Breed Associated Eye Diseases
Quick Reference Guide
Foreword

Inherited or breed-related ocular diseases of dogs and cats have been and continue to be intensively studied by numerous investigators. Genetic, pathological, and clinical investigations of these conditions have contributed invaluably to the current body of knowledge in veterinary ophthalmology. In addition, the efforts of the Canine Eye Registry Foundation (CERF) have provided clinical data to better document and monitor the prevalence of these diseases among the canine population.

The following reference is intended to familiarize the veterinary practitioner with breed-related eye diseases. The information included, however, is not exhaustive and cannot be considered a replacement for a thorough anamnesis and ophthalmic examination. While certain breeds are strongly predisposed to specific conditions, it is important to bear in mind that the entire list of ocular diseases can be diagnosed in any breed (or breed combination).

Included at the end of this reference is a brief glossary for a number of the listed conditions. I urge the reader to consult the provided references as they can be invaluable clinical resources for the small animal practitioner.

Animal Eye Center of New Jersey
Canines

Cataracts
Inherited cataracts are exceptionally common among purebred dogs and genetic predisposition is the most common cause of cataracts within the species. In fact, of the breeds listed in this reference, only the Borzoi, Greyhound, Pomeranian, and Pug are not listed as having a predisposition to cataract development. The location, age of onset, and progression of cataract may vary between breeds and between individuals. In any canine patient diagnosed with cataracts, examination by a veterinary ophthalmologist is recommended. Early evaluation aids in providing a long-term prognosis for vision and in determining a patient’s candidacy for surgical cataract removal. Earlier surgical intervention for cataracts, if necessary, is associated with a higher rate of postoperative success.

Progressive Retinal Atrophy (PRA)
PRA is an “umbrella” term describing a number of breed-associated forms of retinal degeneration. Similar (but not identical) to retinitis pigmentosa in humans, these conditions involve progressive loss of retinal cell function and vision. Unfortunately, the vision impairment is irreversible and without definitive treatment at this time. The majority of the breeds listed in this reference have a documented predisposition for at least one form of PRA. In some breeds with certain forms, the progression may occur very quickly and at a very young age, while in others the progression and age of onset may be variable. Almost all forms of PRA result in long-term vision impairment and are likely to lead to complete blindness. There are many causes for progressive vision impairment or blindness in dogs, and therefore, examination by a veterinary ophthalmologist can aid in the definitive diagnosis of PRA, either through detailed fundic examination or electroretinographic testing (ERG). In addition, genetic tests for a number of breed-related forms of PRA are available through Optigen® (www.optigen.com).
Chihuahua
- Corneal endothelial dystrophy/degeneration
- Vitreous degeneration

German shepherd
- Chronic superficial keratitis ("pannus")
- Corneal dystrophy
- Medial canthal erosion syndrome
- Optic nerve hypoplasia

Chow chow
- Primary entropion
- Primary glaucoma

Golden retriever
- Distichiasis
- Ectopic cilia
- Primary entropion
- Iris cysts
- Pigmentary (immune-mediated) uveitis
- Retinal dysplasia
- Progressive retinal atrophy (PRA)

Doberman pinscher
- Microphthalmia
- Ligneous conjunctivitis
- Persistent hyperplastic primary vitreous
- Persistent tunica vasculosa lentis

Great dane
- Microphthalmia
- Primary entropion/ectropion
- Everted third eyelid ("scrolled" cartilage)
- Ciliary body cysts
- Primary glaucoma

Cocker spaniel
- Distichiasis
- Ectopic cilia
- Primary entropion/ectropion
- Imperforate lacrimal puncta
- Prolapsed third eyelid gland
- Keratoconjunctivitis sicca
- Corneal dystrophy
- Retinal dysplasia
- Primary glaucoma
- Progressive retinal atrophy (PRA)

English bulldog
- Distichiasis
- Ectopic cilia
- Prolapsed gland of the third eyelid
- Primary entropion/ectropion
- Keratoconjunctivitis sicca

