



Around The Globe in 60 Minutes

Cornell University Veterinary Specialists 



Around the GLOBE in Sixty Minutes

Basic Ocular Anatomy, Examination, and Diagnostic Techniques



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Cornell University Veterinary Specialists
Annual Winter Conference 2018

Introduction – Focusing on canine and feline ocular anatomy and basic examination techniques



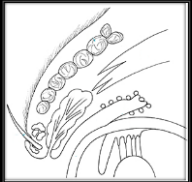


- Basic anatomy of the globe
- Tools and testing
- Common complications
- Handling and restraint

Anatomy

Front to back






Eyelids



- Physical defense
- Distribute tears
- Cilia
- Meibomian glands

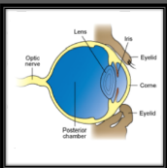
Eyelids



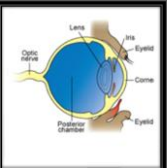
Distichiasis Trichiasis Ectopic Cilia

Eyelids

Entropion



Ectropion



Eyelids

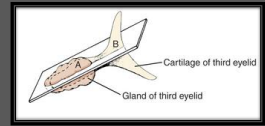


Entropion



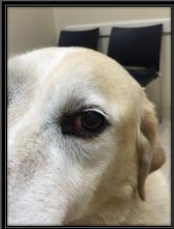
Ectropion

Third Eyelid



Third Eyelid

Mass



Conjunctiva



Mucus membrane covering the inner surface of the eyelids, the surface of the third eyelid, and anterior sclera

Conjunctiva

Conjunctival Hyperemia

a symptom for a wide array of diseases

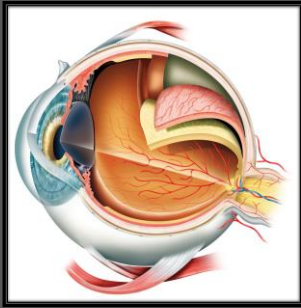


Conjunctiva



Bilateral Conjunctival Grafts

The Globe



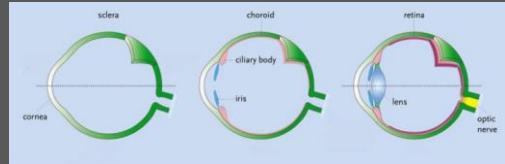
The Globe



Fibrous Tunic

Vascular Tunic

Nervous Tunic



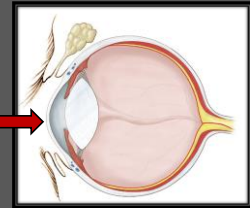
Sclera

Fibrous opaque white part of the eye



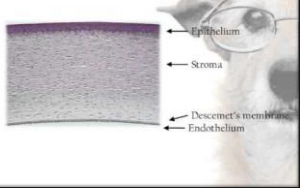
Cornea

Anterior clear portion of the surface of the eye comprised of extremely thin layers of collagen specially arranged to remain transparent and allow light to enter the eye



Cornea

Basic Corneal Anatomy



Four layers

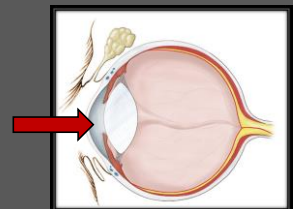
1. Epithelium
Superficial Ulcer
2. Stroma
Deep Ulcer
3. Descemet's Membrane
Descemetocele
4. Endothelium



Average of 0.5mm thick
Absence of blood vessels, lymphatics, pigment
allows for transparency

Anterior Chamber

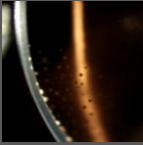
Area in front of the iris containing aqueous humor



Anterior Chamber

Anterior Uveitis

Keratic
Precipitates



Hypopyon

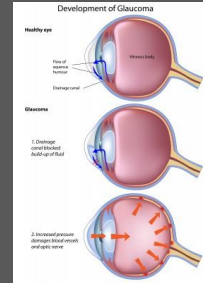


Aqueous Flare



Anterior Chamber

Glaucoma



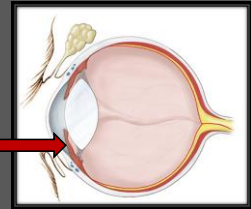
Anterior Chamber

Glaucoma Shunt



Iris

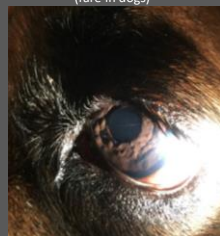
Controls the amount of light entering the eye by dilating or constricting the pupil



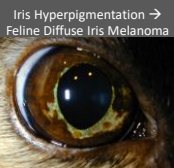
Iris



Iris Atrophy



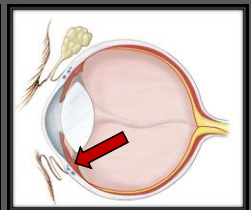
Iris Thickening
(rare in dogs)



Iris Hyperpigmentation →
Feline Diffuse Iris Melanoma

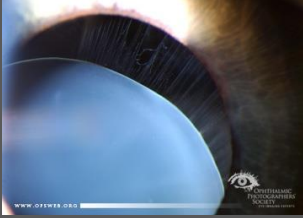
Ciliary Body

Just behind the iris, it is composed primarily of muscle, blood vessels, fibrous tissue, and a surface double layer epithelium.



