



Ocular disorders known or presumed to be inherited (published)

	Diagnosis	Description and comments specific to the breed	Inheritance	Gene/ marker test	References
A	Microphthalmia with multiple ocular anomalies		Presumed autosomal dominant	NO	1,2,3,4
B	Distichiasis		Unknown	NO	3,4
C	Prolapsed gland of the nictitating membrane		Unknown	NO	3,4
D	Corneal dystrophy		Unknown	NO	3,4,5,6,7,8,9
E	Persistent pupillary membranes		Unknown	NO	4
F	Iris cysts		Unknown	NO	3,4
G	Cataract		Unknown	NO	1,3,4,10,11
H	Glaucoma	Primary open angle glaucoma (POAG). The IOP is elevated by one year of age	Autosomal recessive	ADAMTS10	3,4,12,13,14 15,16,17,18 19,20,21,22, 23,24,25
I	Tapetal degeneration		Presumed autosomal recessive	NO	3,4,26,27,28 29

J	Progressive Retinal Atrophy (PRA)		Unknown	NO	3,4
K	Retinal dysplasia -multifocal		Unknown	NO	3,4
L	Optic nerve hypoplasia		Unknown	NO	3,4
M	Coloboma of the optic nerve		Unknown	NO	3,4
N	Congenital stationary night blindness (CSNB)		Autosomal recessive	LRIT3	30, 31

The ECVO's advice relating to hereditary eye disease control

Please see ECVO Manual chapter 8: VET Advice

Recommendations regarding age and frequency for eye examinations

Please see ECVO Manual chapter 7: ECVO Age and Frequency recommendations

Other ocular disorders (reported)

	Diagnosis	Source

References

1. Rubin LF. Hereditary microphakia and microphthalmia syndrome in the beagle. Trans Am Coll Vet Ophthalmol 1971; 2: 50.
2. Anderson AC, Shultz FT. Inherited (congenital) cataract in the dog. Am J Path. 1958; 34: 956.
3. Rubin LF (1989) Inherited ocular diseases in purebred dogs. Williams & Wilkins, Baltimore, 22-30.

4. Chaudieu G, Chahory S Affections oculaires héréditaires ou à prédisposition raciale chez le chien. 2nd ed, Ed. du Point Vétérinaire, 2013 pp.307-311.
5. Roth AM, Ekins MB, Waring GO, 3rd, et al. Oval corneal opacities in beagles. III. Histochemical demonstration of stromal lipids without hyperlipidemia. Invest Ophthalmol Vis Sci. 1981; 21: 95-106.
6. Ekins MB, Sgoutas DS, Waring GO, 3rd, et al. Oval lipid corneal opacities in beagles: VI. Quantitation of excess stromal cholesterol and phospholipid. Exp Eye Res. 1983; 36: 279- 286.
7. Morrin LA, Waring GO, 3rd, Spangler W. Oval lipid corneal opacities in beagles: ultrastructure of normal beagle cornea. Am J Vet Res. 1982; 43: 443-453.
8. Spangler WLea. Oval corneal opacities in Beagles, V. Ultrastructure. Vet Pathol. 1982; 19: 150.
9. Waring GOea. Oval lipid corneal opacities in beagles and crystalline lipid corneal opacities in Siberian Huskies. Metab Pediatr Ophthalmol. 1979; 3.
10. Heywood R. Juvenile cataracts in the Beagle dog. J Small Anim Pract. 1971; 12.
11. Hirth RS, Greenstein ET, Peer RL. Anterior capsular opacities (spurious cataracts) in Beagle dogs. Vet Pathol. 1974; 11: 181-194.
12. Gelatt KN. Familial glaucoma in the Beagle dog. J Am Anim Hosp Assoc. 1972; 8: 23.
13. Gelatt KN, Peiffer RL, Gwin RM, et al. Glaucoma in the beagle. Trans Am Acad Ophthal Otolaryngol 1976: 81.
14. Gelatt KN, Peiffer RL, Jr., Gwin RM, et al. Clinical manifestations of inherited glaucoma in the beagle. Invest Ophthalmol Vis Sci. 1977; 16: 1135-1142.
15. Peiffer RL, Jr., Gelatt KN. Aqueous humor outflow in Beagles with inherited glaucoma: gross and light microscopic observations of the iridocorneal angle. Am J Vet Res. 1980; 41: 861- 867.
16. Gelatt KN, Gum GG. Gelatt KN, Gum GG: Inheritance of primary glaucoma in the beagle. Am J Vet Res. 1981; 42: 1691.

