



## OCULAR INJURY FACT SHEET

*Horses have virtually 360 degree vision, primarily so that they can keep watch for predators approaching from any direction whilst grazing. The need for all-round vision has resulted in the horse having large eyes on each side of their head. This prominent position makes the eye vulnerable to blunt and sharp traumatic injury. Even minor damage to an eye can rapidly worsen and threaten the horse's sight in that eye. This can occur rapidly (hours to days) as a result of infection and inflammation, or over a period of months or years due to scarring. It is therefore important to be able to recognise ocular injuries and to understand why it can be paramount to seek veterinary attention.*

### ***Anatomy of the Horse's Eye***

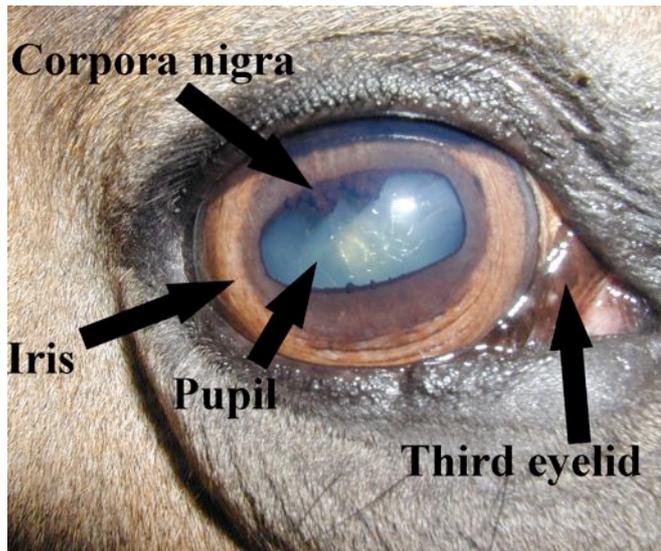
The globe of the horse's eye is contained within the bony orbit of the skull. The lower and upper eyelids help protect the clear outer surface of the eye (the cornea). The eyelids are designed to sweep the whole surface of the cornea, removing dust and particles, as well as spreading a thin film of tear fluid. This process keeps the cornea moist and healthy. The eyelids provide a physical barrier to trauma, therefore the eyelids themselves can be injured and any cuts, particularly of the eyelid margins, should be attended to by a veterinary surgeon. If the eyelids do not heal perfectly, they may not be able to sweep the surface of the eye effectively and may cause persistent conjunctivitis. The horse has a *third eyelid* that also sweeps the cornea when the outer eyelids close. This can be just seen as a pink, fleshy structure in the inner corner of the eye (Fig. 1). It too can be directly damaged, or trap sharp objects such as grass seeds or grit that scratch the surface of the cornea causing an ulcer.

The inner surface of the eyelids is lined by *conjunctiva* that can become inflamed resulting in reddening and a discharge (conjunctivitis). Conjunctivitis can be caused by low-grade infection or irritation by flies.

The *cornea*, the clear, outer surface of the eye does not have a direct blood supply (to maintain its transparency) although it does have a rich supply of sensory nerves. This makes the cornea less able to fight infection and slower to heal than other regions of the body.

Behind the cornea is the pigmented *iris* (usually brown). This dilates and contracts, controlling the size of the pupil and therefore the amount of light that enters into the back of the eye. On the upper edge of the iris is a granular structure, called the *corpora nigra*, which is thought to further filter the amount of light that enters the eye. Some horses may also have a similar looking, smaller structure on the lower edge of the iris.

Between the cornea and the iris there is a fluid filled space, the *anterior chamber*. Directly behind the iris is the *lens* that focuses light from the outside world onto the back of the eye where the *retina*, comprising of millions of light receptors, transmits the 'images' to the brain via the *optic nerve*.



