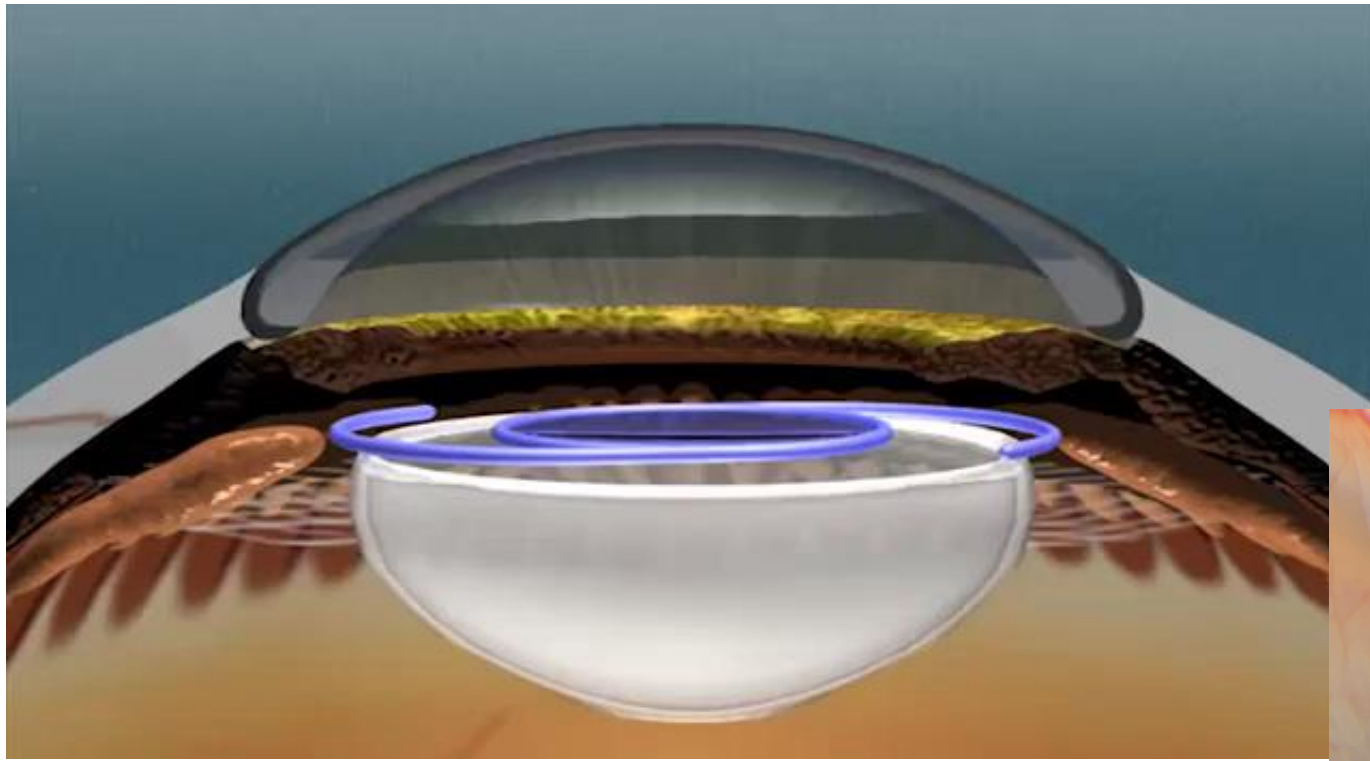
Endoscopy is the only imaging tool offering every ophthalmic surgeon a panoramic to up-close view of anterior and posterior segment anatomy.

Integrated laser fiber technology offers a complete diagnostic and treatment solution across all specialties.



Beaver-Visitec International, Inc. (BVI) is the sole manufacturer of ophthalmic laser microendoscopes worldwide. The Endo Optiks® brand of endoscopy systems and microendoscopes were first manufactured in 1991. Over 25 years of innovation, technological advances and quality workmanship has allowed microendoscopy to become an invaluable tool in every ophthalmic operating room. Clinical data has consistently shown the safety, efficacy and advantages of microendoscopy both in the glaucoma and retina applications.





The platform for all cases

The OS 4 by Oertli is a powerfully efficient all-in-one platform for cataract, glaucoma and vitreoretinal surgery. As a versatile and user-specific OR device, the OS 4 works as the extended hand of the surgeon and carries out his orders and intuitions perfectly.

CATARACT

GLAUCOMA

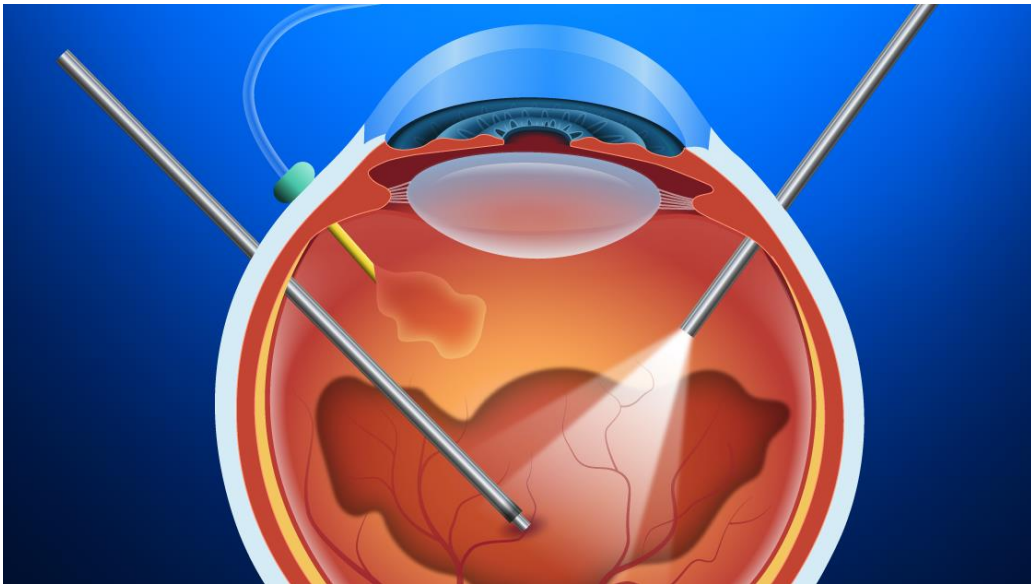
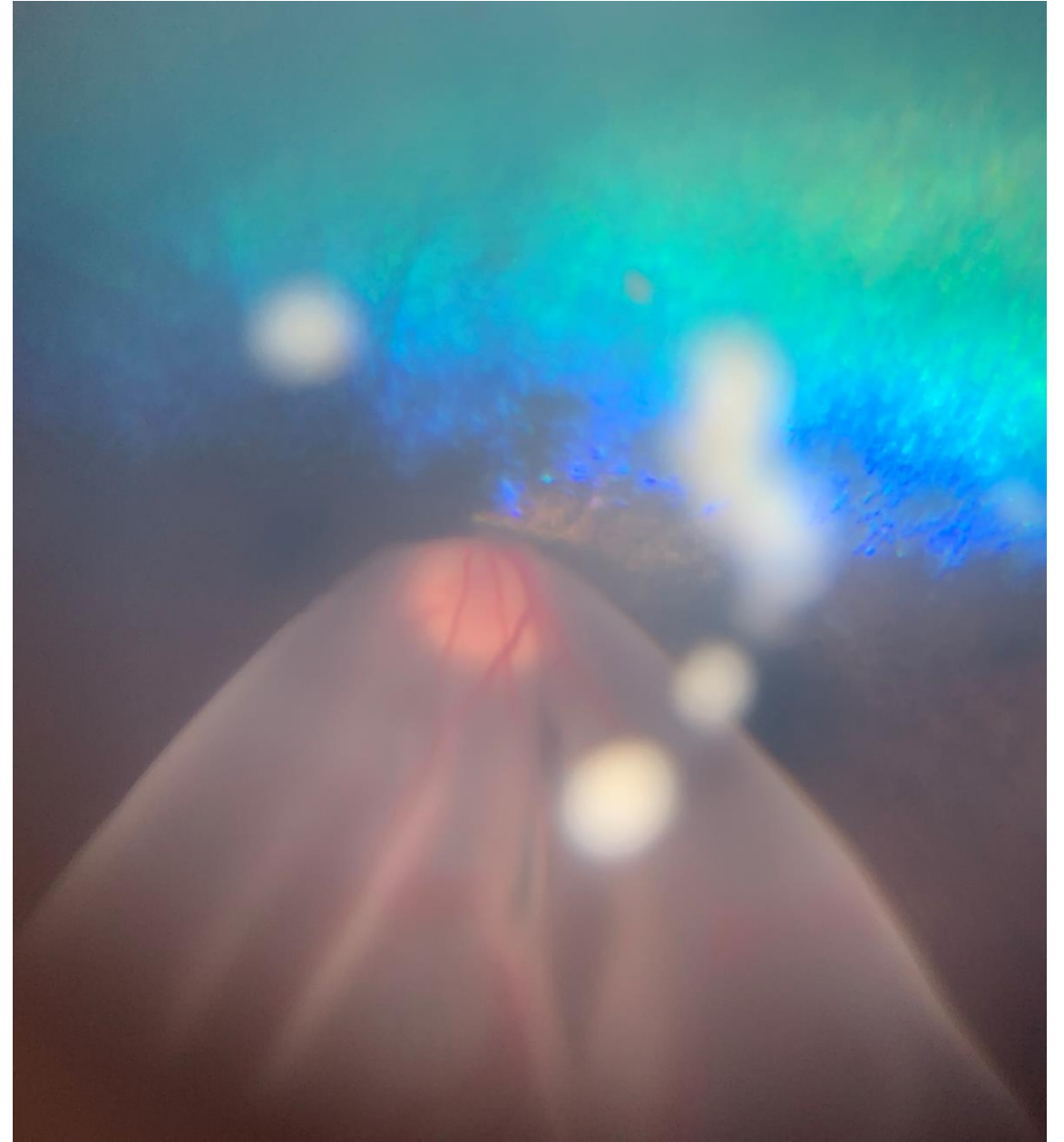
VITRECTOMY

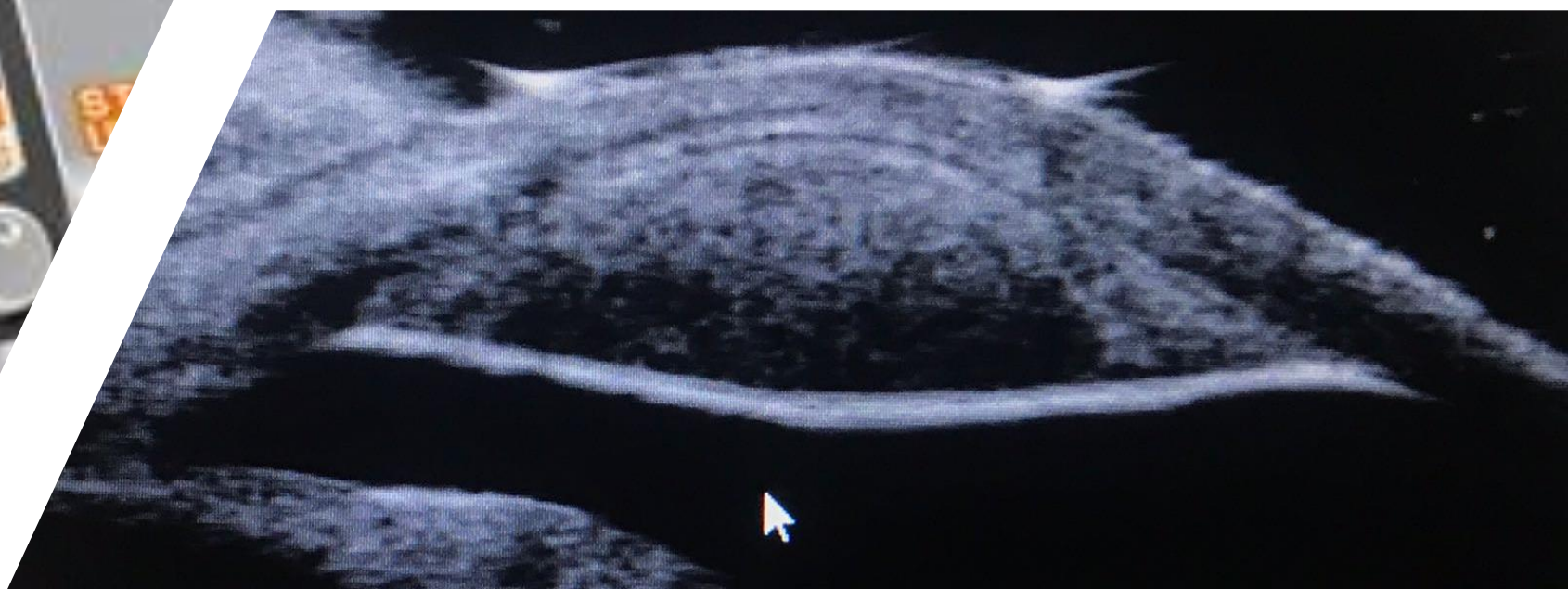
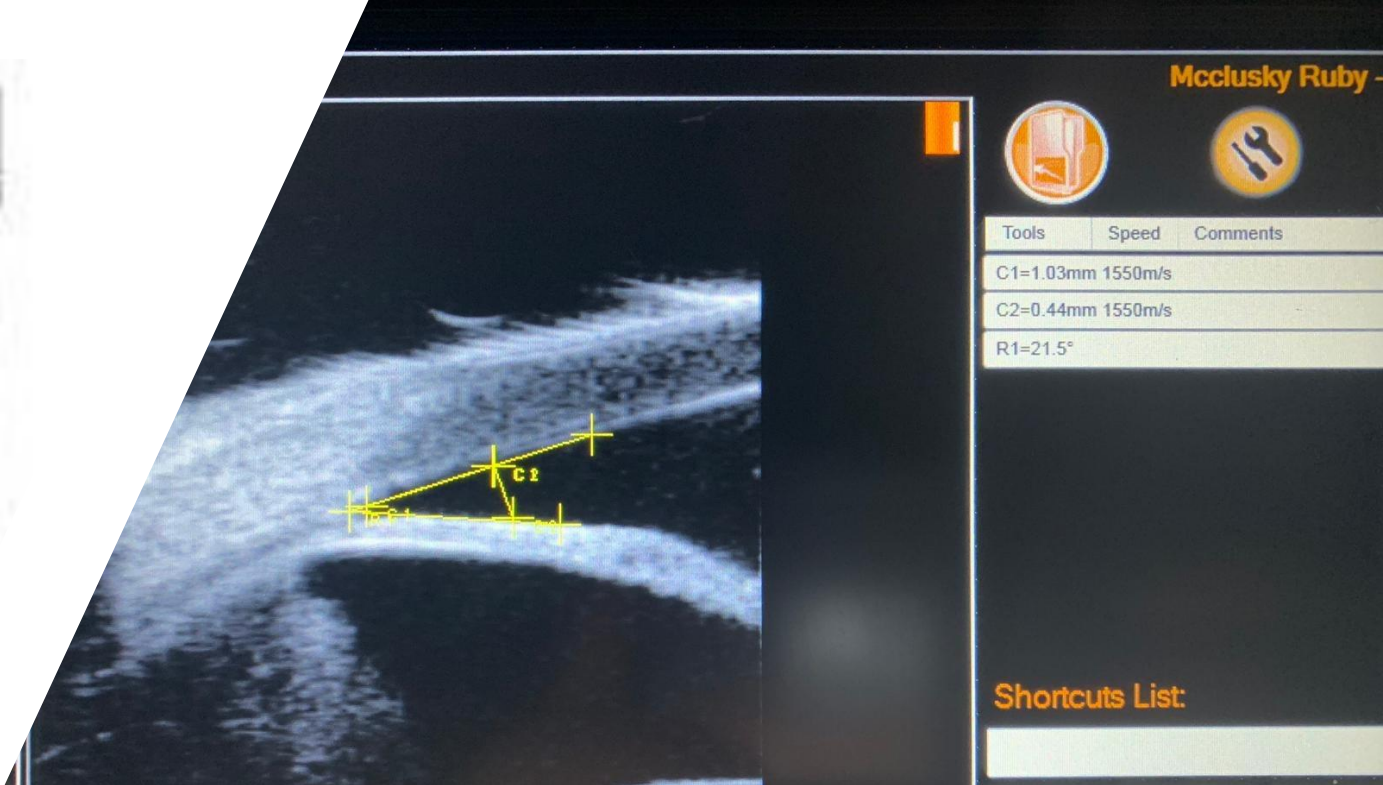


● Cataract

● Glaucoma

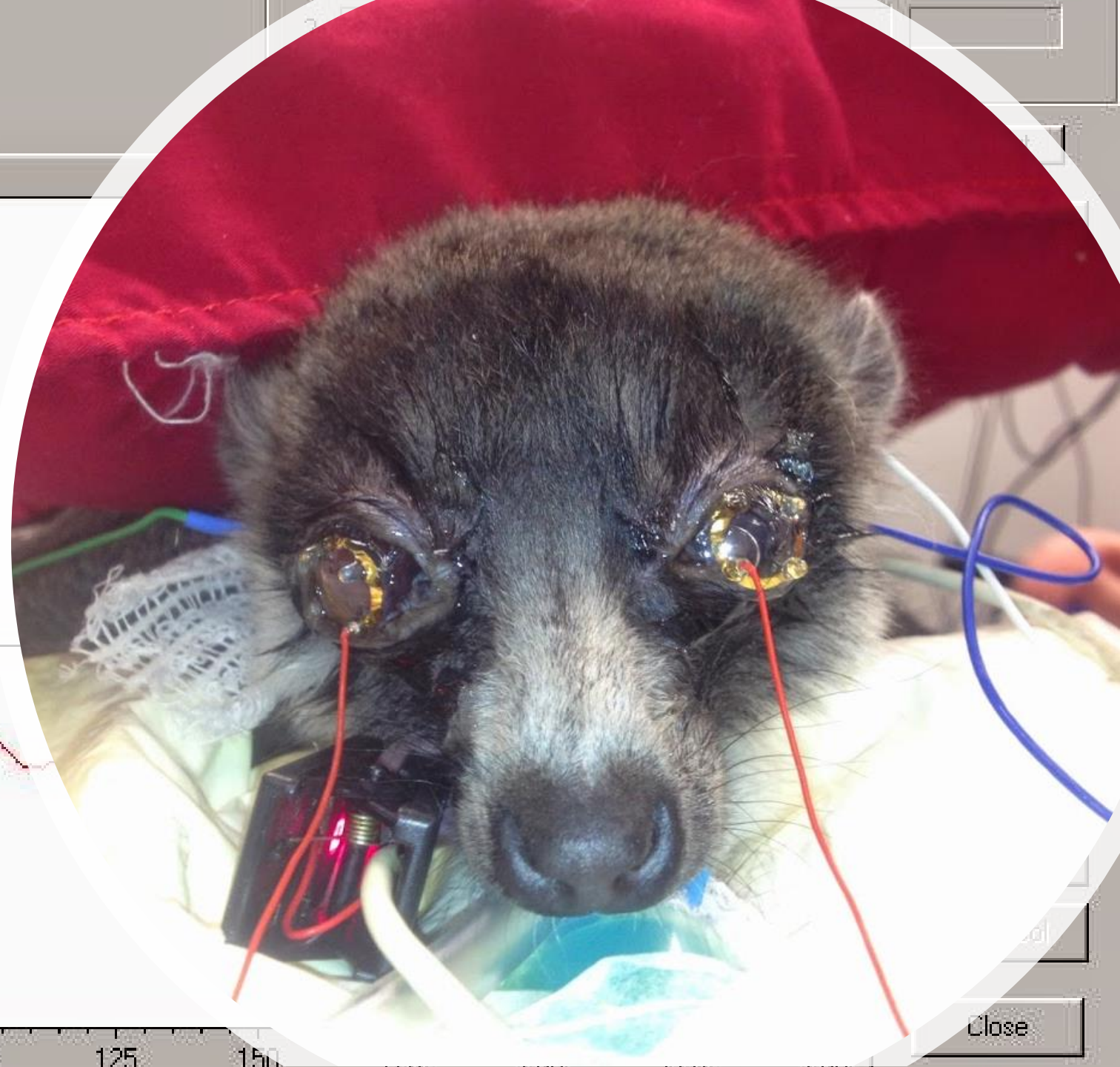
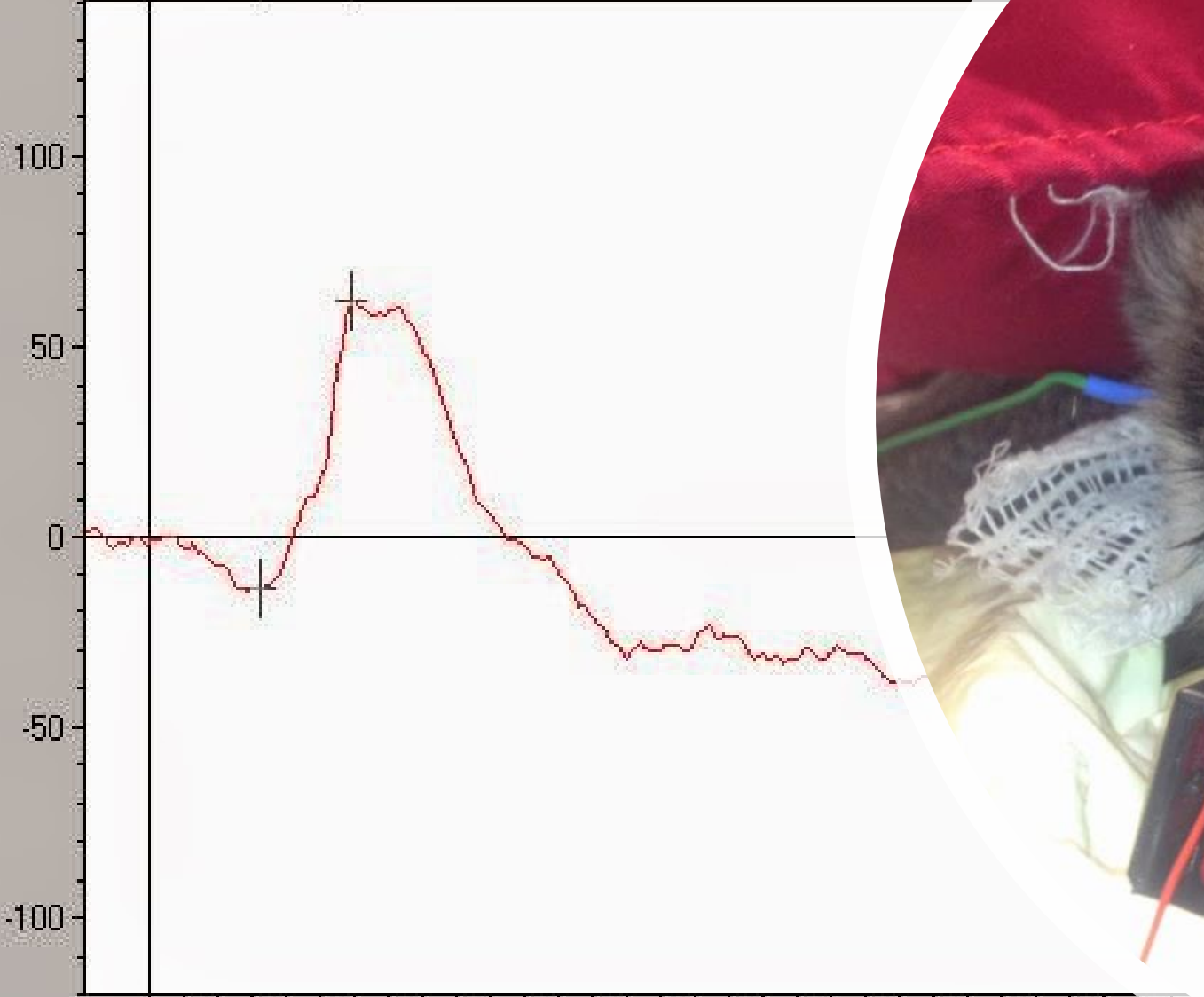
● Vitrectomy





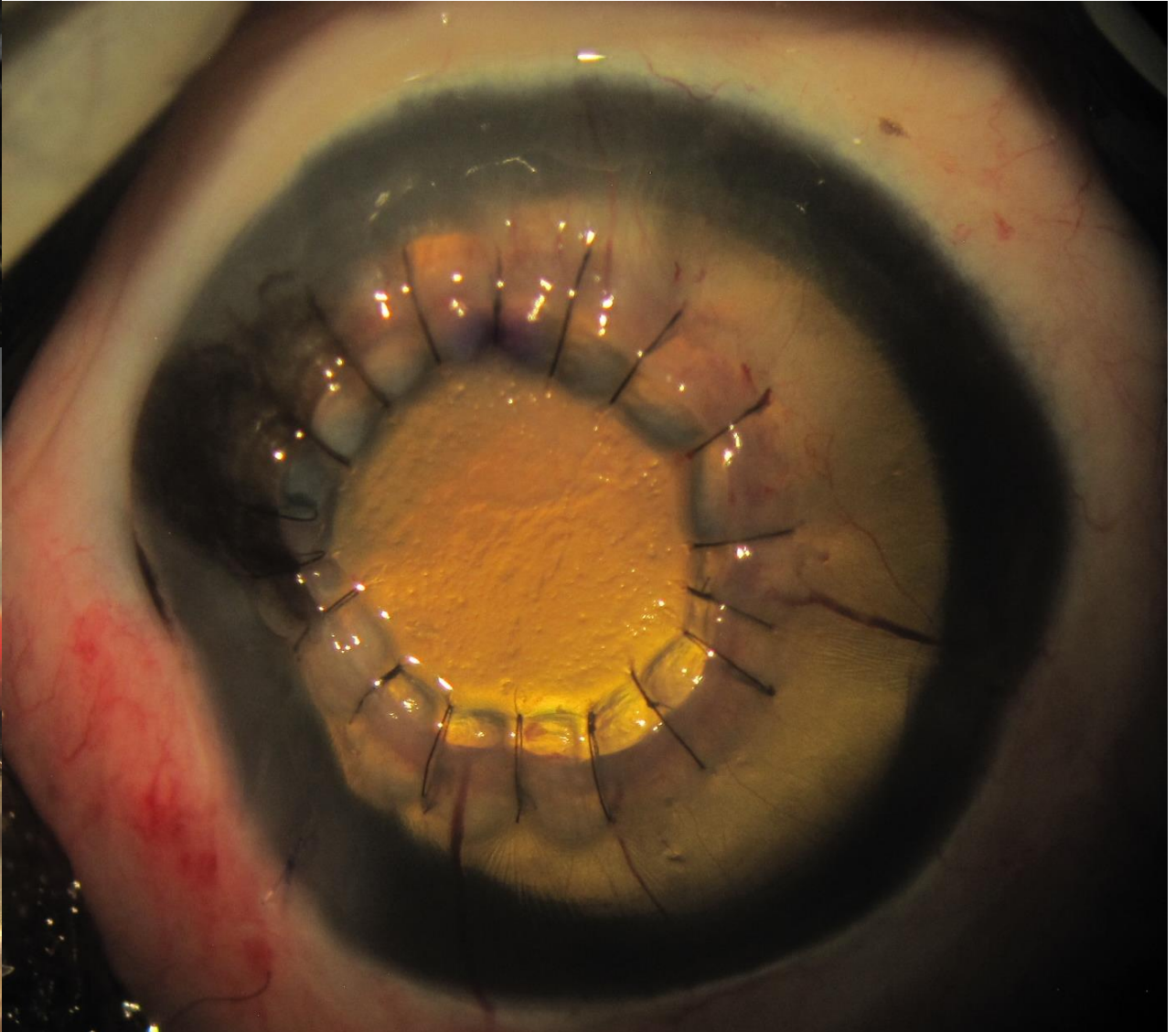
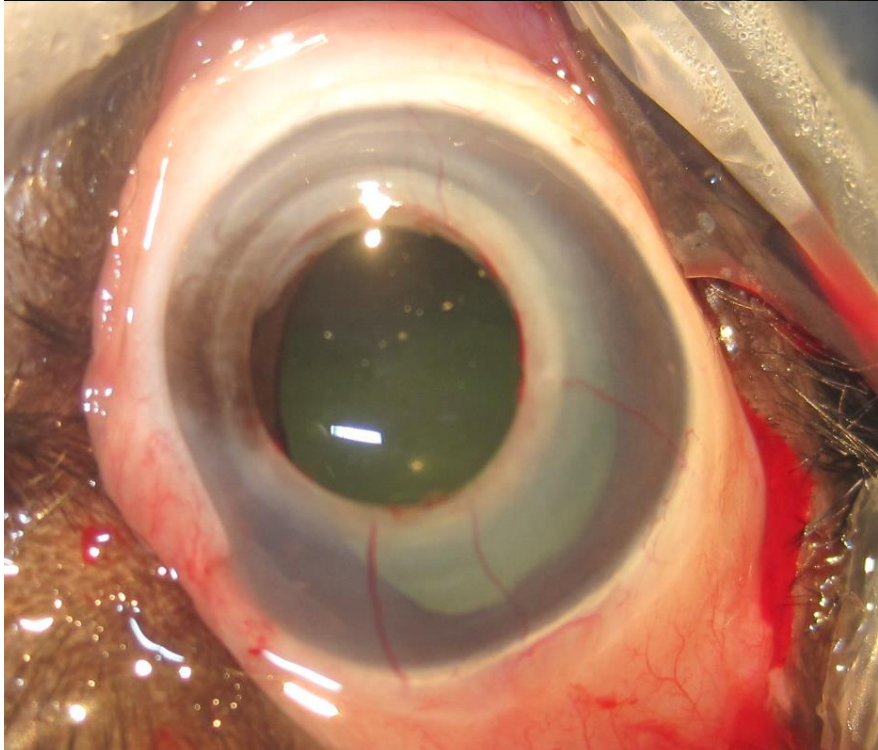
Left eye | Right eye

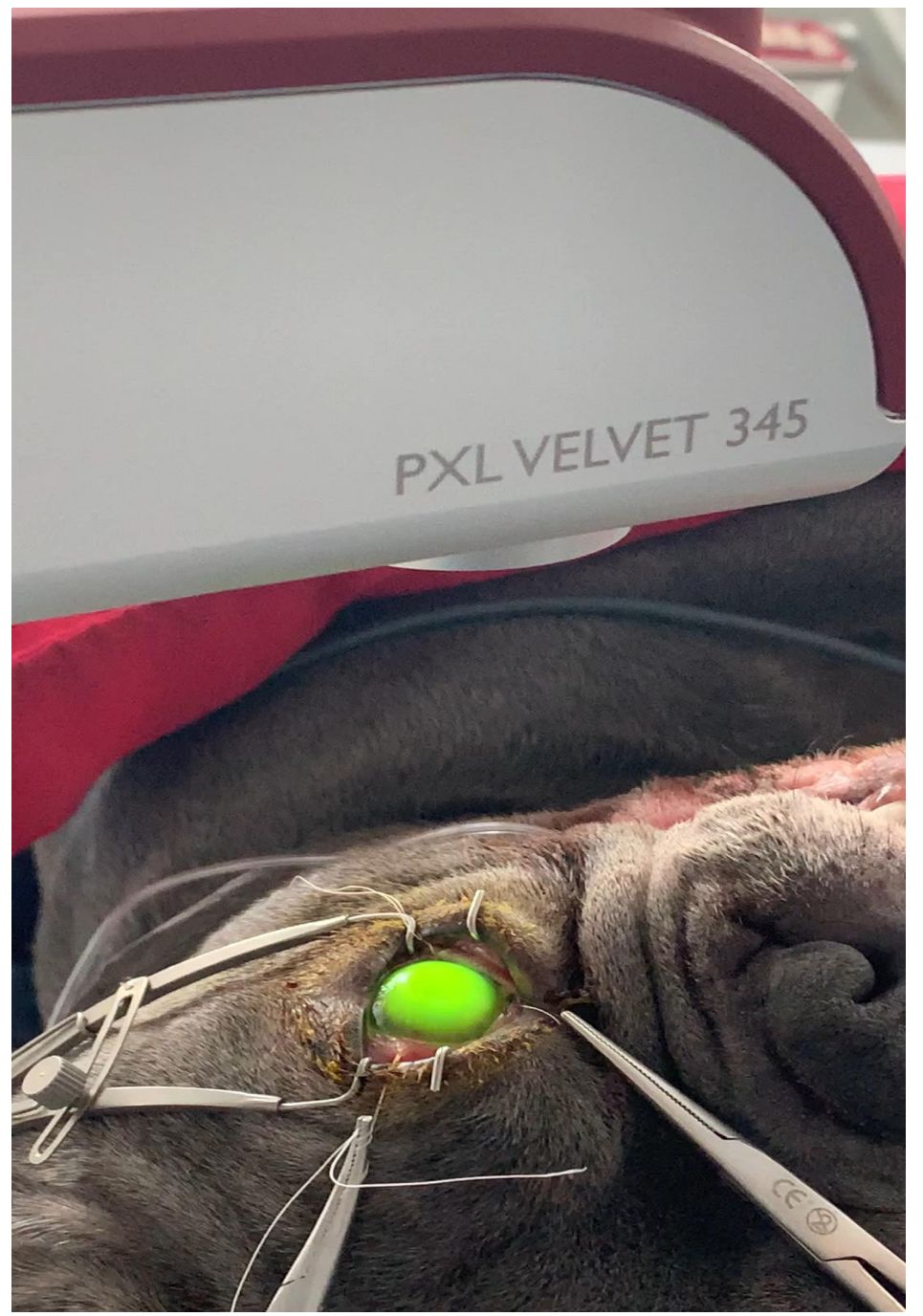
+1 +2



Close

Penetrating keratoplasty:
(fresh) Gift of sight scheme“





Infapower

JOHN WEISS & SON, Ltd.
11, WIGMORE STREET,
LONDON, W1H 0DN

CALIBRATION CHART FOR SCHIOTZ TONOMETER—(1955 Scale)

Scale Reading	Pressure (mm. Hg.) according to Load		
	5.5g.	7.5g.	10.0g.
0			
1	41.4		
2	34.5	59.1	81.6
3	29.0	49.8	69.3
4	24.4	42.1	59.1
5	20.6	35.8	50.6
6	17.3	30.4	43.4
7	14.6	25.8	37.2
8	12.2	21.9	31.8
9	10.2	18.5	27.2
10	8.5	15.6	23.1
11	7.1	13.1	19.5
12	5.9	10.9	16.5
13	4.8	9.1	13.8
14	4.0	7.5	11.5
15		6.2	9.5
16		5.0	7.8
17		4.1	6.4
18			5.2
			4.2





Number 1

and your **other** pair of eyes...
now more than ever....



Avoiding ophthalmological disasters



HOW TO LOOK



WHEN TO LOOK



WHEN TO
WORRY



WHEN TO
PHONE

Avoiding ophthalmic disasters

Using smart phones to help



HOW TO LOOK



WHEN TO LOOK



WHEN TO WORRY



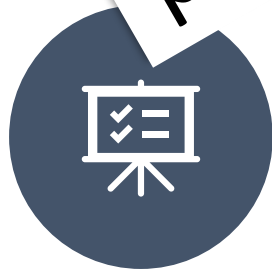
WHEN TO PHONE

Avoiding ophthalmic disasters

Using smart phones to help



HOW TO LOOK



WHEN TO LOOK



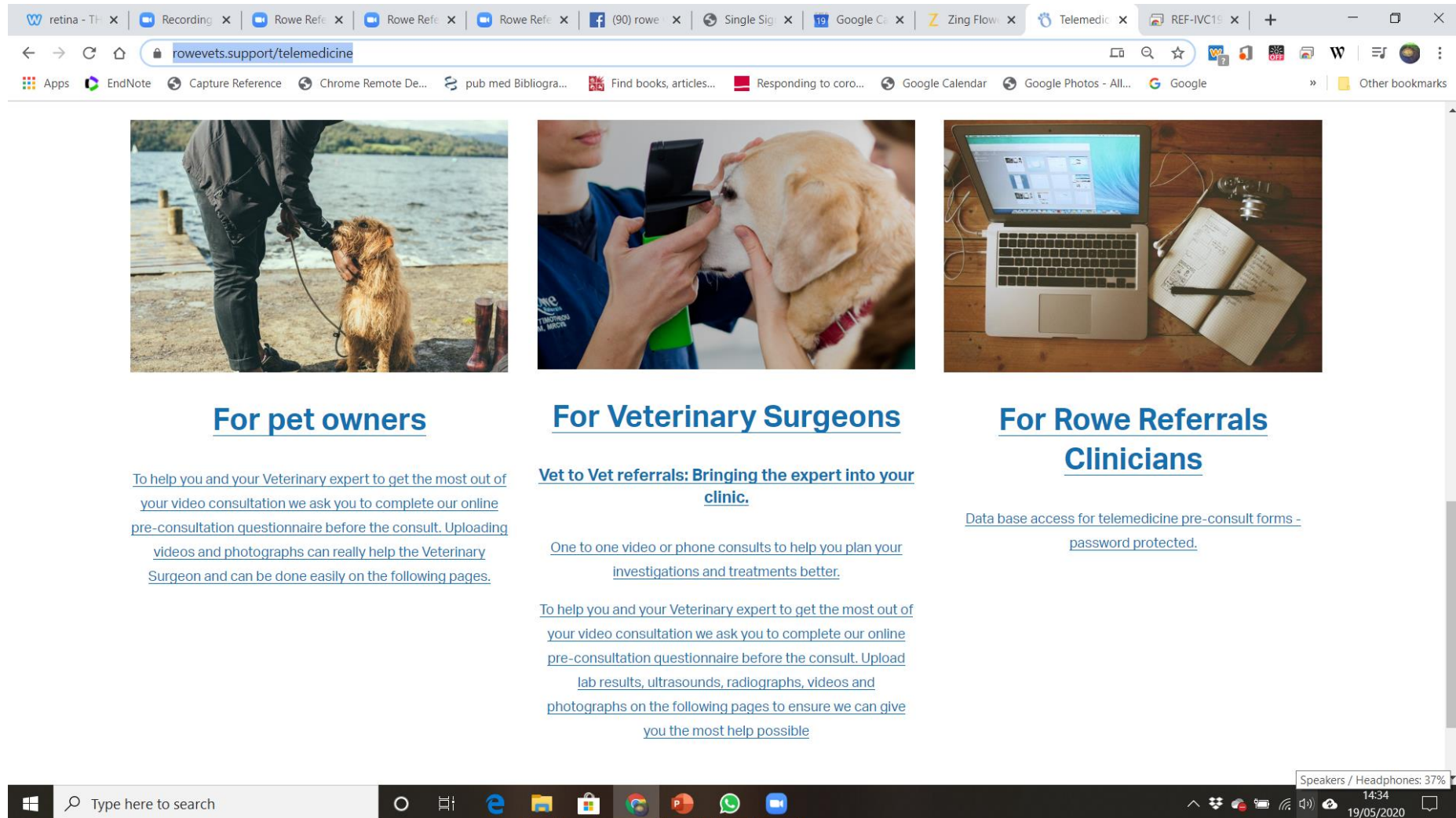
WHEN TO WORRY



WHEN TO PHONE

“How we try to make the most of telemedicine consults”


<https://rowevets.support/telemedicine>



retina - Th x Recording x Rowe Refe x Rowe Refe x Rowe Refe x (90) rowe x Single Sig x 19 Google Co x Zing Flow x Telemedic x REF-IVC19 x +


rowevets.support/telemedicine

Apps EndNote Capture Reference Chrome Remote De... pub med Bibliogra... Find books, articles... Responding to coro... Google Calendar Google Photos - All... Google Other bookmarks



For pet owners

To help you and your Veterinary expert to get the most out of your video consultation we ask you to complete our online pre-consultation questionnaire before the consult. Uploading videos and photographs can really help the Veterinary Surgeon and can be done easily on the following pages.




