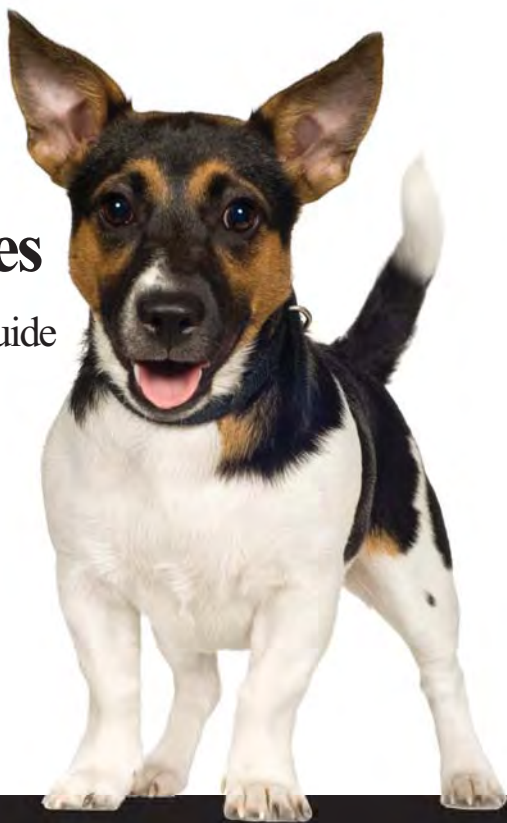


Breed Associated Eye Diseases

Quick Reference Guide



**Animal Eye Center
of New Jersey**

Little Falls, New Jersey
888.722.7200

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Monday – Friday
8:00 AM – 5:00 PM

animaleysofnj.com
animalerc.com

Local: 973.890.4430
Toll free: 888.722.7200
Fax: 973.890.4876



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 invaluable 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.

Joshua Seth Eaton, VMD
Diplomate, American College of Veterinary Ophthalmologists

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).

Akita

- Primary entropion
- Uveodermatologic syndrome (VKH-“like” syndrome)

Australian shepherd

- Distichiasis
- Merle ocular dysgenesis
- Microphthalmia
- Iris coloboma
- Choroidal hypoplasia

Basenji

- Corneal dystrophy
- Persistent pupillary membranes

Basset hound

- Primary ectropion/macrolepharon
- Primary entropion
- Primary glaucoma

Beagle

- Distichiasis
- Prolapsed third eyelid gland (“cherry eye”)
- Corneal dystrophy
- Primary (“open-angle”) glaucoma
- Retinal dysplasia

Bedlington terrier

- Microphthalmia
- Distichiasis
- Imperforate lacrimal puncta
- Retinal dysplasia

Bichon frise

- Distichiasis

Border collie

- Collie eye anomaly
- Nodular granulomatous episclerokeratitis (NGE)
- Primary lens luxation

Borzoi

- Multifocal retinopathy (idiopathic)

Boston terrier

- Distichiasis
- Corneal endothelial dystrophy/degeneration
- Primary glaucoma

Bouvier des Flandres

- Primary glaucoma
- Persistent hyperplastic primary vitreous
- Persistent tunica vasculosa lentis

Boxer

- Distichiasis
- Primary ectropion
- Indolent corneal ulcerations

Bull terrier

- Primary lens luxation

Cavalier King Charles spaniel

- Distichiasis
- Corneal dystrophy
- Keratoconjunctivitis sicca
- Retinal dysplasia

Chihuahua

Corneal endothelial
dystrophy/degeneration
Vitreous degeneration

Chow chow

Primary entropion
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)

Collie

Microphthalmia
Nodular granulomatous
episclerokeratitis (NGE)
Collie eye anomaly
Progressive retinal atrophy (PRA)

Dachshund

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

Uveodermatologic syndrome
(VKH-"like" syndrome)
Progressive retinal atrophy
Micropapilla (small optic nerve)
Optic nerve coloboma

Doberman pinscher

Microphthalmia
Ligneous conjunctivitis
Persistent hyperplastic primary
vitreous
Persistent tunica vasculosa lentis

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")
Corneal dystrophy
Medial canthal erosion syndrome
Optic nerve hypoplasia

Golden retriever

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

Great dane

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

Greyhound

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

Havanese

Distichiasis
Vitreous degeneration

Italian greyhound

Vitreous degeneration

Jack Russell terrier

Primary lens luxation
Primary glaucoma
Vitreous degeneration

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

Alaskan malamute

Primary glaucoma
Retinal dysplasia
Progressive retinal atrophy (PRA)

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
Punctate superficial keratitis
Uveodermatologic syndrome
(VKH-"like" syndrome)
Collie eye anomaly

Shiba inu

Primary glaucoma

Shih tzu

Distichiasis
Ectopic cilia

Primary medial entropion
Pigmentary keratitis/exposure
keratopathy syndrome
Keratoconjunctivitis sicca
Vitreous degeneration
Progressive retinal atrophy (PRA)
Optic nerve hypoplasia

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

Ectropion: eversion or outward rolling of the eyelid

Entropion: introversion or inward rolling of the eyelid

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

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

References

Maggs DJ, Miller PE, and Ofri R, eds. *Slatter's Fundamentals of Veterinary Ophthalmology*. 4th ed. St. Louis: Elsevier, 2008.

Gelatt KN, ed. *Veterinary Ophthalmology*. 4th ed. Wiley and Sons, 2007.

Ocular Disorders Presumed to be Inherited in Purebred Dogs. 3rd ed. 1999, American College of Veterinary Ophthalmologists.

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

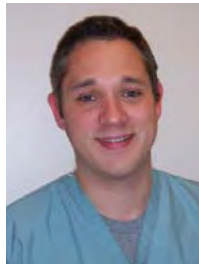
Doctorate of Philosophy with a concentration in neuroendocrinology from the University of Missouri. Dr. Holmberg became a Diplomate of the American College of Veterinary Ophthalmologists in 2005.

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/Cedar Grove 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.

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