

## **Corneal Transparency - ulceration, degeneration, dystrophy**

The cornea is the front part of the eye, the clear part that is to be transparent, – *like glass*. The word cornea means “window” and fits well, as the cornea is the window of the eye or – as some may put it – the soul.

The cornea is a thin piece of tissue (less than 1 mm in thickness) and becomes opaque/loses its transparency in a number of disease processes. The main corneal disease processes include:

1. **ulceration** – loss of corneal tissue after trauma or infection.
2. **deposits** – in the middle of the cornea (the stroma) these may be *cholesterol* (young animals or animals with previous corneal inflammation) or *calcium* (older animals with calcification of the cornea – typically dogs 12-18 years of age).
3. **vascularization** – any type of injury or irritation to the cornea results in in-growth of blood vessels and the blood vessels leak water into the cornea. This water causes swelling (edema) of the cornea and it loses its’ transparency.
4. **endothelial degeneration** – the endothelial cells (on the inside of the cornea) maintain the cornea in a dehydrated state, which is necessary for transparency. If these cells are lost the cornea becomes opaque and vision is reduced in a similar way as cataract reduces vision quality/acuity.
5. **Pigmentation/melanosis** – pigment is deposited in the epithelium (outside layer of the cornea) – the disease process is poorly understood. This most commonly occurs after corneal inflammation (keratitis) and is most commonly seen in Pugs.

The medical treatment options for corneal disease processes include:

1. *antibiotics* (ofloxacin, gentamicin, tobramycin) – stop bacterial growth in the cornea – or used after surgery to reduce the risk of post-operative infection.
2. *corticosteroids* – reduce inflammation and growth of blood vessels (Prednisolone acetate 1% eye drops, slow release triamcinolone injections or oral prednisone).
3. *Free radical scavengers* – acetylcysteine – a free radical scavenger that may slow down degenerative processes in the tissue and chelate (remove) calcium.
4. *Pigment reducing agents* – in pigmentation/melanin deposition in the cornea - the main currently used medication is topical tacrolimus.
5. *Dry Eye medical treatment* - cyclosporine or tacrolimus – increases tear production and improves the tear quality.

The word “**degeneration**” indicates that the disease process is progressive.

The word “**dystrophy**” indicates a bilateral disease (affecting both eyes) and that there is a strong inheritance of the defect. Most commonly the word corneal dystrophy is used for bilateral corneal cholesterol deposits and bilateral corneal endothelial degeneration in young dogs (see endothelial degeneration above).

Should you have any further questions about corneal diseases, call our office and ask to speak to Drs. Clinton or Evans.