



PURINA Pro Club

Rottweiler Update

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Researchers Study PPS Cataracts in Rottweilers

Francis Keays of Half Moon Bay, Calif., was unprepared to learn that her promising 19-month-old Rottweiler, "Duncan," had cataracts after a routine Canine Eye Registration Foundation (CERF) eye examination. "I was shocked," she says.

Cataracts are the most common treatable form of blindness in dogs and the most commonly reported eye disease diagnosed in Rottweilers. Among Rottweilers tested for eye disease, 8 percent are diagnosed with cataracts.¹ Of these, between 5 percent and 6 percent are identified as posterior polar subcapsular (PPS) cataracts, or slow-developing opacities in the central (polar) posterior (back part) of the lens in which the typical age of incidence is around 18 months of age.

Despite the prevalence of cataracts in the breed, many breeders and owners are misinformed or unaware of the problem. Laura Wright-Smith of New Castle, Colo., has owned Rottweilers since 1989. She competes with her dogs in obedience, conformation, herding and rally, and all are AKC conformation champions. Some are certified therapy dogs.

Wright-Smith never realized that Rotties are susceptible to cataracts until her dog, "Raku," was diagnosed in 2000. "I had never heard of cataracts until my 2-year-old male failed his CERF examination," she says. Like Keays' dog Duncan, Raku was diagnosed with PPS cataracts.

Gregory Acland, B.V.Sc., professor of medical genetics at the James A. Baker Institute for Animal Health at

Cornell University's College of Veterinary Medicine, says, "A few affected dogs develop a unilateral cataract that is a cataract that occurs in only one eye, in which case the other eye often remains normal for life. Other dogs test normal on multiple ophthalmologic examinations and do not develop cataracts until they are 4 to 6 years of age."

Losing Functional Vision

The canine eye, like the human eye, has a clear lens inside that is used for focusing. A cataract is an opacity that forms on the lens, inhibiting light from reaching the retina. Cataracts may begin as small cloudy sections of the lens that do not impair vision. Typically the opacity grows to cover the entire lens and functional vision is lost.

Cataracts may develop in one or both eyes quickly over the course of several weeks or slowly over several years. Cataracts also can occur as a secondary complication to eye disorders such as progressive retinal atrophy, glaucoma and inflammatory uveitis and to health conditions such as traumatic injuries or metabolic disorders like diabetes.

Some types of cataracts are known to be hereditary, and many others are considered to be hereditary, Acland says. Approximately 60 breeds are known to have a higher than average incidence of some form of primary cataract.² Breeding recommendations for affected dogs vary, creating a degree of uncertainty among breeders about which dogs are all right to breed.

Several factors determine the diagnosis, prognosis and best breeding recommendation for an individual dog. The dog's age, location of cataract within the lens, and pattern of opacity are evaluated to determine if cataracts are hereditary and likely to progress.

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Surgery resolves cataracts for dogs that are eligible candidates, but it is important to consider genetic impact. "The inheritance patterns of PPS cataracts have been looked at a lot more in Labrador Retrievers and Golden Retrievers," says Sue Pearce-Kelling, manager at Optigen in Ithaca, N.Y., a diagnostic testing laboratory that provides DNA test services for breeders and dog owners.

"Based on that research, PPS cataracts are presumed to have a recessive mode of inheritance. This would mean that a dog would need to inherit the gene mutation from both parents to be affected. Carriers would inherit one causative gene and would not be affected. Although we still don't know for sure, it is recommended that breeders do not breed Rottweilers affected with cataracts."

For most dogs, surgery to remove the cataract(s) becomes necessary. As long as a dog is in good general health with no other significant eye problems, the animal is considered a good candidate for cataract surgery. The success rate for cataract surgery is greater than 90 percent due, in part,

Rottweiler Owners May Participate in Cataract Research

Rottweiler owners whose dogs have been diagnosed with posterior polar subcapsular (PPS) cataracts, or slow-developing cataracts in which the typical age of incidence is around 18 months of age, may participate in research to learn the mode of inheritance of this type of cataract.

Investigators at Optigen and Cornell University are seeking dogs that have developed PPS cataracts by 18 months of age and have been CERF-tested with posterior cortex marked in the lens box. To participate, owners should submit a copy of an eye examination along with a four- or five-generation pedigree to Optigen. For information, please contact Sue Pearce-Kelling at Optigen at suepk@optigen.com.

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to more sophisticated equipment and ever-improving surgical techniques.

The most common method of canine cataract removal is phacoemulsification, the same procedure used for human cataract removal. In surgery, a veterinarian makes a small incision through which a probe is used to break up the cataract with ultrasonic vibration. After the entire lens is removed, an artificial replacement lens, called an intraocular lens, is put in place.

Optigen Sponsors 20/20 Clinics to Test for Genetic Eye Disease

Optigen, a diagnostic testing laboratory in Ithaca, N.Y., offers owners and breeders discounts for genetic eye testing when at least 20 dogs are tested. Optigen also holds 20/20 clinics in which genetic eye testing is performed. Board-certified veterinary ophthalmologists are sometimes on hand at 20/20 clinics to conduct Canine Eye Registration Foundation (CERF) testing. For information, visit www.optigen.com/opt11_calendar.taf for a listing of upcoming 20/20 clinics.