For Veterinary Surgeons

Vet to Vet referrals: Bringing the expert into your clinic.

One to one video or phone consults to help you plan your investigations and treatments better.

To help you and your Veterinary expert to get the most out of your video consultation we ask you to complete our online pre-consultation questionnaire before the consult. Upload lab results, ultrasounds, radiographs, videos and photographs on the following pages to ensure we can give you the most help possible



For Rowe Referrals Clinicians

Data base access for telemedicine pre-consult forms - password protected.

Speakers / Headphones: 37%
14:34
19/05/2020

*“How we try to make the most of telemedicine consults”
thank you Dr Matt Dobson*



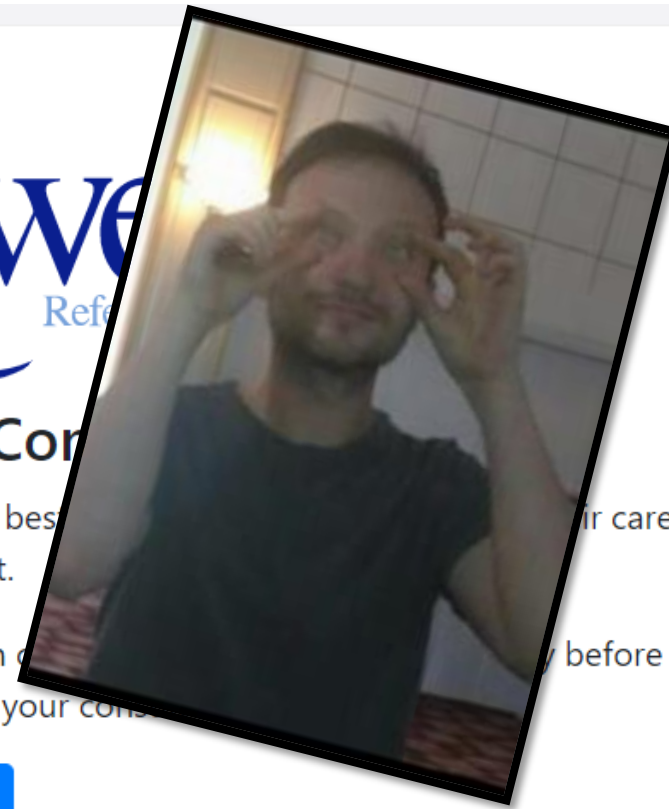
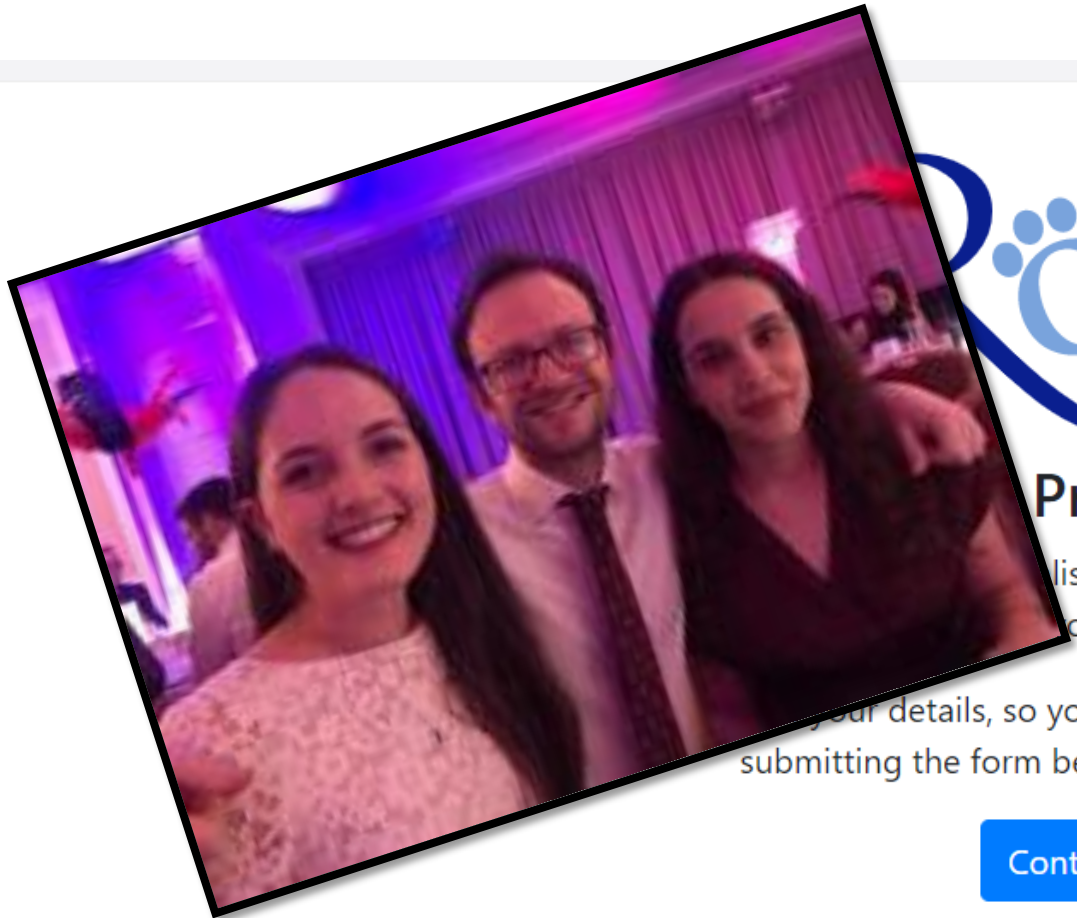
Telemedicine Pre-Consult Form

This web form helps give your veterinary specialist the best possible information to guide their care for your pet.

Progress is saved as you enter your details, so you can come back and amend as necessary before submitting the form before your consultation.

[Continue](#)

*“How we try to make the most of telemedicine consults”
thank you Dr Matt Dobson*



Röwe
Ref

Pre-Con

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Continue

“How we try to make the most of telemedicine consults”

Consult Type

1 of 8

Department/specialism?

Ophthalmology (eyes) ▼

Choose...

Ophthalmology (eyes)

Soft Tissue Surgery

Orthopaedics (bones/joints)

Internal Medicine

Dermatology (skin)

Dentistry

Neurology (brain/nerves)

Eye Photo Guide

2 of 8

For eye cases, please view this guide on how to take good photos of your pet's eyes. If you have already viewed it, please skip to complete the pre-consult form.

[View Guide](#)

[<- Prev](#)

[Next ->](#)

<https://preconsult.rowevets.support/eye-photo-guide>

1. Keep the Room Dark

Take your picture in a dark room. Turn off all room lights and close curtains.

Taking a photo in a lit room will obscure the eye's structures due to the prominent reflections of the environment.

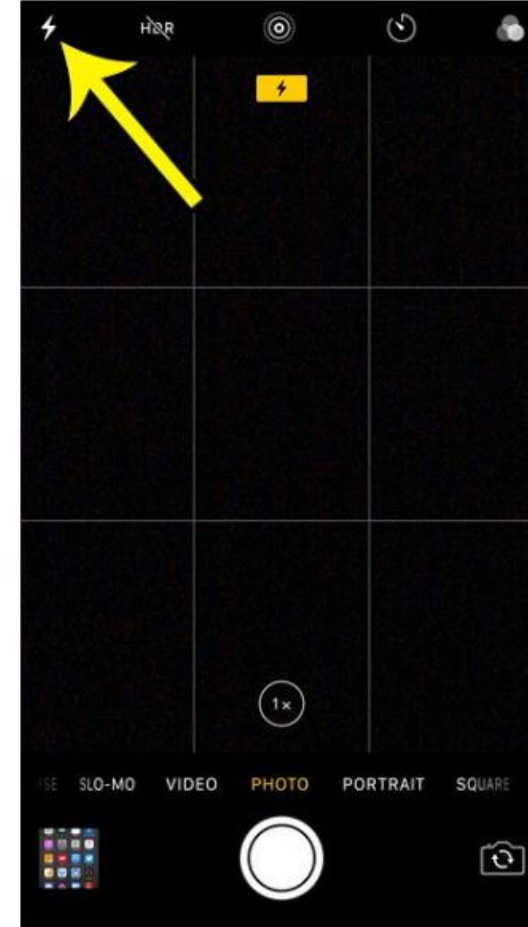


It is difficult to see the eye's internal structures in this photo, due to the prominent reflections of the environment. If this was taken in a dark room with camera flash, it would be possible to see the structures within the eye.

2. Turn on Flash

Turn on your camera flash. In your smartphone camera app, this is usually an icon in the top left or top right that looks like a thunderbolt or torch. You can tap this icon to toggle flash to be "ON".

Flash will illuminate the eye and reduce motion blur.



This is where the toggle for flash is present on most iPhone devices. Location of this setting will vary on other phones.

<https://preconsult.rowevets.support/eye-photo-guide>

3. Find a Helper

Where possible have someone holding your pet so you have your hands free to take the images

If your pet is a little wriggly, having another pair of hands is really helpful!



Having an assistant to hold your pet whilst you take photos will make the process quicker, less stressful and more successful.

<https://preconsult.rowevets.support/eye-photo-guide>

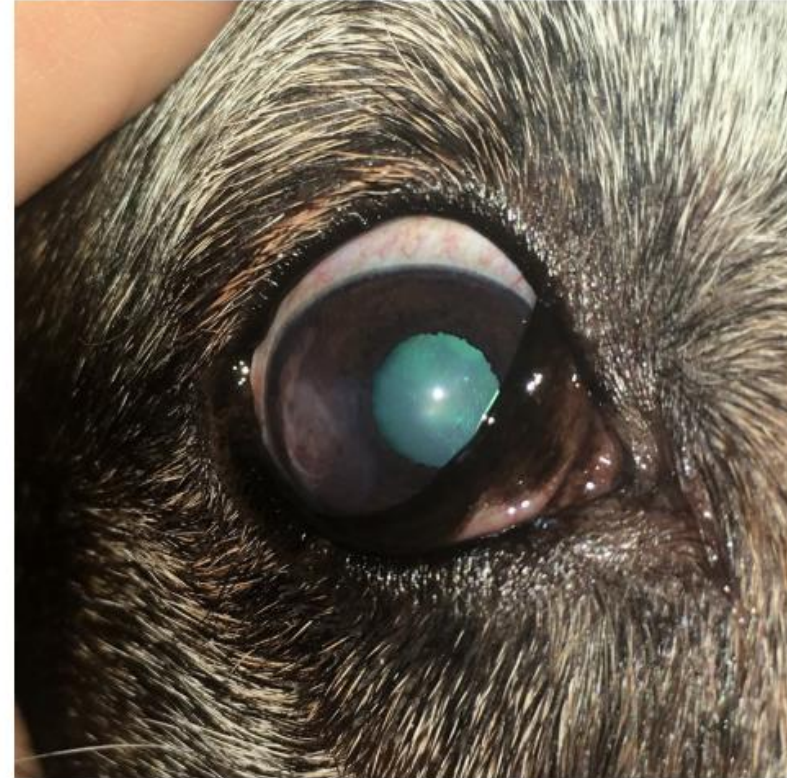
4. Keep your Distance

Hold phone a good 10 to 15cm away from the eye. Trying to fill whole screen with your pet's eye will mean you will be too close and have a blurry image.

It is much better to have a crisp, distant image than a close, blurry image. If possible, increase your zoom to 2x, to reduce the temptation of getting too close.



This photo is blurry, due to the camera being too close to the dog. Taking the picture from further away would keep the picture sharp.



This photo has been taken at a suitable distance (~15cm), preventing blurriness.

<https://preconsult.rowevets.support/eye-photo-guide>



5. Keep Eye Central

When photographing each eye, keep the eye in the centre of the photo. This will help your phone's autofocus keep the area of interest crisp.

<- Prev

Next ->

<https://preconsult.rowevets.support/eye-photo-guide>

6. Gently Open Eyelids

Use your non-dominant hand to carefully and gently open the eyelids of each eye with your thumb and finger, as you take a photo with the other hand.



The photographer here is gently opening the eyelids with his thumb and fingers using his left hand, while his right hand is taking the photo with his smartphone.

<https://preconsult.rowevets.support/eye-photo-guide>

7. Take Multiple Photos

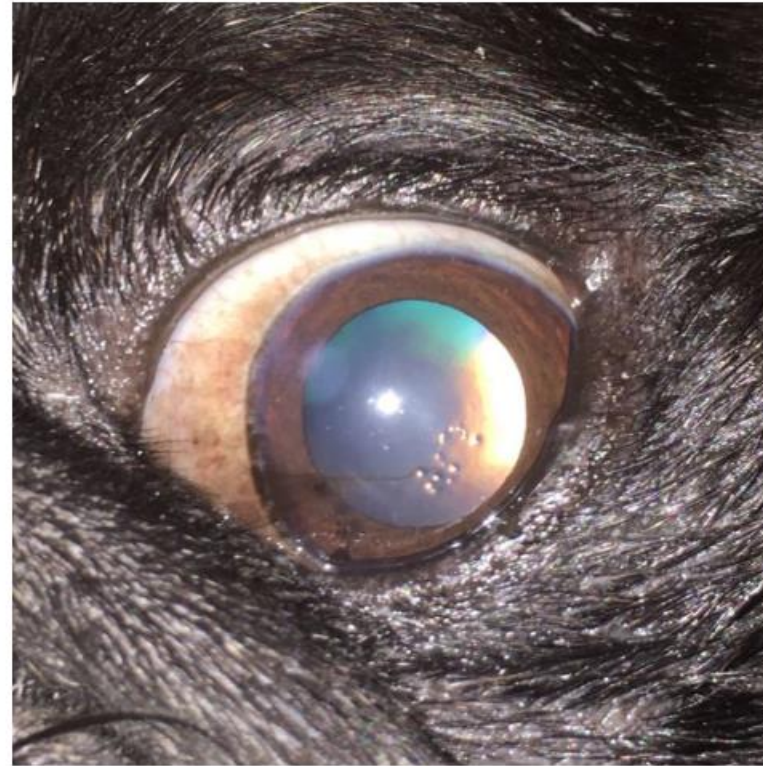
Take multiple photos at different angles. We would advise at least three of each eye. The more pictures, the greater the likelihood of a diagnostic image.

A wiggly patient may need multiple attempts to have a clear image of the eye. Don't worry if most of the images are blurry, just one good image will help a lot.

The best images are where the light from the phone flash bounces off the back of the eye - this makes lots of subtle changes to the eye much more obvious.



This pug was significantly wiggly, with lots of blurry photos like this one. However, with a little persistence...



... a few decent photos could be taken in between wiggles.

<https://preconsult.rowevets.support/eye-photo-guide>



Summary

That's the end of the guide. In summary, follow these tips to get the most of your eye photos:

1. Keep the Room Dark
2. Turn on Flash
3. Find a Helper
4. Keep your Distance (10-15cm)
5. Keep Eye Central
6. Gently Open Eyelids
7. Take Multiple Photos

With a bit of trial & error, and some practice, you should be able to take clear photos that will really help with diagnosis and management of you pet's problem.

[<- Prev](#)

[Continue Form ->](#)

<https://preconsult.rowevets.support/eye-photo-guide>

Patient Details

3 of 8

Pet name

Pet age

First name

Last name

Postcode

Species

Breed

Sex

Neutered Status

< - Prev

Next ->

General Info

4 of 8

How old was your pet when you obtained him/her?

Where did you get your pet from? (breeder, private sale, rescue, etc.)

If you have had your pet since a puppy, are you aware of any problems with his/her littermates?

Otherwise, are you aware of any problems or relevant history before you own your pet?

Are your pet's vaccinations up-to-date? When are they next due?

Does your pet receive non-core vaccines? (e.g. Kennel cough, FeLV, rabies, leishmania)

Does your pet receive routine flea/worm treatment? If so, give details on which ones, and when they were last given.

Has your pet been outside of the UK? If so, give details

Are there any other animals in the house? Are they well? Are they showing any similar signs to your pet?

Presenting Concern

5 of 8

What is your pet's presenting concern?

How long has this been going on for?

Did it come on suddenly? Progressively? Or intermittently?

Can you think of any event that may have cause your pet's signs?

Have similar issues happened before?

Does your pet have any concurrent health concerns?

Is your pet taking any medications currently? If so, which and how often?

If so, has any improvement been seen with treatment?

Any other information that may be helpful?

Presenting Concern (eyes)

6 of 8

Have you noticed any issues with your pet's vision?

If you have been applying eye drops, how challenging has this been?

Choose...

Choose...

<<petName>> not having eye drops

Easy to apply

Challenging but achievable to apply

Difficult and sometimes not achievable

Impossible to apply

Photo/Video Upload (eyes)

7 of 8

We ask for:

- Photo of whole face from the front
- Photo of left eye, with eyelids gently held open
- Photo of right eye, with eyelids gently held open
- Video of both eyes, slowly moving left to right

If you are struggling to take good photos, don't worry, send what you have, and we'll do our best with the images. We may ask you to take further photos to clarify some details.

Drag & Drop your files or [Browse](#)

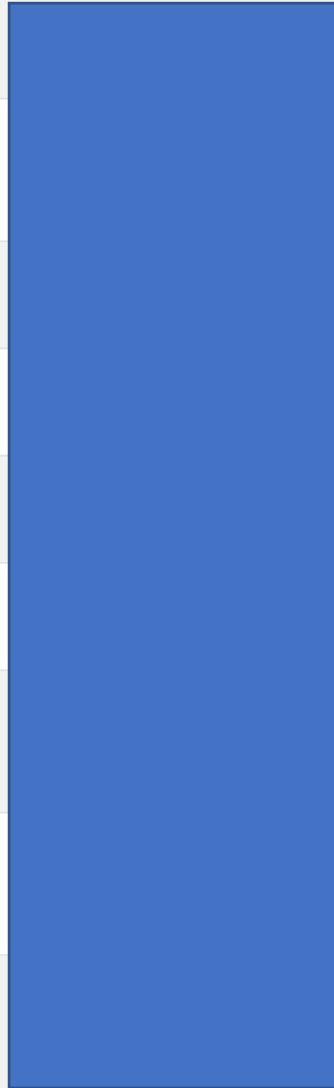
<- Prev

Next ->

Dept:

Search name:

All depts... ▼

# / Date	Dept / ConsultType:	Name: / Signalment:	
#76 /Tue, 19 May 2020 07:55:16 GMT	ophth / recheck		View
#75 /Mon, 18 May 2020 15:59:25 GMT	derm / recheck		View
#74 /Sat, 16 May 2020 08:18:46 GMT	ophth / recheck		View
#73 /Fri, 15 May 2020 06:43:10 GMT	ophth / recheck		View
#72 /Thu, 14 May 2020 08:23:11 GMT	ophth / recheck		View
#71 /Wed, 13 May 2020 18:01:02 GMT	ophth / recheck		View
#70 /Wed, 13 May 2020 06:55:14 GMT	derm / firstConsult		View
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#68 /Tue, 12 May 2020 06:46:20 GMT	ophth / recheck		View

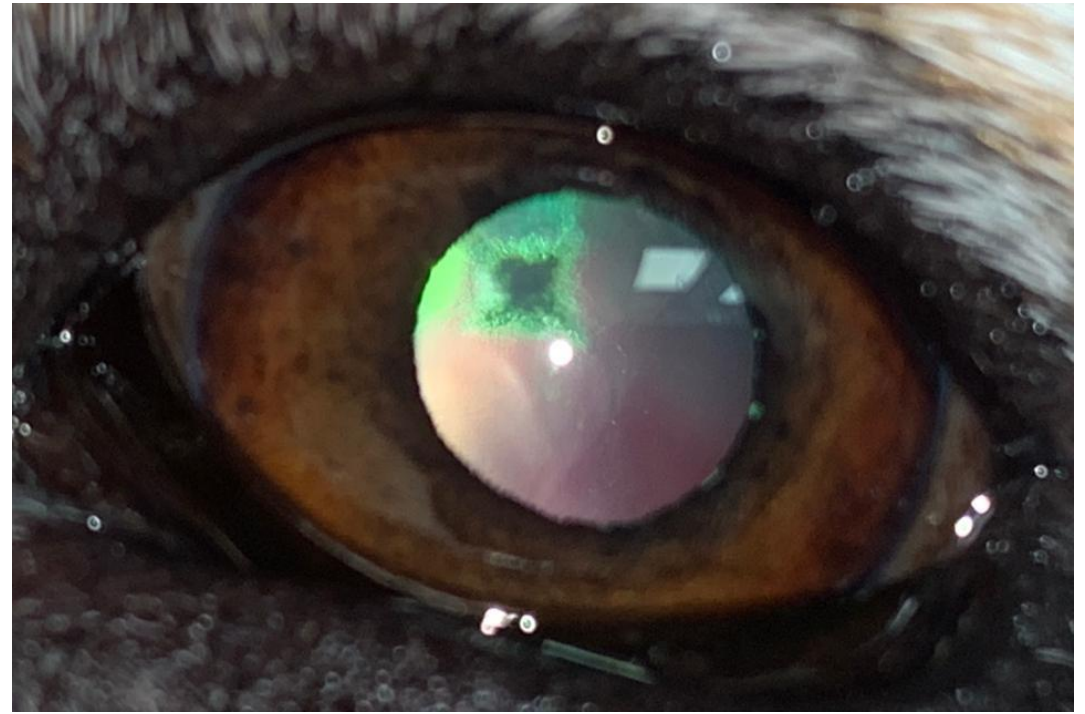




How to look

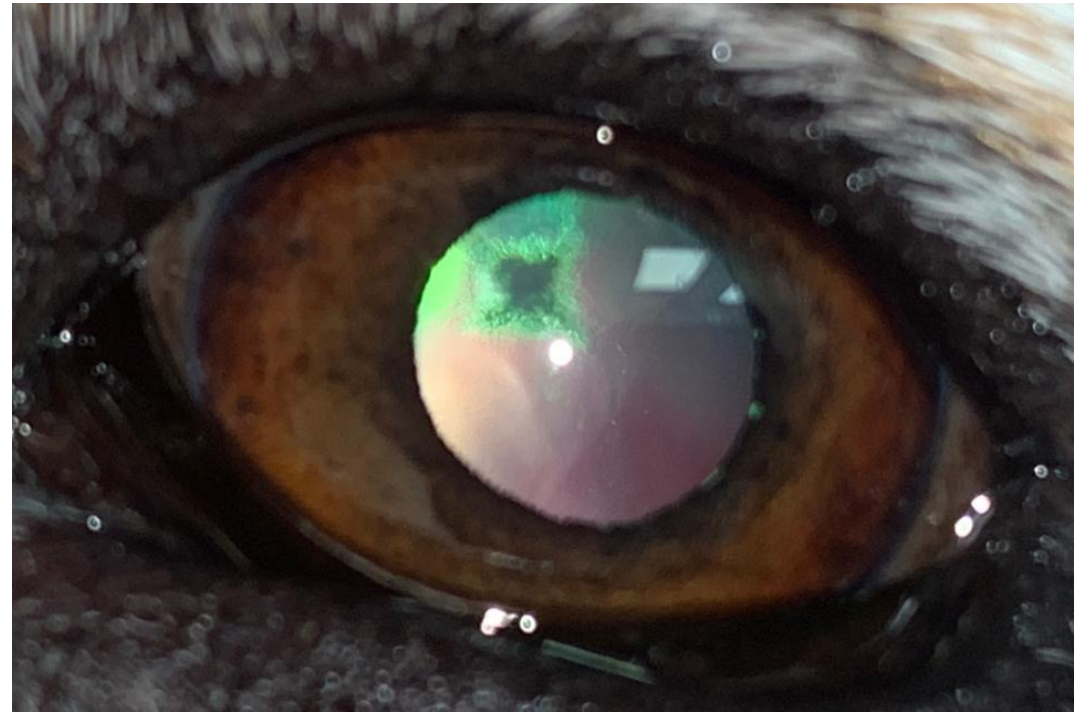
Ophthalmoscopy 101: *distant direct, close direct and indirect*





Distant direct ophthalmoscopy

Your 5 second ophthalmic overview



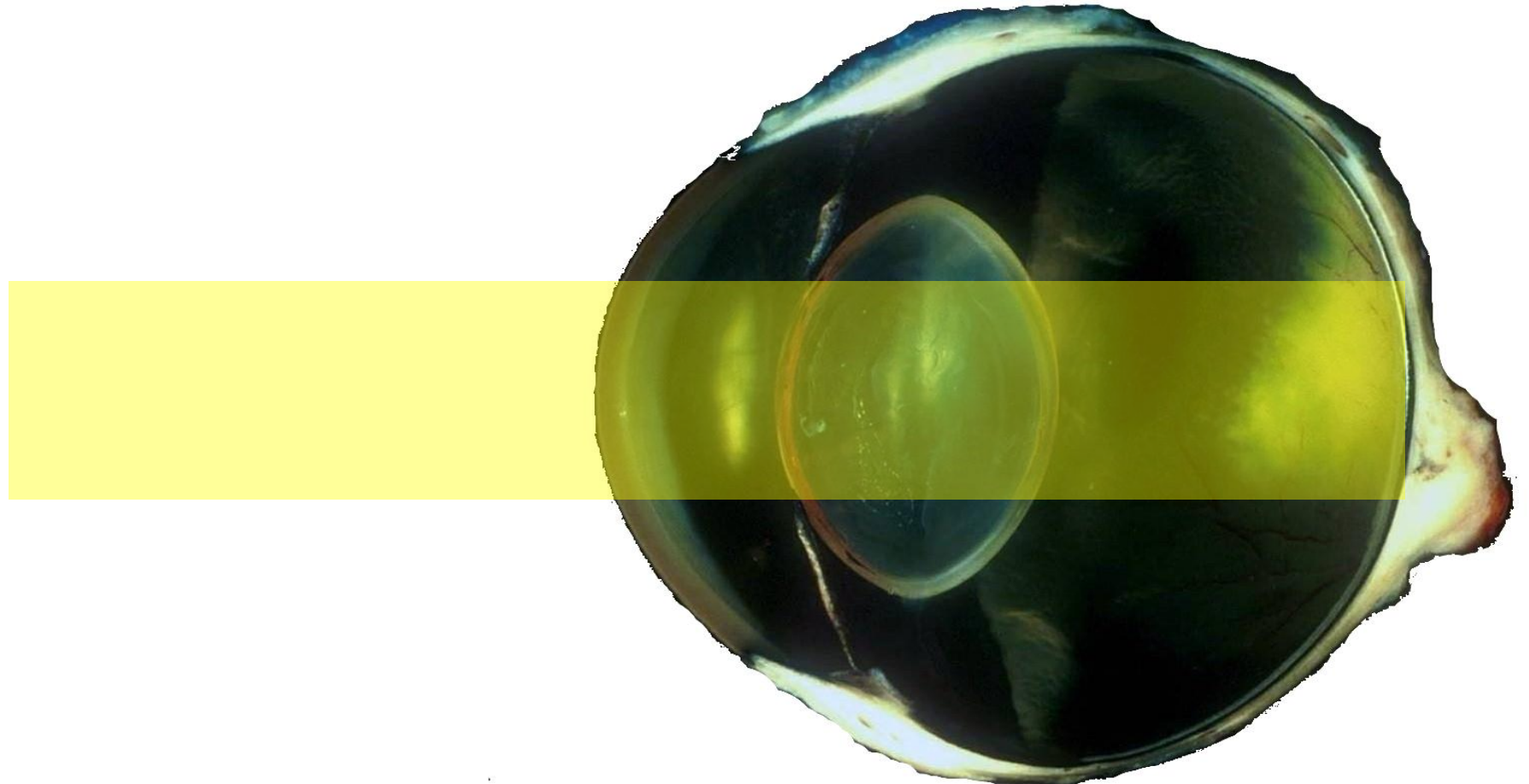
Distant direct ophthalmoscopy

Your 5 second ophthalmic overview



Visual axis

- Cornea
- Aqueous
- Pupil
- Lens
- Vitreous
- Retina





Distant direct ophthalmoscopy: *how to*

- Ophthalmoscope on zero or
- Light source as close to visual axis as possible



1. Use as a “pupilometer” :
assess pupil size, symmetry,
shape and response to light.
2. Assess fundic reflectivity &
symmetry.
3. Assess opacities & refractive
oddities in the visual axis
4. Assess opacities outside the
visual axis



Distant direct ophthalmoscopy: *how to*

- Ophthalmoscope on zero or
- Light source as close to visual axis as possible



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Distant direct ophthalmoscopy: *how to*

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Distant direct ophthalmoscopy: *how to*

- Ophthalmoscope on zero or
- Light source as close to visual axis as possible



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visual axis



Distant direct ophthalmoscopy: *how to*



Pupil – fundic reflection - opacities

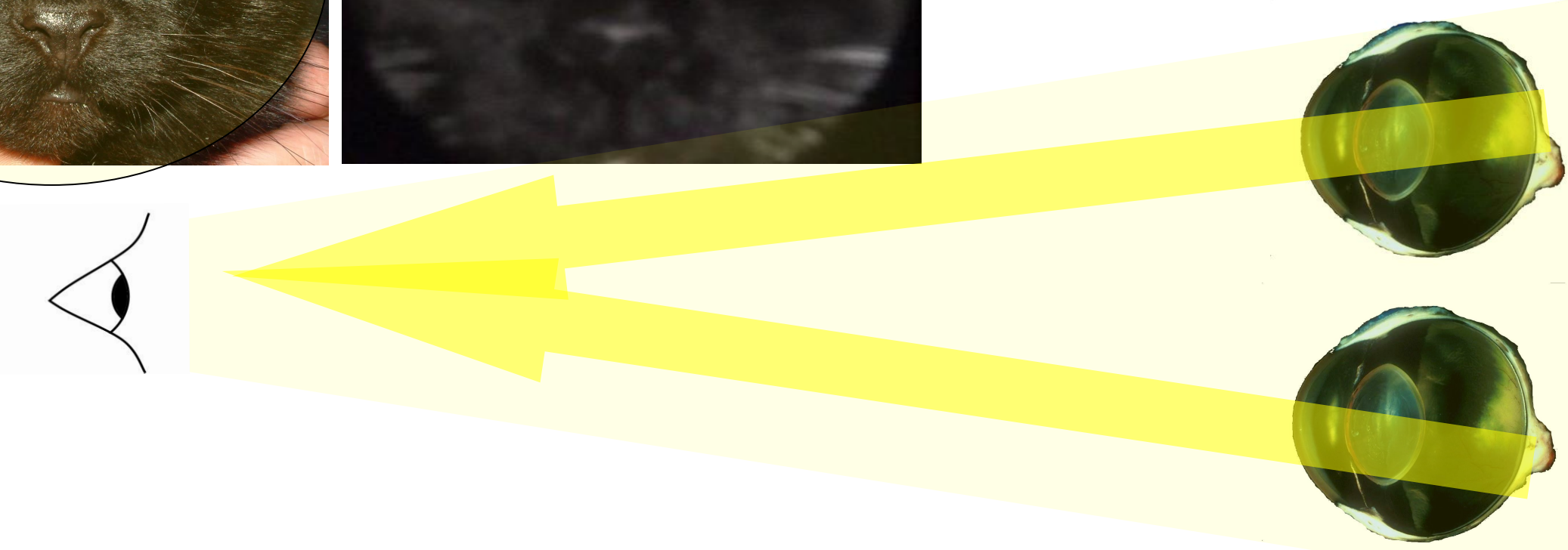
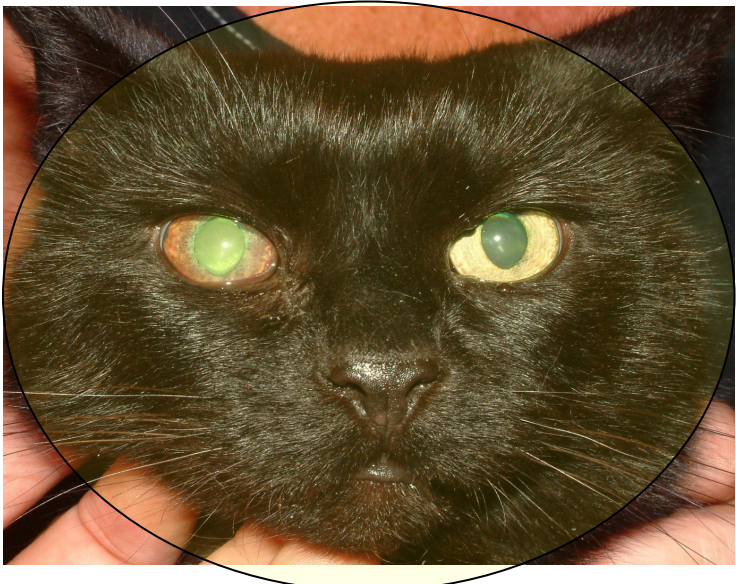


Distant direct ophthalmoscopy: *pupilmeter*





Distant direct ophthalmoscopy: *pupilometer*





Distant direct ophthalmoscopy: *tapetal reflection*

Normal cat tapetal reflection



Hyperreflective dog tapetal reflection



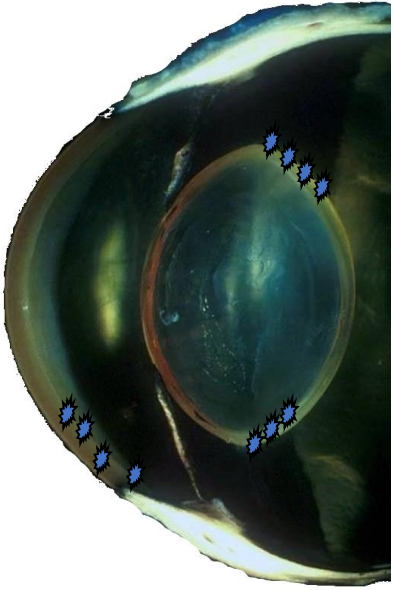
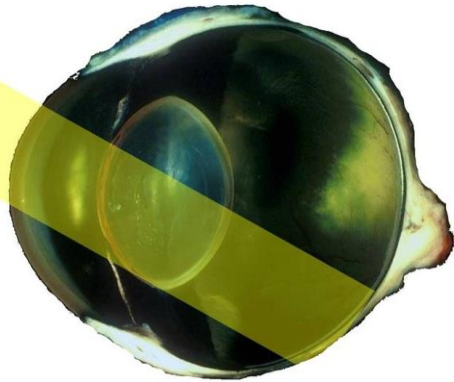
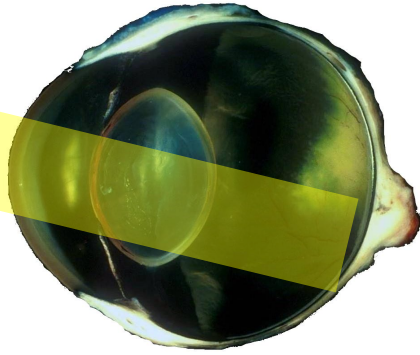
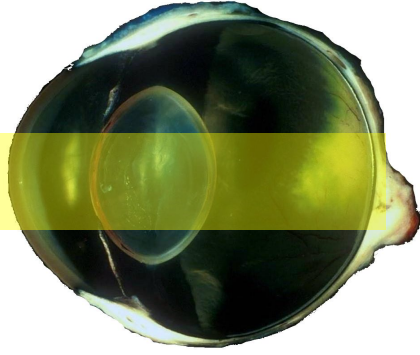
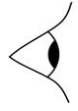
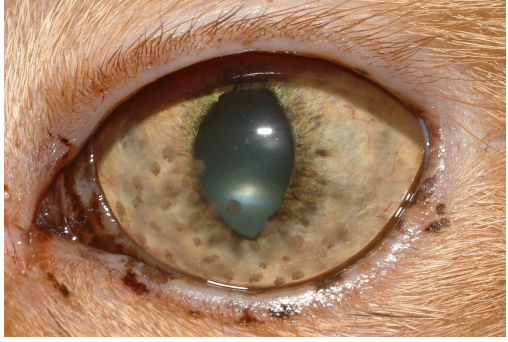
Distant direct ophthalmoscopy: *tapetal reflection*





Distant direct ophthalmoscopy: *opacities*

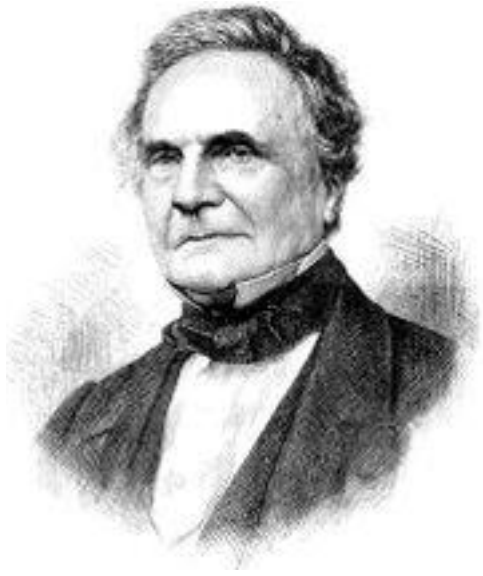






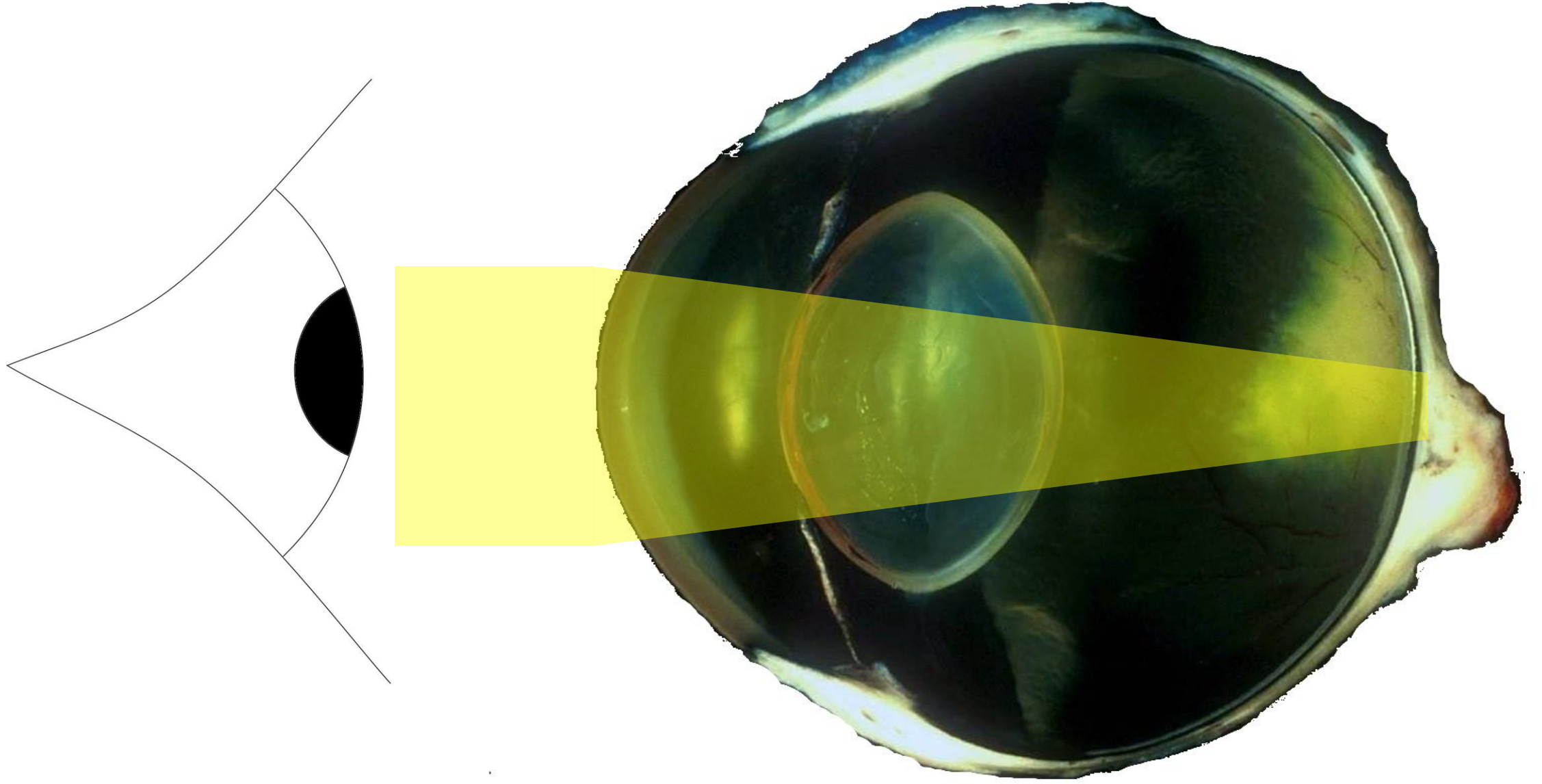
Distant direct ophthalmoscopy: *your friend*