**Fig. 1:** Some of the normal structures of the horse's eye

### ***Signs of a Painful Eye***

Scratching or damage to the surface of the cornea, perhaps from a branch or a piece of grit trapped behind the third eyelid, immediately causes intense pain. A horse will respond by tightly closing its eyelids and producing excessive tears that may run down the face. The horse will avoid bright light e.g. by standing at the back of the stable. Depending on what caused the injury, and how long ago it occurred, the eyelids and conjunctiva may be swollen, bruised and inflamed. No attempt should be made to force the eyelids open.

The horse should be moved to a dark stable and prevented from rubbing the eye. Veterinary attention should be sought immediately. If left untreated, bacteria will rapidly infect the damaged cornea resulting in the formation of a corneal ulcer (Fig. 2). Ulcers can rapidly get deeper and at their worst become 'melting' ulcers, which can quickly progress to rupture of the cornea. Direct trauma as well as infection and ulceration of the cornea can result in severe inflammation of the whole front part of the eye, including the iris, (*anterior uveitis*). This results in the front of the eye taking on a discoloured appearance and constriction of the pupil and is an extremely painful and serious condition.

Warning signs of a painful eye are;

- Closed eye with tear production
- Discolouration of the eye
- Swelling or redness of the eye
- Discharge from the eye



**Fig: 2:** The eye of a horse showing an ulcer stained green in the centre of the cornea (arrow). The cornea can be seen to have turned white (opaque) in response to the injury. This will resolve as the ulcer heals.

### ***Examination of the Painful Eye***

Usually a horse with a painful eye will be very reluctant to have it examined. Frequently a veterinary surgeon will need to sedate the horse and put some topical local anaesthetic drops in the eye to allow a full examination. Nerve blocks may be also be required to relax the eyelids and allow inspection of the eye.

Once the eye can be examined, the external eyelids and the third eyelid are searched for signs of injury and for any foreign bodies that could be trapped behind them. The surface of the cornea is examined for injury which usually involves use of a dye, called fluorescein, to show up any damage to the cornea. The fluorescent green dye only stains parts of the cornea that are damaged (Fig. 2).

The deeper structures of the eye will be also examined as far as possible; however the cornea turns white following injury due to the damaged cells allowing water into this normally waterproof layer. Often the pupil is also tightly constricted due to pain, which further decreases examination of the deeper structures.

### ***Treatment of the Painful Eye***

The treatment required will depend on the extent and cause of the problem. Sometimes intensive hospitalisation is required or even surgery. What follows is only a broad description of some possible treatments.

Firstly anti-inflammatory drugs may be given to reduce inflammation and provide pain relief. Atropine eye drops may be used to dilate the pupil; this provides pain relief and keeps the edges of the iris out of the way (this effect can last for several weeks). If the pupil remains constricted, the inflammation in the anterior chamber could cause the iris to become stuck to other parts of the eye.

Antibiotic eye drops or ointment will usually be required to fight any infection. These will need to be administered at regular and often frequent intervals. The regimen should be strictly adhered to; any failure to do so can have catastrophic consequences. If your horse refuses to let you place drops or ointment into its eye you must inform

your vet. If a horse needs very frequent treatment, or is difficult to administer eye drops to, a tube to deliver the medication can be stitched into the upper eyelid (Fig. 3).



**Fig. 3:** This horse has an eye treatment administration set inserted into the upper eyelid (arrows). Eye medications can be inserted into the end of the tube (attached to the mane) and be deposited in the eye without needing to touch the painful eye.

The horse should be kept in a dark stable and dust kept to a minimum; for example feed hay or haylage from the floor. Initially it may be necessary for your vet to examine your horse's eye on a daily basis to ensure healing is occurring. Over time, depending on the extent of the injury, you may see blood vessels slowly migrate across the cornea to aid healing. It can take weeks and even months for corneal damage to completely resolve.

**If you wish to discuss the appearance of your horse's eye or book an appointment for a visit, please phone the Dick Vet Equine Practice on 0131 445 4468.**