17. Slater MR, Erb HN. Effects of risk factors and prophylactic treatment on primary glaucoma in the dog. *J Am Vet Med Assoc.* 1986; 188: 1028-1030.
18. Brooks DE, Samuelson DA, Gelatt KN. Ultrastructural changes in laminar optic nerve capillaries of beagles with primary open-angle glaucoma. *Am J Vet Res.* 1989; 50: 929-935.
19. Brooks DE, Samuelson DA, Gelatt KN, et al. Morphologic changes in the lamina cribrosa of beagles with primary open-angle glaucoma. *Am J Vet Res.* 1989; 50: 936-941.
20. Samuelson DA, Gum GG, Gelatt KN. Ultrastructural changes in the aqueous outflow apparatus of beagles with inherited glaucoma. *Invest Ophthalmol Vis Sci.* 1989; 30: 550- 561.
21. Brooks DE, Strubbe DT, Kibilis PS, et al. Histomorphometry of the optic nerves of normal dogs and dogs with hereditary glaucoma. *Exp Eye Res.* 1995; 60: 71-89.
22. Gum GG, Gelatt KN, Knepper PA. Histochemical localization of glycosaminoglycans in the aqueous outflow pathways in normal beagles and beagles with inherited glaucoma. *Prog Vet Comp Ophthalmol.* 1993; 3.
23. Gelatt KN, Gum GG, MacKay EO, et al. Estimations of aqueous humor outflow facility by pneumotonography in the normal, genetic carrier and glaucomatous beagles. *Vet Comp Ophthalmol.* 1996; 6: 148.
24. Kuchtey J, Olson LM, Rinkoski T, et al. Mapping of the disease locus and identification of ADAMTS10 as a candidate gene in a canine model of primary open angle glaucoma. *PLoS Genet.* 2011; 7: e1001306.
25. Kuchtey J, Kunkel J, Esson D, Sapienza JS, Ward DA, Plummer CE, Gelatt KN, Kuchtey RW. Screening ADAMTS10 in dog populations supports Gly661Arg as the glaucoma-causing variant in beagles. *Invest Ophthalmol Vis Sci* (2013) 13;54(3):1881-6.
26. Belhorn Rea. Hereditary tapetal abnormality in the Beagle. *Ophtho Res.* 1975; 7.
27. Wen ea. Changes in the tapetum of Beagles with heredity abnormality. *Invest Ophthalmol Vis Sci.* 1982; 23.
28. Burns MS, Bellhorn RW, Impellizzeri CW, et al. Development of hereditary tapetal degeneration in the beagle dog. *Curr Eye Res.* 1988; 7: 103-114.

29. Burns MS, Tyler NK, Bellhorn RW. Melanosome abnormalities of ocular pigmented epithelial cells in beagle dogs with hereditary tapetal degeneration. *Curr Eye Res.* 1988; 7: 115-123.
30. Kondo M, Das G, Imai R, et al. A naturally occurring canine model of autosomal recessive congenital stationary night blindness. *PLoS One.* 2015;10:e0137072.
31. Das RG, Becker D, Jagannathan V, Goldstein O et al. Genome-wide association study and whole genome sequencing identify a deletion in LRIT3 associated with canine congenital stationary night blindness. *Scientific reports* 9 (1), 1-12, 2019.