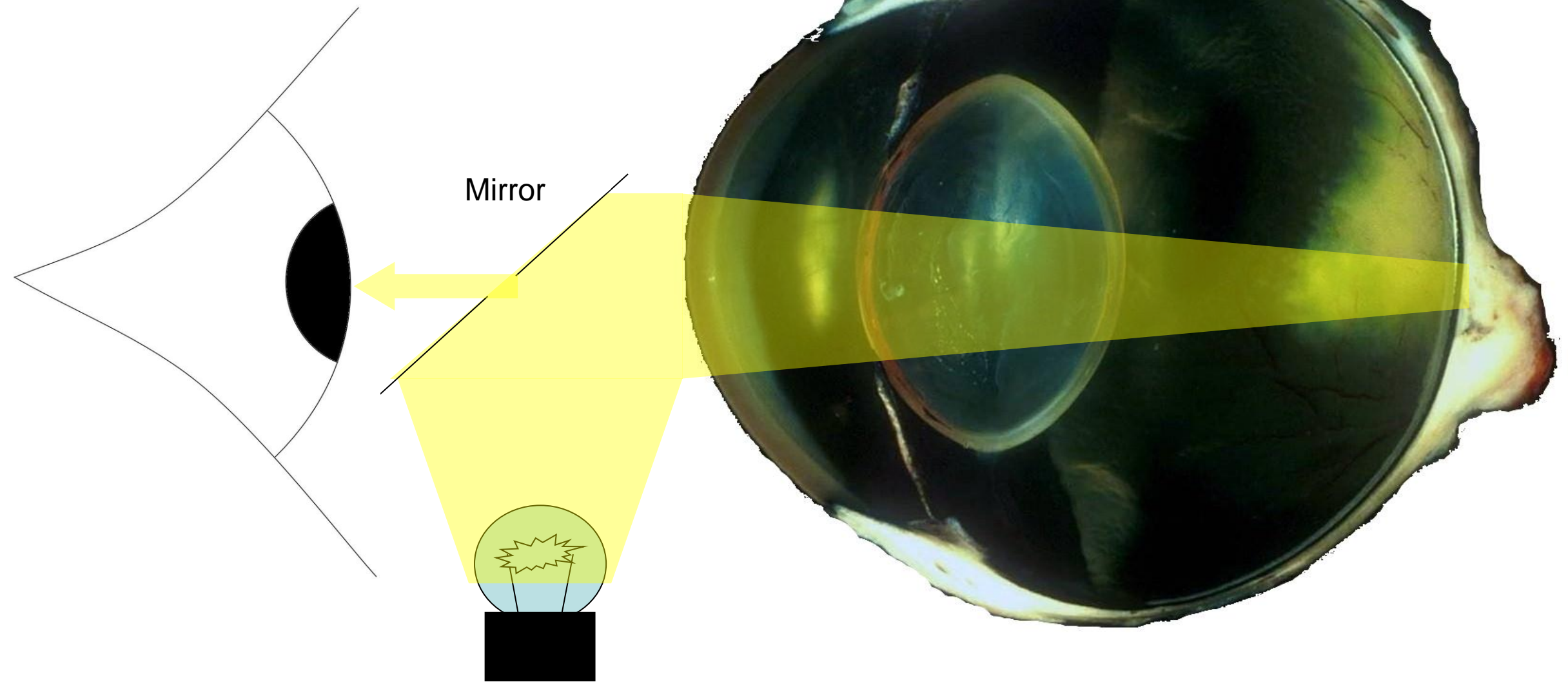


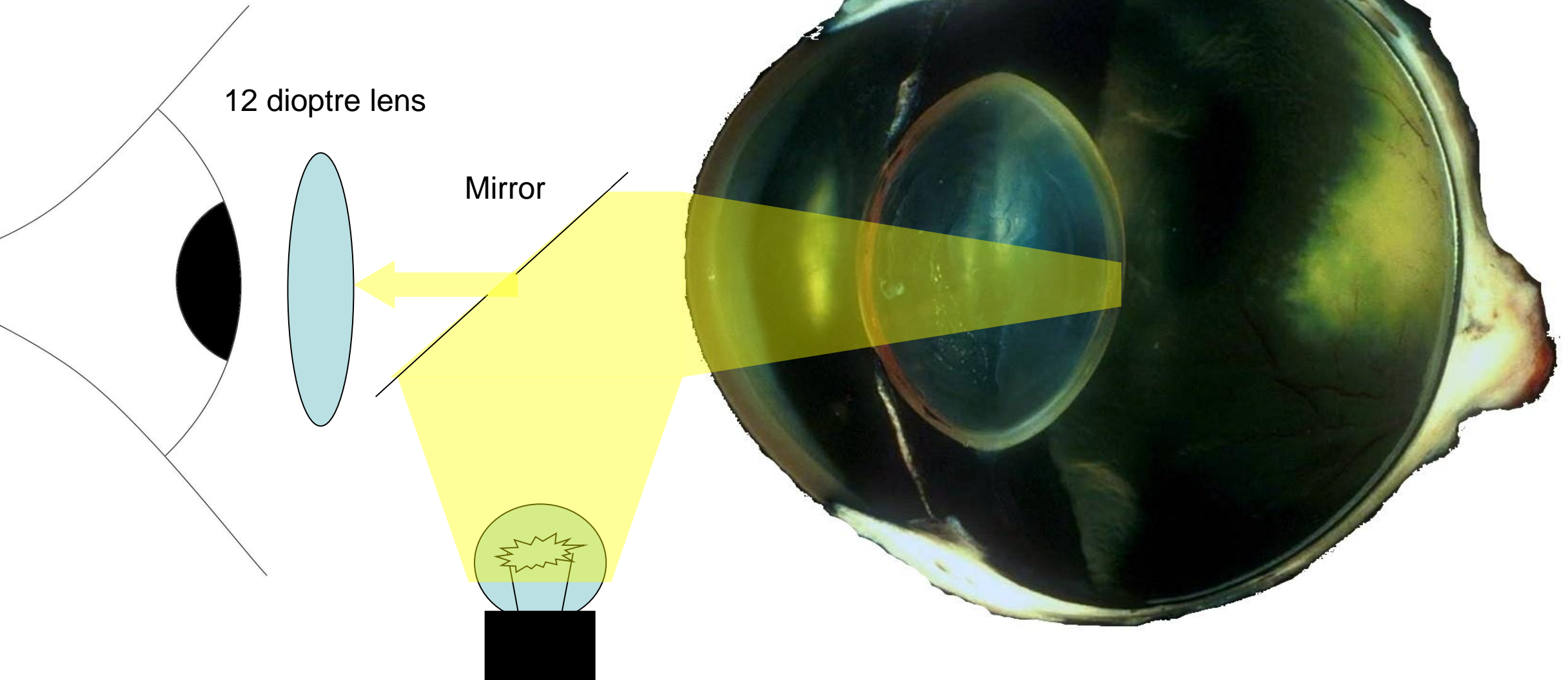


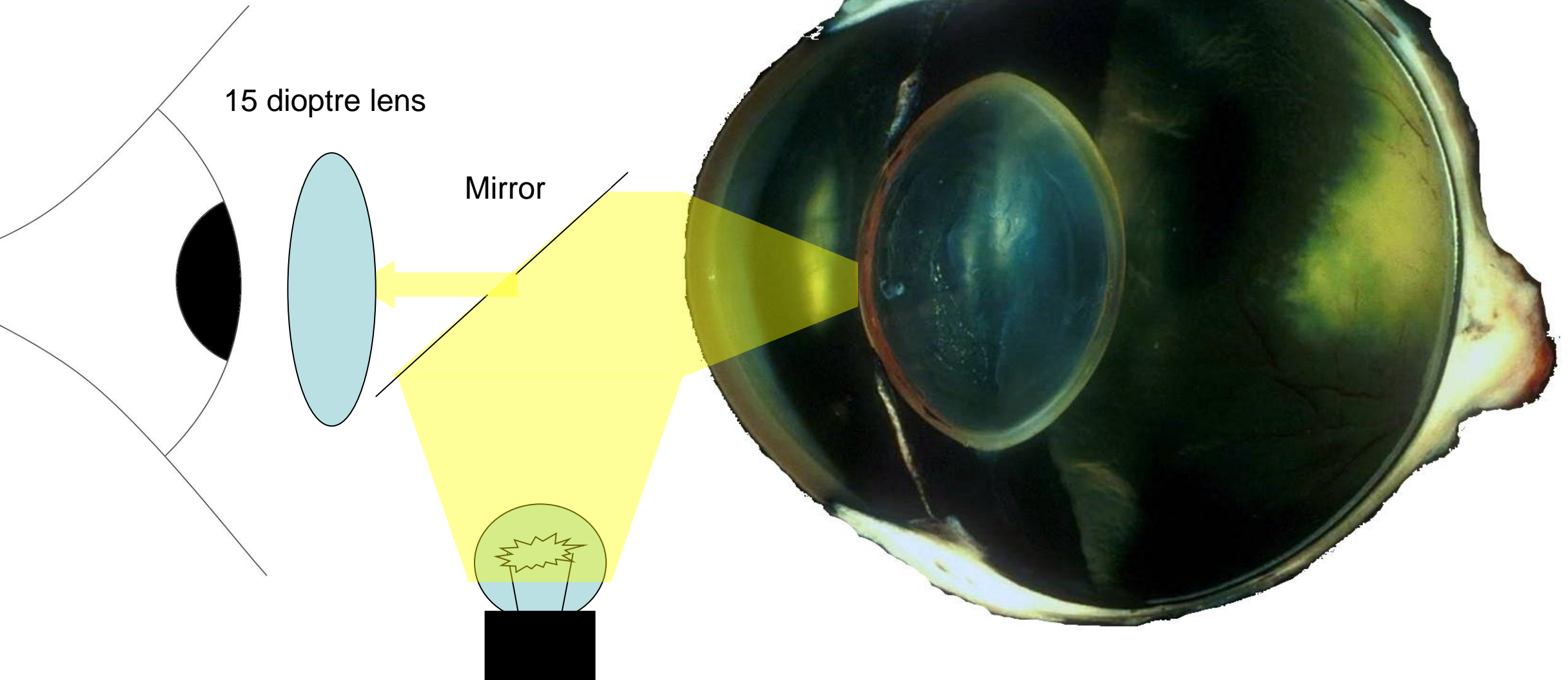
Close direct ophthalmoscopy

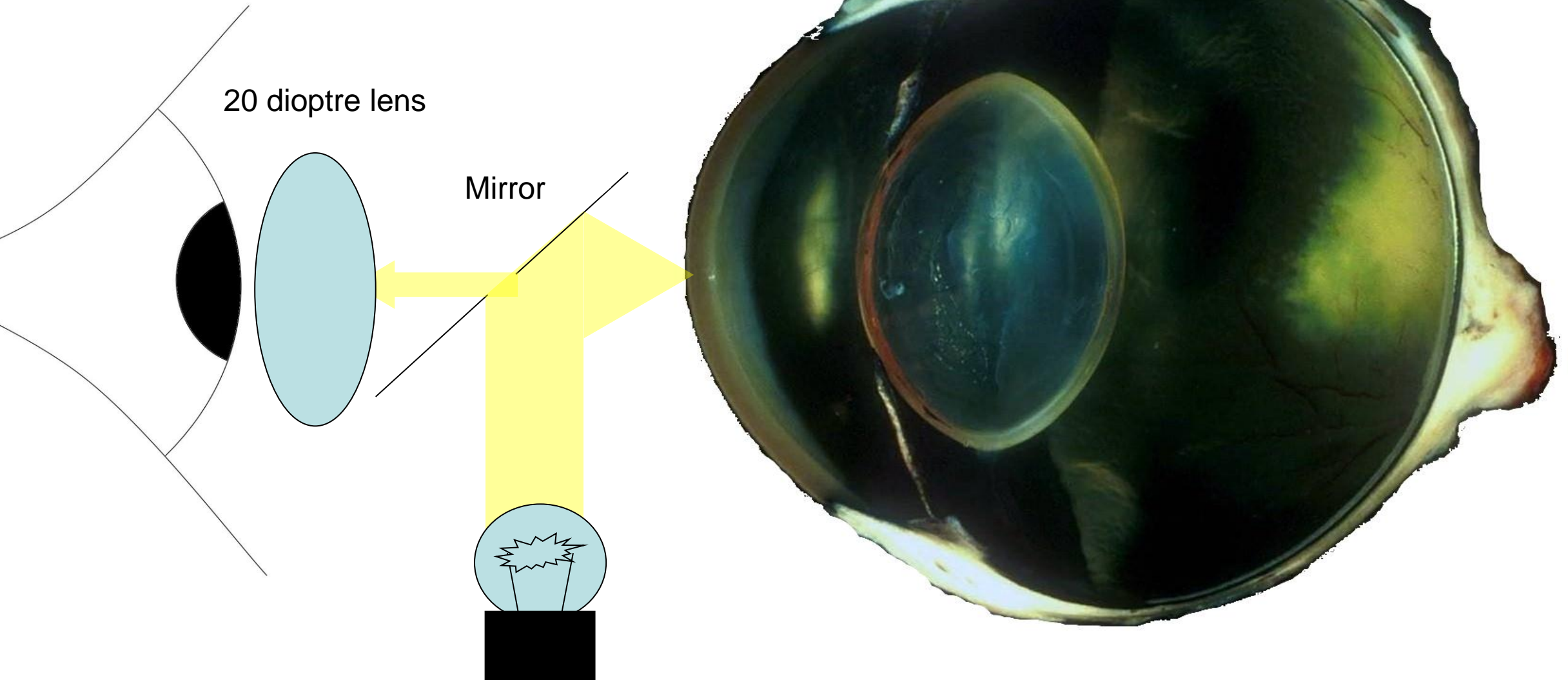
How we're used to seeing the fundus

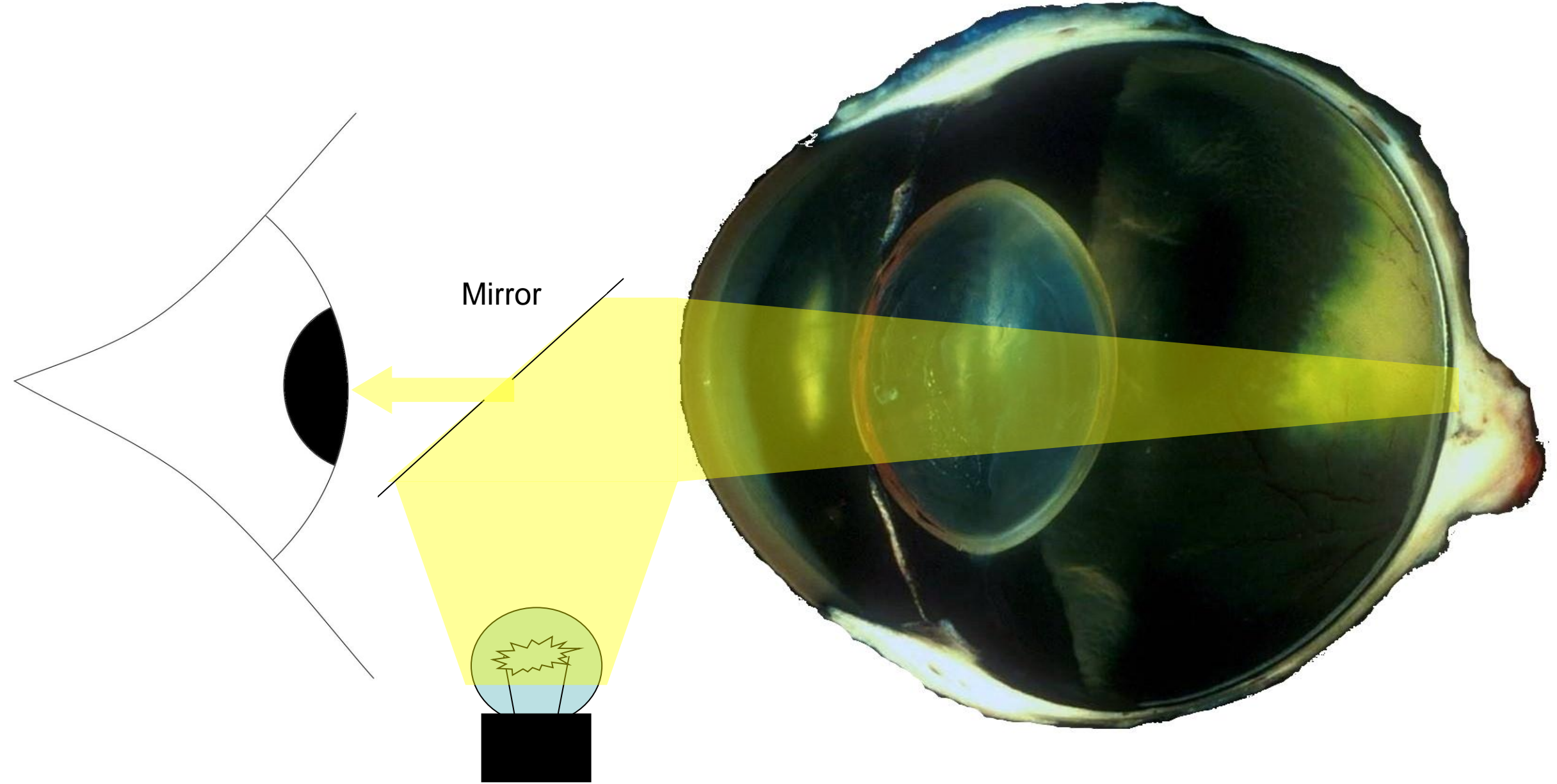


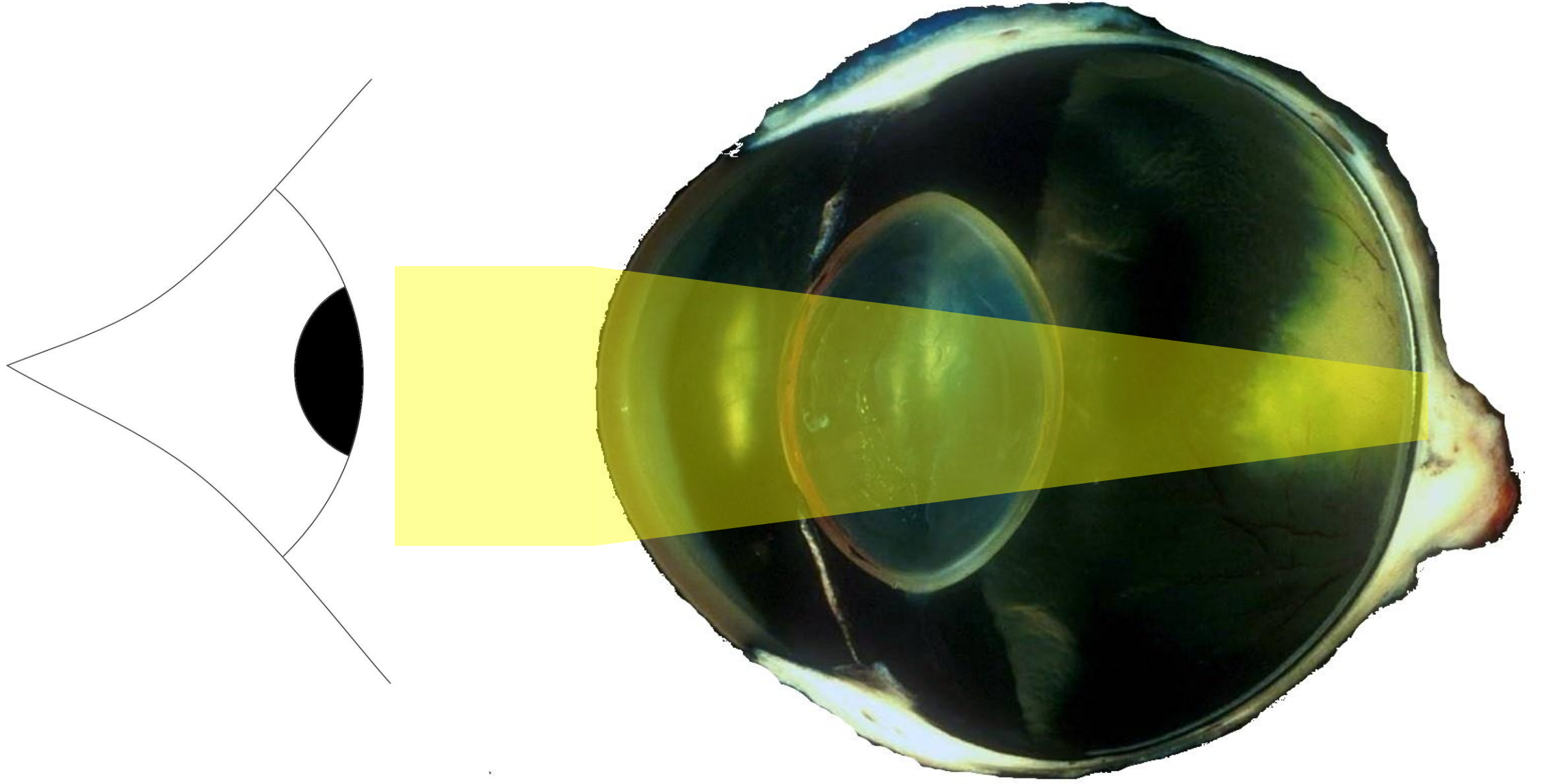


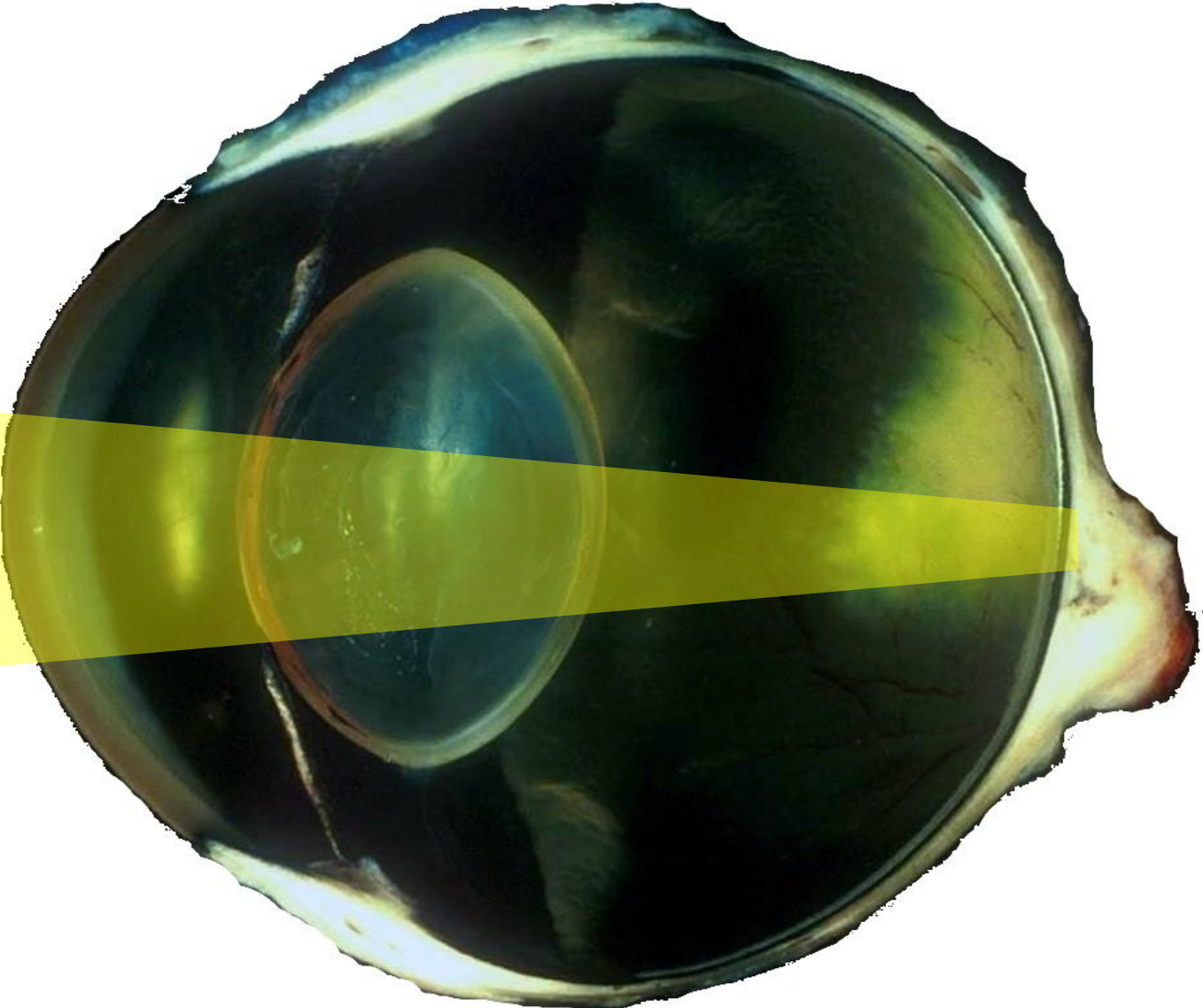
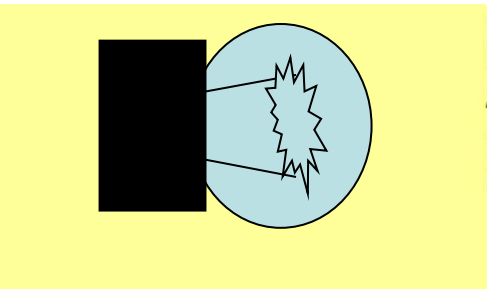
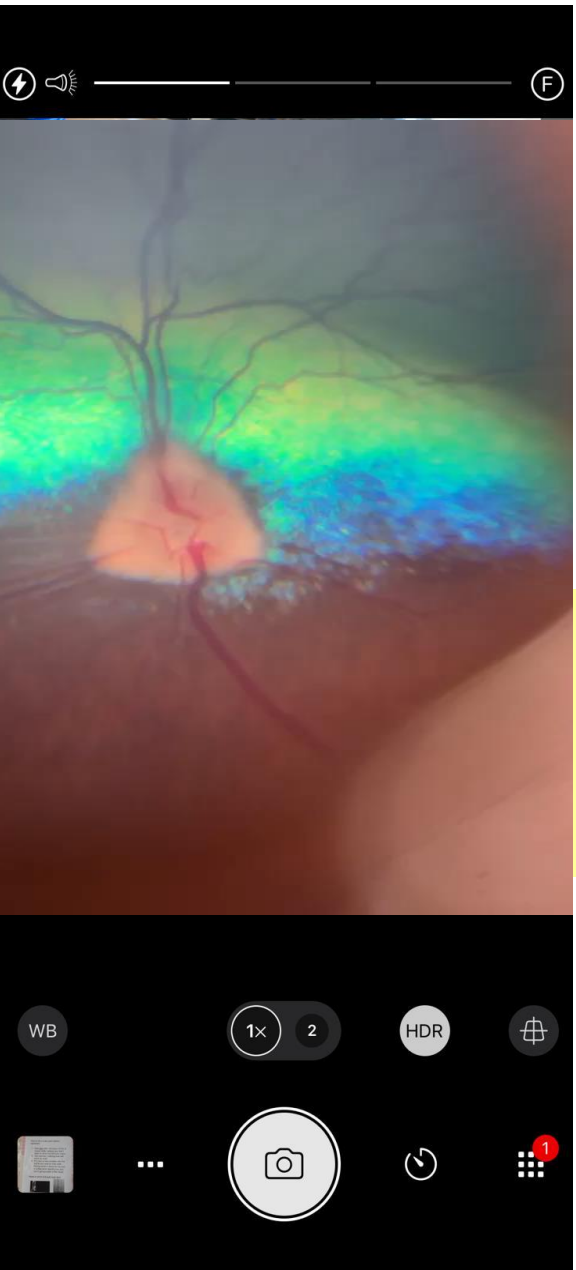


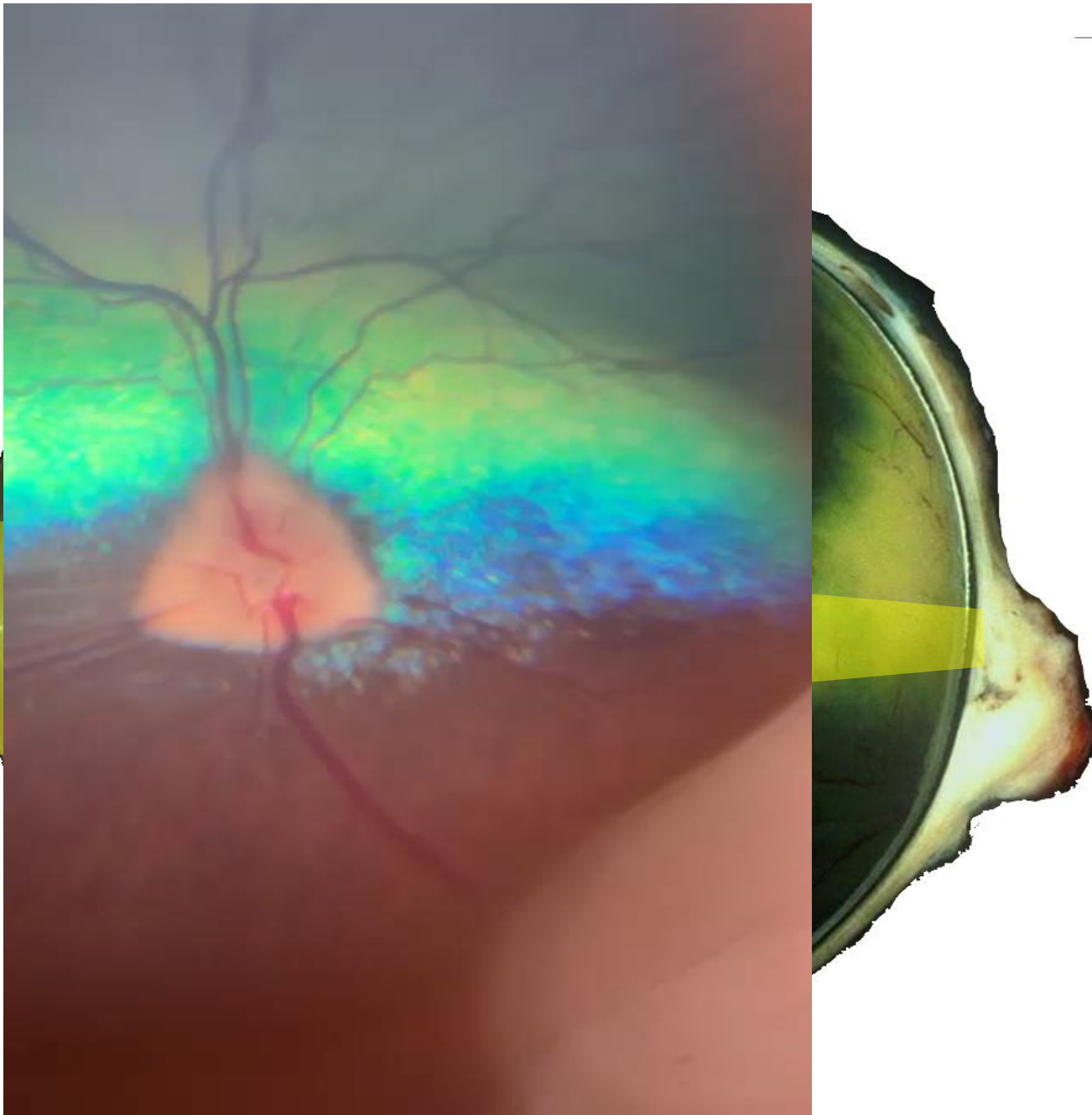
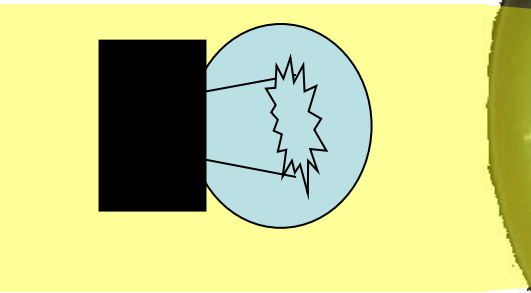
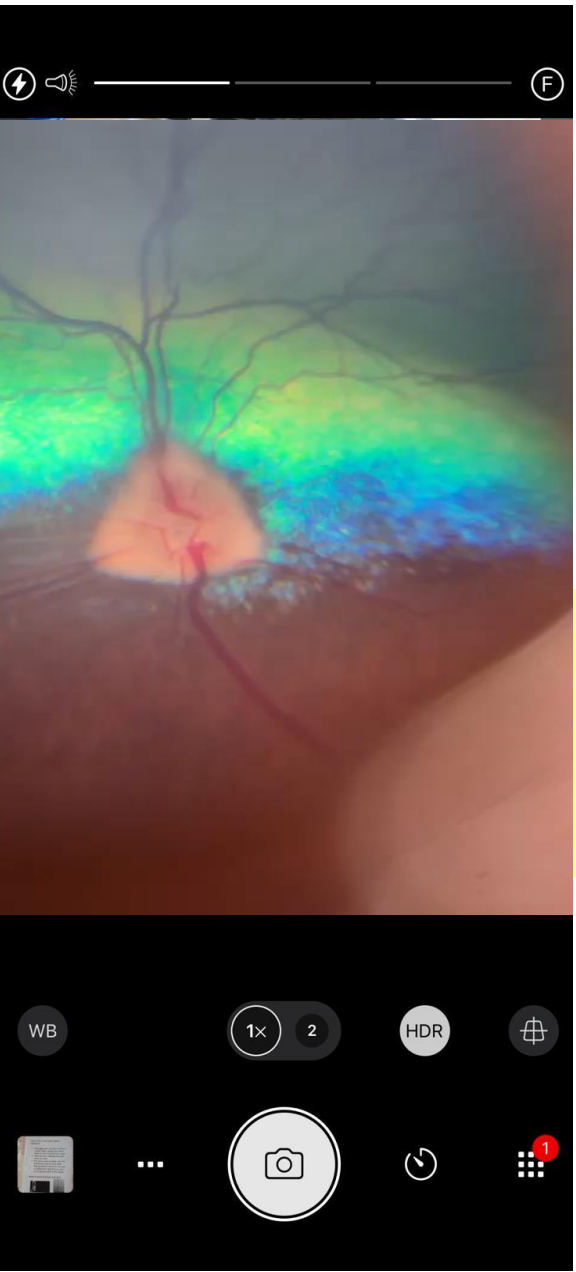


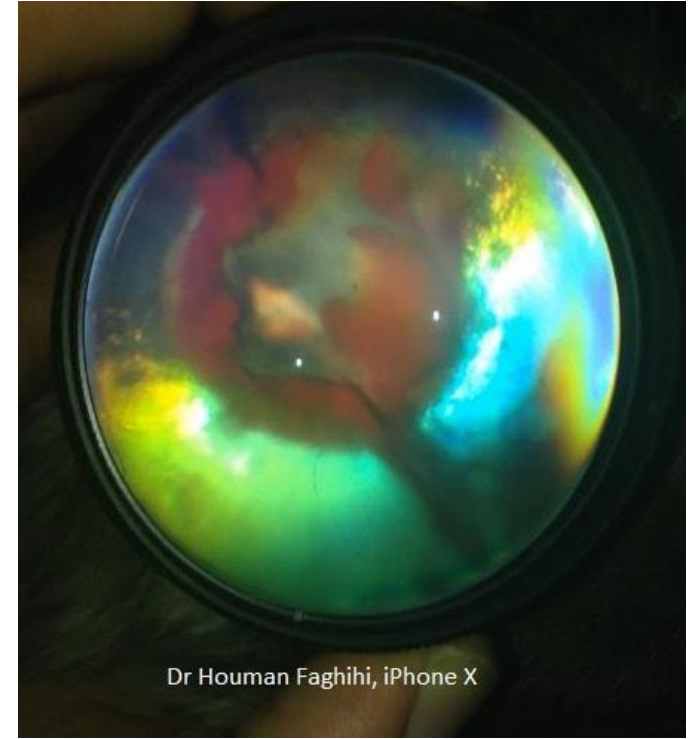












Using the diagnostic lens

INDIRECT OPHTHALMOSCOPY



Indirect ophthalmoscopy: Why?

Characteristics of direct and indirect ophthalmoscopy



Figure 1a. Direct ophthalmoscopy.



- Easy learning
- Upright image
- High magnification



- Monocular vision
- Narrow field of view



Figure 1b. Indirect ophthalmoscopy.



