

# DRY EYE CAUSES & TREATMENT



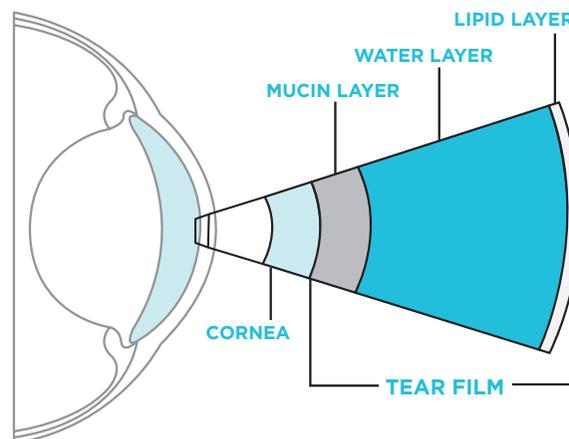
## WHAT IS DRY EYE?

Dry Eye, also known as **Keratoconjunctivitis sicca (KCS)**, is a condition in which a lack of tear production leads to ocular surface inflammation, discomfort and increased rates of secondary complications such as corneal ulceration and scarring of the ocular surface. There are many and varied causes of KCS, but it most commonly occurs as a result of genetically-based autoimmune inflammation within the tear-producing glands of the eye. Once the underlying cause is identified, appropriate therapy can be administered.



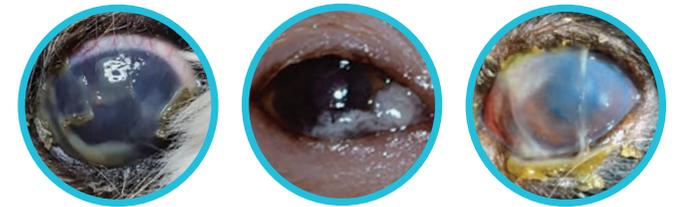
## OCULAR ANATOMY

The eye is a delicate structure and the first layer of protection is the ocular tear film, a complex structure made of multiple layers of interacting elements. This water-based layer of the tear film serves many functions including optics; lubrication and clearing of debris from the ocular surface; nourishment of the ocular surface; and antimicrobial and immune functions. When this important layer of protection is missing, the ocular health suffers.



## CLINICAL SIGNS OF KCS

KCS generally results in the development of a red, painful eye with increased amounts of discharge. The discharge is generally thick and ropey and can range in color from clear-gray to yellow-green, depending on the presence of secondary bacterial infection. Drying and accumulation of the discharge on the eyelashes and inside corner of the eyelids is commonly seen. Without treatment, the low tear production leads to blood vessel growth, scarring and pigment accumulation in the normally clear cornea. Over time, it can result in decreased vision.



**KCS COMMONLY CAUSES RED, PAINFUL EYES WITH VARYING COLORS AND DEGREES OF DISCHARGE. OVER TIME, IT CAN CAUSE SCARRING AND PIGMENT ACCUMULATION.**

## MEDICAL THERAPIES

Most cases of KCS can be managed medically with the use of eyedrops to stimulate tear production and reduce surface inflammation, including cyclosporine and tacrolimus. In patients that are difficult to medicate, or have a poor response to therapy, a cyclosporine implant can be surgically inserted under the conjunctival tissue that surrounds the eye to help continually increase tear production. These implants are generally thought to be effective for up to one year following placement. In cases of KCS suspected to be due to neurologic dysfunction, the use of medications to stimulate the nerve directly (pilocarpine) must be used. When medical therapy fails to produce a sufficient change in tear production or ocular surface comfort, surgery to re-route the parotid salivary duct from the mouth to the ocular surface can be pursued to help increase surface lubrication and comfort.

## CAUSES

The most common cause of KCS is genetically-based autoimmune inflammation within the tear-producing glands. This form increases once the pet is neutered, and with age. It can be seen in the following breeds and conditions:

- West Highland White terrier and Miniature schnauzer
- English bulldog, Cocker spaniel, and Dachshund, especially with concurrent allergic skin disease
- Many brachycephalic breeds, such as the Boston terrier, Lhasa Apso, Pekingese, Pug, and Shih tzu, which tend to have more severe secondary complications due to increased exposure of their eyes
- Many toy and miniature breeds of dogs, including the Chihuahua, Doberman pinscher, and Yorkshire terrier, which is compounded by these dogs' inherently small tear-producing glands

KCS can also occur secondary to endocrine disease (Hyperadrenocorticism, diabetes mellitus, hypothyroidism); underdevelopment of the tear-producing gland at birth (congenital alacrima); nerve damage or dysfunction of the gland (neurogenic KCS); secondary to the use of certain medications (Etogesic, sulfonamides, atropine); and secondary to surgical removal of the gland.

## IS MY PET PREDISPOSED TO KCS?

Breeds with the highest incidence of KCS include the English bulldog, West Highland White terrier, Lhasa Apso, Pug, Pekingese, American cocker spaniel, Yorkshire terrier and Shih tzu.



## SURGICAL THERAPIES FOR KCS MANAGEMENT

Surgical therapies for the management of KCS include the cyclosporine implant, parotid duct transposition and in very rare circumstances, enucleation, or removal of the eye.

- Placement of a **cyclosporine implant** can result in significant improvement in tear production and reduction in ocular surface inflammation for approximately one year following surgery. Improvement can occur in both cases that respond to therapy with topical cyclosporine or tacrolimus, and those that do not. This procedure may need to be repeated on a long-term basis.
- The **parotid duct transposition** works by re-routing a salivary duct from the mouth to the eye. This results in lubrication of the ocular surface with saliva. While exceptionally helpful in select cases, this surgery is generally reserved for refractory cases since it can result in the development of other ocular surface problems such as mineral formation (similar to plaque buildup on teeth); potential for skin infection under the eye due to less control over the secretion of saliva than tears; and risk of duct damage during the translocation to the eye.
- The last surgical procedure that is infrequently considered for severe KCS is **enucleation**, or removal of the eye. This surgery is reserved for chronically painful eyes that have become blind from scarring of the surface or severe corneal ulceration. This procedure can provide significant return of comfort and quality of life in animals suffering with severe forms of KCS.



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### HOURS OF OPERATION

Monday, Wednesday, Friday 9:00 a.m. - 5:00 p.m.

Tuesday, Thursday 10:00 a.m. - 6:30 p.m.

One Saturday a Month 11:00 a.m. - 2:00 p.m.

## SERVICES WE OFFER

**Complete Exam & Diagnosis**

**Medical Therapy**

**Surgical Therapy**

**Orthopedic Foundation for Animals (OFA) Eye Exams & Registration**

**Genetic Testing for Prevention**

**Free Exams to Service Dogs**

**Military, First Responder, & Senior Citizen Discounts**

**CareCredit® Financing**