Better anti-inflammatory drugs also contribute to the success of cataract surgery. Owners can expect aggressive therapy with non-steroidal anti-inflammatory drugs for dogs for several weeks after surgery. These drugs help to control the inflammation that is a consequence of cataract surgery.

When Keays learned that Duncan had cataracts, she was concerned that he might eventually go blind. Now, 10 years old, Duncan sees fine and has never needed treatment or surgery. Fortunately, his cataracts have not progressed.

This is not always the case. Wright-Smith urges owners to proceed cautiously when a dog has been diagnosed with cataracts. "I have one Rottweiler with posterior polar subcapsular cataracts that were found when he was 2, who was neutered and never bred. His dam had cataracts as did two siblings. One sibling was bred, producing a male that had severe cataracts and lost most of his vision by age 2."

Researchers studying cataracts in humans have found several mutations believed to be associated with inherited cataracts. Canine investigators have studied 20 genes linked to hereditary cataracts in humans to identify genetic counterparts in dogs that may cause various forms of cataracts. The research has successfully led to

identification of mutations responsible for hereditary cataracts in Staffordshire Bull Terriers, Boston Terriers and Australian Shepherds.³

Meanwhile, investigators at Optigen in conjunction with researchers at Cornell University are specifically looking at posterior polar subcapsular (PPS) cataracts in several breeds of dog, including Rottweilers, Labrador Retrievers and Golden Retrievers.

"The dogs in the study should have CERF exams in which the posterior cortex has been marked in the lens box," explains Pearce-Kelling. "We expect to have some answers on the mode of inheritance about a year down the road. Our goal is to develop a genetic test to identify carriers and affected and normal dogs. Once a test is available, breeders will be able to selectively breed to help decrease cataracts in the breed."

Testing for Eye Disease

The American Rottweiler Club (ARC) urges breeders and owners of Rottweilers to have their dogs' eyes tested annually until age 7 for cataracts and other eye diseases common to the breed, such as entropion and ectropion, genetic conditions in which the eyelids turn inward or outward, respectively. The parent club also encourages Rottweiler owners to participate in the Canine Health Information Center (CHIC) database by submitting eye test results as well as test results for other health conditions.

Sponsored by the Orthopedic Foundation for Animals (OFA) and the AKC Canine Health Foundation, CHIC currently serves 80 national parent clubs. Providing a centralized health database on individual dogs, CHIC recognizes a breed's specific health concerns, with each parent club choosing the set of health tests needed for its breed.

Rottweilers were one of the original eight pilot breeds when CHIC began in 2001, says Eddie Dziuk, director of OFA and founder of CHIC. "CHIC provides a database to archive data, promote more informed breeding decisions, increase awareness of health issues and testing, and promote betterment of the breed through the pursuit of breeding better dogs," he says.

The four health conditions that Rottweilers are tested for are:

- Hip and elbow dysplasia, with results accepted from OFA, PennHIP, the Institute for Genetic Disease Control (GDC) or the Ontario Veterinary College (OVC);
- Eye disease, with results accepted from the Canine Eye Registration Foundation (CERF); and
- Congenital cardiac disease, with results accepted from OFA.

A board-certified veterinary ophthalmologist must examine a dog for the eye test and submit the results to CERF. The owner must also submit

the results to CERF to obtain certification. Test results from OFA and CERF are shared automatically with CHIC at no cost to owners. To enter results from another source, there is a one-time fee of \$25 a dog.

Although Rottweilers only need to be tested one time for cardiac disease and hip and elbow dysplasia to be enrolled in CHIC, annual testing for cardiac disease is recommended and is required for eye disease. As new results are recorded, an updated CHIC report is generated.

Health test results can be entered into the CHIC database regardless whether a dog has normal results; however, the results can only be listed in the open registry if an owner chooses to share the information publicly. A dog receives CHIC certification if the results are open, which encourages owners to share information publicly even when a dog doesn't pass all the required tests.

A CHIC-certified dog is noted on the OFA Web site with a red-white-and-blue banner by the dog's name, and owners receive a CHIC certificate in the mail. CHIC numbers are updated annually and new CERF results are entered automatically, requiring no additional fees or paperwork.

One of the most important aspects of the CHIC database is the ability to provide research and statistical information to scientists without the disclosure of individual dogs. Parent clubs may tap into the CHIC data on their breed to help determine health research priorities. As the database becomes more complete, researchers will be able to use the information for epidemiological studies that will enhance knowledge of health issues affecting all breeds of dogs.

Though a genetic test is not yet available to identify Rottweilers that carry the gene mutation causing cataracts, owners and breeders can test for cataracts and use selective breeding to reduce the incidence in their bloodlines. Hopefully, as more information is learned about cataracts in the breed, the day will come when no dog suffers blindness due to cataracts. ■

¹ Ocular Disorders Presumed to be Inherited in Purebred Dogs. Genetics Committee, American College of Veterinary Ophthalmologists. 2007, fifth edition.

² Prevalence of primary breed-related cataracts in the dog in North America. *Vet. Oph.* 2005, March-April; 8(2):101-11.

³ Autosomal Dominant Cataract: Intrafamilial Phenotypic Variability, Interocular Asymmetry, and Variable Progression in Four Chilean Families. *Am. J. Ophthalmol.* 2006, April; 141(4): 750-752.

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