- Stereoscopic vision
- Wider field of view



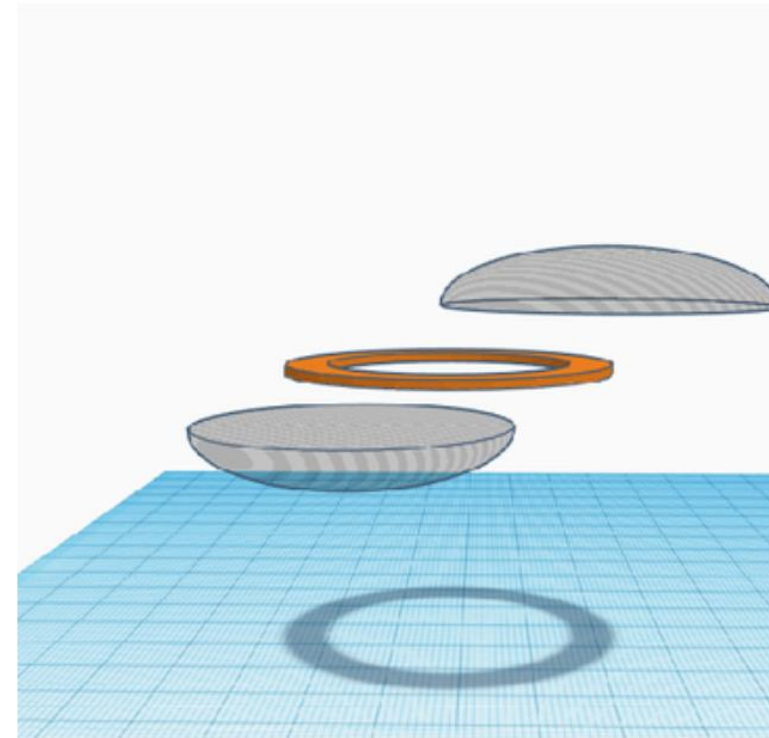
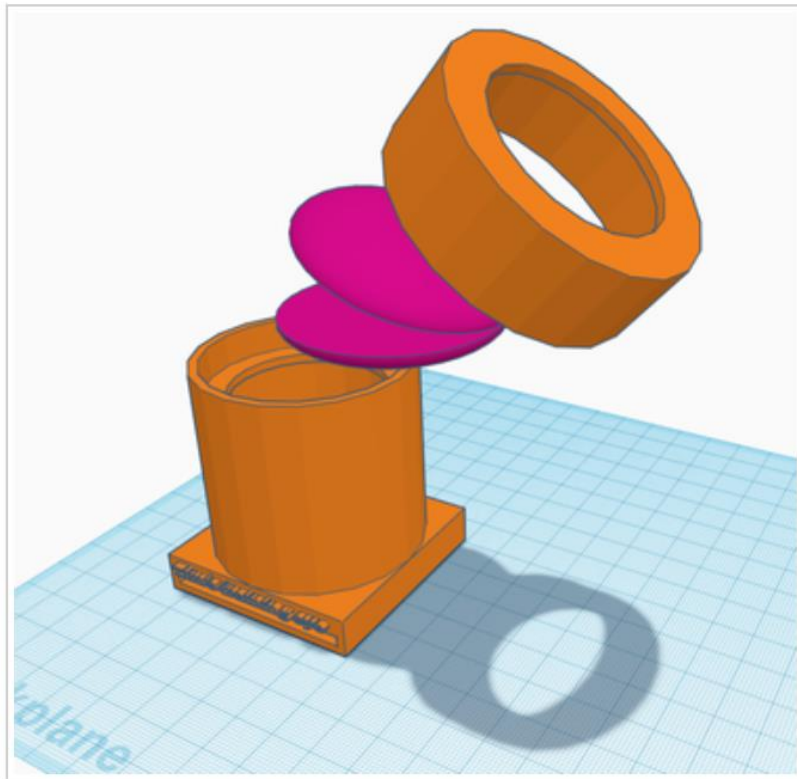
- Technically more difficult
- Inverted and reversed image
- Less magnification



Indirect ophthalmoscopy: *how to learn?*

2) 3D printed training eyes: free to download and use

www.TheEyePhone.com

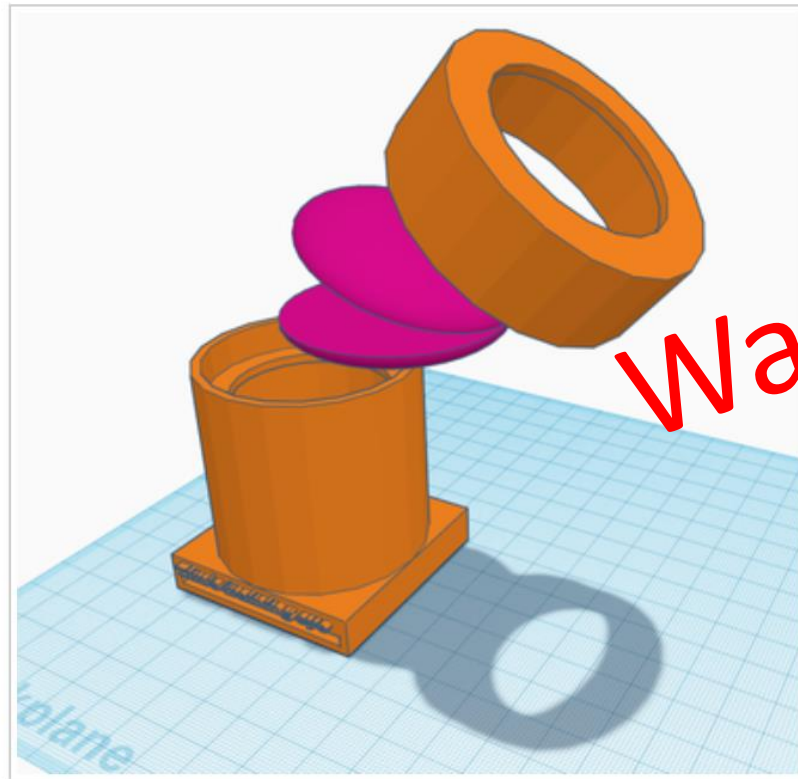


These models were designed to mimic the equine and small animal eye for the training of Veterinary Surgeons and students in the art and science of ophthalmoscopy and ophthalmic photography.

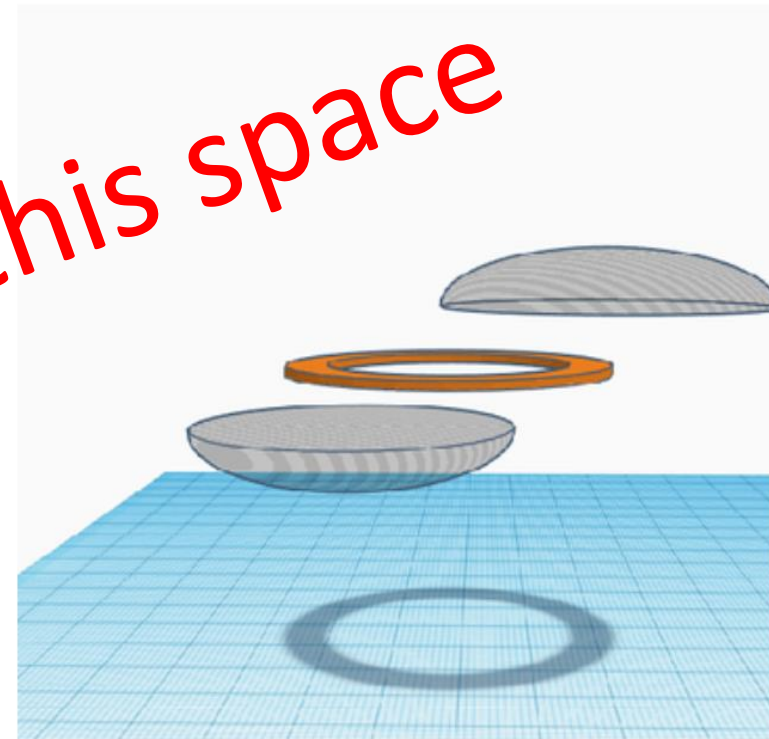


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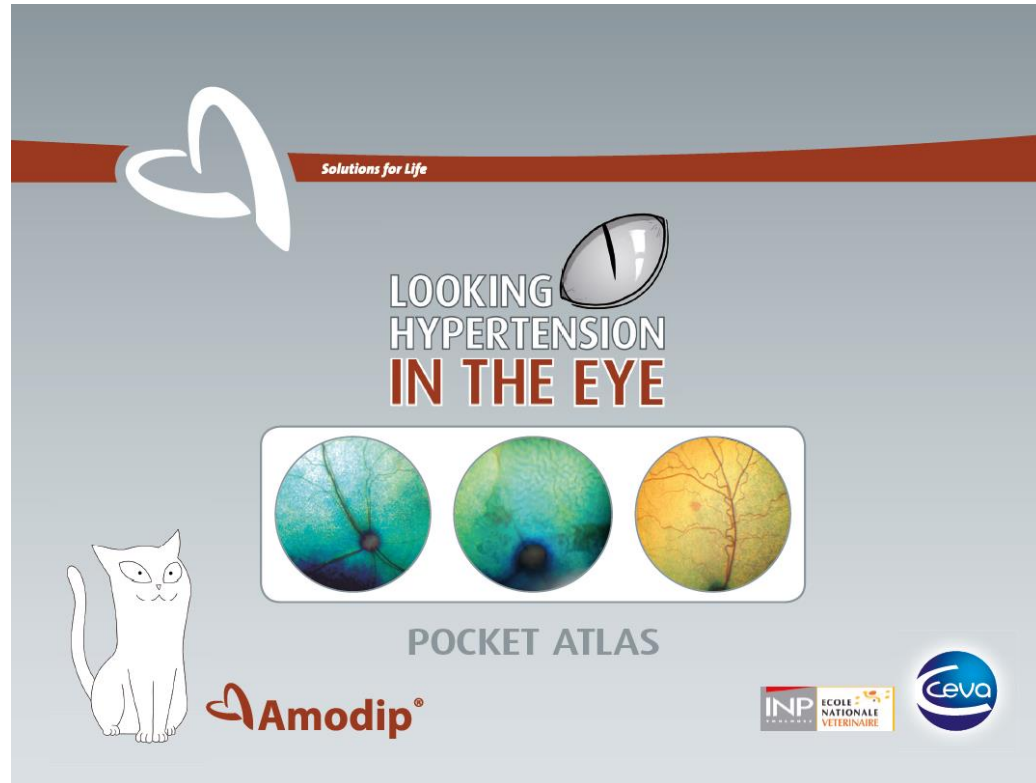
Watch this space



These models were designed to mimic the equine and small animal eye for the training of Veterinary Surgeons and students in the art and science of ophthalmoscopy and ophthalmic photography.



Watch out for CEVA road shows post C19



PREFACE

Feline hypertension has been recognised in feline practice for many years.

In fact, ocular lesions associated with hypertension are reported in approximately 50%* of affected cats and many of them suffering from severe hypertensive ocular damage have impaired eyesight resulting from complete retinal detachments and/or intraocular haemorrhage. The changes in the hypertensive eye are often irreversible. But early lesions that are not associated with blindness are much more likely to resolve after antihypertensive treatment, which proves the importance of an early diagnosis and management of the disease.

The objective of this work is to provide veterinarians with a practical and highly illustrated tool to facilitate ocular and fundus examination. We hope that this atlas will awaken your interest in “looking for hypertension in cats’ eyes”, and especially in the feline fundus.

Indeed, annual blood pressure measurement and ophthalmic examinations should be routinely performed on all ageing cats at risk of developing hypertensive lesions in the eye.

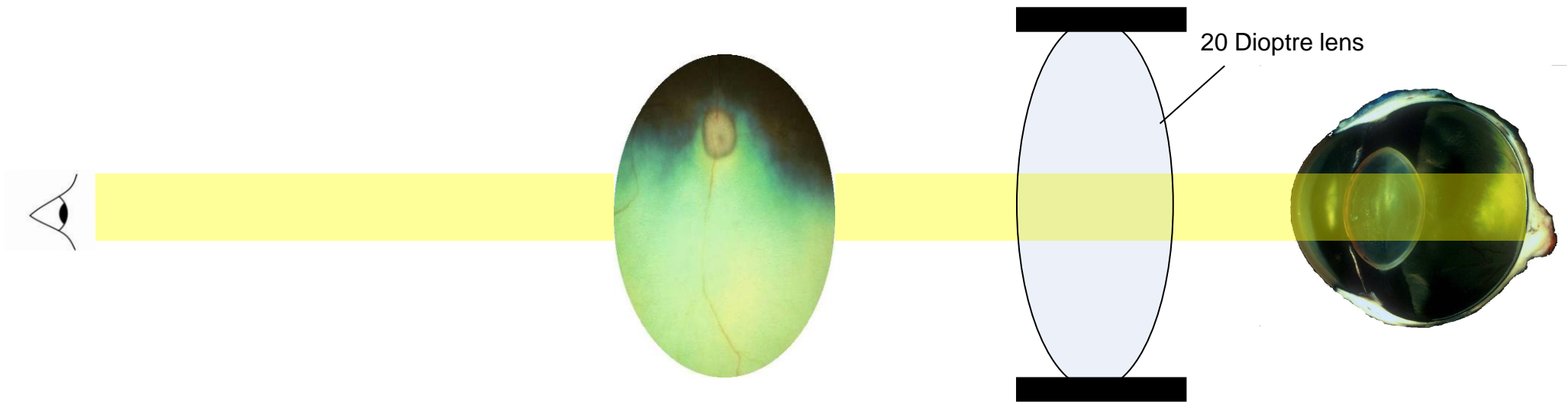
Dr. Jean-Yves DOUET

DVM, PhD, French specialist in veterinary ophthalmology (DESV)
Associate professor in veterinary and comparative ophthalmology
National Veterinary School of Toulouse (France)



* Taylor SS, Sparkes AH, Briscoe K et al. ISFM Consensus Guidelines on the Diagnosis and Management of Hypertension in Cats. *J Feline Med Surg.* 2017. 19(3):288-303.

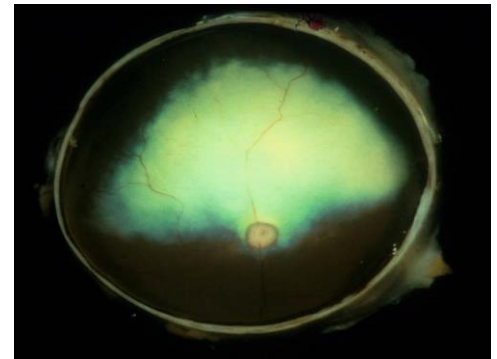




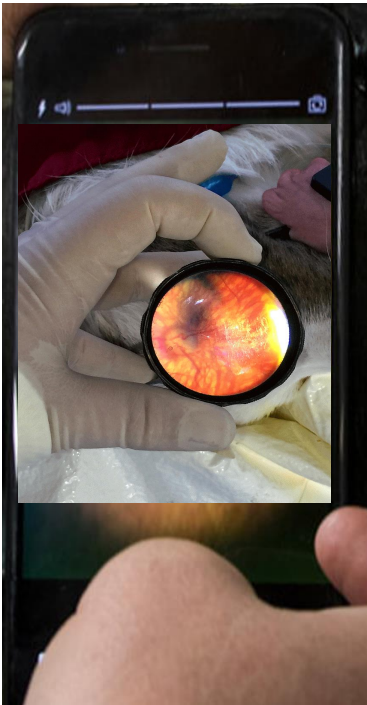
Virtual, **inverted**, image formed in front of lens



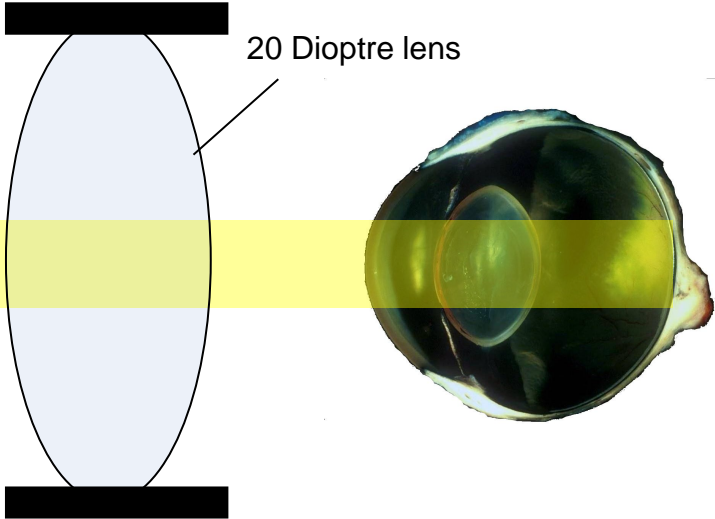
Large field of view



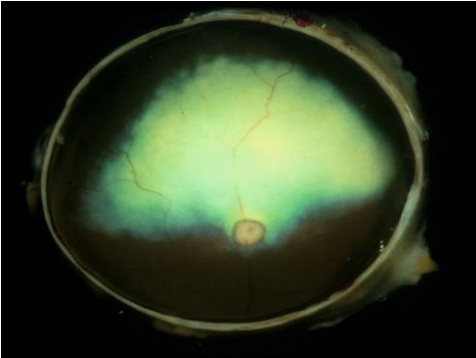
Whole fundus



Virtual, **inverted**, image formed in front of lens



20 Dioptre lens



Whole fundus

Panoptic

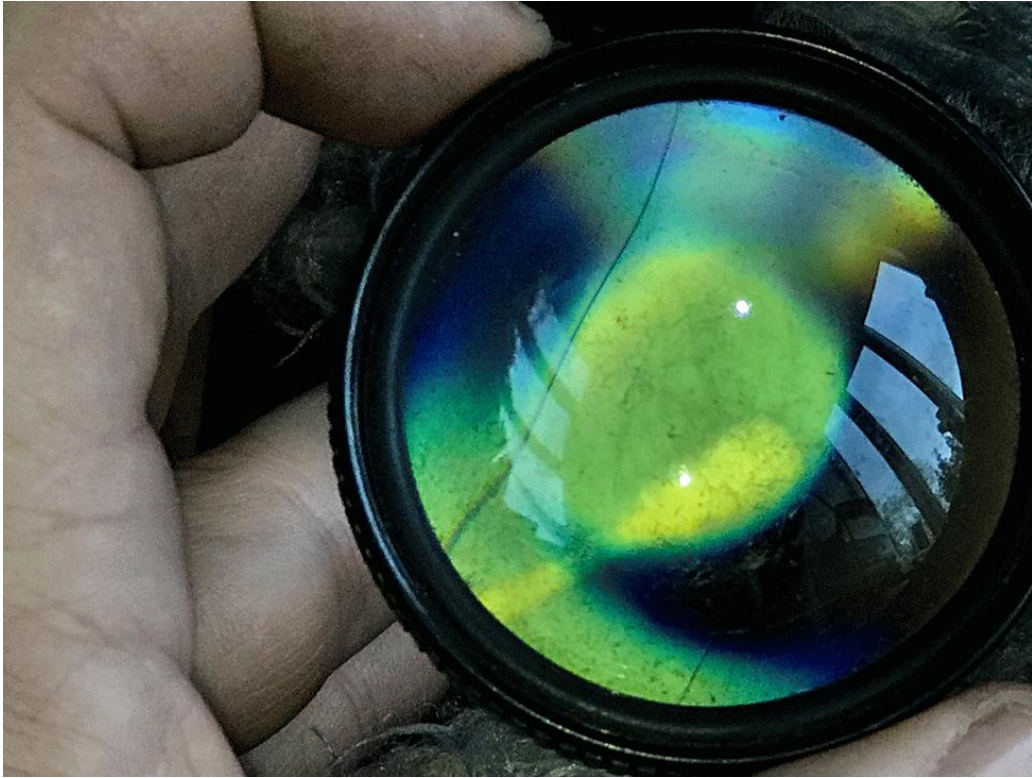
Examining dorsal tapetum



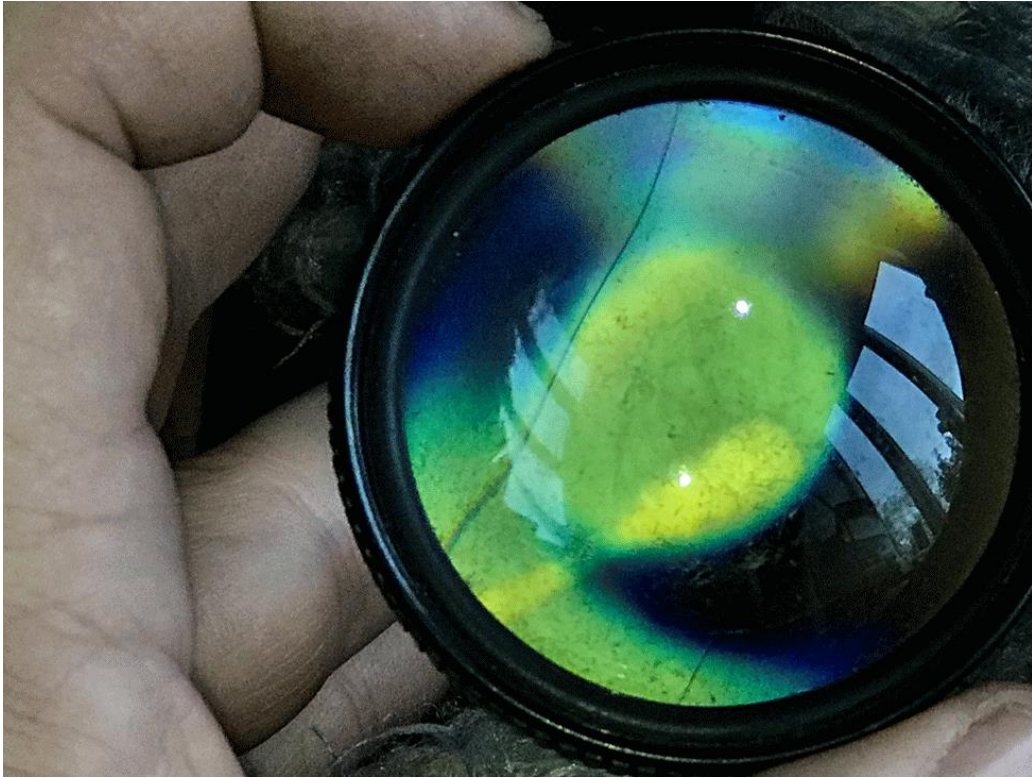
and then ONH



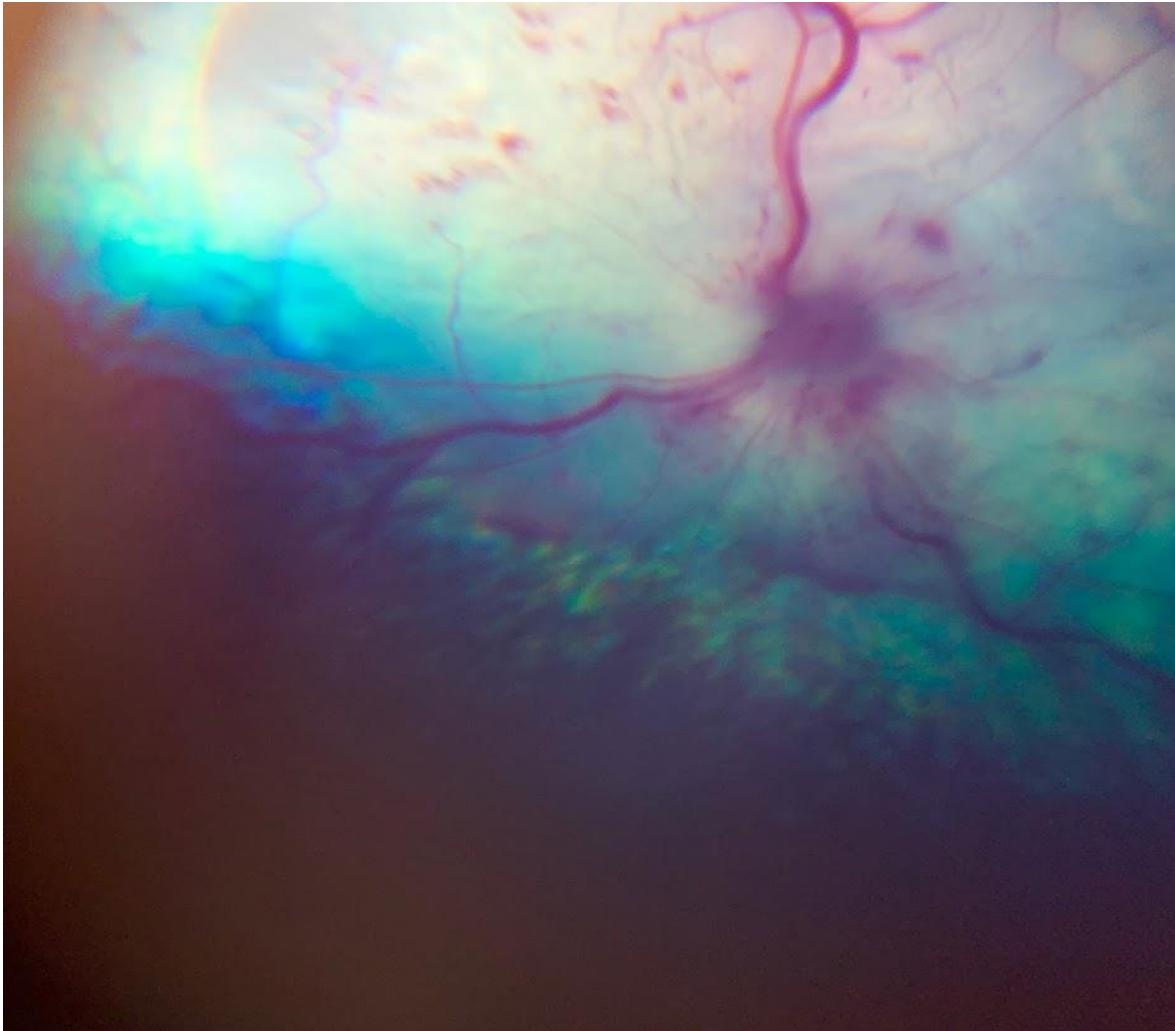
Guess the species



Guess the species



Field of view: determined by camera



photography basics:

Focus

Exposure

Depth of field





“Focus first “

Almost everything else can be fixed in post processing -
prioritize focus!

“if you're too close you can't focus - Know your minimum focal distance “

Avoid camera shake by ensuring shutter speed fast enough



Exposure

“Cameras see more than we can”

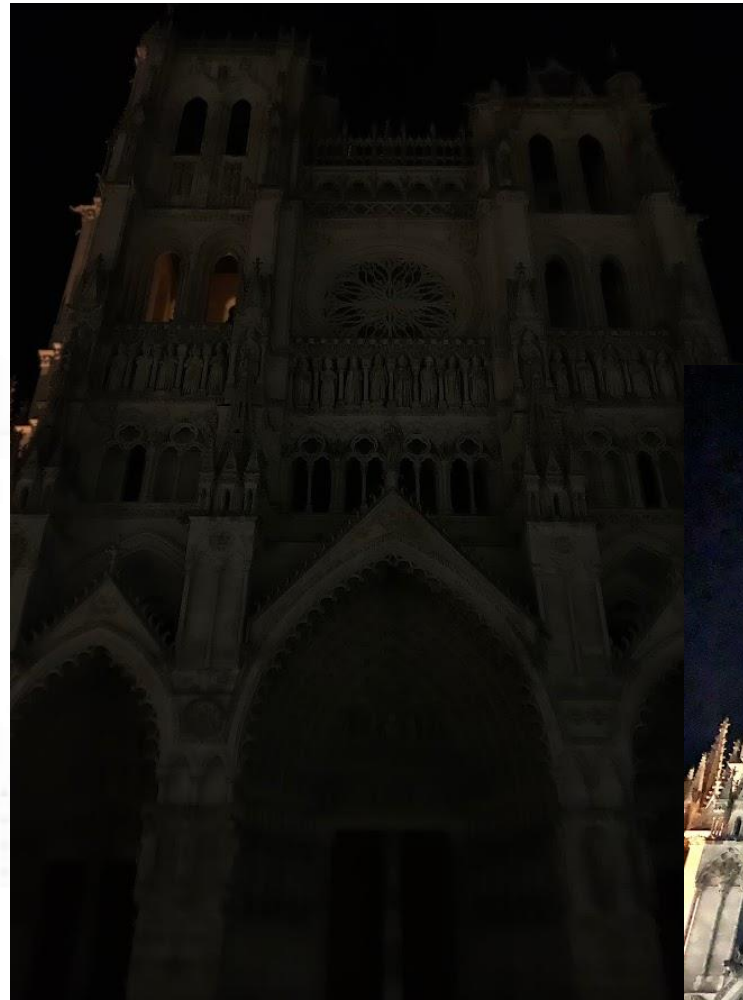
Dark images often carry lots of information- especially RAW images

...whilst over exposed images contain very little.

1st add light

2nd decrease shutter speed (but never at the expense of focus)

3rd increase sensitivity (ISO)



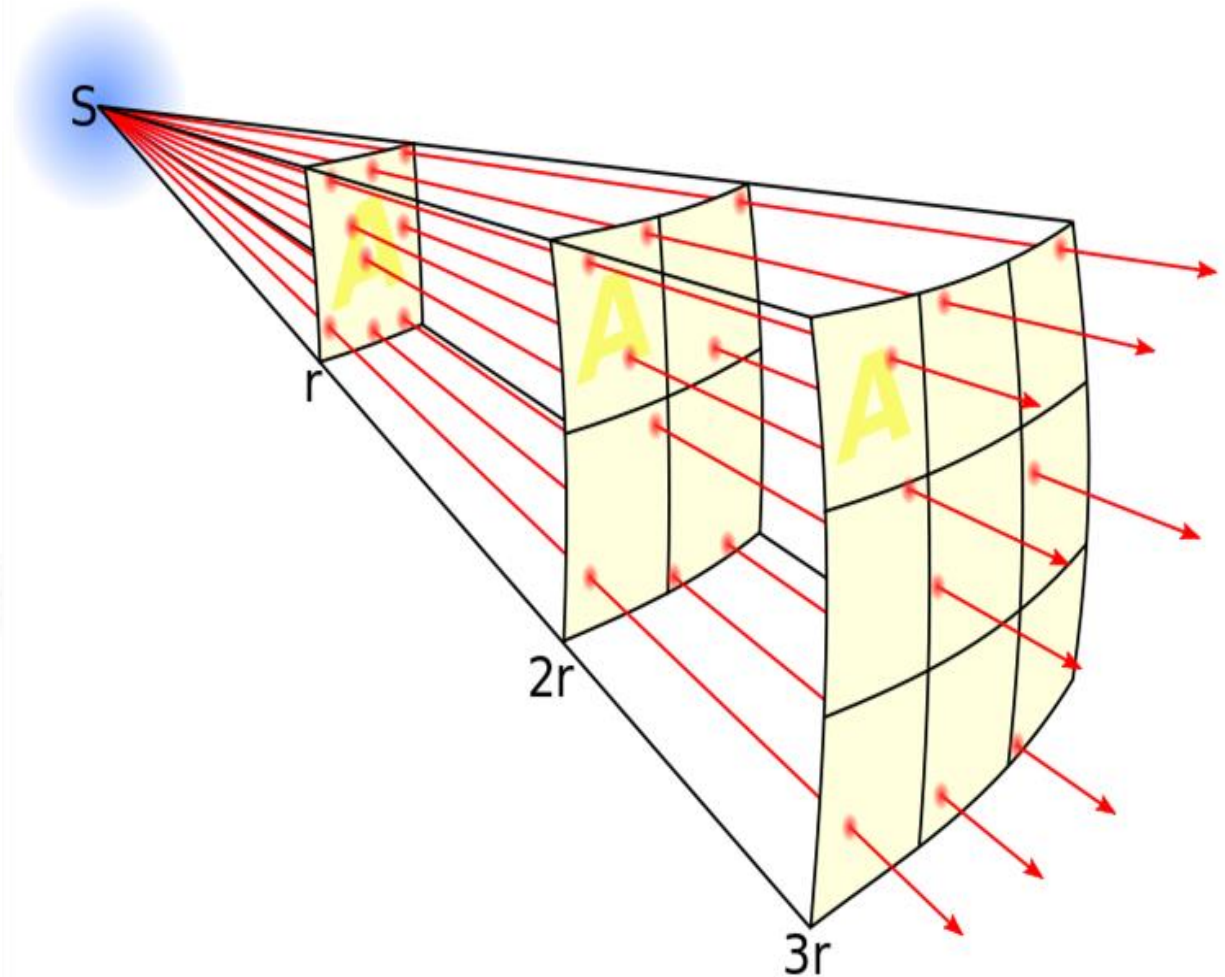


Exposure: add light

“Light intensity increase and decreases **rapidly** with changes of distance”

Light intensity is proportional to the square of its distance - the inverse square law.

But remember not to add too much...





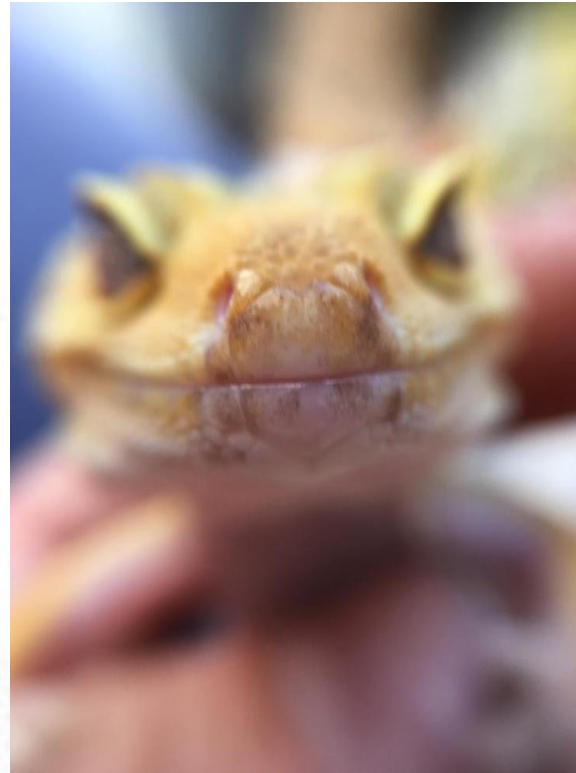
Depth of field

“Decreases as magnification increase”

“Increase by reducing aperture but you can't with camera phones”

Increase by reducing magnification

Matthew Dobson, iPhoneSE, x10 macro lens





Depth of field





Depth of field

Using “stacked images” e.g.:

- google photo animations
- Live view
- Video

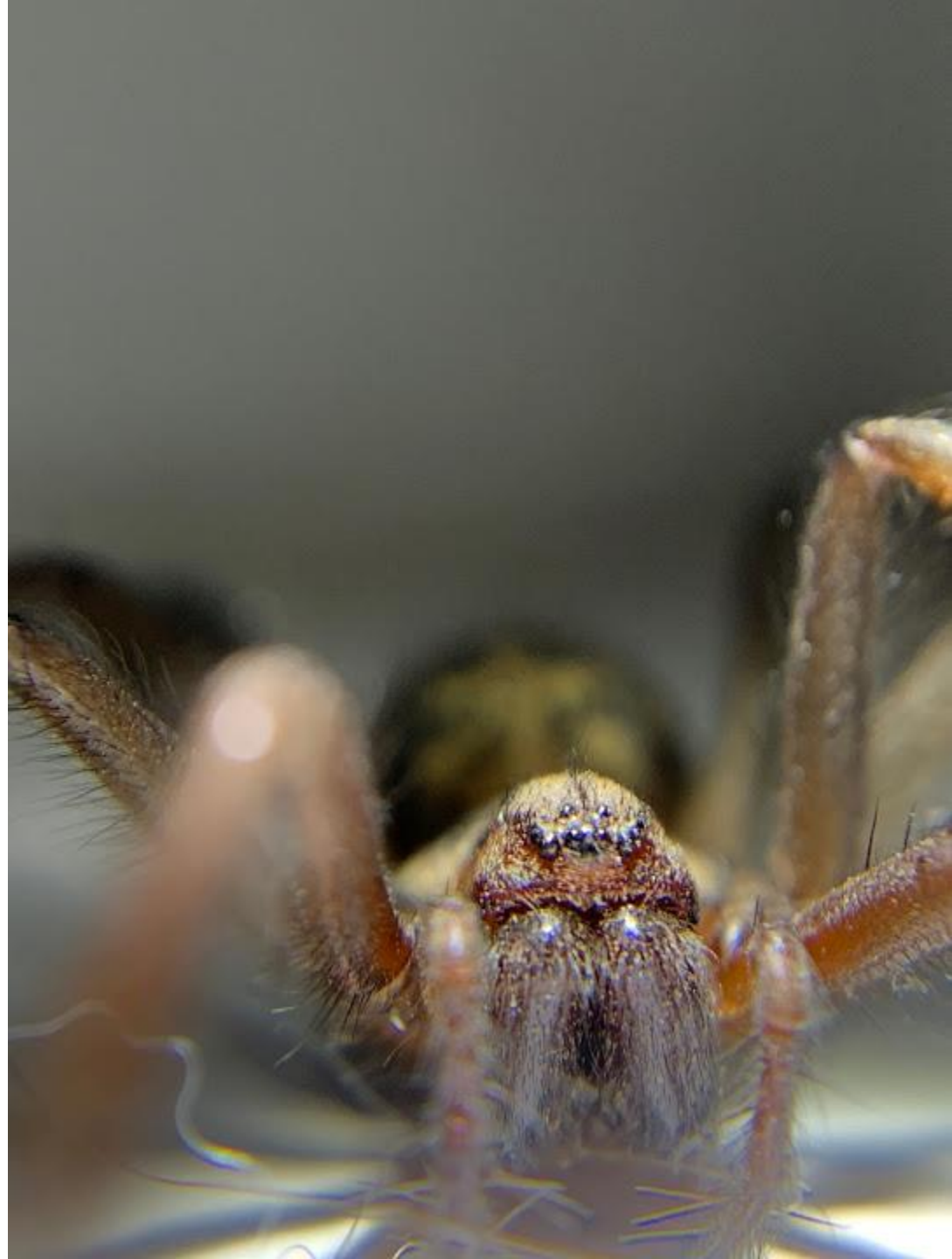
Learn to use your phone like your slit lamp – micromovements to focus



Depth of field

iPhoneXSMaX, 10x macro lens, telephoto lens, oblique lighting

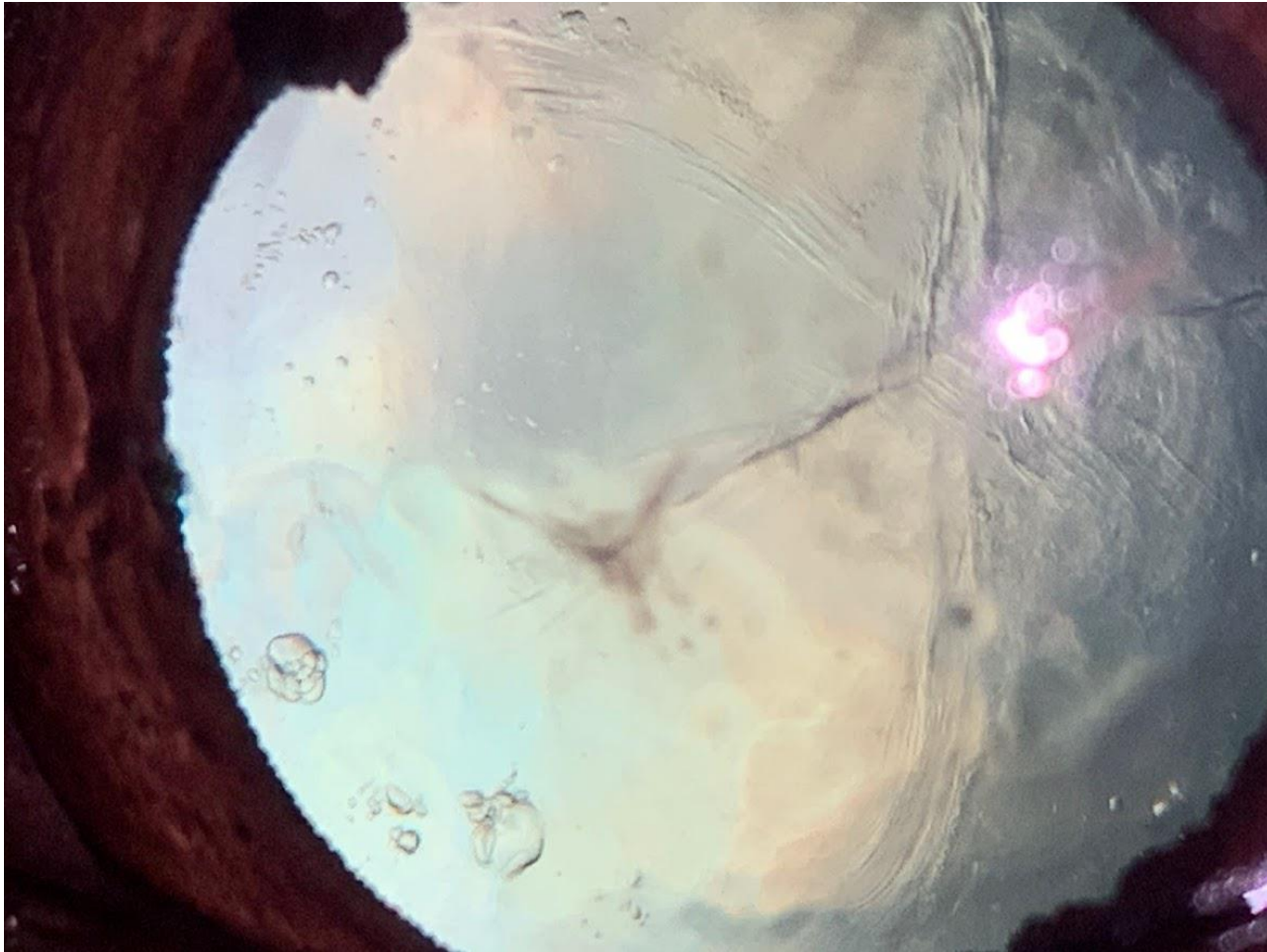
Giant House spider, Eratigena atrica



Why use your smartphone to image the eye?

