

## In the Blink of an Eye

**Glaucoma blinds before most owners even notice a problem, but gene therapy offers hope.**

*Jo Rossman*

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"Glaucoma can be likened to a bathtub in which water is supposed to be flowing in and draining out, but there is a problem with the drain," said Dr. Gelatt, a professor of comparative ophthalmology in the Colleges of Veterinary Surgery and Medicine at the University of Florida in Gainesville. "In a bathtub, the water overflows. But in the eye, there is no way for fluid to overflow, so pressure increases."

Glaucomas are classified by three general causes: Canine glaucoma unrelated to another condition is called primary glaucoma; accounting for most cases, this type is linked to specific breeds and generally appears when a dog is 4 to 8 years old. When glaucoma is caused by another eye condition inflammation, lens luxation (the dislocation of the eye's lens), injury, tumor, infection or previous surgery, for example it is known as secondary glaucoma. Birth defects that cause the eye to develop improperly can cause congenital glaucoma in puppies, a rare condition.

Because primary glaucoma is linked to breed, it is assumed hereditary, but the defective gene may be unique to each breed. "That increases research expenses and slows down the development of DNA tests because you have to work on two or three breeds at a time and figure it out," said Dr. Gelatt, a past president and a founder of the American College of Veterinary Ophthalmologists and editor-in-chief of the Journal of Veterinary Ophthalmology.

A lack of available information about affected dogs' heritage has also hindered researchers. "Primary glaucoma is generally a middle-age disease the dog is 4 or 5 or 6 when it shows up," Dr. Gelatt said. "Frequently, by that time, contact with the initial breeder has been lost."

While the Canine Eye Registration Foundation collects data on heritable eye diseases, exams are generally conducted at breeding age, when primary glaucoma seldom has shown visible symptoms. CERF does not require dogs to be tested for glaucoma to be certified as eye-disease-free, but even if they were tested, most that can pass on the disease would appear normal at the time of the exam. By the time the breeder realizes a dog has glaucoma, several litters may have been produced.