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

Around the GLOBE in Sixty Minutes
Basic Ocular Anatomy, Examination, and Diagnostic Techniques

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Annual Winter Conference 2018

Anatomy
Front to back

Eyelids
- Physical defense
- Distribute tears
- Cilia
- Meibomian glands

Eyelids
Distichiasis
Trichiasis
Ectopic Cilia

Entropion
Ectropion
Eyelids

- Entropion
- Ectropion

Third Eyelid

- Mass

Third Eyelid Gland

- Additional protection

Conjunctiva

- Mass

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

Conjunctiva

- Conunctival Hyperemia
  - A symptom for a wide array of diseases

Conjunctiva

- Bilateral Conjunctival Grafts
The Globe

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
Four layers
1. Epithelium
2. Stroma
3. Descemet's Membrane
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 Precipitants
- Hypopyon

**Aqueous Flare**

**Glaucoma**

- Development of Glaucoma
  - Cilioretinal vessels
  - Humphrey SLM perimetry
  - Laser therapy

**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.

**Glaucoma Shunt**

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

- Glaucoma Shunt
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

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

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

Tapetum Lucidum
A specialized portion of the choroid found in many domestic species

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

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

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 (Schiotz) 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

Cats can have drastically altered tear values caused by the stress of an exam (normal range of 3-32)
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**

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.

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).

Epithelium is hydrophobic
Stroma is hydrophilic

**Electroretinography (ERG)**

**Restraint**

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