*“how **does** it work as a digital ophthalmoscope”*

The magic of the fundic reflection



Light to lens distance

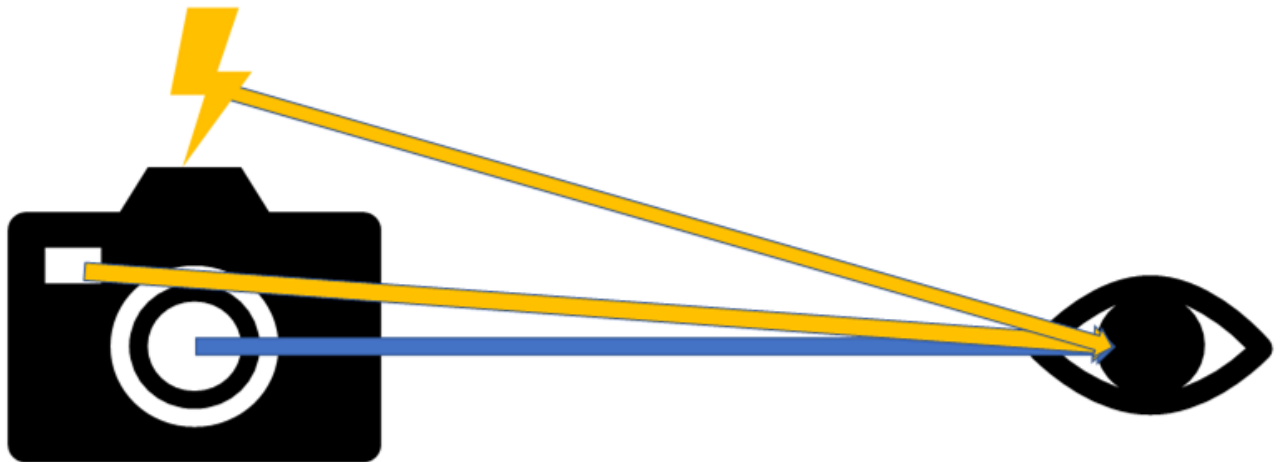
LLD is directly proportional to the angle between the incident light and the camera's optical axis.

Camera to patient distance is inversely proportional to this same angle.

Pupil diameter is directly proportional to the angle of incident light required to obtain a fundic reflection

“Getting the fundic reflection”

move away +/- or enlarge pupil +/- or reduce LLD



Light to lens distance

85mm



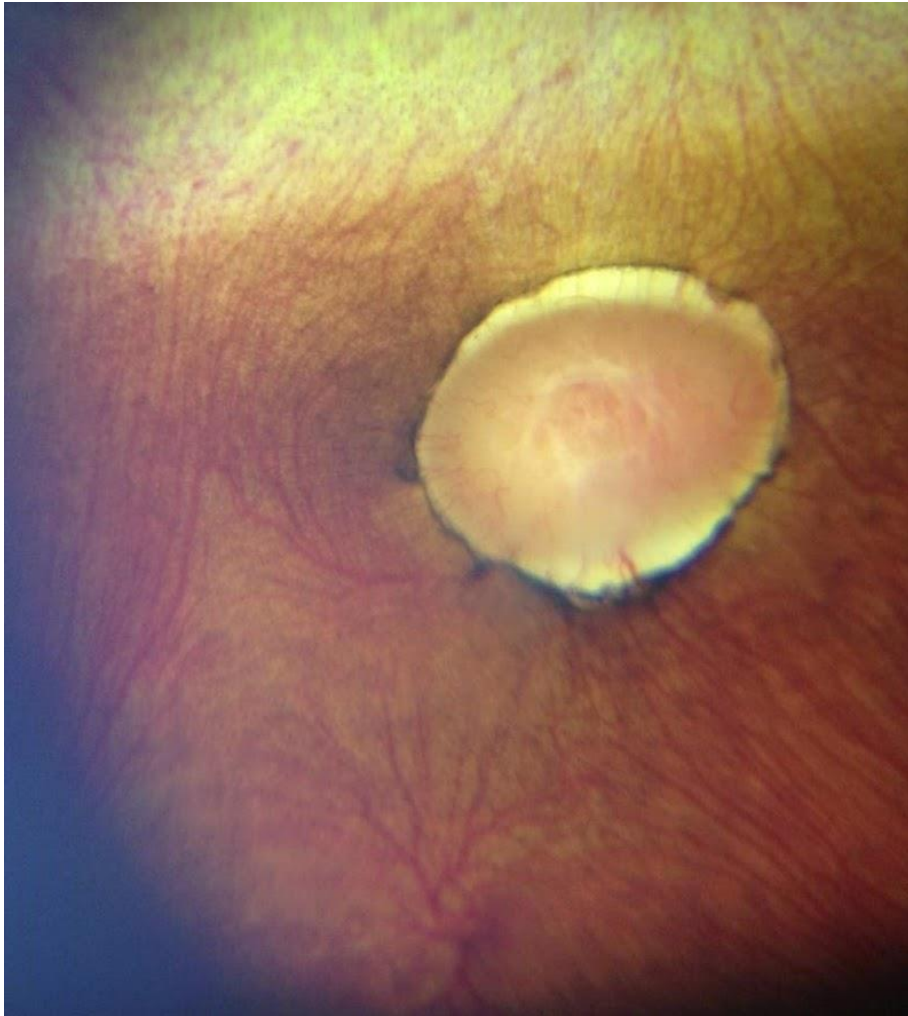
30mm



5.5mm



Your phone as a fundus camera



Direct fundoscopy - iPhone 6plus indirect fundoscopy



iPhone XS max & volk panretinal 2.2

What's the best phone for imaging the eye?

“The one in your pocket” - any phone can be used to obtain helpful clinical images with a little help however.....

iPhone X - best for fundus

iPhone 7Plus - best for macro photography

“But any phone with any camera can take amazing images with a little ingenuity, a light source and a macro lens”



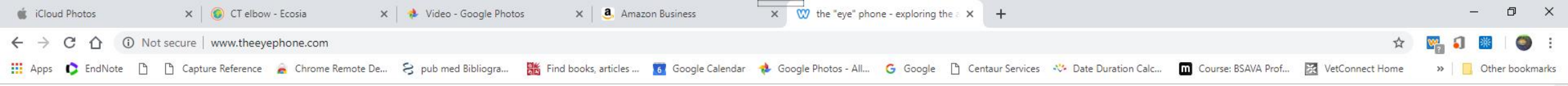
iPhone X



iphone 7plus

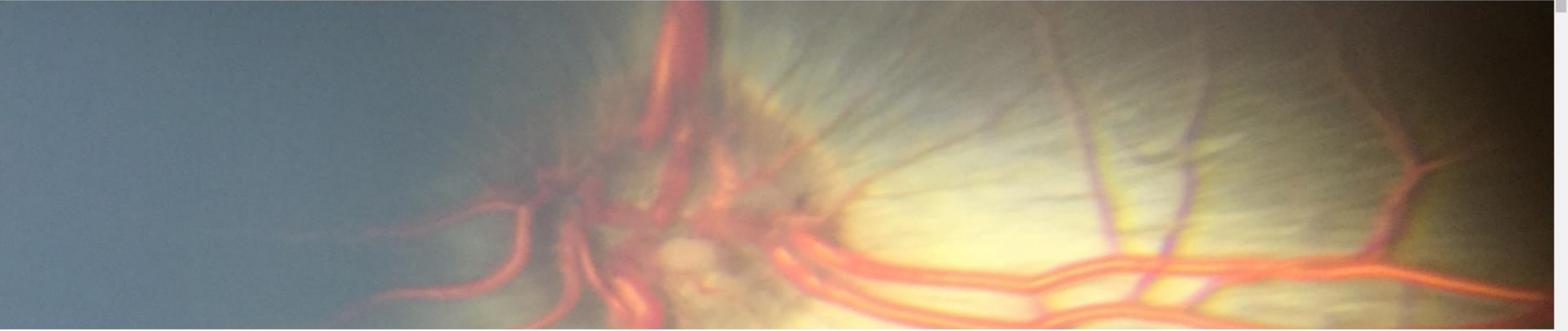


Using your smart phone to image the eye: *www.TheEyePhone.com*



THE "EYE" PHONE - EXPLORING THE ART OF PHONESCOPY

- HOME
- ABOUT
- CONTACT
- TRAINING EYES
- HOW TO IMAGE THE...
- WHICH CAMERA PHONE?
- WHAT APP?
- CLOUD STORAGE



The art of phoneoscopy - using the smart phone to image the eye.



Phoneography 101: basic skills

- Know your minimum focal distance :
- Know how to focus (manual vs autofocus)
- Know how to turn the light on whilst taking an image
- Learn how to use a macro lens

Phoneography 101: Tips

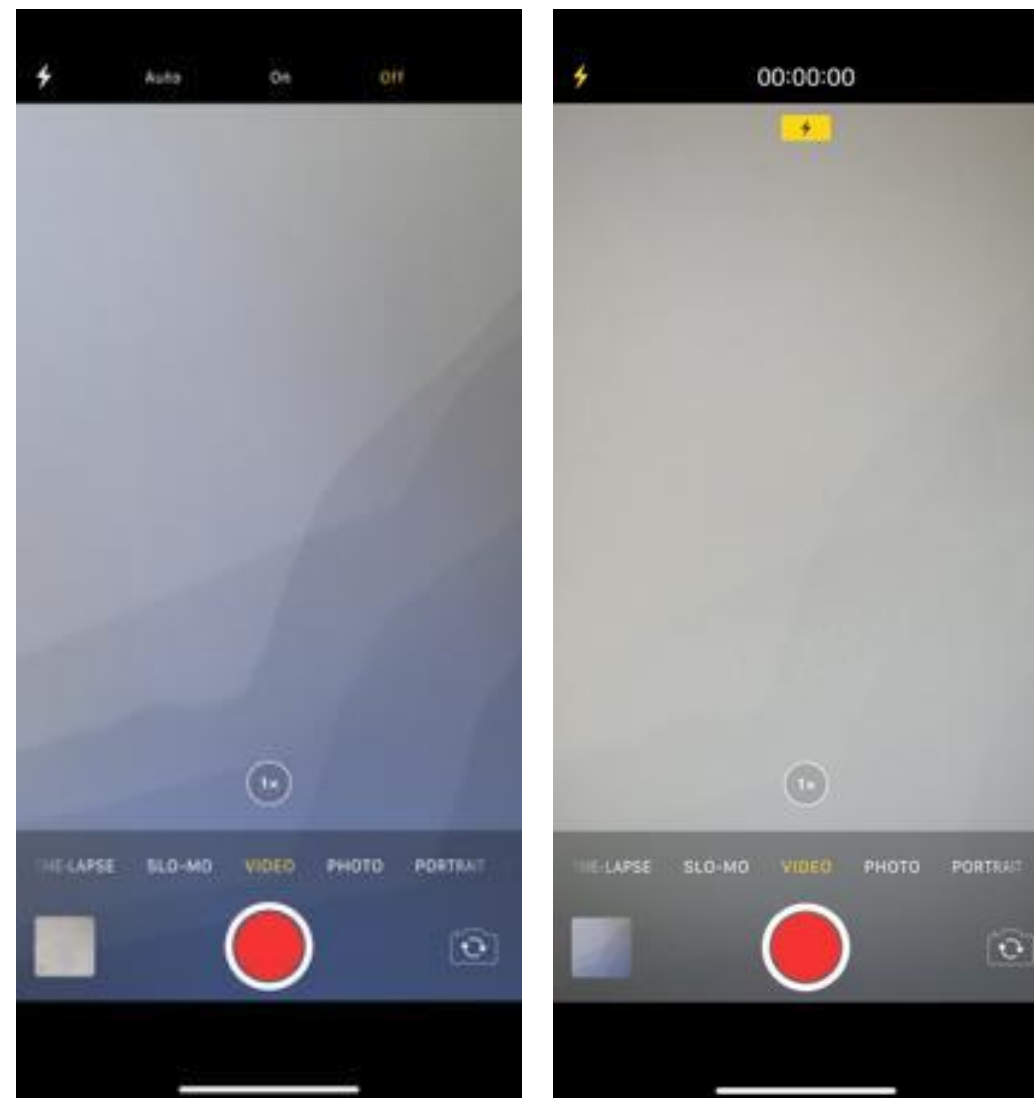
- 1) Check your app options (guides for common apps on TheEyePhone.com)
- 2) Remove your case. Getting close is the key – even the few mm of a case can limit your view.
- 3) Keep your phone warm (in your pocket) if using outside – if not the lens will steam up when you get close to the eye.
- 4) Use a cloud storage service and install the app on your phone, select auto-upload in the cloud app – this way you'll never lose that vital image even if you lose or break your phone.
- 5) For cats – hold the phone horizontally.
- 6) For Horses and rabbits hold the phone vertically.
- 7) Practice on anaesthetised patients, enucleated eyes and training models

Aim to take standard views for all patients

1. Photograph the name of the patient e.g. clinical record screen & whole patient.
2. Whole face – aim to get both tapetal reflections.
3. Lid anatomy :
 1. Eyes open
 2. Eyes closed – induced blink
 3. Lid margins everted
 4. Nictitating membrane prolapsed
4. Whole eye, straight on– aim to fill screen with eye using digital zoom, aim to get tapetal reflection – talk to patient just before take picture
5. Whole eye, lateral view – aim to skyline corneal curvature and anterior chamber.

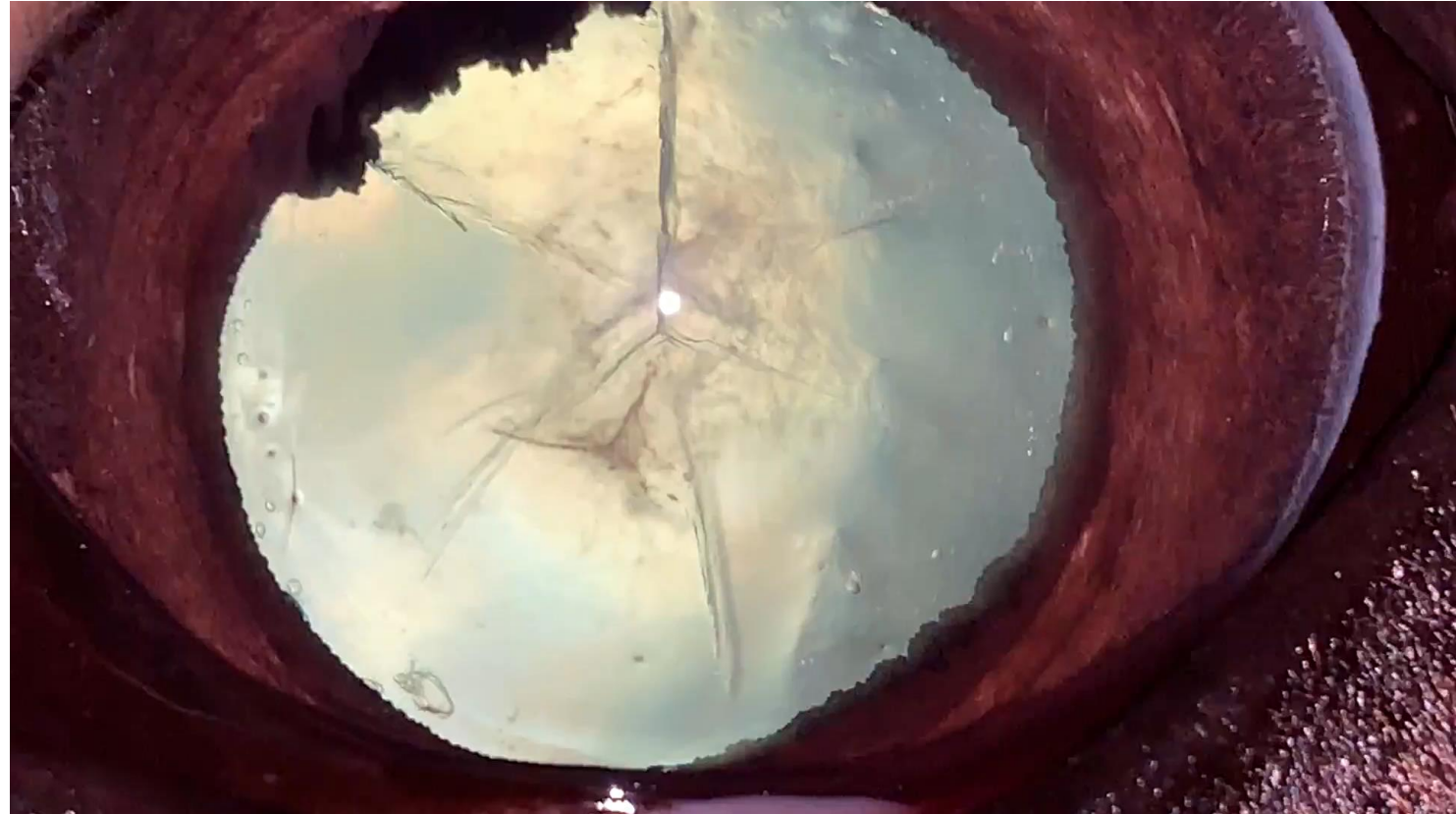
“Phoneoscopy for beginners: video mode”

- The problem:
 - Camera app won't let you have light on until you take picture
- The solution:
 - Use phone's native camera app
 - Select video mode
 - Select flash on
 - Start videoing
 - Remember not to get too close
 - Zoom in to get whole eye
 - Use lots of angles

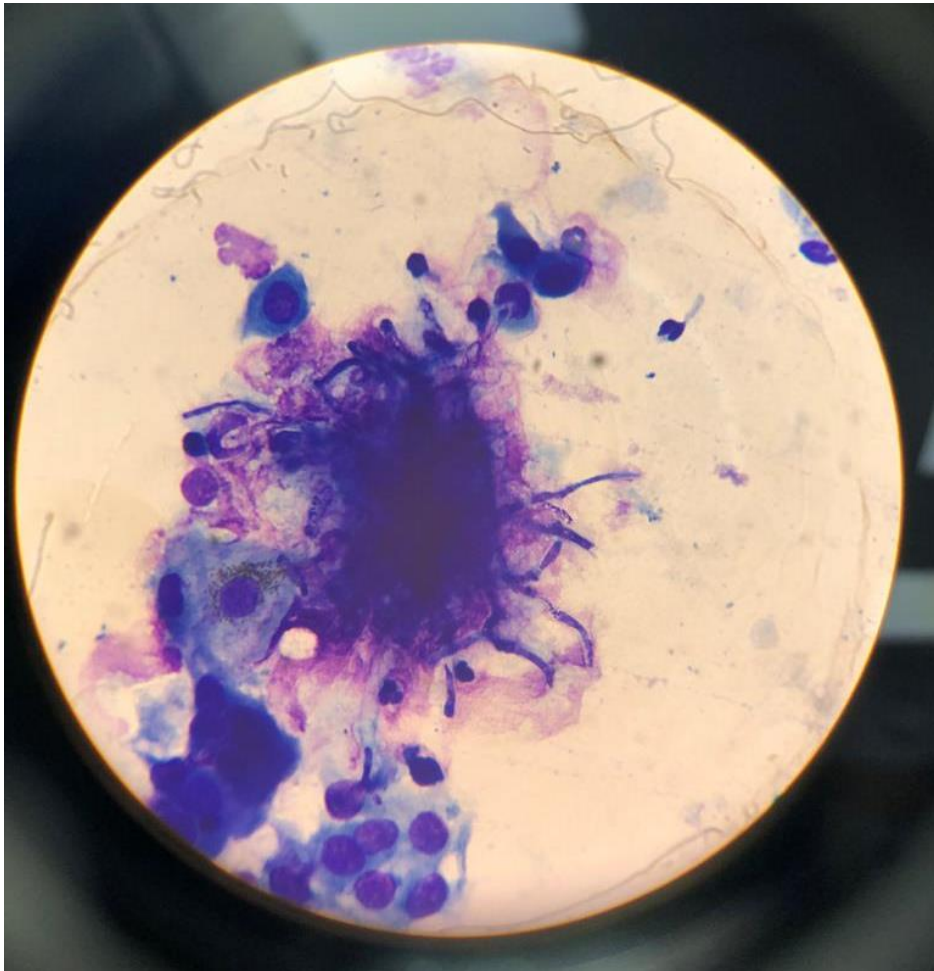


“Phoneoscopy for beginners: video mode”

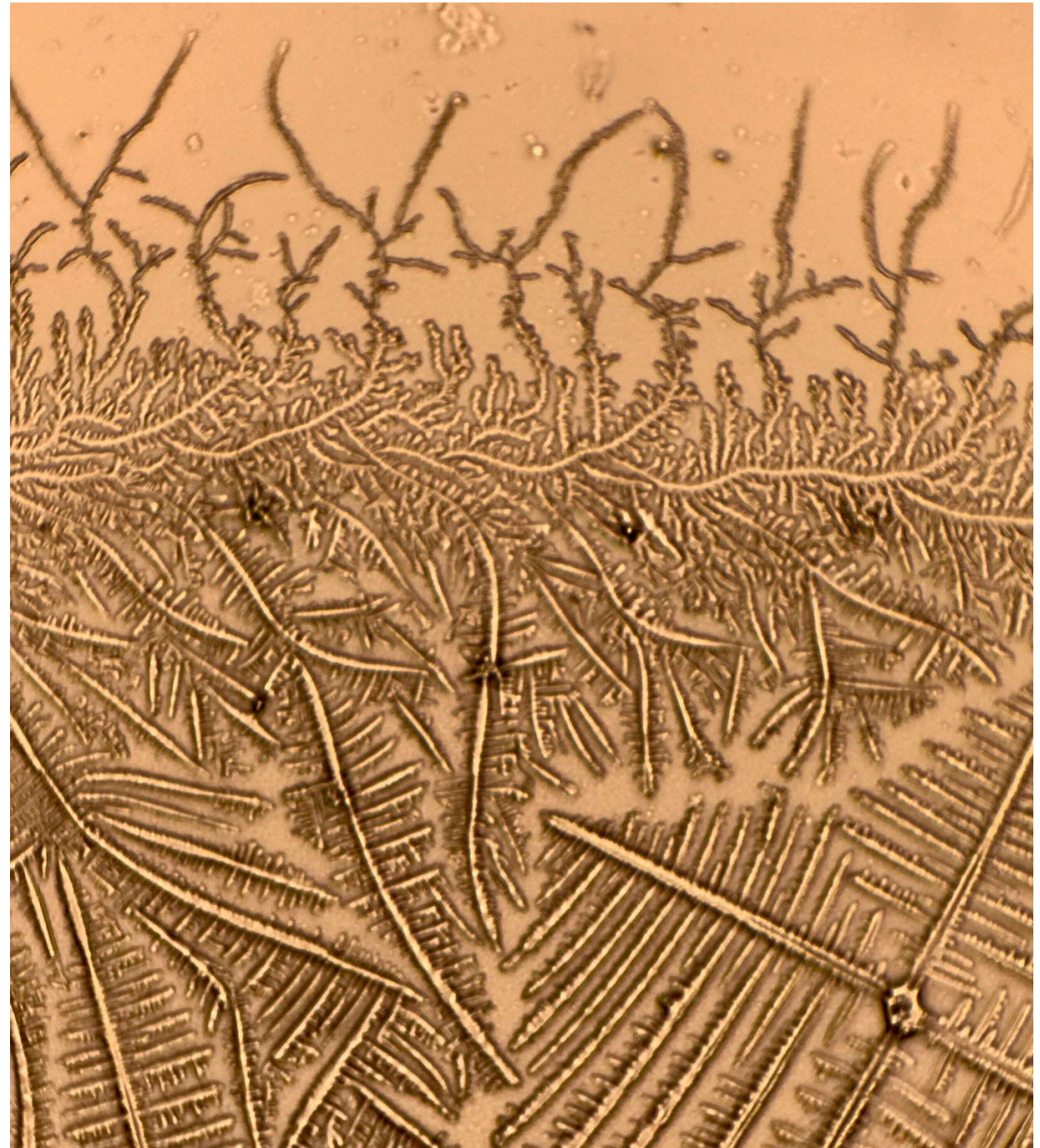
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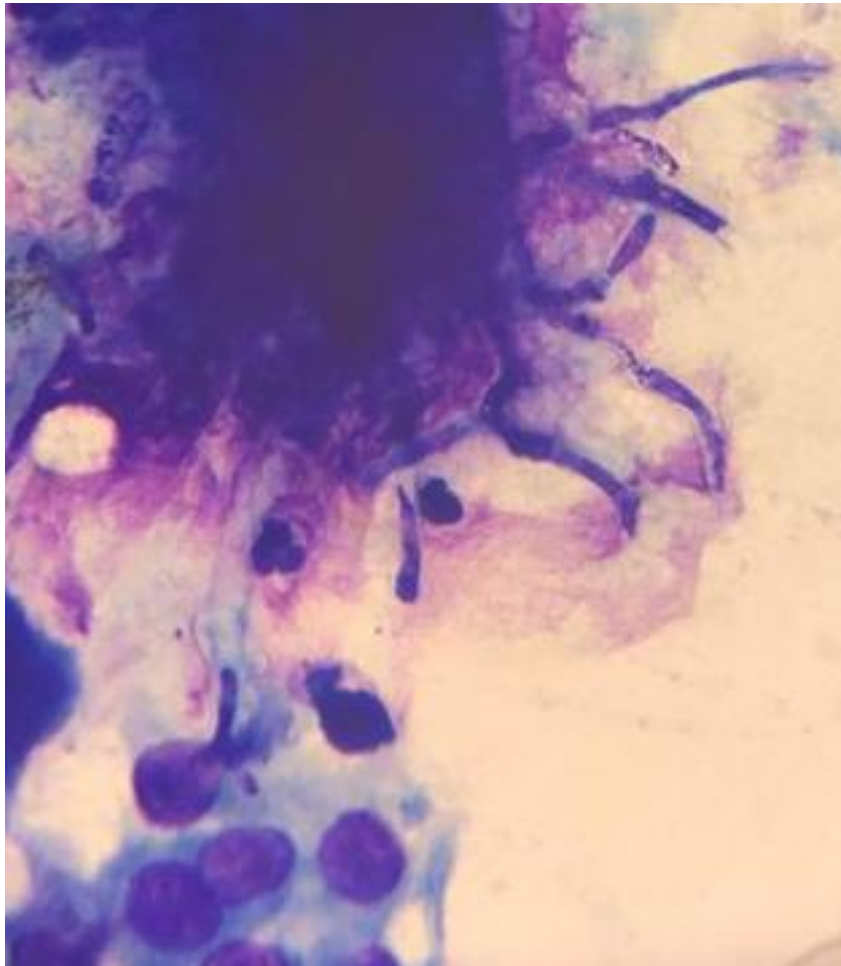
Don't forget your
microscope



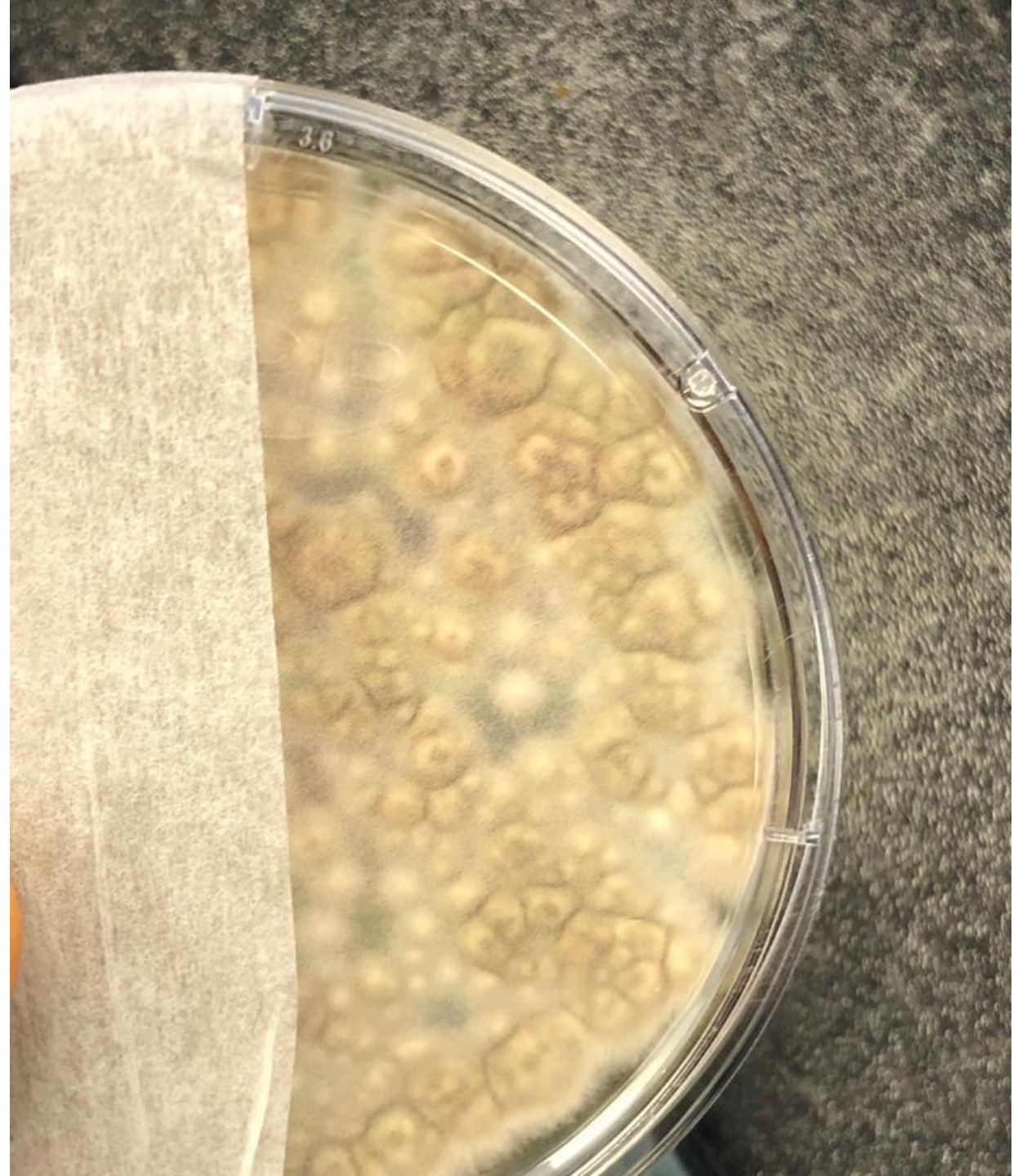
David Nutbrown-Hughes



Don't forget your microscope



David Nutbrown-Hughes

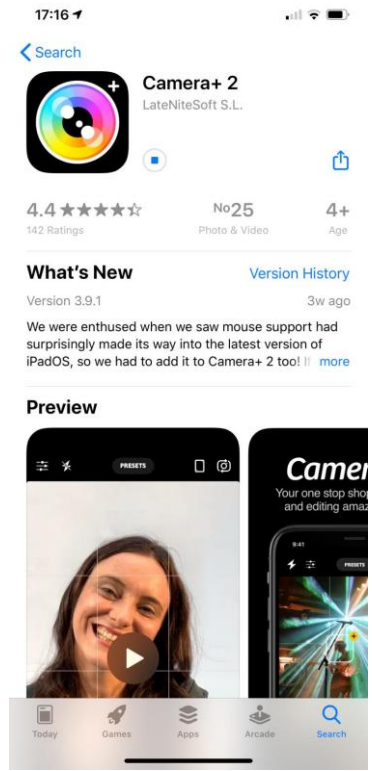
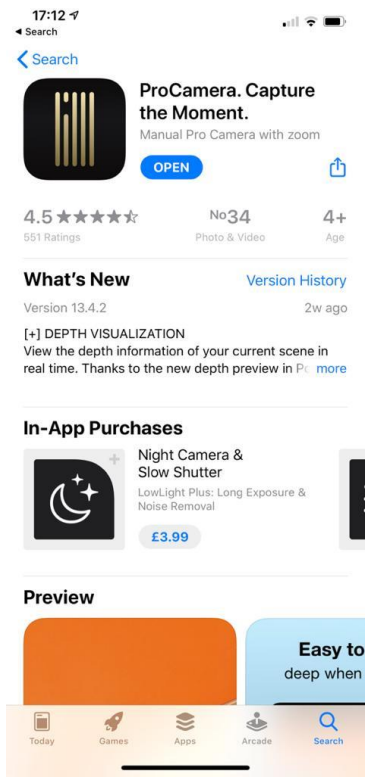




Using your smart phone to image the eye: *www.TheEyePhone.com*

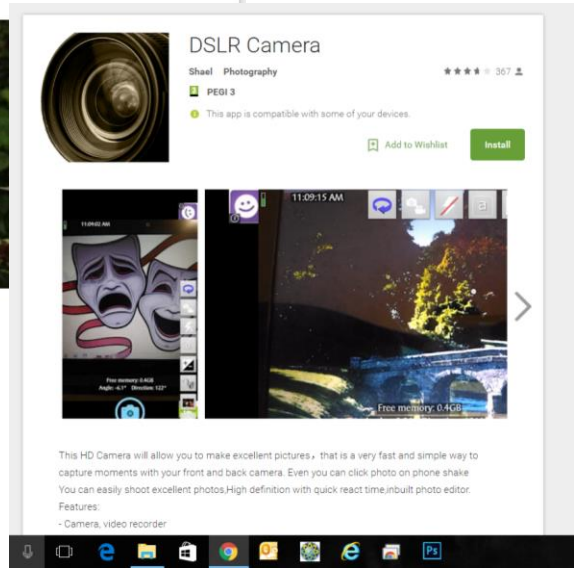
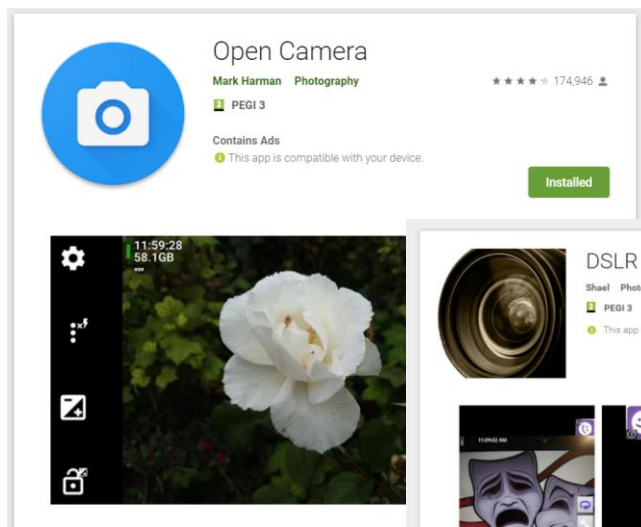
iPhone users:

Camera + 2 (LateniteSoft) (£2.99) or Procamera (£5.99)



Android users:

Open Camera (Mark Harman) & DSLR Camera (Shael) free

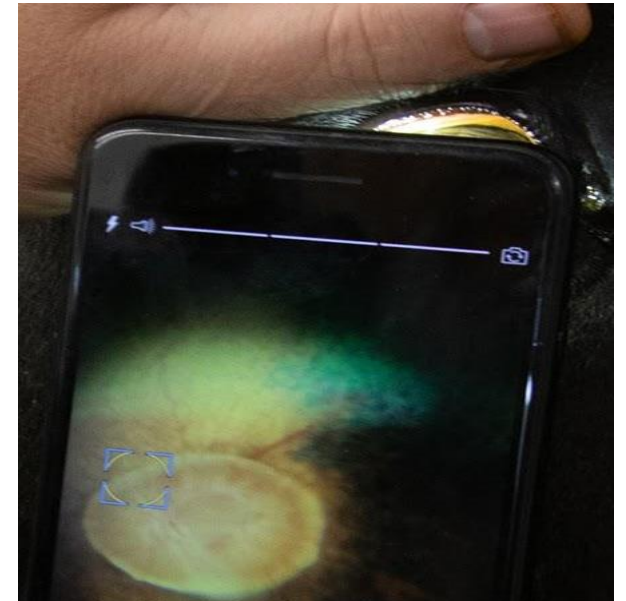
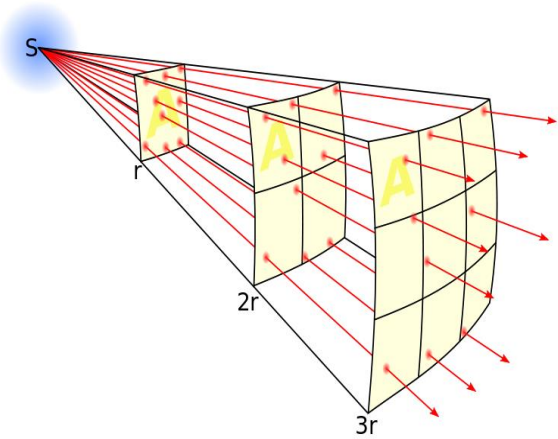


Setting up your camera app for phoneography

1. Save images to the camera roll and not just in the app.
2. Use maximum image capture resolution (RAW if possible).
3. Use “touch to focus” and “touch to set exposure”
4. Turn on “Volume snap” – this allows you to press the volume buttons to take images.
5. Turn on geotagging – always remember where you were when you took the image.
6. Turn on “live exposure” – display ISO and shutter speed and help you decide if your illumination needs to be altered
7. Select full manual if available – this will allow you to set your focus at infinity which will stop the camera “hunting” for the right focal point.

