

VET 433A Ocular Pharmacology

When considering how to treat an eye, you need to think about the vascularity and location

Vascular ocular tissues

- Adnexa Conjunctiva
- Orbit
- Posterior uvea
- Retina
- Optic Nerve
- Anterior Uvea

Back half of the eye

- Orbit
- Posterior Uvea
- Retina
- Optic nerve
- Vitreous
- *Use systemic therapy

Avascular Ocular Tissues

- Corneal epithelium
- Corneal stroma
- Lens

Front half of the eye

- Adnexa
- Conjunctiva
- Corneal epithelium
- Corneal stroma (some)
- Aqueous (some)
- Anterior uvea (some)
- *Use topical therapy

The cornea is a complex trilaminar sandwich

Hydrophobic epithelium

Hydrophilic stroma

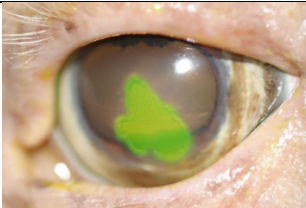
Hydrophobic DM/Endothelium

Penetrates corneal layers	Bounces off corneal layers
Parasympatholytics -Atropine -Tropicamide	Topical Antibiotics -Neomycin, Polymyxin B sulfates and Bacitracin zinc

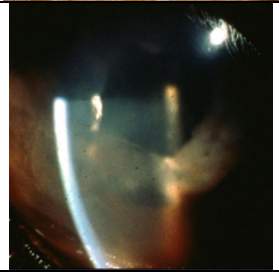
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Glaucoma Drugs -Latanoprost -Dorzolamide -Timolol	Aminoglycosides -Tobramycin -Gentamicin -Tetracycline -Macrolide (Erythromycin)
Fluoroquinolones -Ciprofloxacin -Ofloxacin	Cefazolin
Dexamethasone Prednisone	Corticosteroids -Hydrocortisone

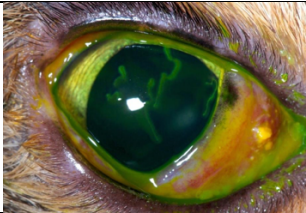
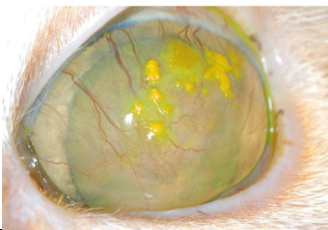
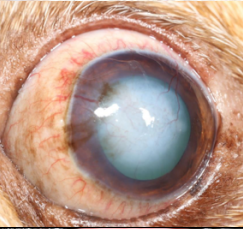
Treating Eye Conditions Medically

Drug	MOA or Rationale	Indication	Adverse Effects	Picture
Neomycin, Polymyxin B, Bacitracin (NPB) Gramicidin (NPG) Aminoglycosides Tobramycin Gentamicin Tetracycline Macrolide Cephalosporin Cefazolin	Topical Antibiotics	Simple ulcers Prevent infection Do not penetrate the corneal layers		
Fluoroquinolones Ciprofloxacin Ofloxacin	Topical Antibiotic	Penetrate the corneal layers		

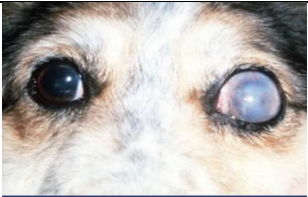
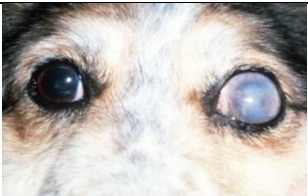
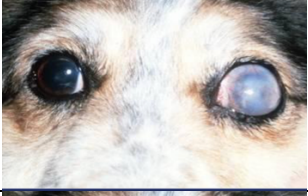
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Autologous serum	Topical Anti-protease/anti-collagenase	Complicated Ulcer		
Atropine 1% Tropicamide	Parasympatholytic Cytoplegic	Reflex uveitis from simple ulcers Penetrates the corneal layers		
Hydrocortisone	Topical Steroid	Does not penetrate the corneal layers		
Dexamethasone Prednisolone	Topical Steroid	Pannus Penetrates the corneal layers	Mineral deposits on the cornea over time	
Cyclosporine 1-2% Tacrolimus 0.03%	Topical immunomodulators	Pannus		
Cidofovir 0.5% sol. Idoxuridine 1% sol. Trifluridine 1% sol.	Topical Anti-viral therapy	FHV-1		

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Famciclovir L-lysine	Systemic anti-viral therapy	FHV-1		
Cyclosporine A	Broad Spectrum Abx	Feline Eosinophilic Keratitis		
Lubricants + Cyclosporine A Tacrolimus	Lubricants Immunomodulatory medications	Exposure Keratitis		
Saline 5%	Topical hyperosmotic	Corneal endothelial disease		
Dorzolamide 2% Brinzolamide 1%	Carbonic Anhydrase inhibitors Decrease aqueous humor production	Primary and secondary glaucoma! +/- Anterior Lens Luxation Penetrates the corneal layers		

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Latanoprost 0.005% Bimatoprost 0.03%	Prostaglandin Analogues Miotics Increase aqueous humor outflow	Glaucoma Rapid action to lower IOP in primary glaucoma +/-Posterior Lens Luxation Penetrates the corneal layers	Do not use with anterior lens luxation Do not use with secondary glaucoma Ineffective with cats and horses	
Timolol 0.5% Betaxolol 0.5%	Beta blockers Decrease aqueous humor production Works synergistically with CAIs	Used solo for prophylaxis in contralateral eye in primary glaucoma Penetrates the corneal layers	Bronchoconstriction Avoid in asthmatic cats Bradycardia Avoid in p with cardiac dz	
Demecarium bromide 0.25%	Parasympathomimetic Increases aqueous humor outflow via conventional pathway	Used for prophylaxis in contralateral eye in primary glaucoma		
Mannitol 20%	Hyperosmotic Therapy Diuretic Dehydrates vitreous body	Emergency treatment for acute glaucoma (primary glaucoma secondary to lens luxation)	Chronic glaucoma Assess hydration, cardiac and renal status prior to administration	