English springer spaniel
- Primary entropion
- Corneal dystrophy
- Primary glaucoma
- Retinal dysplasia
- Progressive retinal atrophy (PRA)

Fox terrier
- Primary lens luxation
- Primary glaucoma

French bulldog
- Distichiasis

German shepherd
- Chronic superficial keratitis ("pannus")
- Optic nerve hypoplasia

Japanese Chin
- Primary medial entropion
- Pigmentary keratitis/exposure keratopathy syndrome

Labrador retriever
- Distichiasis
- Primary entropion
- Primary ectropion
- Iris melanoma
- Persistent hyaloid
- Persistent hyperplastic primary vitreous
- Persistent tunica vasculosa lentis
- Retinal dysplasia
- Progressive retinal atrophy (PRA)

Lhasa apso
- Distichiasis
- Ectopic cilia
- Prolapsed third eyelid gland ("cherry eye")
- Imperforate lacrimal puncta
- Keratoconjunctivitis sicca
- Pigmentary keratitis/exposure keratopathy syndrome

Greyhound
- Chronic superficial keratitis ("pannus")
- Persistent hyperplastic primary vitreous

Havanese
- Distichiasis
- Vitreous degeneration

Alaskan malamute
- Primary glaucoma
- Retinal dysplasia
- Progressive retinal atrophy (PRA)

Dachshund
- Microphthalmia
- Distichiasis
- Dermoid
- Chronic superficial keratitis ("pannus")
- Punctate superficial keratitis
- Corneal dystrophy

Italian greyhound
- Vitreous degeneration
Maltese
 Persistent hyaloid artery
 Progressive retinal atrophy (PRA)

Mastiff
 Primary entropion/ectropion
 Prolapsed third eyelid gland
 (“cherry eye”)
 Retinal dysplasia
 Progressive retinal atrophy (PRA)

Miniature Schnauzer
 Microphthalmia
 (with congenital cataract)
 Keratoconjunctivitis sicca
 Persistent hyaloid artery
 Progressive retinal atrophy (PRA)

Neapolitan mastiff
 Primary entropion/ectropion
 Prolapsed third eyelid gland

Newfoundland
 Primary entropion/ectropion
 Prolapsed third eyelid gland

Norwegian elkhound
 Primary glaucoma
 Progressive retinal atrophy

Pekingese
 Distichiasis
 Primary medial entropion
 Pigmentary keratitis/exposure
 keratopathy syndrome
 Facial fold trichiasis
 Keratoconjunctivitis sicca

Pointer (German short-haired)
 Everted third eyelid cartilage
 (“scrolled” cartilage)
 Persistent hyperplastic
 primary vitreous
 Persistent tunica vasculosa lentis
 Progressive retinal atrophy (PRA)

Pomeranian
 Distichiasis

Poodle
 Microphthalmia
 Distichiasis
 Ectopic cilia
 Imperforate lacrimal puncta
 Primary glaucoma
 Vitreous degeneration
 Retinal dysplasia
 Progressive retinal atrophy (PRA)
 Optic nerve hypoplasia
 Micropapilla

Pug
 Distichiasis
 Primary medial entropion
 Pigmentary keratitis/exposure
 keratopathy syndrome
 Keratoconjunctivitis sicca

Rottweiler
 Primary entropion
 Corneal dystrophy
 Iris cysts
 Retinal dysplasia

Saint Bernard
 Microphthalmia
 Primary entropion/ectropion
 Dermoid
 Everted third eyelid
 (“scrolled” cartilage)

Samoyed
 Corneal dystrophy
 Uveodermatologic syndrome
 (VKH-“like” syndrome)
 Primary glaucoma
 Retinal dysplasia
 Progressive retinal atrophy

Shar pei
 Primary entropion
 Prolapsed third eyelid gland
 (“cherry eye”)
 Primary glaucoma
 Primary lens luxation
 Congenital esotropia