NB guides for common aps on TheEyePhone.com

Diffuser, app &/or physics to dim the light



Practical session 1

Smart phone photography basics

Task 1: Learn how to focus

Focus on table , focus on furthest point in room.

Tips:

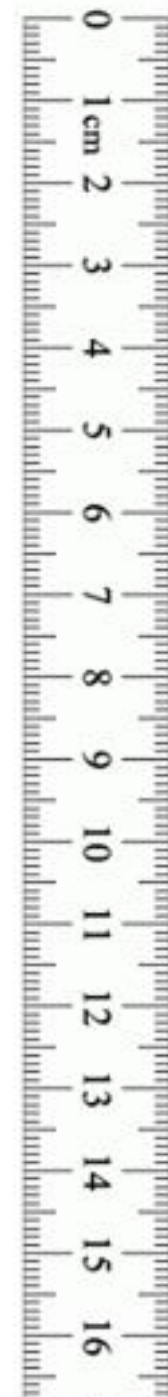
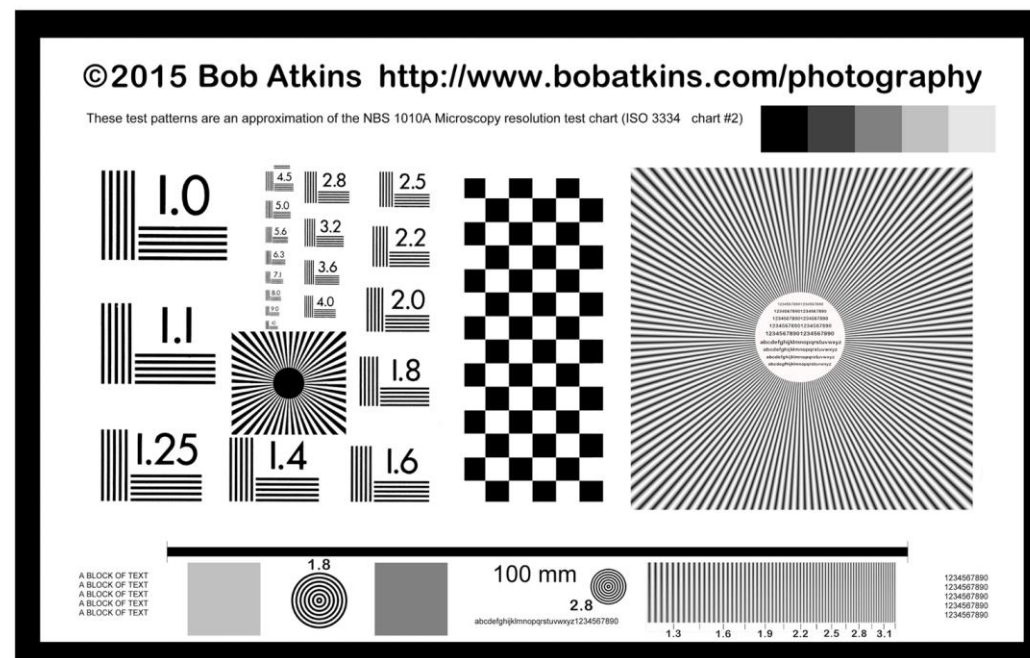
Autofocus by tapping on the screen

Manual focus (where available) - select macro for closest focus point and infinity (mountains) for furthest focal point.



Task 2: Identify your smart phones minimum focal distance (MFD)

Using the focus chart below to work out the closest distance you can clearly focus and using your hand as a measure record it on the ruler. Remember your MFD it's the key to successful images.



Task 3: Task Whole head photography

With a partner take 2 images of their face from the front:

- one with no flash
- one with the phone in “torch mode” (the LED turned on continuously).

Tips:

- focus on eyes
- “patient” looking towards you

Look for:

- Asymmetry
- Corneal reflection (on the unlit image)
- Red reflex (anisocoria, opacities in visual axis on the illuminated image)

“Distant direct phoneoscopy (DDP)”

Step 1: Camera light on

Step 2: Phone at arms length (30cm+) from eye to obtain fundic reflection – use digital zoom so both pupils easily visible

Step 3: Assess (and record) PLR by moving light away from pupil

Step 4: Move camera closer to eye maintaining the fundic reflex & using digital zoom to get pupil to fill your screen.

Step 5: Change angle of view to assess peripheral fundic reflection



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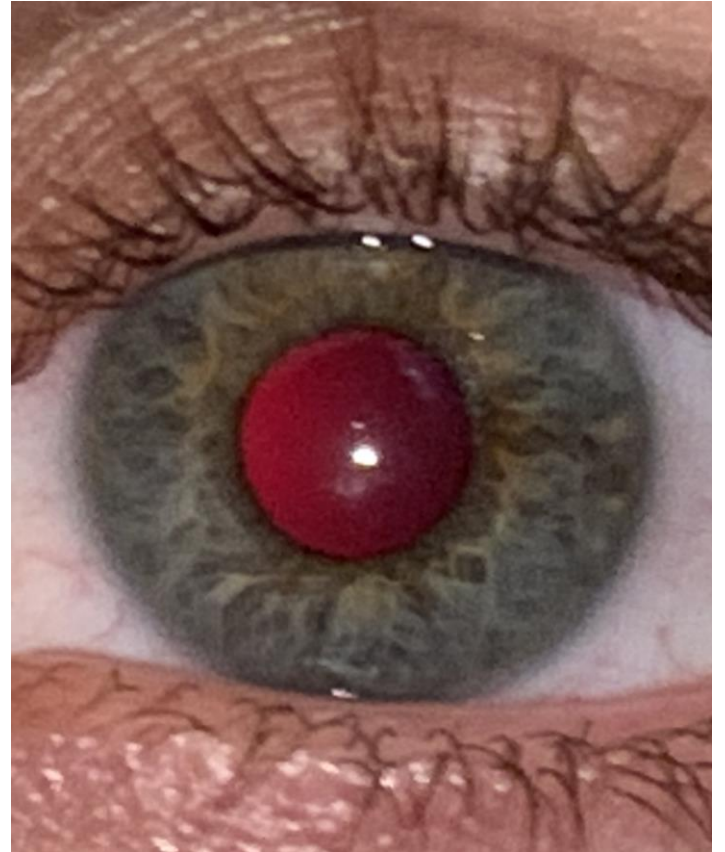
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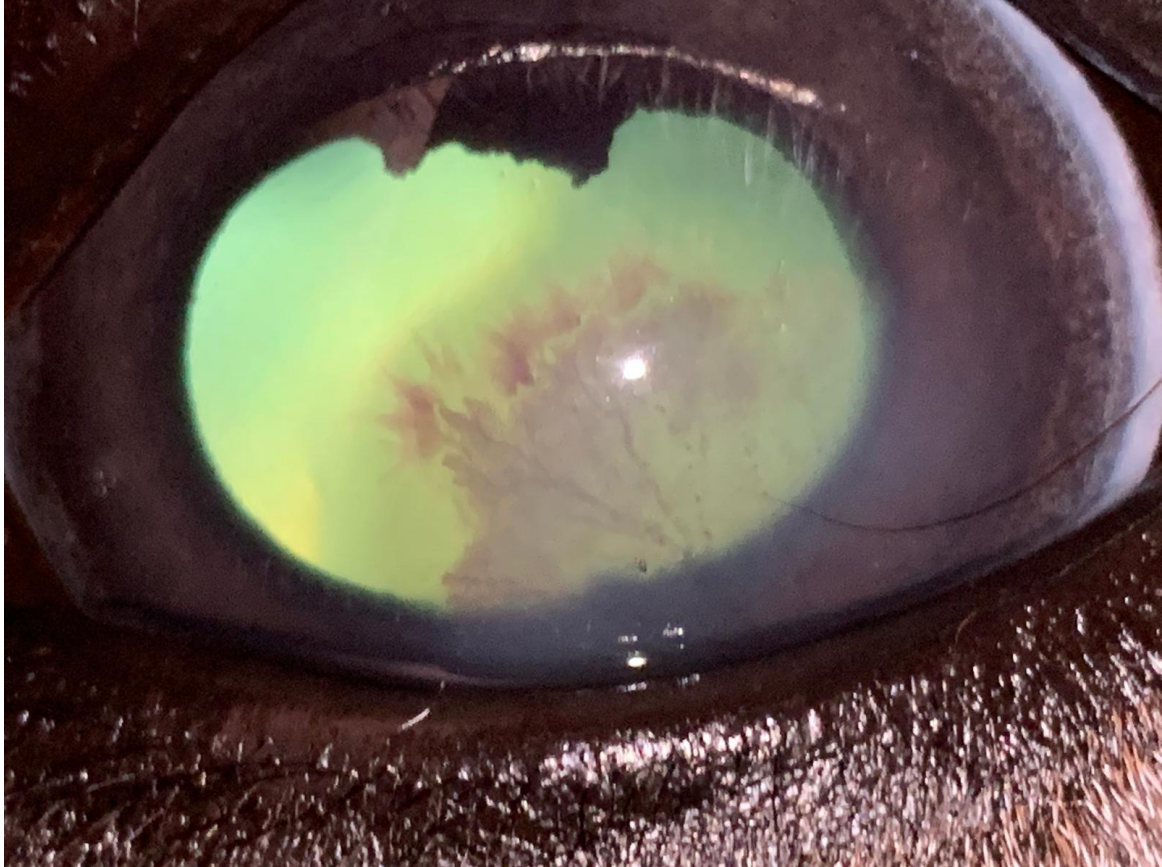
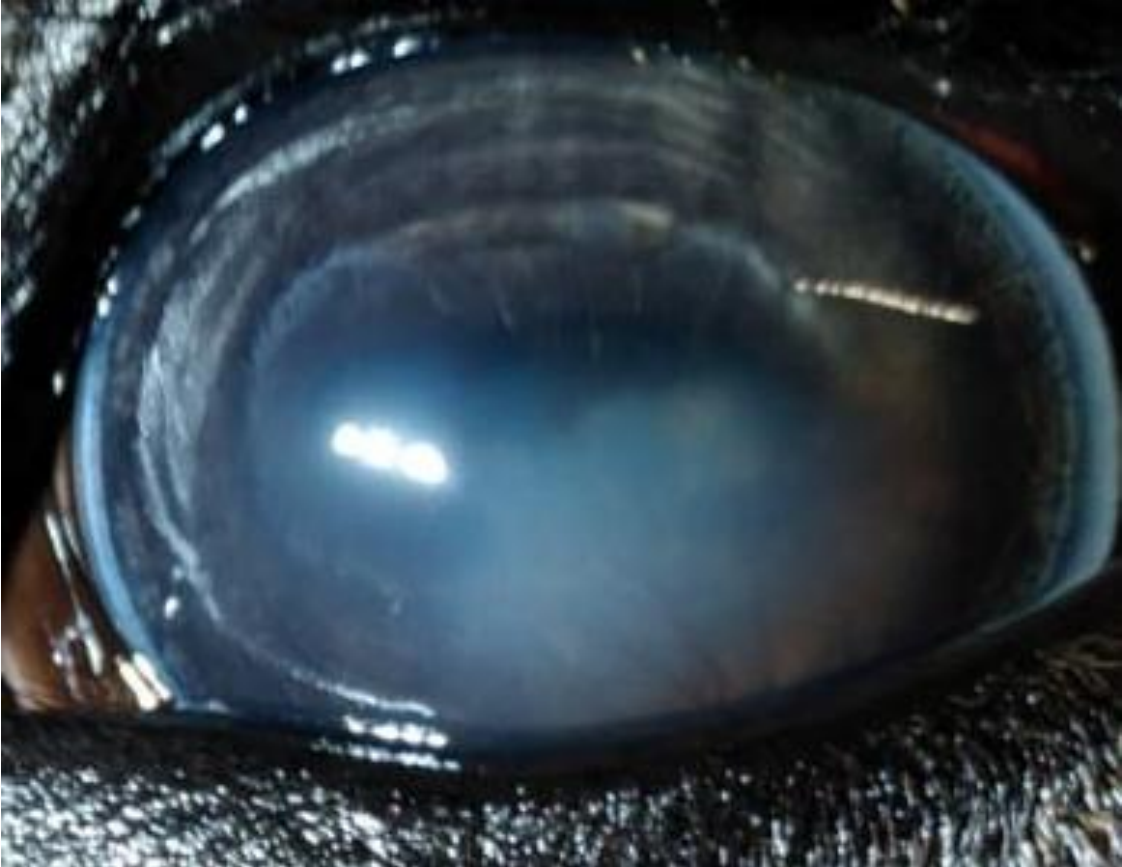
Step 5: Change angle of view to assess peripheral fundic reflection





The smart phone for: “*distant direct*”

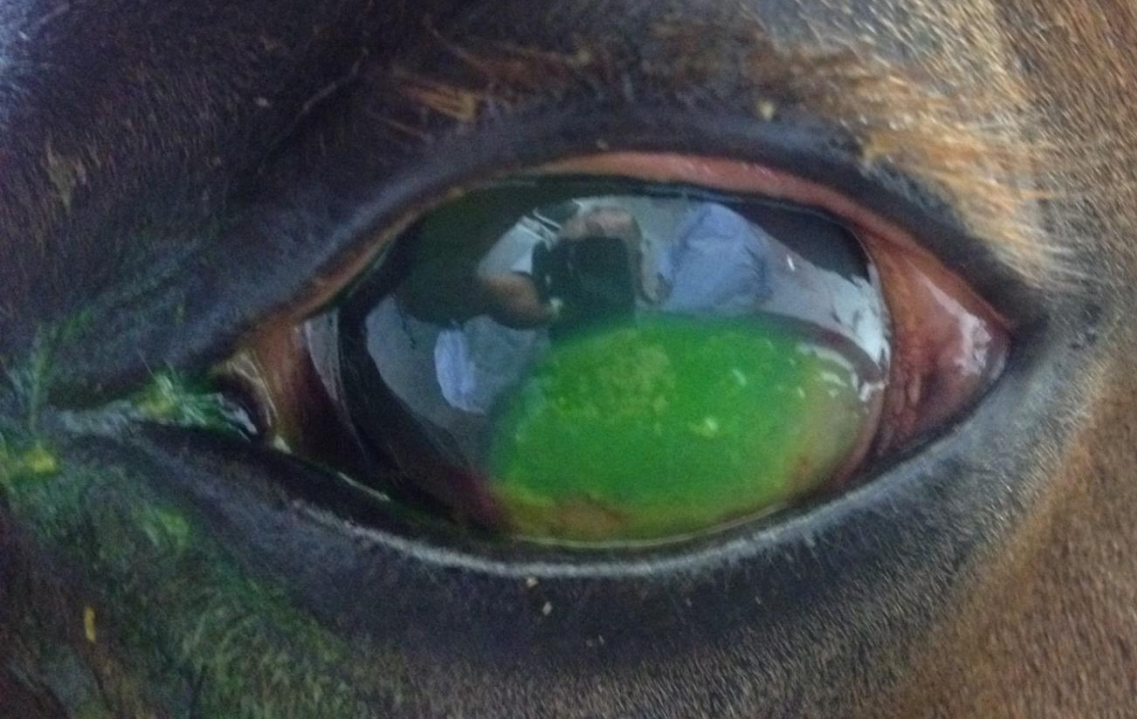
www.TheEyePhone.com





The smart phone for: “*distant direct*”

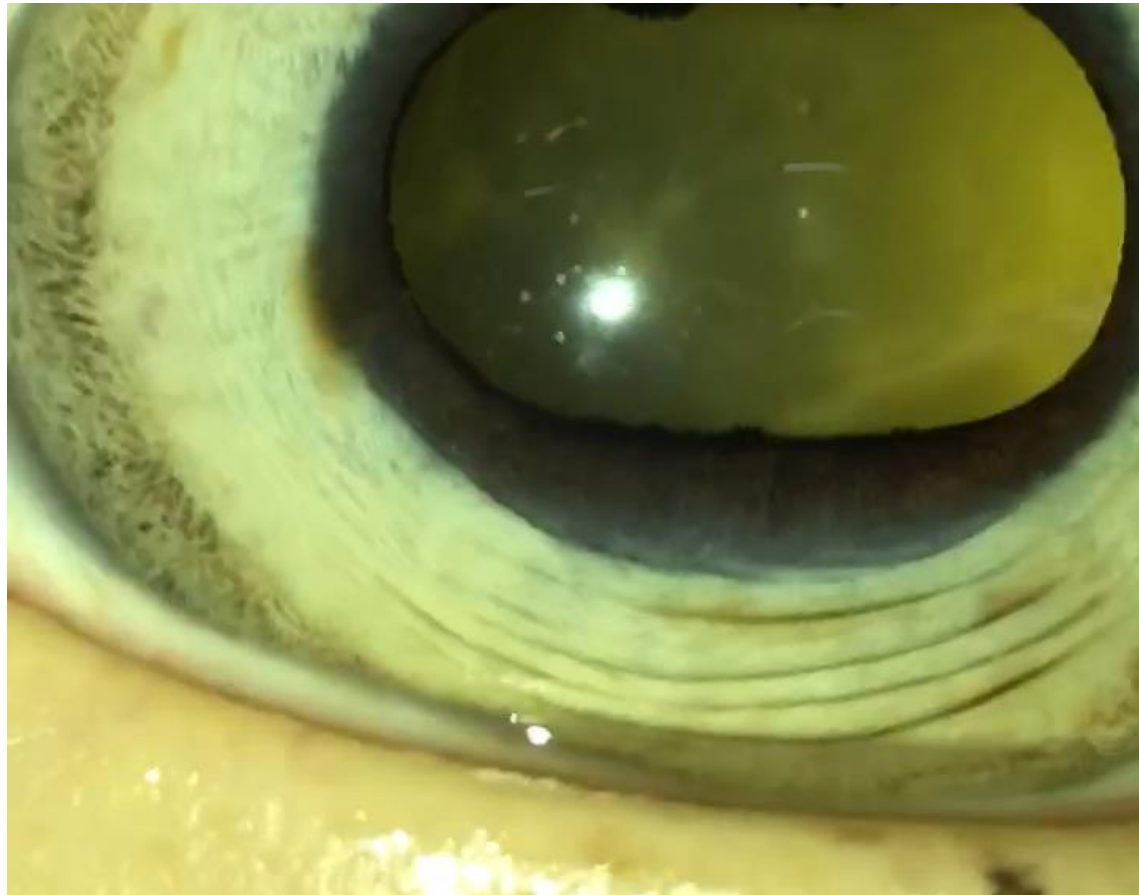
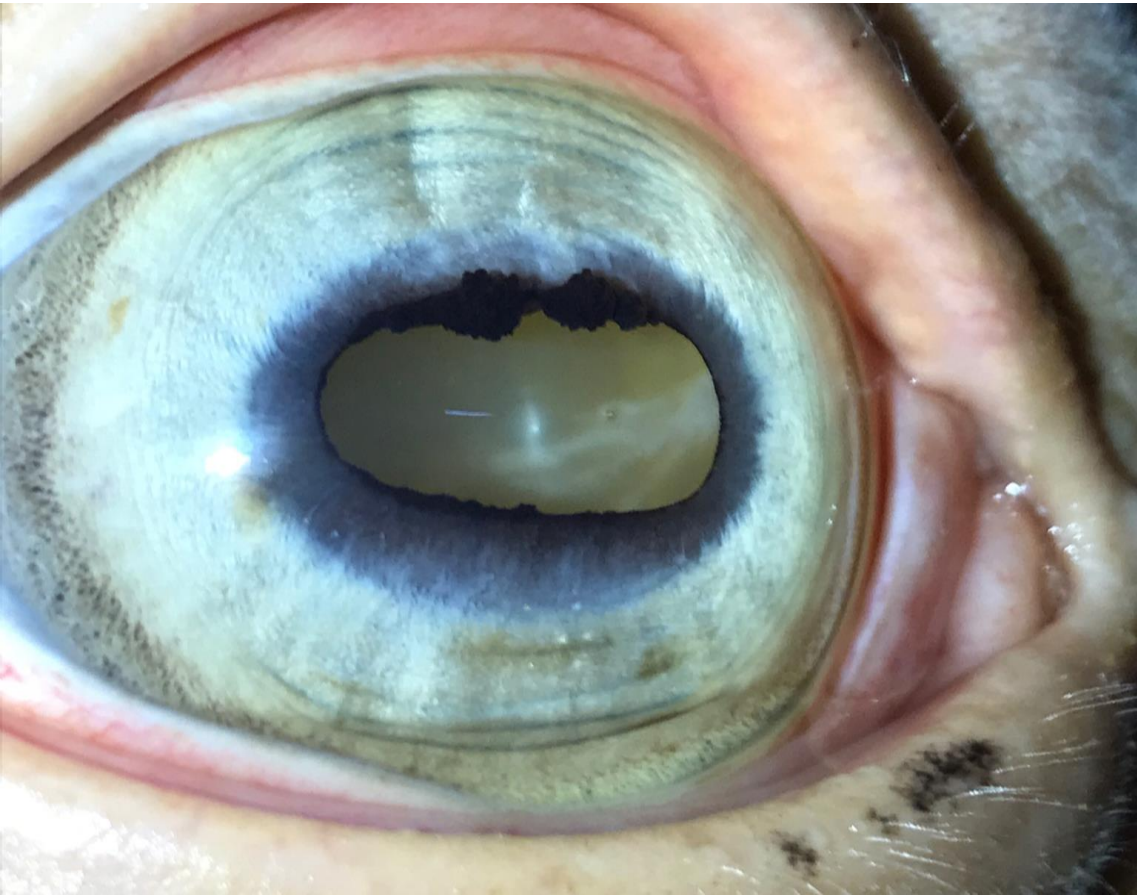
www.TheEyePhone.com





The smart phone for: “*distant direct*”

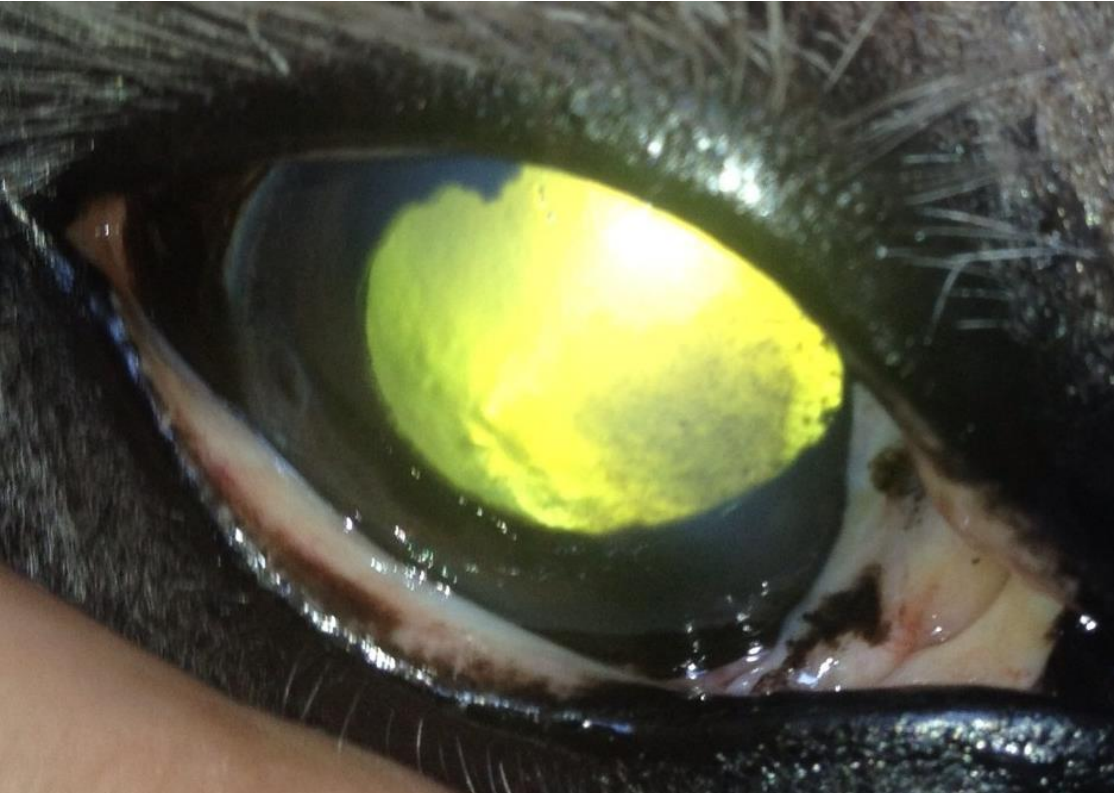
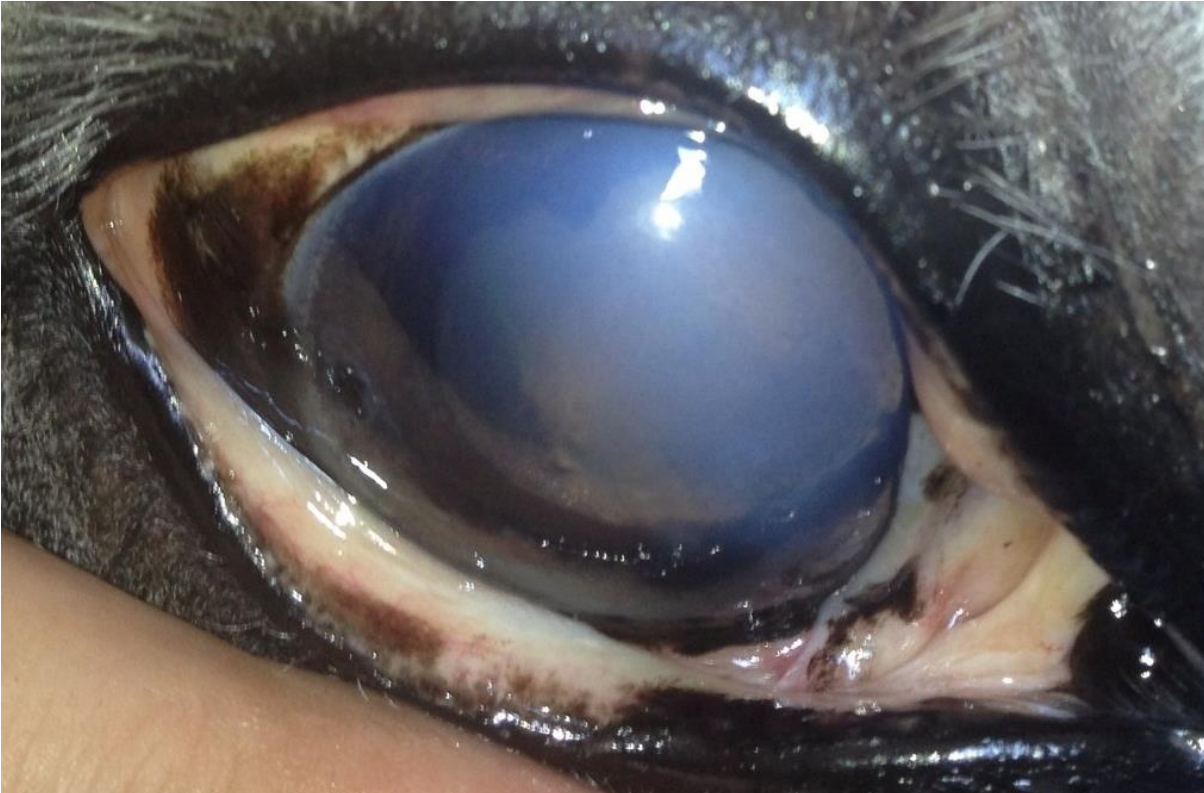
www.TheEyePhone.com





The smart phone for: “*distant direct*”

www.TheEyePhone.com





Smartphone Macro photography

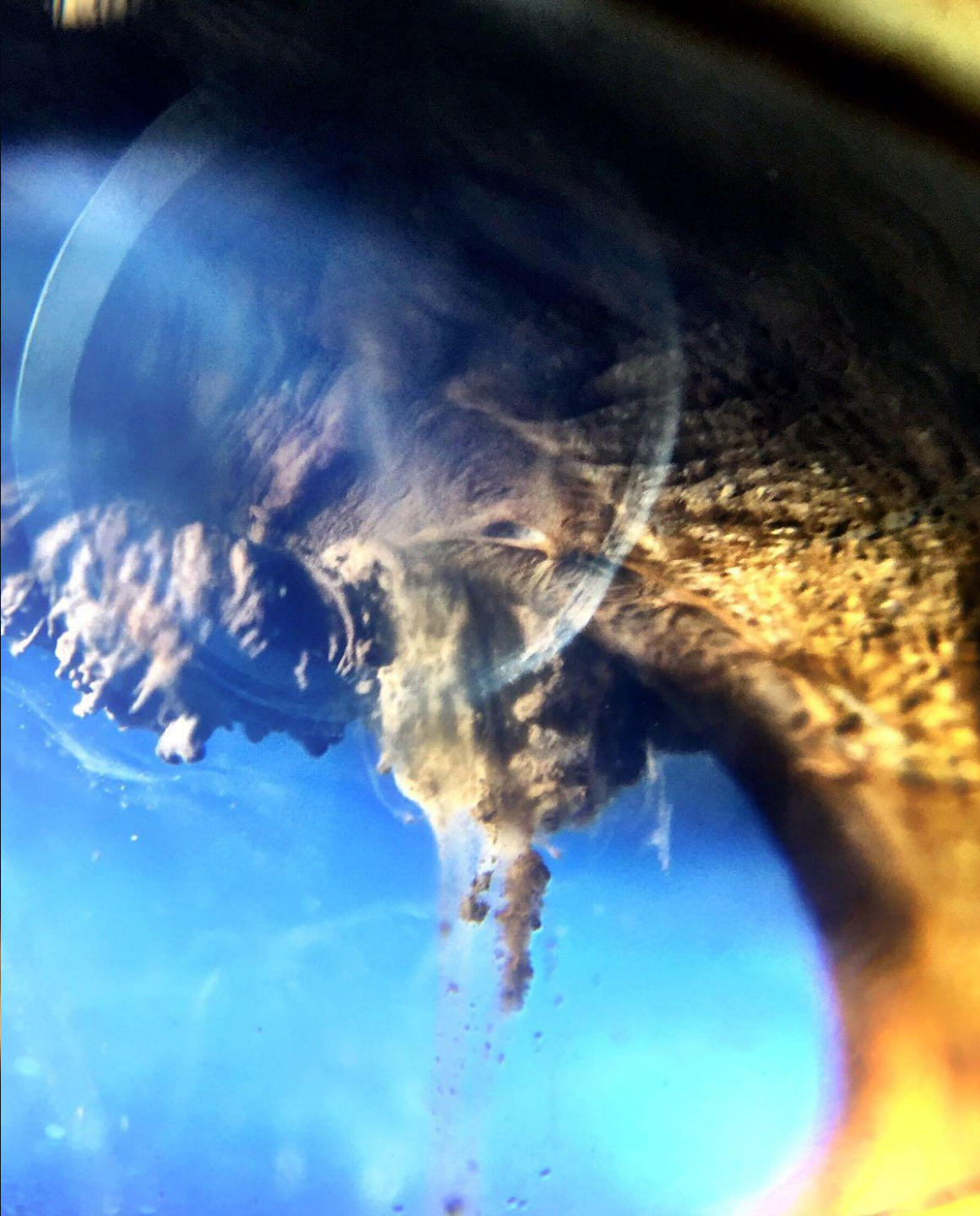
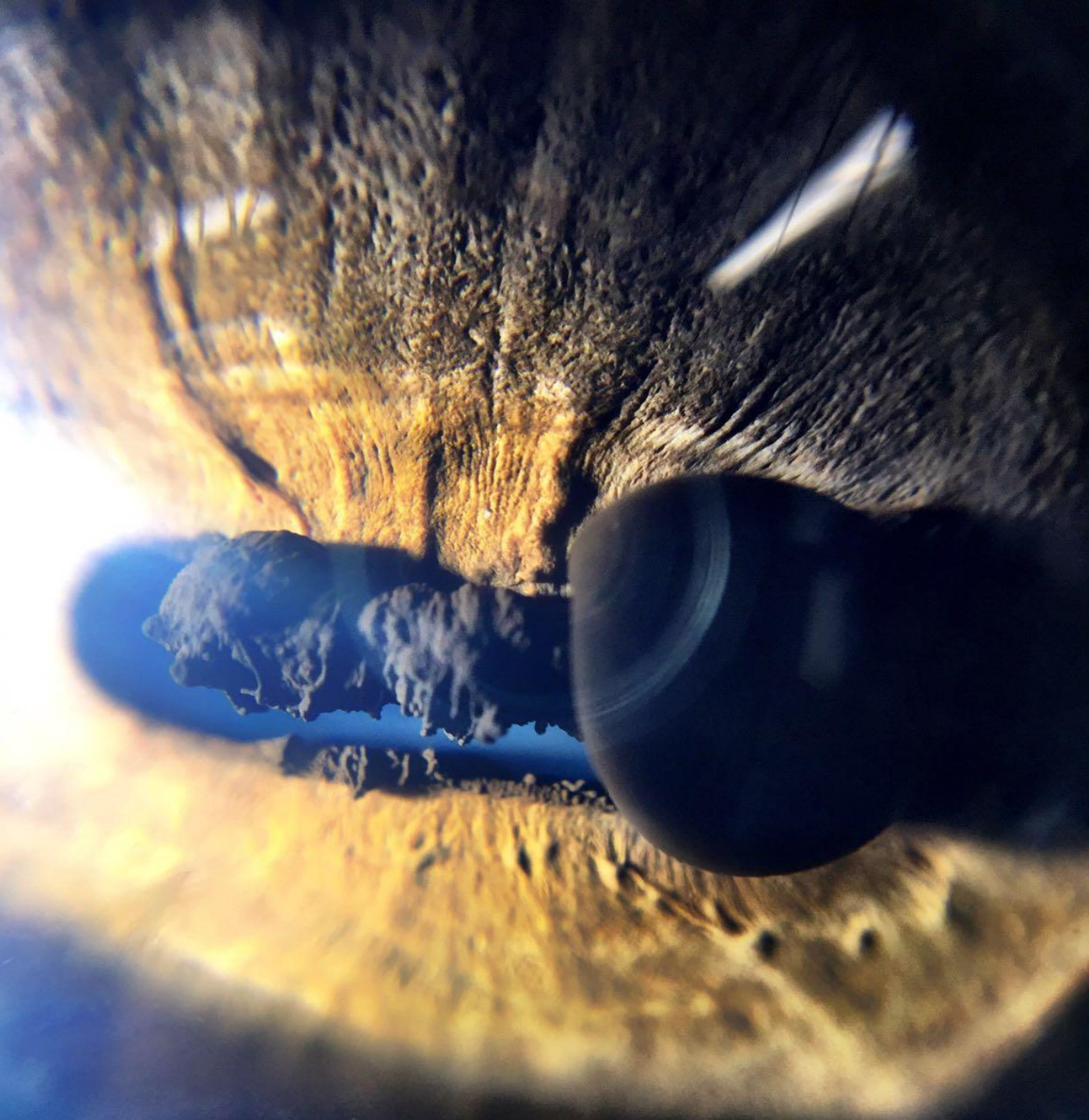


Macro lens

Look for:

- Black
- Case fitted lens?
- Magnification x10 fine
- x20 can be helpful
- Coated glass lenses ideal
- Small (light to lens distance?)





Macro lens

Look for:

- Black
- Case fitted lens?
- Magnification x10 fine
- x20 can be helpful
- Coated glass lenses ideal
- Small (light to lens distance?)



