

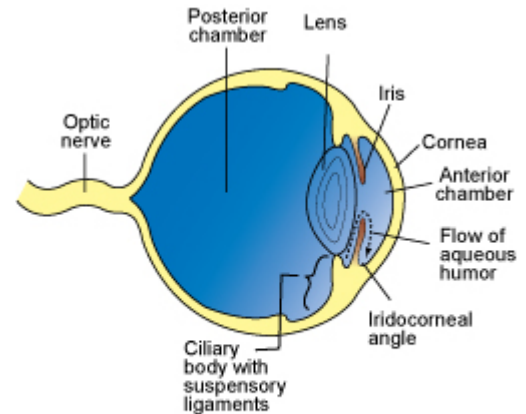
## Glaucoma in Dogs

### What is intraocular pressure and how is it maintained?

The size and shape of the normal eye is maintained by the amount of fluid within the eyeball. The pressure of the fluid inside the front or anterior chamber of the eye is known as the *intra-ocular pressure* (IOP). Fluid inside the eye is constantly produced by a structure called the *ciliary body*. In addition to producing this fluid (*aqueous humor*), the ciliary body contains the *suspensory ligaments* which hold the lens in place. Muscles in the ciliary body pull on the suspensory ligaments, controlling the shape and focusing ability of the lens.

Aqueous humor contains nutrients and oxygen that are used by the structures within the eye. The excess fluid is constantly drained from the eye between the cornea and the iris. This area is called the *iridocorneal angle* or the filtration and drainage angle.

The intra-ocular pressure remains constant as long as the production and absorption or drainage of aqueous is equal.



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### What is glaucoma?

*Glaucoma* is defined as an *increase in IOP*. This is measured using an instrument called a *tonometer*.

"Glaucoma is caused by inadequate drainage of aqueous fluid rather than the over production of fluid."

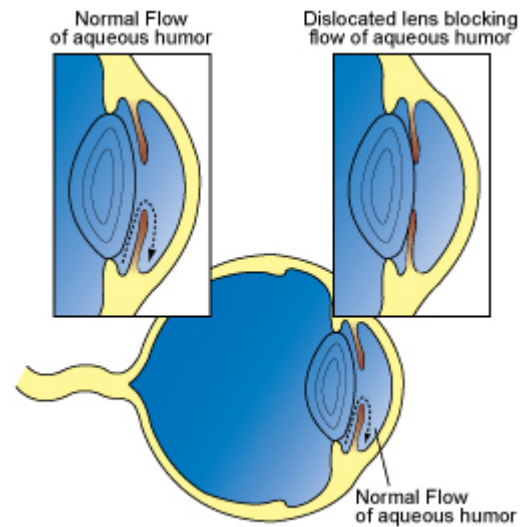
Glaucoma is caused by inadequate drainage of aqueous fluid rather than the over production of fluid. Glaucoma may be further classified as *primary* or *secondary*.

**Primary glaucoma** results in increased intra-ocular pressure in a healthy eye. Some breeds are more prone than others. It occurs due to inherited anatomical abnormalities in the drainage angle. For example, in *narrow angle glaucoma* there is a shallow anterior chamber which causes the iris to block the iridocorneal angle interfering with the filtration. Abnormalities in the drainage angle (*goniodysgenesis*) can lead to a raised IOP in middle age.

**Secondary glaucoma** results in increased intra-ocular pressure due to disease or injury to the eye.

This is the most common cause of glaucoma in dogs and cats. Causes include:

- *Uveitis* (inflammation of the interior of the eye) or severe intra-ocular infections, resulting in debris and scar tissue blocking the drainage angle.
- *Anterior dislocation of lens* – The lens falls forward and physically blocks the drainage angle or pupil so that fluid is trapped behind the dislocated lens.
- *Tumors* can cause physical blockage of the iridocorneal angle.
- *Intra-ocular bleeding* – The blood clot can prevent drainage of the aqueous humor.
- *Damage to the lens* – Lens proteins leaking into the eye as a result of a ruptured lens can cause an inflammatory reaction, which results in swelling and blockage of the drainage angle.



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#### Breeds Associated with Glaucoma

|                         |                          |                           |
|-------------------------|--------------------------|---------------------------|
| Akita                   | Dalmatian                | Norwegian elkhound        |
| Alaskan malamute, husky | English Cocker Spaniel   | Poodle                    |
| American cocker spaniel | English springer spaniel | Samoyed                   |
| Basset hound            | Flat-coated Retriever    | Shar Pei                  |
| Beagle                  | Giant schnauzer          | Shih tzu                  |
| Boston terrier          | Great Dane               | Siberian husky            |
| Bouvier des flandres    | Greyhound                | Smooth haired fox terrier |
| Bull mastiff            | Italian greyhound        | Welsh springer spaniel    |
| Chow chow               | Miniature pinscher       | Wirehaired fox terrier    |
| Cocker spaniel          | Miniature schnauzer      |                           |

#### What are the symptoms of glaucoma and how is it diagnosed?

The most common clinical signs noted by owners are:

- *Ocular or eye pain.* Your dog may partially closed and rub at the eye. He may turn away as you touch him or pet the side of his head.
- *A watery discharge* from the eye, accompanied by a dog that is depressed and unresponsive.
- *Obvious physical swelling and bulging of the eyeball.* The white of the eye (sclera) looks red and engorged.
- The cornea or clear part of the eye may become *cloudy or bluish* in color.
- *Blindness.* Blindness can occur very quickly unless the increased IOP is reduced.

All of these signs can occur very suddenly with acute glaucoma. In chronic glaucoma they develop more slowly. They may have been present for some time before your pet shows any signs of discomfort or clinical signs.

**"Acute glaucoma is an emergency."**

Diagnosis of glaucoma depends upon accurate IOP measurement and internal eye examination using special instruments. **Acute glaucoma is an emergency.** Sometimes immediate referral to a veterinary ophthalmologist is necessary.

## What is the treatment for glaucoma?

It is important to reduce the IOP as quickly as possible to reduce the risk of irreversible damage and blindness. It is also important to treat any underlying disease that may be responsible for the glaucoma.

Analgesics are usually prescribed to control the pain and discomfort associated with the condition. Medications that decrease fluid production and promote drainage are often prescribed to treat the increased pressure.

Medical treatment often must be combined with surgery in severe or advanced cases. Veterinary ophthalmologists use various surgical techniques to reduce intra-ocular pressure. In some cases that do not respond to medical treatment or if blindness has developed, removal of the eye (*enucleation*) may be recommended to relieve the pain and discomfort.

*This client information sheet is based on material written by: Ernest Ward, DVM*

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