Shetland sheepdog
 Corneal dystrophy
 Persistent hyperplastic
 primary vitreous
 Persistent tunica vasculosa lentis
 Progressive retinal atrophy (PRA)

Shiba inu
 Primary glaucoma

Shih tzu
 Distichiasis
 Ectopic cilia

Siberian husky
 Corneal dystrophy
 Uveodermatologic syndrome
 (VKH-“like” syndrome)
 Primary glaucoma
 Progressive retinal atrophy (PRA)

Weimeraner
 Primary entropion
 Everted third eyelid
 (“scrolled” cartilage)

Welsh corgi
 Indolent corneal ulceration
 Retinal dysplasia

West Highland white terrier
 Keratoconjunctivitis sicca

Yorkshire terrier
 Congenital alacrima
 (absolute KCS)
 Corneal dystrophy
 Retinal dysplasia
 Progressive retinal atrophy (PRA)
Felines

Birman
  Dermoid

Burmese
  Prolapsed third eyelid gland
    (“cherry eye”)

Persian/Himalayan
  Entropion
  Exposure keratopathy syndrome
  Corneal sequestrum

Siamese
  Congenital nystagmus
    (pendular)

Glossary

Anterior uveitis: inflammation of the ciliary body and/or iris

Cataract: opacity of the lens and/or lens capsule

Choroid: the posterior aspect of the uveal tract immediately external to the retina

Chronic superficial keratitis: immune-mediated disease of the conjunctiva and cornea of dogs; also known as pannus

Collie eye anomaly: inherited developmental defect of collies and related breeds characterized by choroidal hypoplasia, with or without colobomas, and retinal detachment

Coloboma: congenital absence of any ocular tissue

Corneal dystrophy: progressive and bilateral hereditary corneal disease, unassociated with inflammation

Corneal sequestrum: condition unique to the cat cornea in which a region of corneal stroma acquires an amber to black discoloration and undergoes degeneration; corneal ulceration may or may not be concurrent

Dermoid: a congenital choristomatous tumor consisting of skin and its appendages

Distichiasis: condition in which cilia (eyelashes) emerge abnormally from one or more meibomian gland orifices

Ectopic cilia: abnormal hair/cilia protruding through the palpebral conjunctiva

Entropion: eversion or outward rolling of the eyelid

Ectropion: introversion or inward rolling of the eyelid

Episcleritis: inflammation of the connective tissue immediately exterior to the sclera
**References**


**Lens luxation**: disinsertion of the lens zonules from the complete lens equator such that the lens displaces into the anterior chamber (anterior luxation) or the vitreous chamber (posterior luxation)

**Macropalpebral fissure**: horizontally enlarged palpebral fissure due to excessive eyelid length

**Microphthalmos**: congenitally small globe

**Nodular granulomatous episclerokeratoconjunctivitis (NGE)**: a disease characterized by a raised tan-pink mass or masses, arising from the episclera usually at the dorsolateral corneoscleral limbus; suspected to be immune-mediated

**Persistent pupillary membranes**: congenital defect in which persistent strands of fetal vascular tissue extend from the iris collarette to other regions of the iris, to the anterior lens capsule, or to the corneal endothelium

**Retinal dysplasia**: abnormal differentiation of the retinal layers

**Staphyloma**: protrusion of uveal tissue into a bulging area of cornea and/or sclera due to thinning or rupture of the eye wall

**Uveodermatologic syndrome**: autoimmune destruction of melanocytes causing marked panuveitis, retinitis, and dermatitis seen in dogs; canine counterpart to human Vogt-Koyanagi-Harada (VKH) syndrome

**What the AEC of NJ is all about:**

Dr. Michael Brown has been providing cutting edge ophthalmology services in Little Falls since 1996. He was the driving force behind establishing this area’s first ophthalmology-dedicated specialty center. The Animal Eye Center of NJ, a partner of Animal Emergency & Referral Associates in Fairfield, was the first veterinary practice in the world to use the Whitestar Signature Phacoemulsification Unit, a sophisticated and successful cataract removal treatment modality.

