

Collie Eye Anomaly

Collie Eye Anomaly, or **CEA**, is a genetic disorder of the eye found in multiple breeds, including most frequently in herding dogs, especially collies and Shetland sheepdogs. The mutation affects the inner structures of the eye, such as the choroid, the retina and the optic disk.

Researchers first noted this problem in the 1960s, but the mutation was only pinpointed in 2007. **It was found to exist in most Collies and in most Collie families. CEA's physical symptoms are present prior to birth. It can present, however, with different degrees of severity.**

Collie Eye Anomaly (CEA) can be easily checked when the puppies are 6-8 weeks old, by a Board Certified Ophthalmologist. The eyes are dilated prior to the examination, so the interior of the eye can be examined with an ophthalmoscope. If the puppy's eyes are not normal, the actual abnormality is noted. Historically, a grading system (mild/moderate/severe) was used, but today only the abnormal findings are noted.

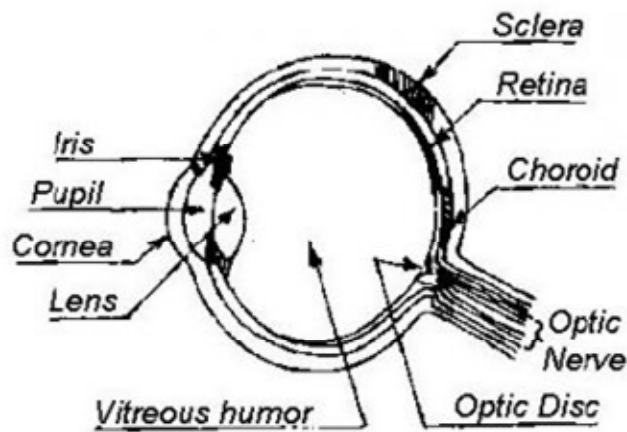
Most dogs with CEA today have no vision defects, thanks to multiple generations of breeding only the least severely affected dogs. CEA is an autosomal recessive disorder, which means a dog requires two copies of the mutation to show symptoms. Thankfully, this disorder generally does not worsen over time. Ophthalmic examination for CEA should be done by all breeders on their puppies at 6-8 weeks. The genetic mutation for CEA can also be tested for using the Optimal Selection test, however this will not replace examination by an ophthalmologist.

- **Can my Collie's eyes become worse? Might he later go blind?**

A dog born with a severe Staphyloma or with Vascular Disease may later suffer loss of vision if a detachment or severe hemorrhage occurs. The majority of dogs that are mildly affected will generally have perfectly adequate vision throughout their life. Even a dog with one blind eye will adapt perfectly well in his surroundings.

- **What have breeders done to improve Collie eyes?**

When the eye problem was identified more than 50 years ago, it was **estimated that 90% of the Collie population was affected with some form of eye disease.** Because CEA has involved such a large percentage of the breed, eradication is difficult. Over the years, with selective breeding and ophthalmic examination of breeding stock, the number of seriously affected Collies has been greatly reduced. ALL reputable breeders should have only their breeding stock, but all puppies that are offered for sale examined by a board certified ophthalmologist.



CEA Eye Grades and their Meaning

Normal: A "Normal" eye rating is, of course, **ideal**. However, some normal-eyed collies still are affected by the mutation and breed as affected. The only way to determine if a Collie is **genetically normal is a DNA test**. There are variations even in "Normal" eyes that correspond somewhat to a dog's **coat color**. It is often difficult to judge choroidal hypoplasia in a Blue Merle's eyes as the retinal pigment is diluted along with his coat color and can sometimes be diagnosed as Choroidal Hypoplasia.

Choroidal Hypoplasia is an abnormality in the development or pigmentation of the choroid. The choroid is a vascular bed beneath the retina. This is the most common abnormality found in Collie eyes. It is the least harmful and least severe form of CEA. Most dogs with this eye grade **function normally with no obvious vision deficits**. Puppies with **minimal choroidal hypoplasia** may **look normal** at subsequent examinations because the area fills in with pigment. These puppies used to be referred to as "**go normal**", but since they remain affected genetically, the term used now is that the area may be "masked" at a later date. **This is the only grade of CEA collie breeders are allowed to use for breeding.**

Retinal folds occur when the developing retina **folds on itself**. It is commonly seen associated with CEA in **puppies**. These folds commonly **resolve with age**.

Staphyloma, Coloboma, Ectasia: While not completely synonymous, these terms all refer to a **cupping or bulging in the back of the eye**, usually in the area of the **optic disc**. These conditions **may or may not be of serious nature**. It depends on the **size** and/or **where** the "bulge/cupping" is located. **Large colobomas** or **severe ectasia** of the sclera can lead to **retinal detachment**.

Vascular Disease or Tortuous Blood Vessels are defects in the blood vessels of the eye which are responsible for its supply and "nourishment." These may be malformed, undersized, or even lacking.

Retinal Detachment is a loosening or separation of the inmost, or retina, layer from the wall of the eye. This may involve a tiny area or the entire retina. It can be either one or both eyes. The complete detachment of the retina results in blindness. This is the most severe grade of CEA.