Macro lens

Look for:

- Black
- Case fitted lens?
- Magnification x10 fine
- x20 can be helpful
- Coated glass lenses ideal
- Small (light to lens distance?)
- iPod touch vs iPhone 7+







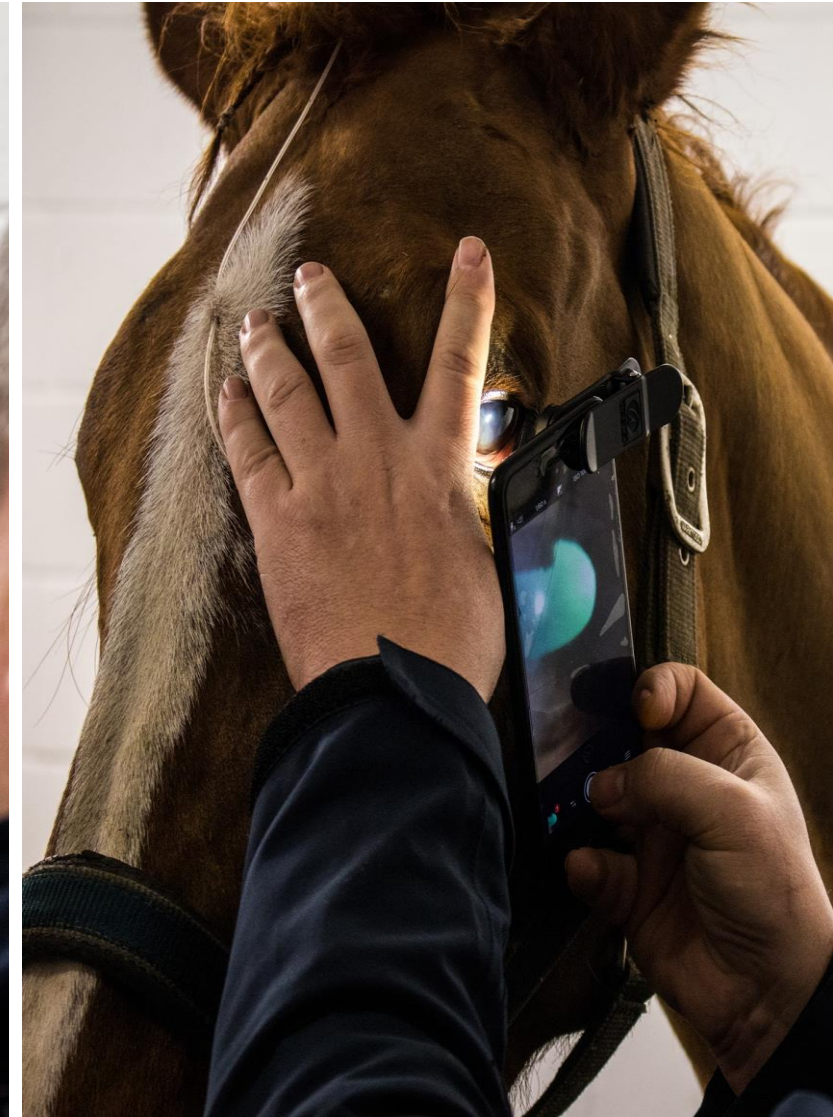
modelling lights vs on-phone light



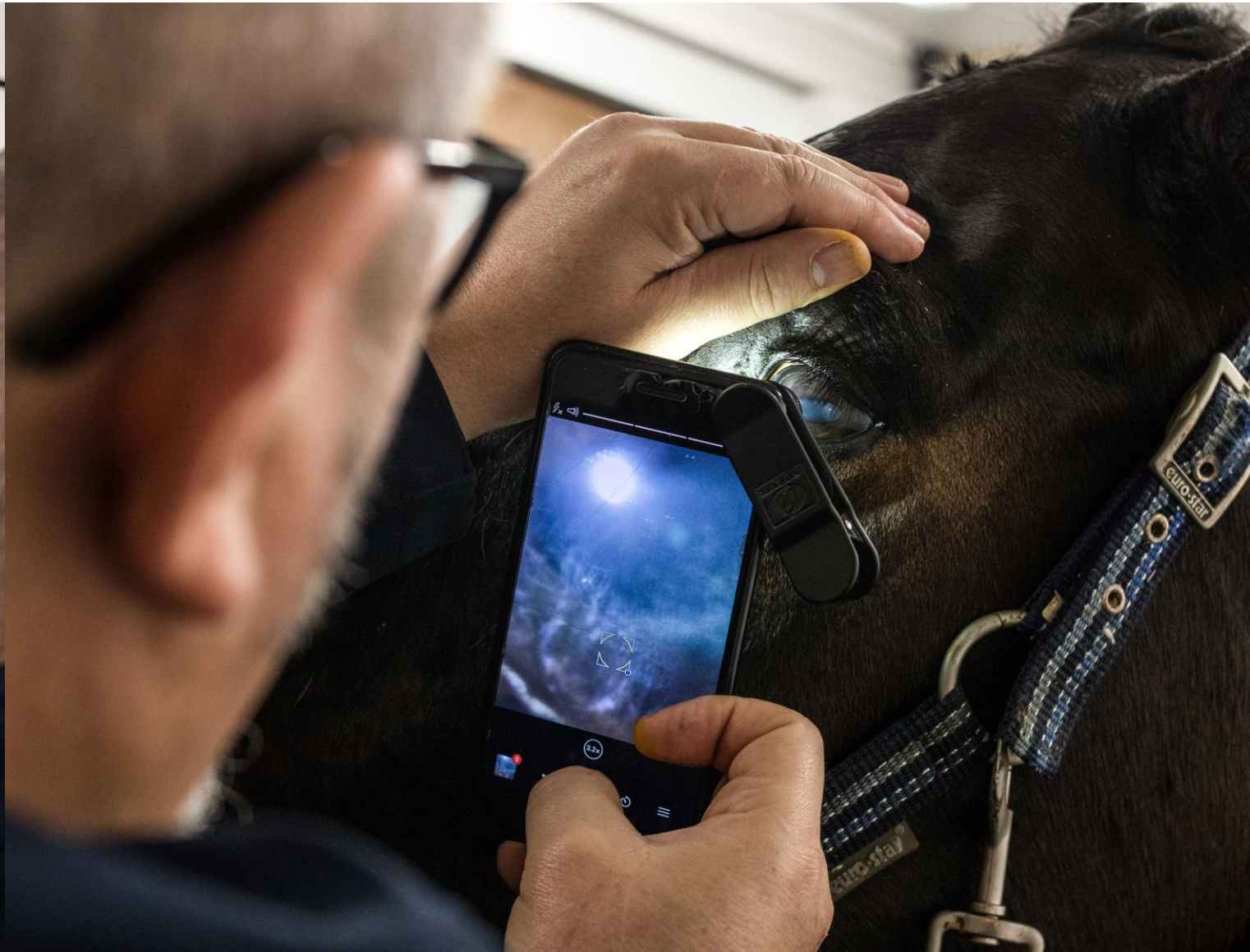
focus with micromovements



Creative holding techniques

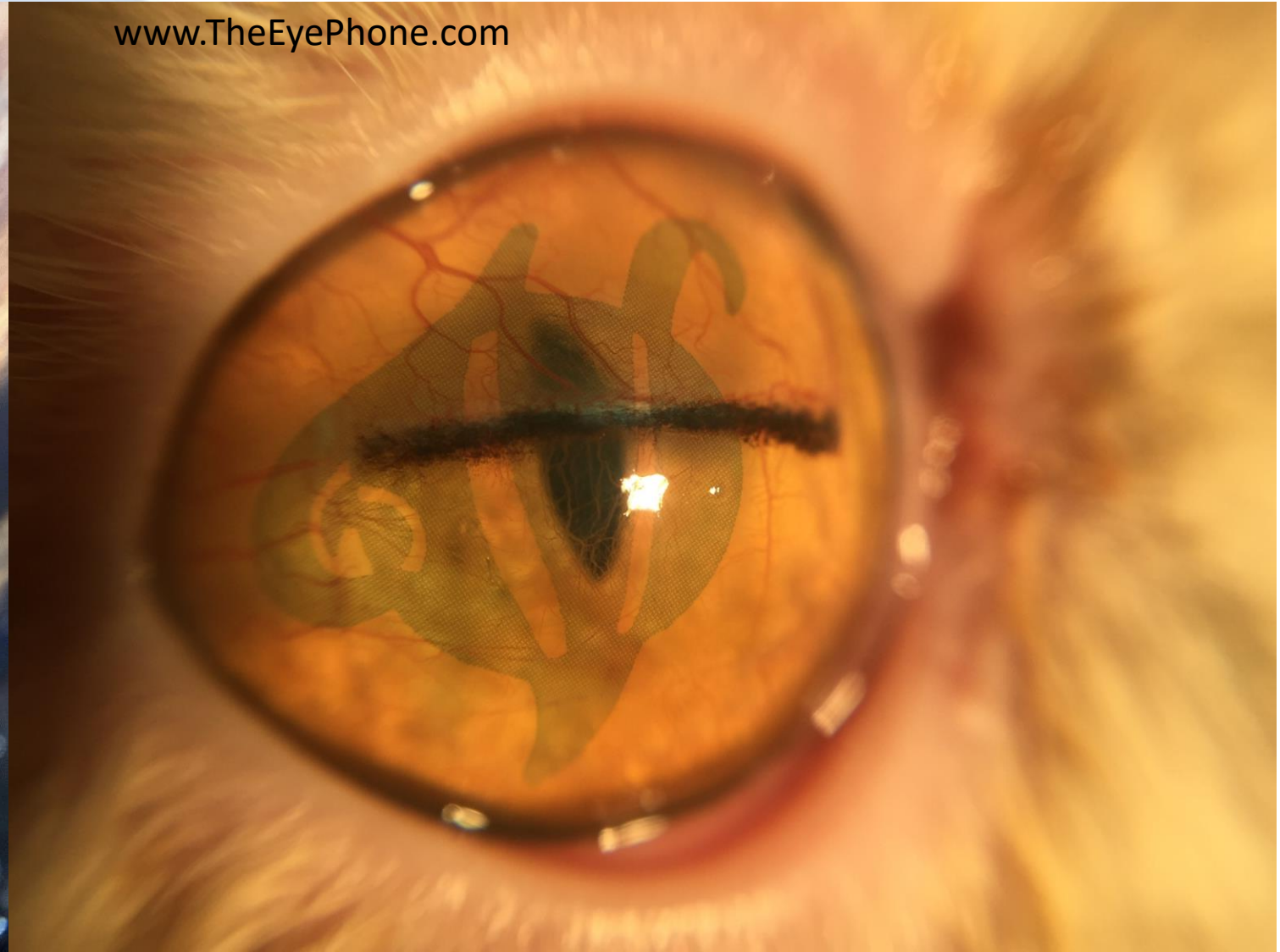
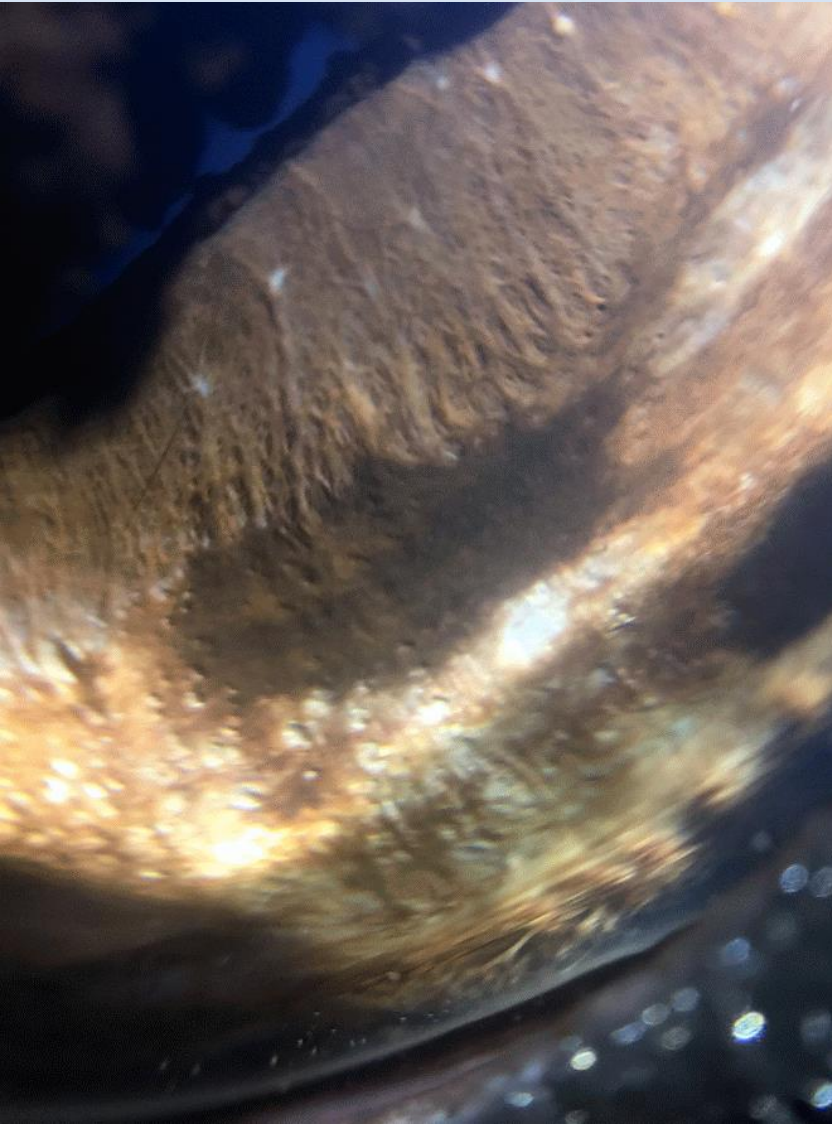


Use digital zoom





The smart phone for: “*ocular microscopy*”



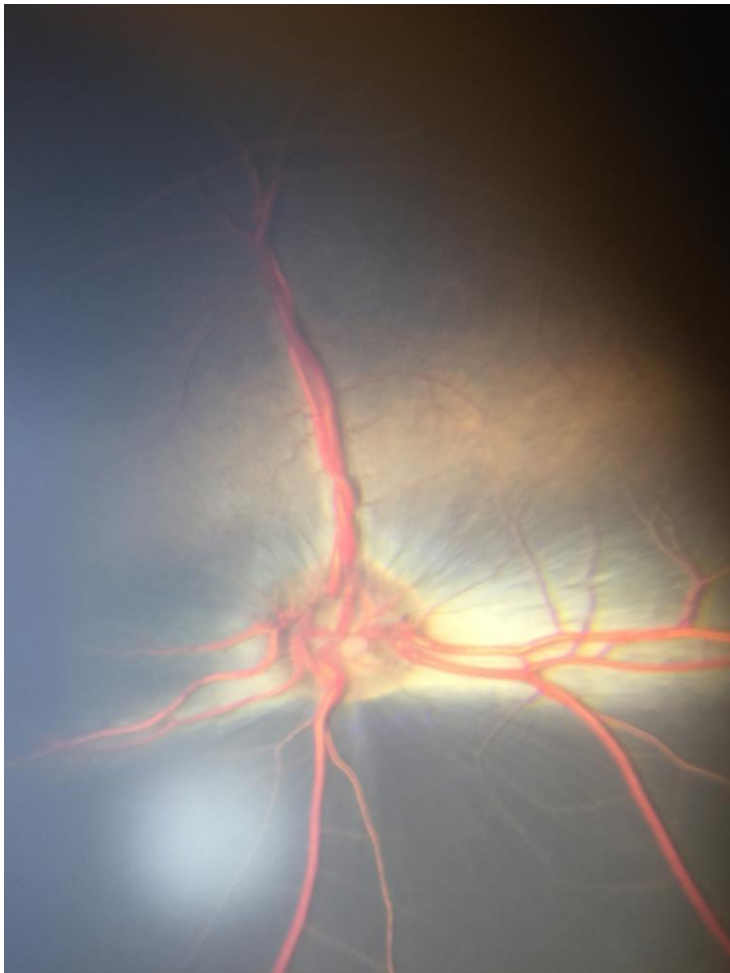
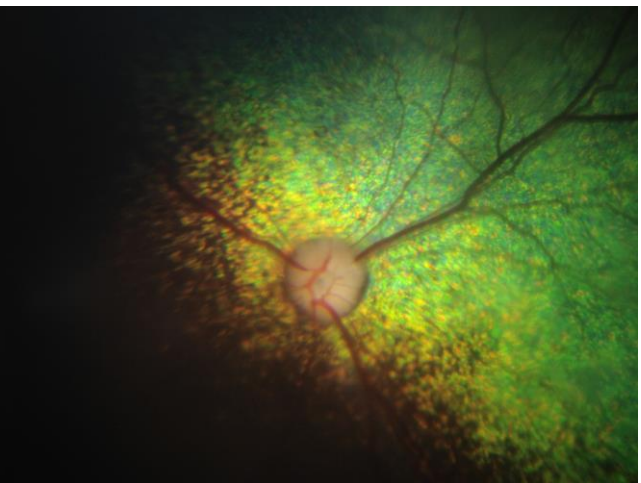
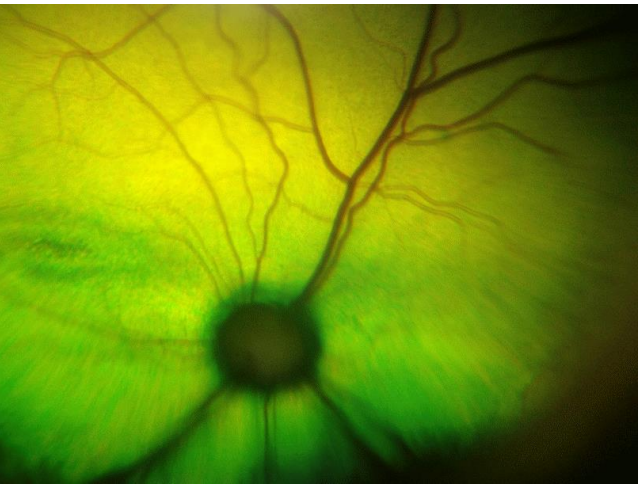


Improving your macro-photography



The smart phone for: *imaging the retina*

www.TheEyePhone.com

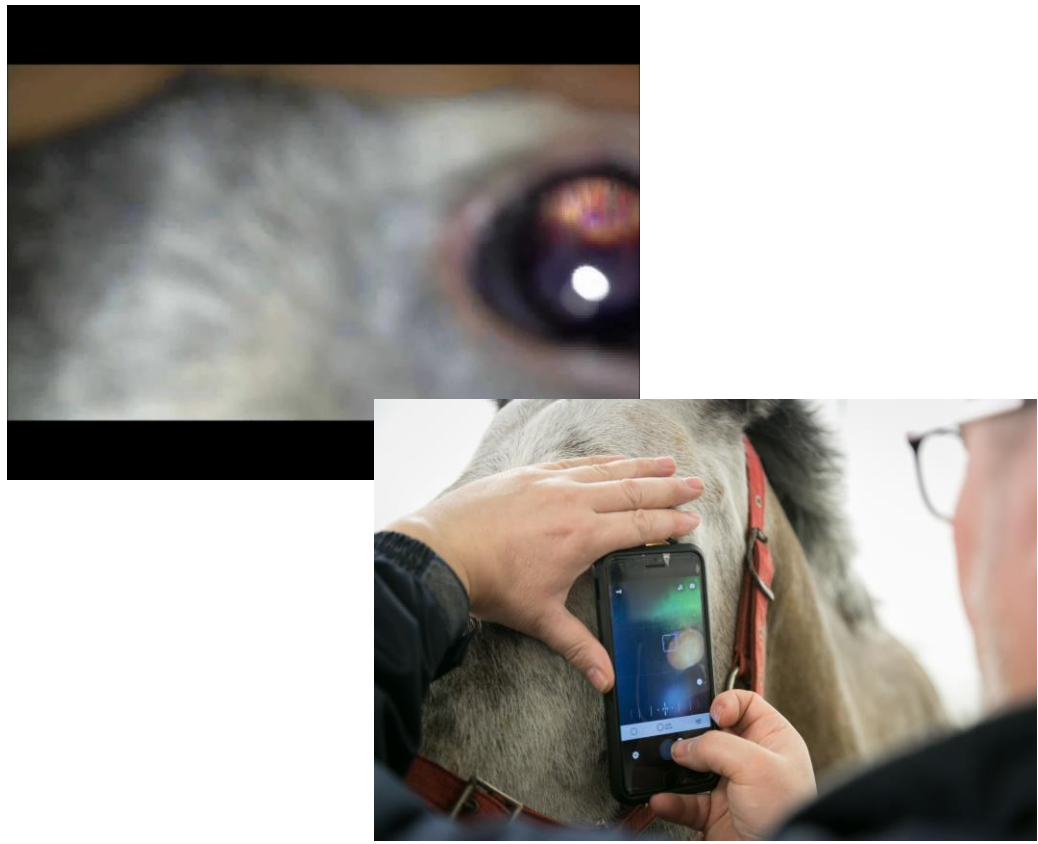




The smart phone for: *imaging the retina*

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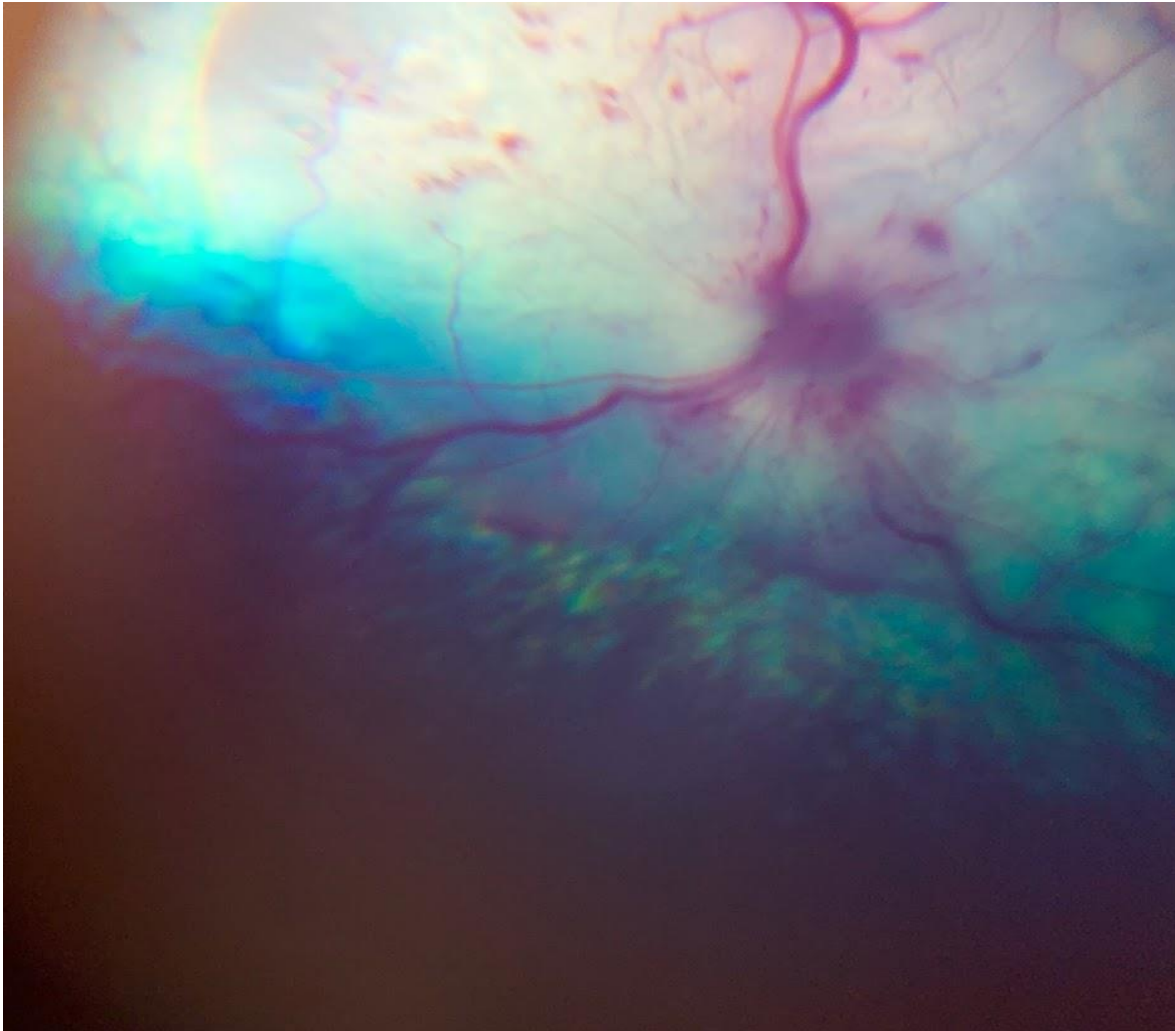
Direct funduscopy



Indirect funduscopy

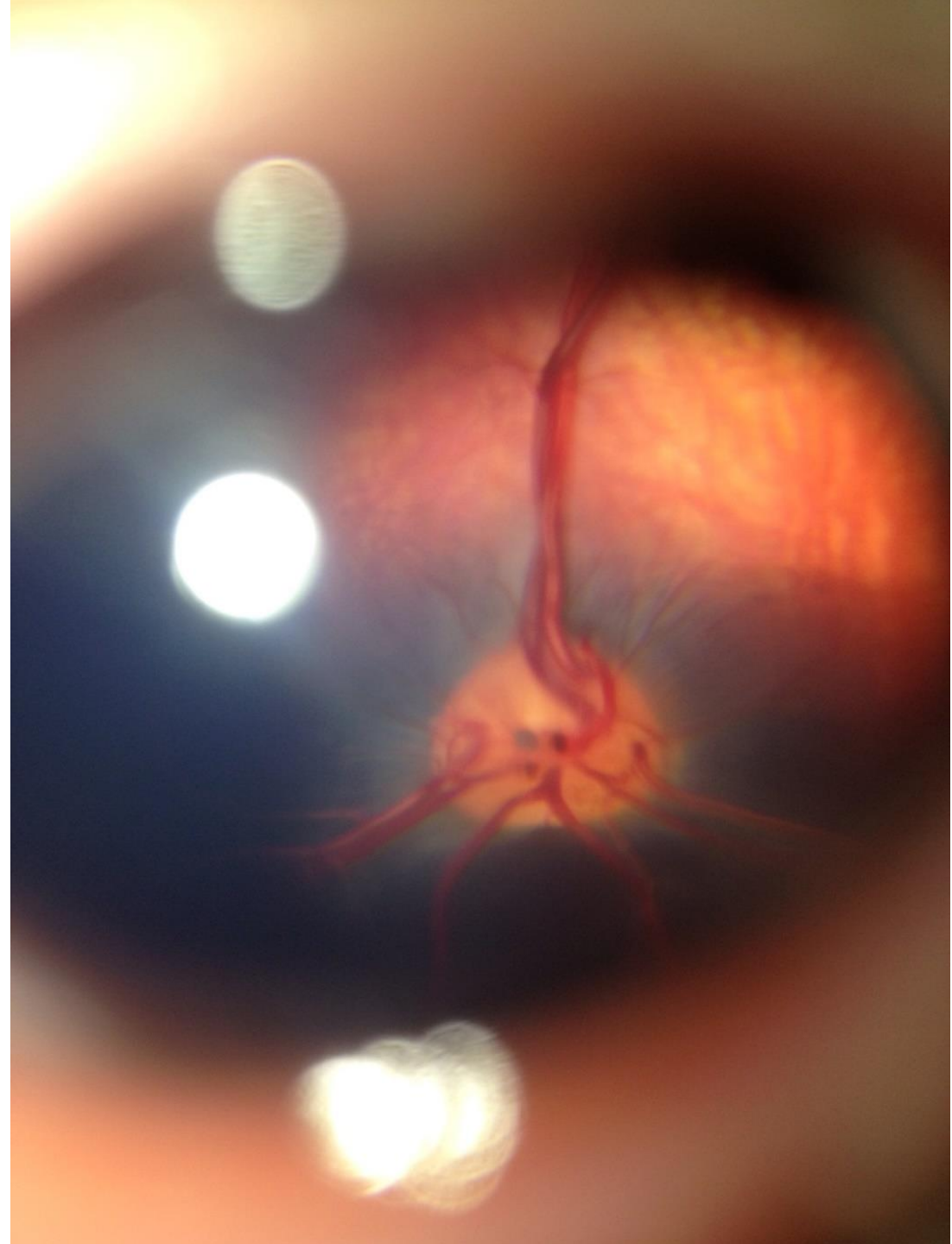


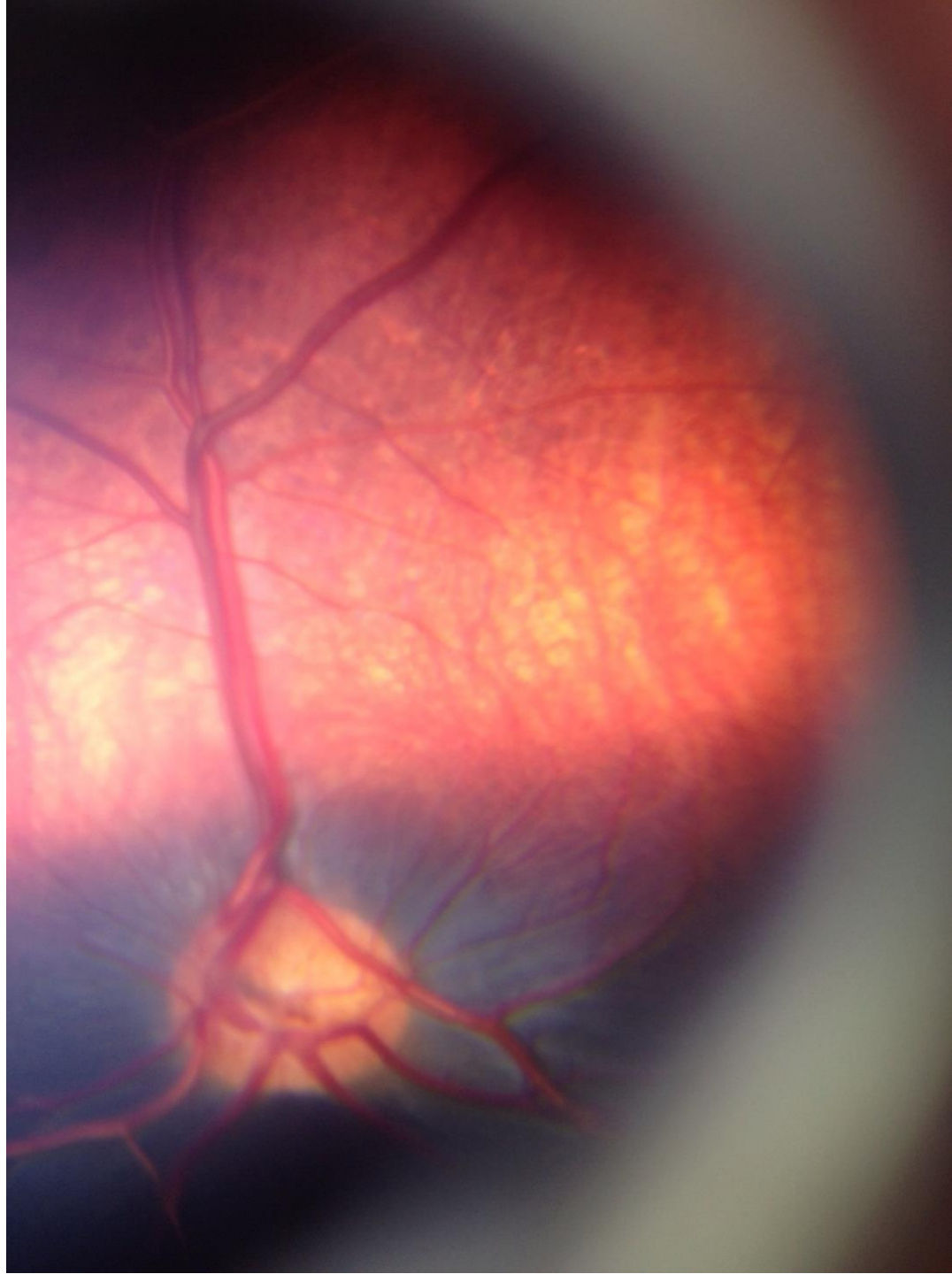
Field of view: determined by camera

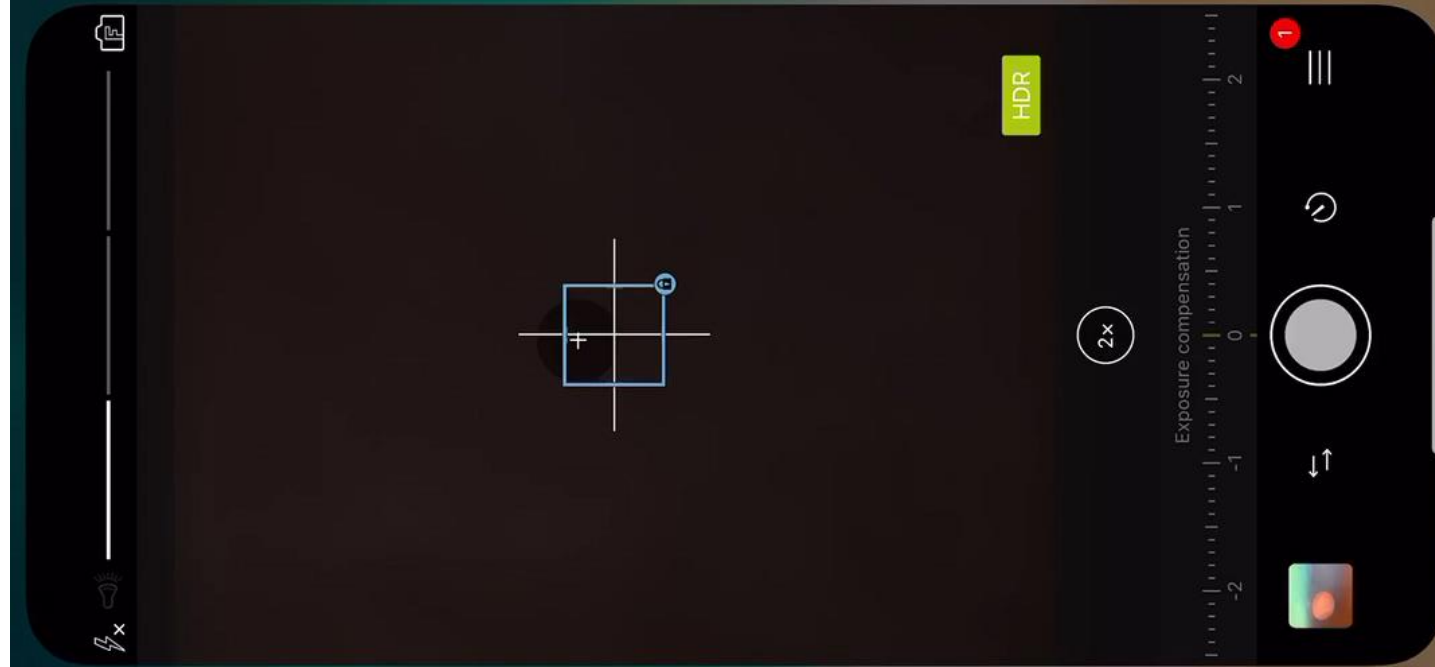












Manual focus & telephoto lens (iPhone Xsmax)



When to look



DD every time, checking the senile retina saves lives, red eyes/blue eyes, STT routinely

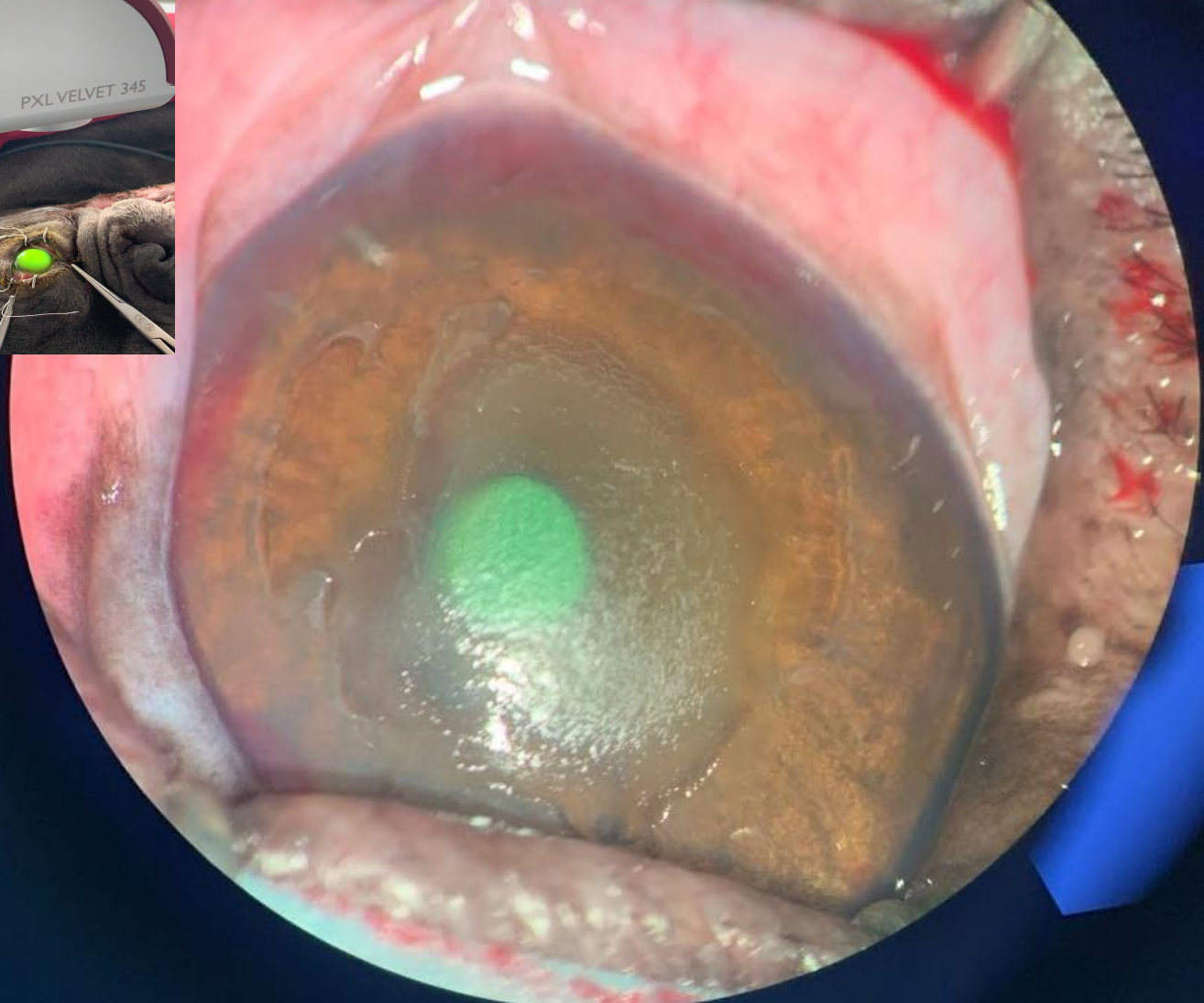


Distant Direct, **every time**: *corneal disease*



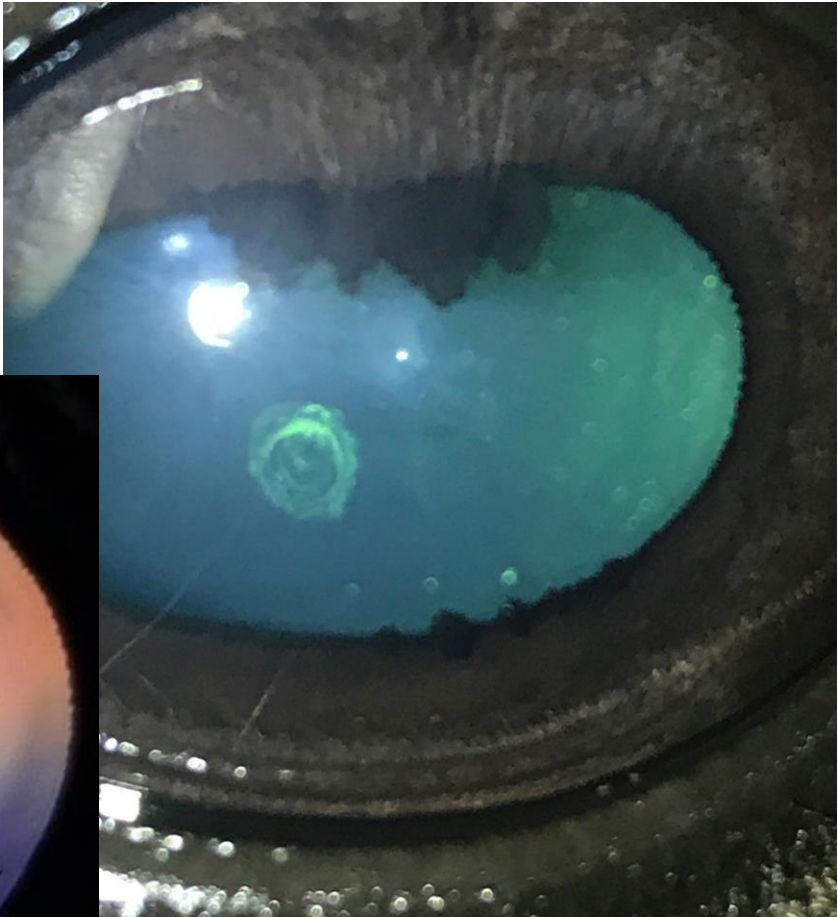
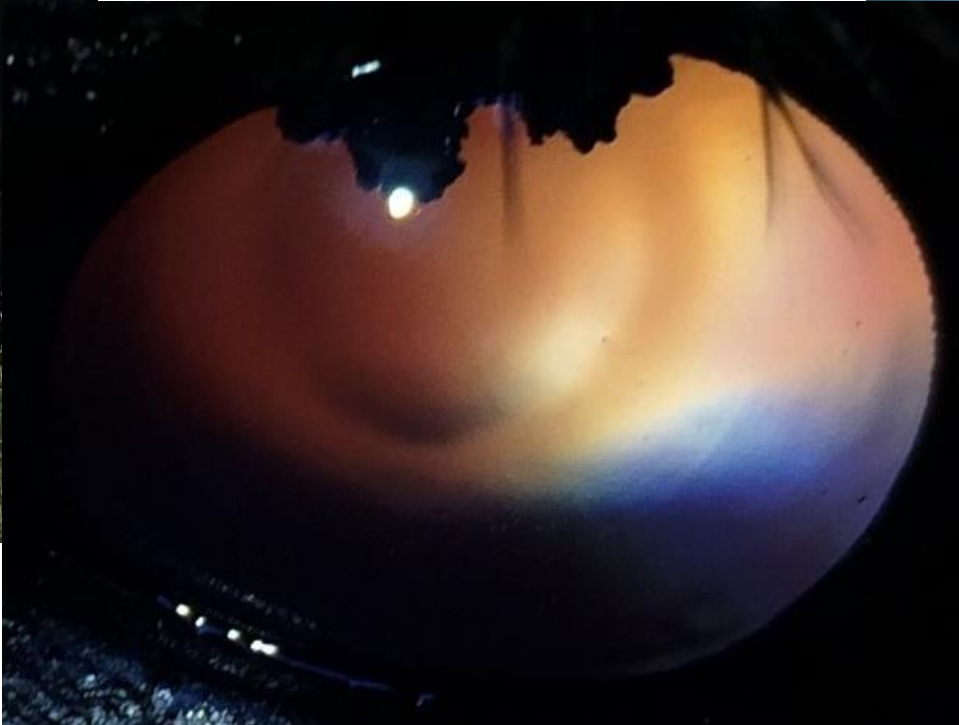