**Meet Our Ophthalmologists**

**Michael H. Brown, DVM, MS, Diplomate ACVO**

Dr. Brown received his Doctorate of Veterinary Medicine from Kansas State University and then completed a small animal internship at the Animal Medical Center in New York City. After returning to Kansas State University for a comparative ophthalmology residency, he received a Master of Science degree for his biochemical study of animal tears.

Dr. Brown became a Diplomate of the American College of Veterinary Ophthalmologists in 1996. His special interests include diseases of the cornea, corneal surgery, intraocular surgery, and diseases of the retina. He has written scientific papers and is a noted lecturer throughout the country.
Bradford J. Holmberg, DVM, MS, PhD, Diplomate ACVO

Dr. Holmberg received his Doctorate of Veterinary Medicine from the University of Missouri. He completed a small animal internship at the University of Florida and then pursued a comparative ophthalmology residency at the University of California – Davis.

In addition, Dr. Holmberg received his Master of Science in neuroscience from Purdue University and his Doctorate of Philosophy with a concentration in neuroendocrinology from the University of Missouri. Dr. Holmberg became a Diplomate of the American College of Veterinary Ophthalmologists in 2005.

His special interests include exotic animal ophthalmology and all aspects of ophthalmic surgery. Dr. Holmberg has been awarded several prestigious research grants, has written numerous scientific papers, and has contributed chapters to several veterinary textbooks. He joined Animal Eye Center in August 2006.

J. Seth Eaton, VMD, Diplomate ACVO

Dr. Eaton graduated magna cum laude from the University of Pennsylvania, School of Veterinary Medicine in 2004. He then completed internships in general medicine/surgery and ophthalmology at the Animal Medical Center in New York City. He joined the ophthalmology service at the University of California - Davis as an ophthalmology resident in August, 2006.

His clinical interests include corneal therapeutics, neuro-ophthalmology and intraocular surgery. He joined Animal Eye Center in September 2009.

DIRECTIONS to AEC
48 Notch Road, Little Falls, NJ 07424

From Points North
Take the Garden State Parkway (GSP) south to exit 154 (Rt. 46/Clifton). Follow signs for Rt. 46 west. Take the Great Notch/Cedar Grove exit. Make a left at the stop sign onto Notch road. The Animal Eye Center is the first building ahead on your left immediately after crossing over Rt. 46.

From Points South
Take the GSP north to exit 153B (Rts. 3 and 46). Follow signs for Rt 46 west. Take the Great Notch/Cedar Grove exit. Make a left at the stop sign onto Notch road. The Animal Eye Center is the first building ahead on your left immediately after crossing over Rt. 46.

From Points West (via Rt. 46)
Follow Rt. 46 east. Take the Great Notch/Little Falls exit. (after the Lower Notch exit) Bear right onto the off ramp. The Animal Eye Center is across the street on your left.

From Points West (via Route 80)
Follow Route 80 east to exit 56A (Squirrelwood Road/West Paterson). You will merge onto Squirrelwood Road. Follow this road (the name will change to Rifle Camp Road) for approximately 3.5 miles. The Animal Eye Center is the first building ahead on your left immediately after crossing over Rt. 46.

From Points East (Lincoln Tunnel)
Follow signs for Route 3 west. Route 3 will merge with Route 46 west. Take the Great Notch/Cedar Grove exit. Make a left at the stop sign onto Notch road. The Animal Eye Center is the first building ahead on your left immediately after crossing over Rt. 46.

From Points East (Holland Tunnel)
Take Route 78 west to the GSP. Follow directions above from points south.

From Points East (George Washington Bridge)
Take Route 80 west to exit 56 (Squirrelwood Road/West Paterson). Make a left after the off ramp onto Squirrelwood Road. Follow this road (the name will change to Rifle Camp Road) for approximately 3.5 miles. The Animal Eye Center is the first building ahead on your left immediately after crossing over Rt. 46.