Ciliary Body

Zonules



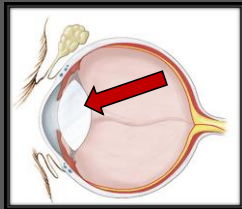
Posterior Chamber

The area behind the iris but in front of the lens



Lens

The basic function is to focus light appropriately onto the retina



Lens

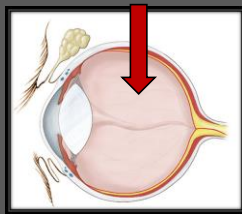
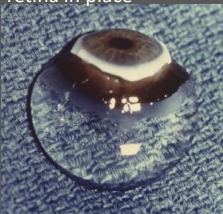
Posterior Lens Luxation

Anterior Lens Luxation with Cataract



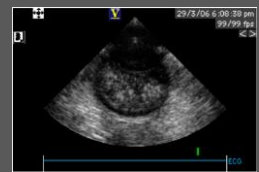
Vitreous

Gelatinous fluid filling the back of the eye behind the lens that helps to maintain the shape of the eye, acts as a shock absorber, and helps hold the lens and retina in place



Vitreous

Vitreous Degeneration



Retina

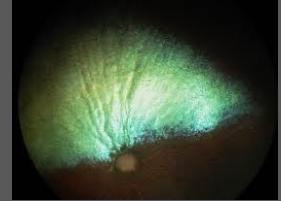
Composed of neurons that perceive light and transmit visual information to the brain



Retina

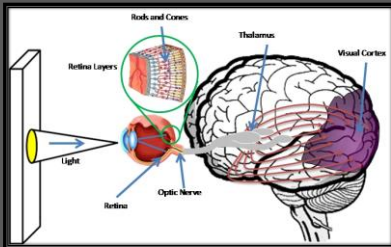
Retinal Detachment

PRA – Progressive Retinal Atrophy



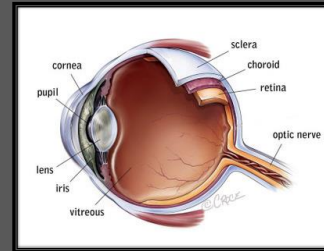
Optic Nerve

The collection of neurons bringing visual information from the eye to the brain



Choroid

Vascular tissue beneath the retina (part of the uvea), which provides blood supply/oxygenation to the retina.



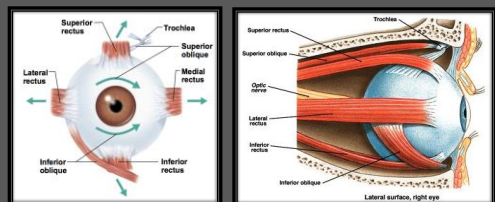
Tapetum Lucidum

A specialized portion of the choroid found in many domestic species



Extraocular Muscles

A set of 7 muscles that move the eyes within the orbit (eye socket)



The Exam



Menace

An imperfect assessment of vision



Dazzle

An indication of light perception



Pupillary Light Reflexes (PLRs)

An assessment of the reflex constriction of the pupil in response to a bright light.



Maze Testing

Used as a tool to assess vision



Cotton Ball Tracking



No smell

No sound

Schirmer Tear Testing

Measurement of the aqueous layer of tears, produced by the lacrimal gland and the gland of the third eyelid



Schirmer Tear Testing

Strip should be placed in the middle or lateral third of the lower eyelid where it can contact the surface of the cornea



Should be left in place for 60 seconds
Values are read as mm/minute

Schirmer Tear Testing



- Placing the strip too far medially can result in third eyelid obstruction.
- Topical anesthetics reduce tear values
- Cats can have drastically altered tear values caused by the stress of an exam (normal range of 3-32)

Tonometry

Measurement of intraocular pressure



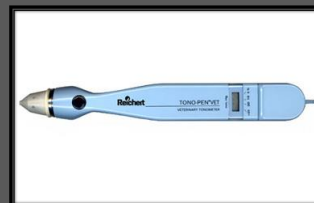
Tonometry



Indentation
(Schiøtz)
Tonometer

Measurement of pressure based on the distance a vertical rod is able to indent the cornea

Tonometry



Applanation
(Tono-Pen)
Tonometer

Measurement of pressure based on the force required to flatten a small area of a sphere

Tonometry



Rebound
(Tonometer)

Measurement of pressure based on the amount of time it takes for a small probe to strike the surface of the cornea and rebound to the instrument

Tonometry



Pressure on the neck or orbital area created by retracting the eyelids, restraint, collars, harnesses, or a struggling patient can significantly increase IOP readings

Fluorescein Stain

Dye used to evaluate breaks in the surface of the cornea (corneal epithelium)

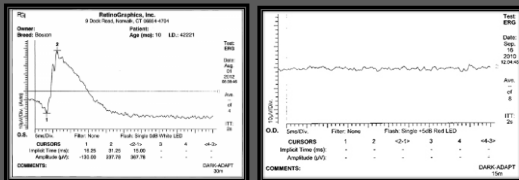


Fluorescein Stain

Epithelium is hydrophobic
Stroma is hydrophilic



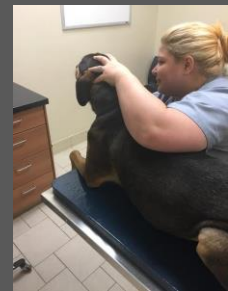
Electroretinography (ERG)



Restraint



Stabilize with hand under jaw, and other hand behind the head



Restraint



Kitty Burrito

Thank you!