Distant Direct, **every time**: *corneal disease*



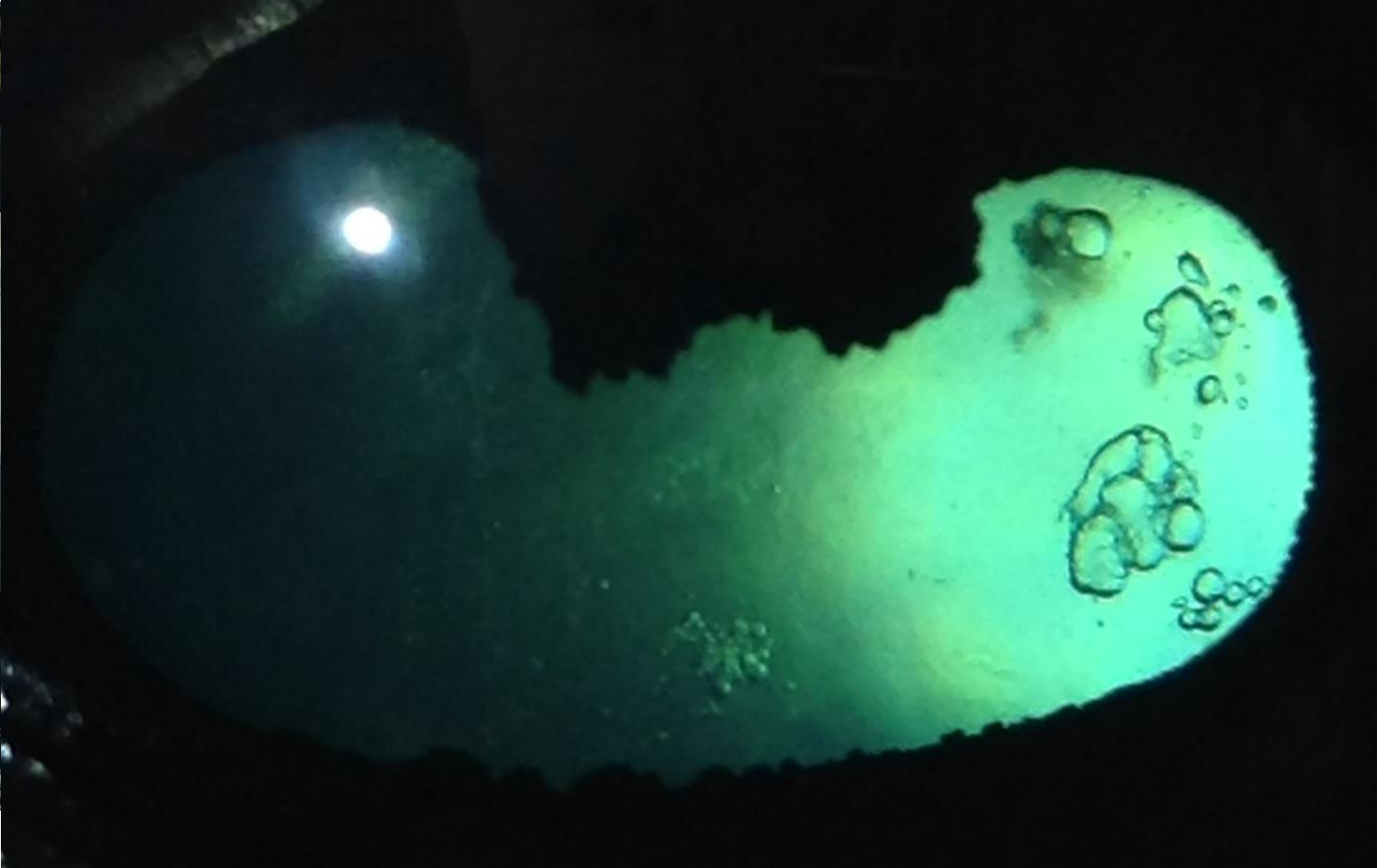
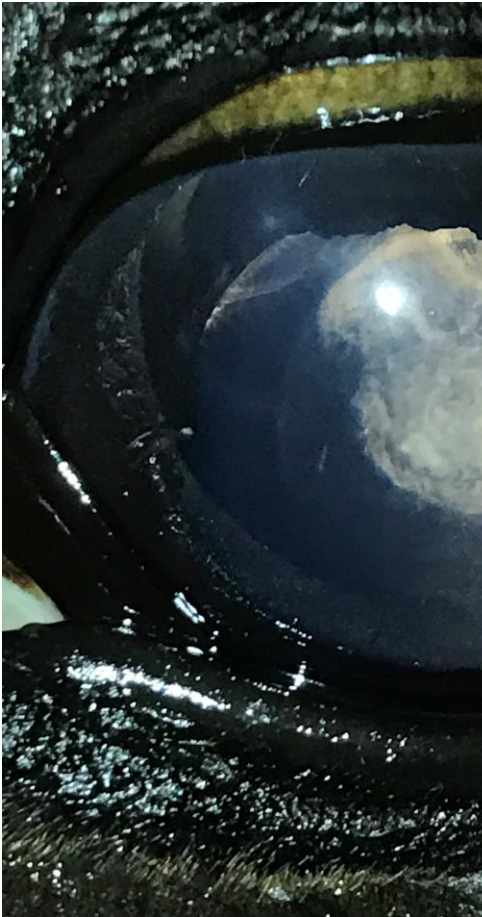


Distant Direct, every time: *cataract*





Distant Direct, **every time:** *cataract*



Distant Direct, **every time**: *posterior disease*



Figure 36. Domestic shorthair cat presented with dilated, unresponsive pupils (lack of pupillary light reflex).



Distant Direct, every time: *why?*

HYPHAEMA

Sometimes, bleeding can reach the anterior chamber and is present as hyphaema.

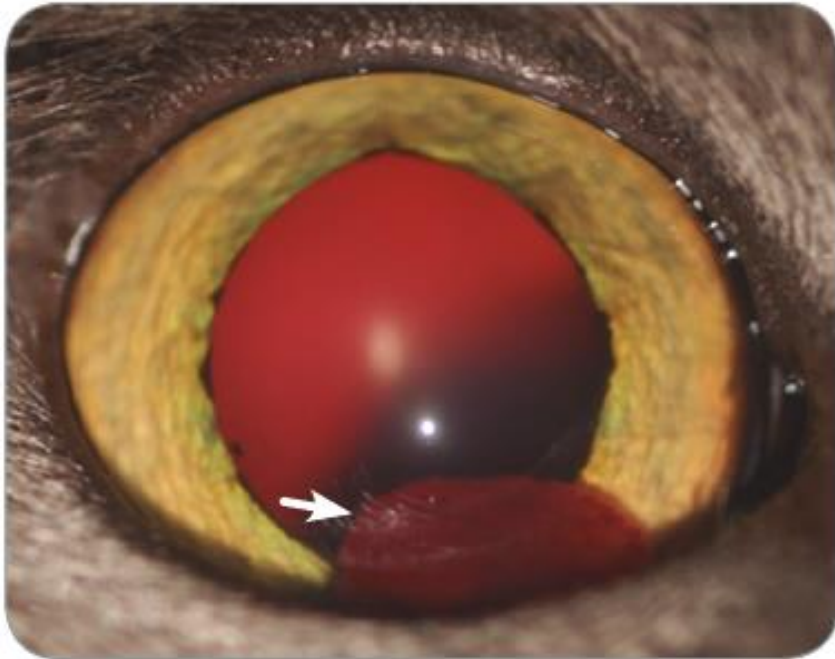


Figure 33. Moderate collected hyphaema forms a blood clot (arrow) in the anterior chamber. The red aspect of the pupil suggests haemorrhage within the anterior vitreous.



Figure 34. Total hyphaema in the right eye.



Distant Direct, every time: *posterior disease*

On **distant examination**, haemorrhage can be seen in the anterior vitreous upon important bleeding.



Figure 31. (a) Distant examination on a cat with a haemorrhage within the anterior vitreous (left eye). Note the loss of tapetal reflectivity. (b) Closer inspection of the left eye of a different cat presenting with a vitreal haemorrhage.



Distant Direct, **every time**: *posterior disease*



Figure 37. Domestic shorthair cat with retinal detachment (arrows).



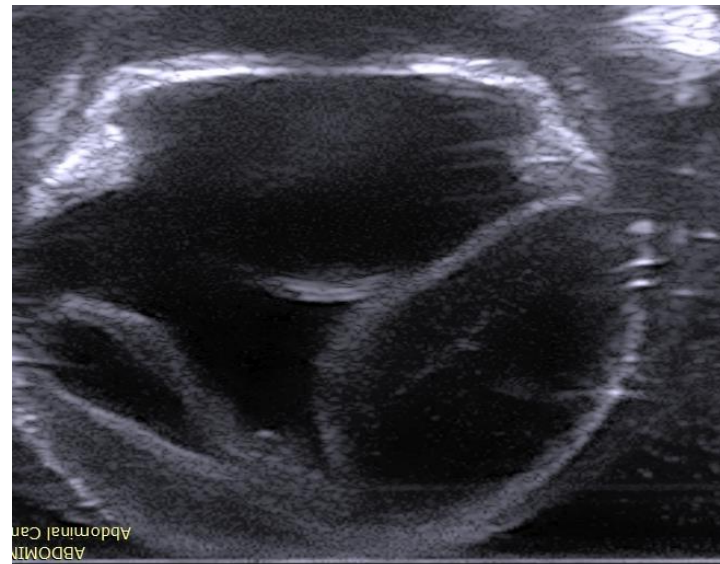
ophthalmoscopy saves lives

- Posterior segment disease is often **only clinically apparent, without fundoscopy, once severe and irreversible**
- You can **easily miss significant posterior segment lesions with direct ophthalmoscopy – you can't see these at all in telemedicine consult**
- Posterior segment disease is rare **except for feline systemic hypertension**
- Inflammatory posterior segment disease is rare but often **reflects life threatening systemic disease**



Indirect saves lives: *other systemic disease*

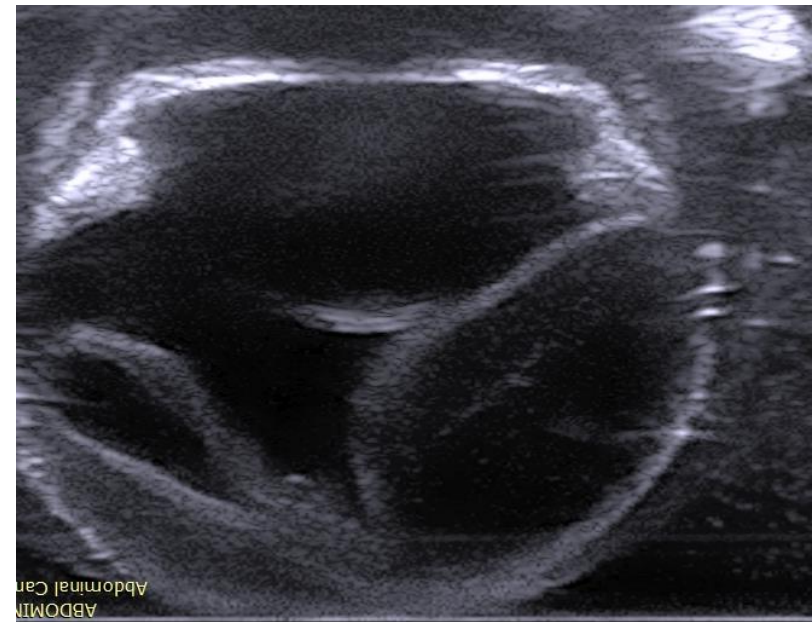
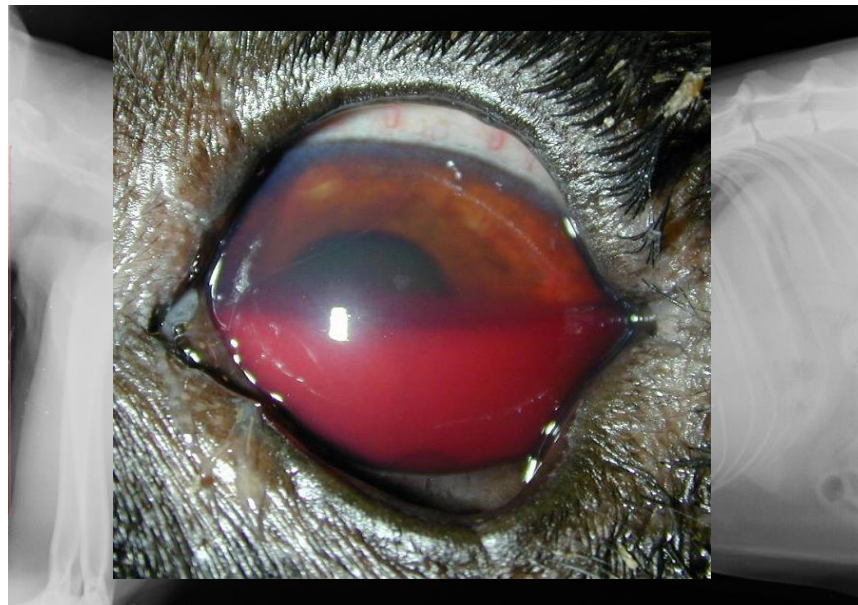
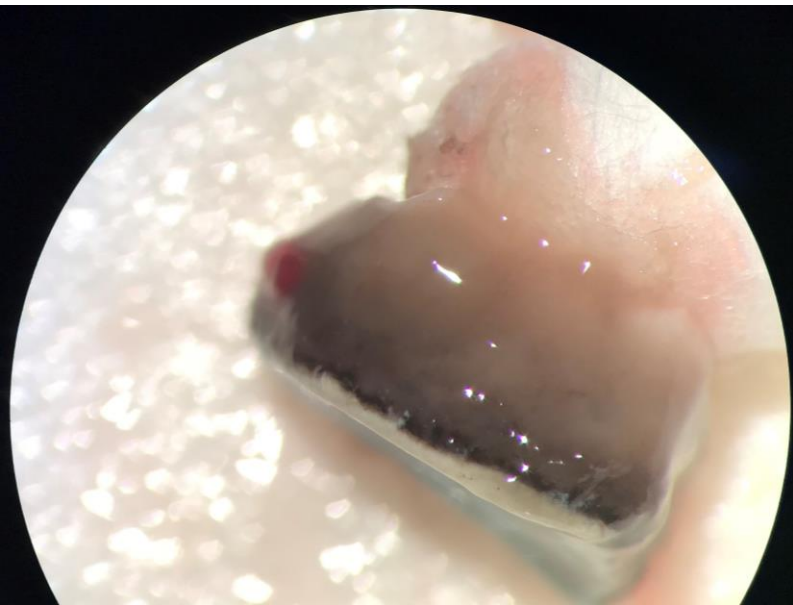
- Systemic hypertension occurs in dogs
- Bleeding and clotting disorders can cause retinal bleeding
- Feline mycobacterial disease can present as retinal detachment
- Feline pulmonary adenocarcinoma can cause choroidal infarction





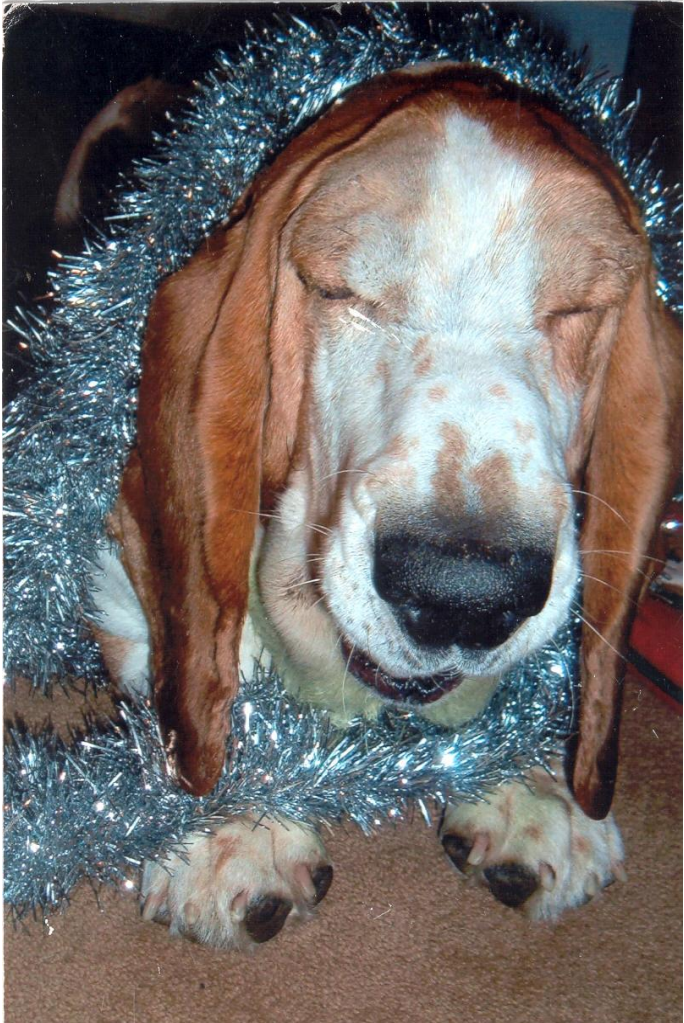
Indirect saves lives: *other systemic disease*

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- Feline pulmonary adenocarcinoma can cause choroidal infarction



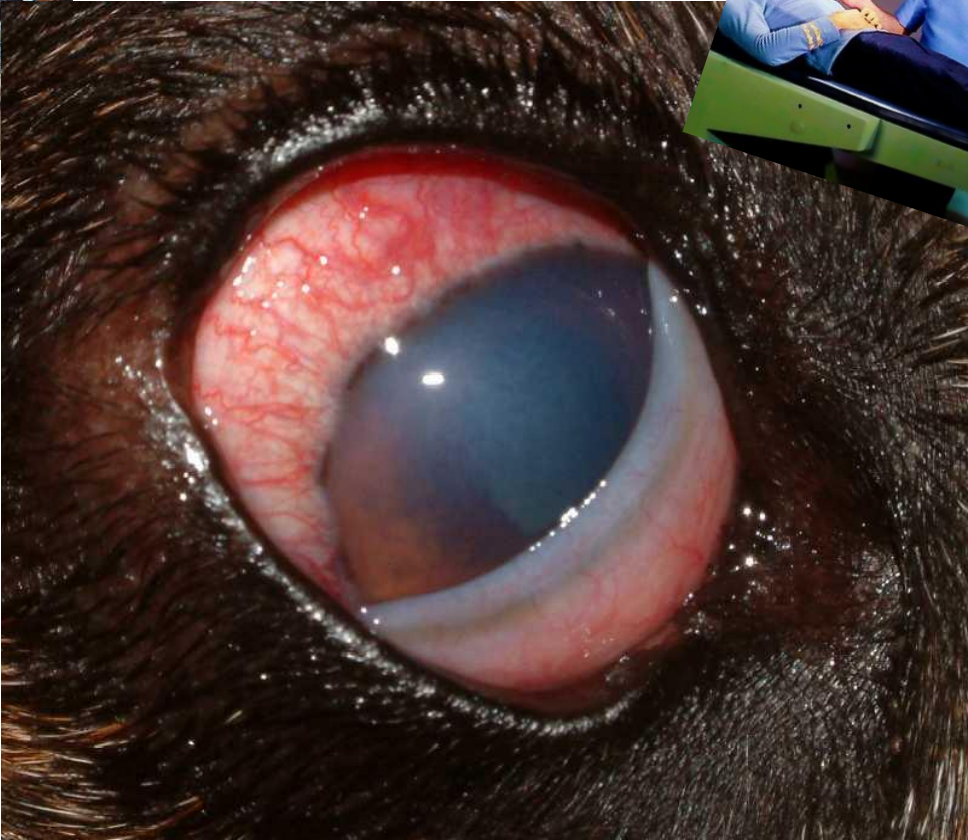


Red eyes, blue eyes: *learn your breeds (PG)*



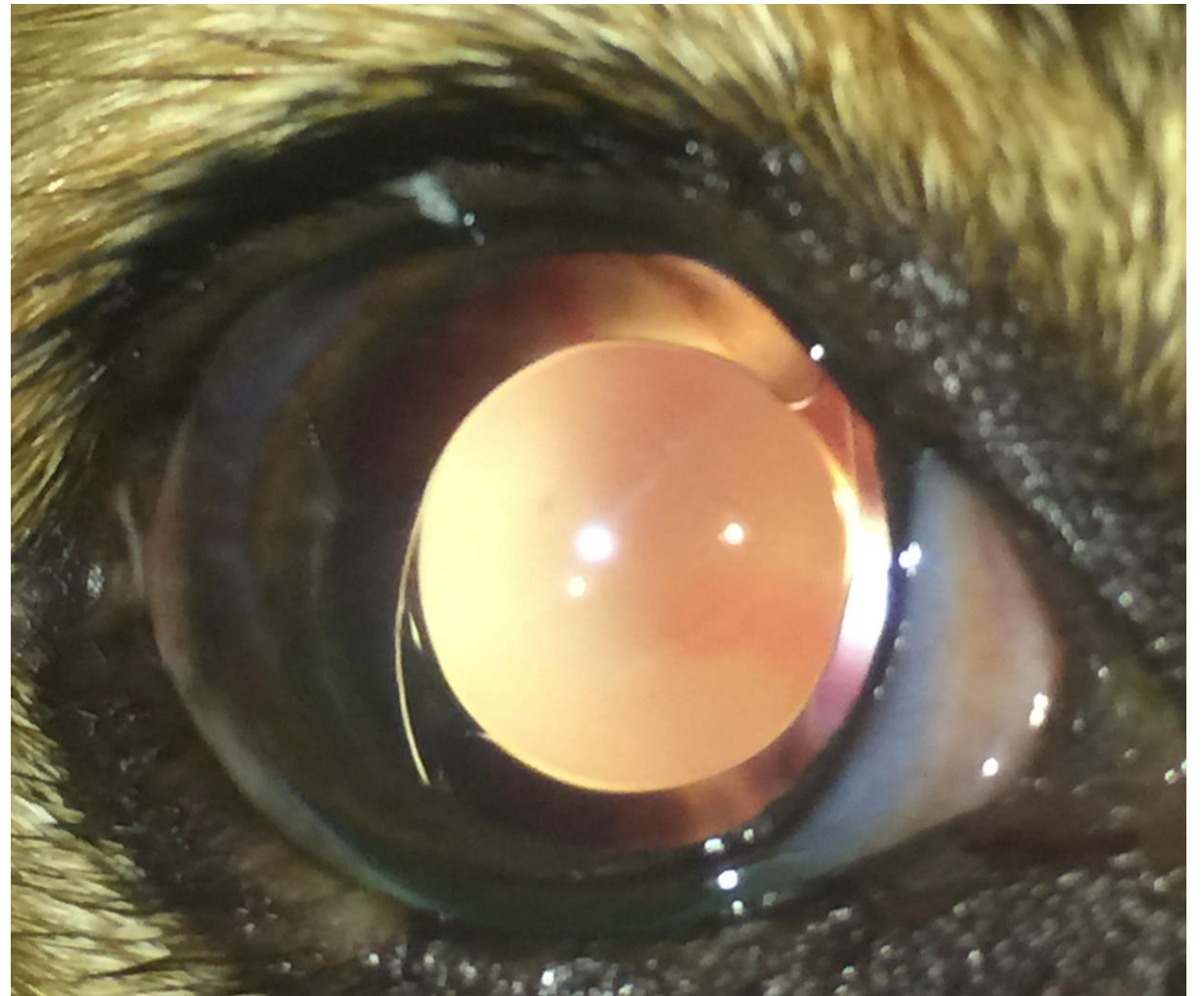


Red eyes, blue eyes: *learn your breeds (PG)*





Red eyes, blue eyes: *learn your breeds (PLL)*





When to worry

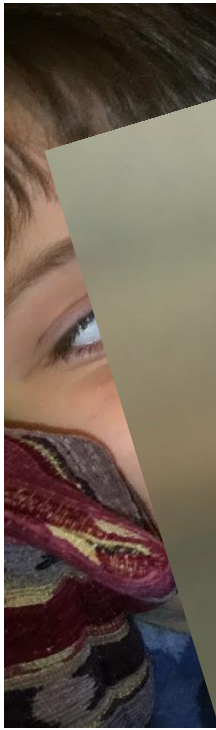




When to worry

All small brachycephalic dogs,





When to

All small brachyceph





When to worry

All small brachycephalic dogs, **especially when + cats**

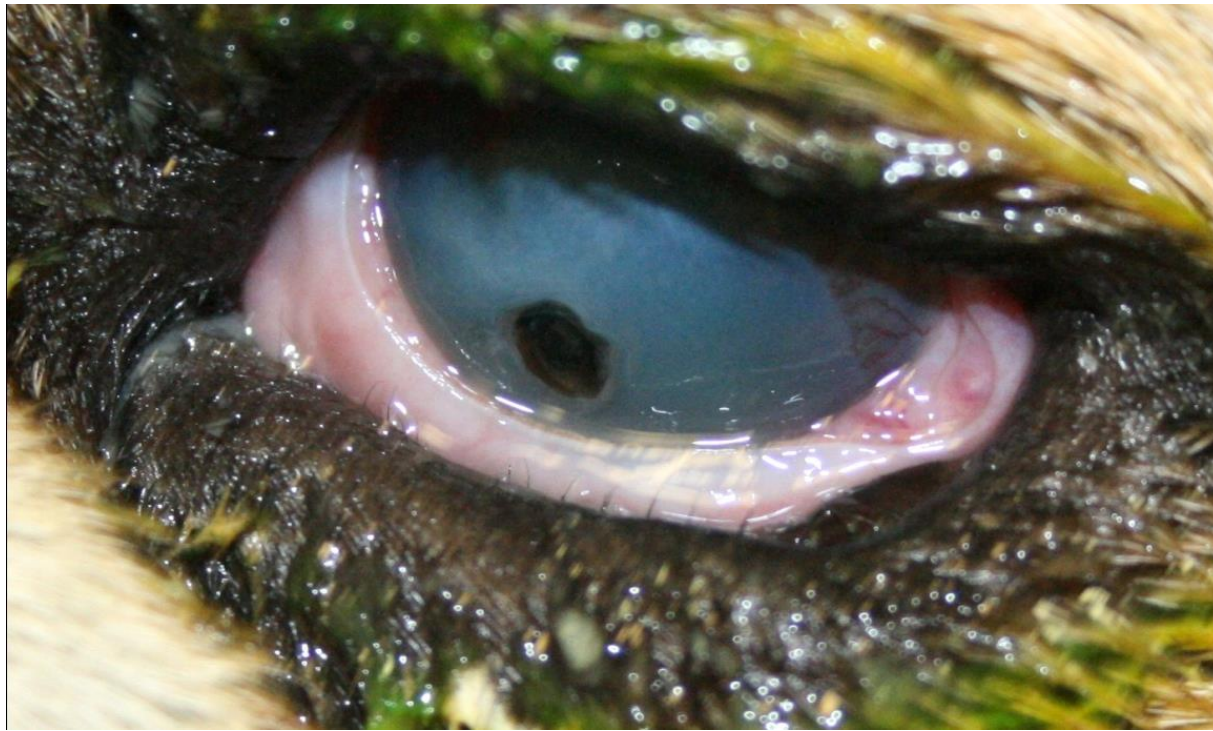




When to worry

All small brachycephalic dogs, **ulcers not healed in 7 days**

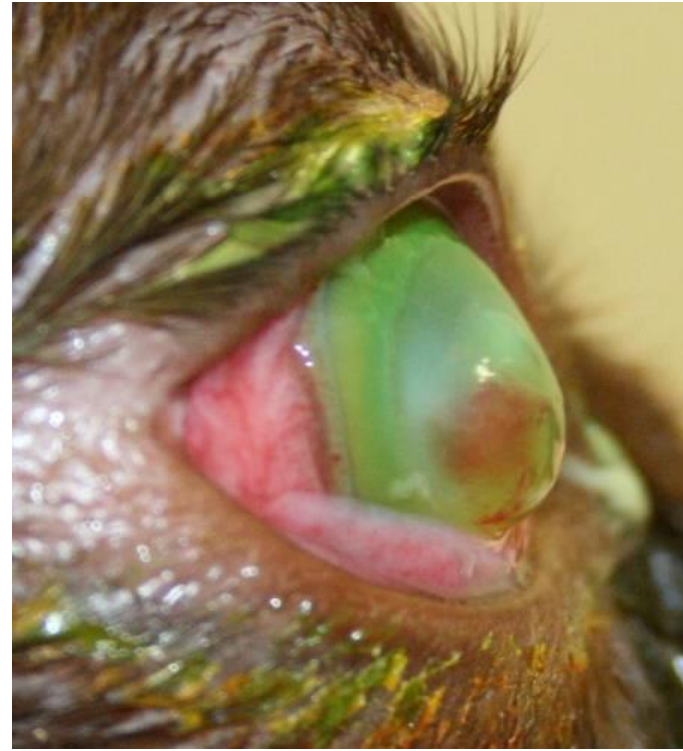
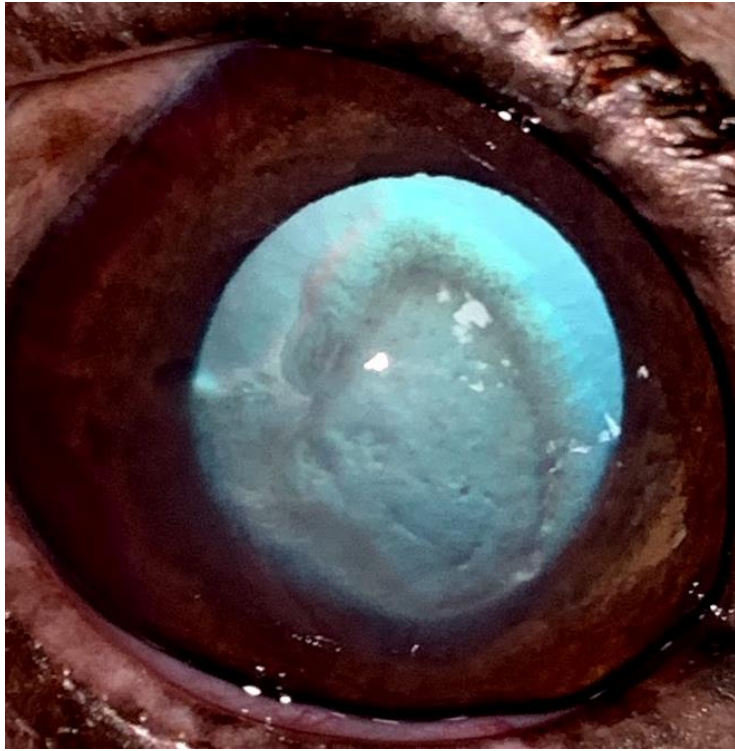




When to worry



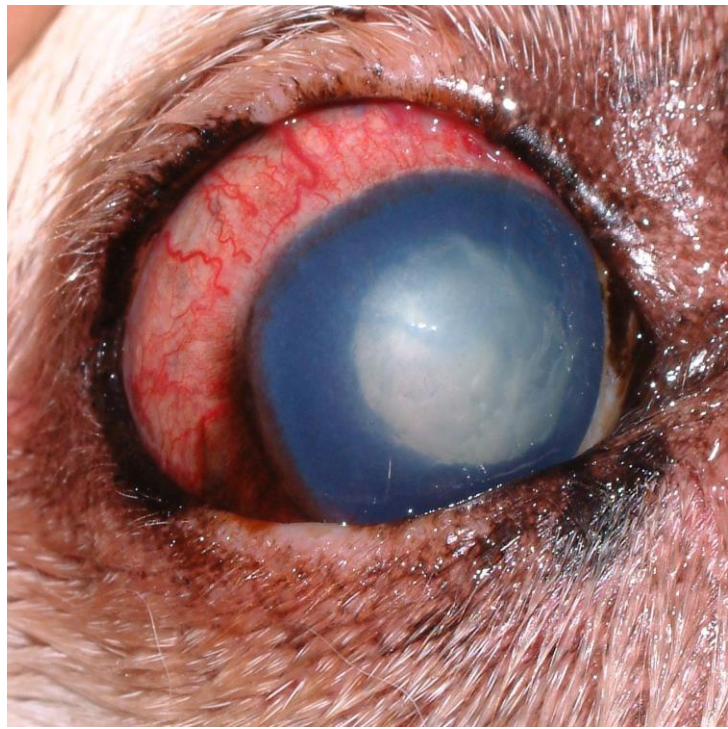
All small brachycephalic dogs, ulcers not healed in 7 days, **the comfortable deep ulcer (especially if increasing transparency)**



When to worry

All small brachycephalic dogs, ulcers not healed in 7 days, the comfortable deep ulcer, **when suspect corneal infiltrate or melting,**

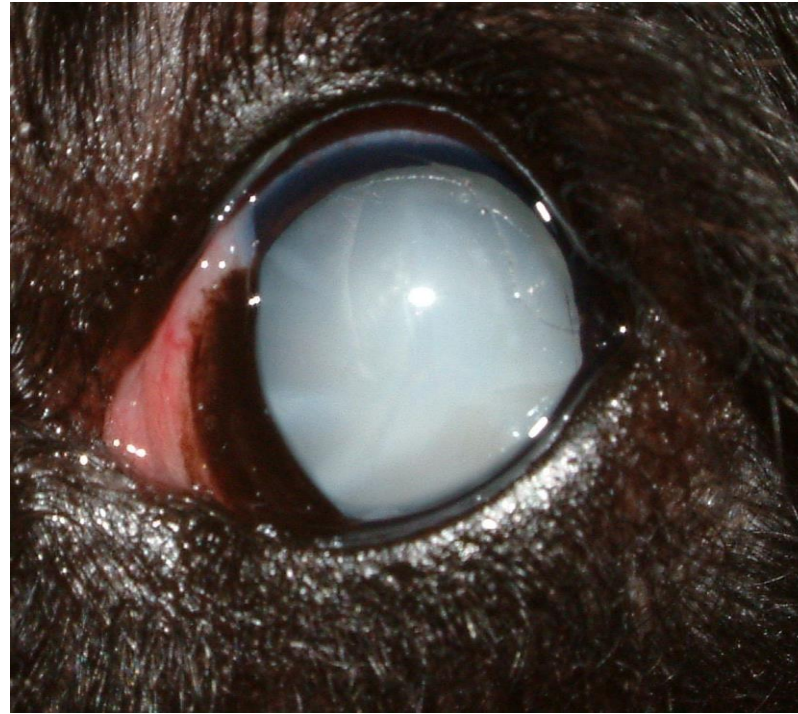




When to worry



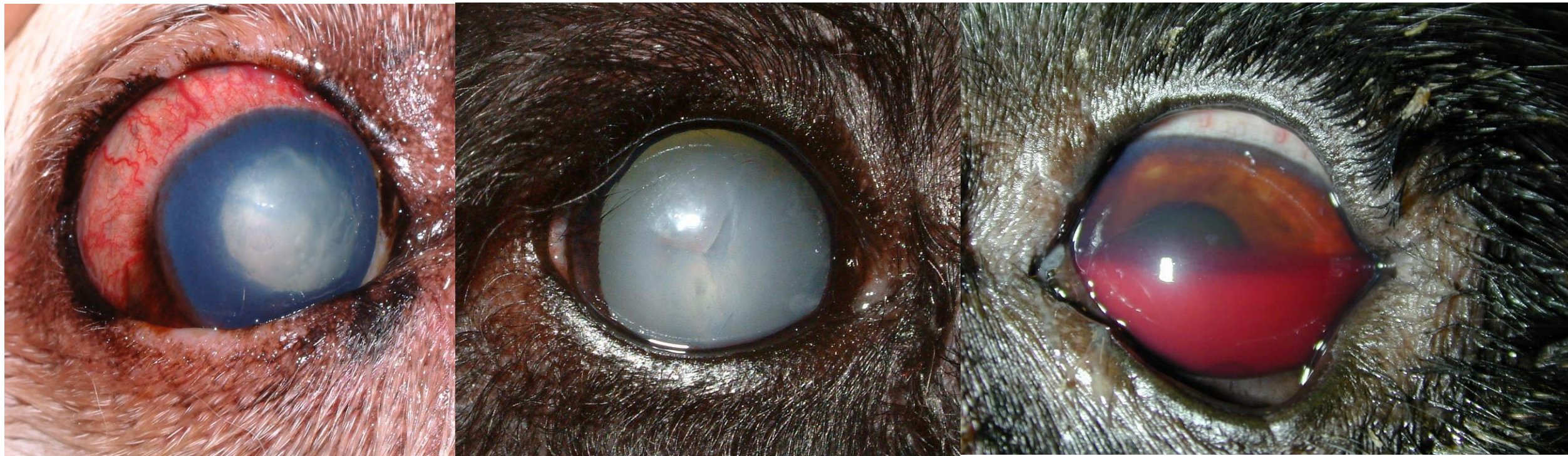
All small brachycephalic dogs, ulcers not healed in 7 days, the comfortable deep ulcer, when suspect corneal infiltrate or melting, **all red and/or blue eyes (there are few good causes),**



When to worry



All small brachycephalic dogs, ulcers not healed in 7 days, the comfortable deep ulcer, when suspect corneal infiltrate or melting, all red and/or blue eyes (there are few good causes), **sudden onset cataract and all diabetic cataracts**



When to worry



All small brachycephalic dogs, ulcers not healed in 7 days, the comfortable deep ulcer, when suspect corneal infiltrate or melting, all red and/or blue eyes (there are few good causes), sudden onset cataract and all diabetic cataracts, **blindness, especially sudden onset,**



Luke, trust your feelings.



Impossible to see, the future is.

When to worry



All small brachycephalic dogs, ulcers not healed in 7 days, the comfortable deep ulcer, when suspect corneal infiltrate or melting, all red and/or blue eyes (there are few good causes), sudden onset cataract and all diabetic cataracts, blindness, especially sudden onset, **and when you're not sure.**



When to ring



When to ring

Not just when it's obvious





When to ring

Not just when the owner can afford referral





When to ring

Whenever you're worried or not sure whether you should be worried





When to ring

- Prolapse
- Ulcers – all brachycephalics, when suspect non-healing, deep, ruptured, infected or melting.
- Glaucoma – permanent blindness can be less than 6 hours away.
- Uveitis – when you aren't certain of the cause
- Cataract – when sudden onset and **always when diabetic.**

A man with a goatee and a checkered shirt is sitting at a desk. A pug dog is lying on the desk in front of him. The background shows a computer monitor, a printer, and a cardboard box. A semi-transparent circular overlay is on the left side of the image, containing text and a list of contact information.

Thanks for listening,
questions?

- Hope to see you at the clinic soon
- eyes@rowevetgroup.com
- 01454 521000 24/7
- WhatsApp Tim on 07782219868