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Keratoconjunctivitis Sicca (KCS) or Dry Eye in Dogs

What is keratoconjunctivitis sicca?

Keratoconjunctivitis sicca (KCS) is a condition that is also commonly referred to as "dry eye." The medical term means *inflammation of the cornea and surrounding tissues from drying*. It is a common eye condition resulting from inadequate production of the aqueous portion of the tear film by the lacrimal gland and/or gland of the third eyelid gland. In a recent study, the prevalence of KCS was reported as approximately 1% in the dogs presented to veterinary colleges in North America.

What causes \"dry eye\"?

Tears are required to lubricate the cornea and remove any debris or infectious agents that may contact the eye. The tear film is a mixture of mucus, fatty liquid and water.



Dry Eye
Picture courtesy of Sally Turner,
MA, VetMB, DVOphthal, MRCVS.

"Any condition that impairs the ability to produce adequate amounts of tear film can result in 'dry eye'."

Any condition that impairs the ability to produce adequate amounts of tear film can result in "dry eye". Some of the common causes of KCS include:

- Immune-mediated diseases that damage the tear producing glands. This is the most common cause of KCS and is poorly understood. The body's immune system attacks the cells that produce a portion of the tear film resulting in decreased production. This is thought to be an inherited disorder.
- Systemic diseases such as canine distemper virus or feline herpes virus infections
- Medications such as certain sulphonamides (sulfa drugs)
- Hypothyroidism

Certain breeds are more likely to develop KCS. These breeds include:

American cocker spaniel
Bloodhound
Boston terrier
Cavalier King Charles Spaniel
English bulldog
English springer spaniel

Lhasa apso
Miniature schnauzer
Pekingese
Pug
Samoyed
Shih tzu
West highland white terrier
Yorkshire terrier

What are the clinical signs of "dry eye"?

Most dogs have painful, red and irritated eyes. They often squint, blink excessively or hold the eyes shut. There is often a thick, yellowish, mucoid discharge present as a result of the decrease in the aqueous (watery) component of the tear film. Corneal ulceration is often present. In chronic cases, there is often a history of recurrent eye injuries, ulcers or conjunctivitis. Many dogs will develop corneal scarring called hyperpigmentation that can be seen on close observation. Corneal scarring often looks like a dark film covering the eyes. You can often see tiny blood vessels coursing across the cornea called neovascularization. Vision may be reduced if scarring is extensive. The eyes often have a dull, lusterless appearance due to the corneal drying. KCS most commonly affects middle aged to older dogs. Both eyes are usually affected although one eye may appear worse than the other.

How is KCS diagnosed?

Diagnosis is based on medical history, clinical signs and decreased tear production tests. The most common tear production test is the *Schirmer tear test* (STT). This simple test uses a special wicking paper to measure the amount of tear film produced in one minute. Additional diagnostic tests that may be performed include corneal staining to check for corneal ulcers, intraocular pressure (IOP) to determine if glaucoma is present and tear duct examination or flushing to ensure normal tear drainage.



Photo courtesy of
Ontario Veterinary College

How is "dry eye" treated?

The treatment of "dry eye" has two objectives: to stimulate tear production and to replace tear film, thereby protecting the cornea. There are two commonly used ophthalmic medications to stimulate tear production, *cyclosporine* and *tacrolimus*. Both are easily placed in the eyes once or twice daily. These drugs are very safe and most pets improve dramatically with their consistent use. *Pilocarpine* is useful in treating cases of neurogenic KCS. *Tear film replacement* is often used in combination with a tear production stimulant. This is critical to keep the cornea moist and healthy, especially during the initial phase of treatment. Most dogs will receive tear replacement every two to six hours, depending on need and severity of condition. Some dogs will require topical antibiotics or anti-inflammatory medications.

Gently cleaning the eyes several times a day with a warm, wet washcloth will help your dog feel better and may help stimulate tear film production. We will demonstrate the correct way to administer your pet's medications and address any questions you may have about caring for your pet's condition.

What if I can't apply the medications?



If you are unable to administer your dog's eye medications, we will discuss the possibility of surgical correction. While this is not an option for all dogs, we will help determine if this is a possibility for your pet. Surgical correction involves repositioning the salivary duct so that it secretes saliva onto the eyes. This surgery is usually performed by to a board-certified veterinary surgeon or ophthalmologist. This procedure has significant risk of complication so it should not be pursued unless all other treatments have failed.

What is the prognosis for a dog diagnosed with KCS?

"With today's tear stimulating drugs, the prognosis for dogs diagnosed with KCS has never been better."

With today's tear stimulating drugs, the prognosis for dogs diagnosed with KCS has never been better. "Dry eye" requires life long medical care. With diligent attention and monitoring, most dogs are able to enjoy a pain-free life. If the condition is diagnosed late in the course of the disease and if extensive corneal scarring has developed, the pet may not respond fully or regain its vision. Once corneal scarring has developed, there is little that can be done to reverse it. It is critical that you carefully follow your veterinarian's treatment plan to maximize the likelihood of a successful outcome.

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