MMVS Client Education Article:

# Eye Problems in Horses

## *HELP!!* My horse won't open his eye!

### A painful eye in any patient is a potentially serious problem…

### First, the Basics - Anatomy of the Equine Eye


**Fig. 1:** The ***conjunctiva*** is the supporting tissue that lines the inside of both eyelids and covers the ***sclera*** **(1)**, the white part of the globe that attaches to the cornea at a junction called the ***limbus*** (X). The **iris** (3) is the colored part of the eye; the ***pupil*** is the space created by the inner edge of the iris (4). This is where light enters the eye; it should be horizontal in horses. The ***lens*** often looks hazy/slightly blue (right image); it turns white when cataracts form. The ***'corpora nigra'*** or 'black bodies' are cysts found at the top edge of the iris; these are normal structures. The center of the left image is reddish orange due to reflection of light on the fundus, the back of the eye. The horse on the right has an abnormal iris – likely a congenital defect.

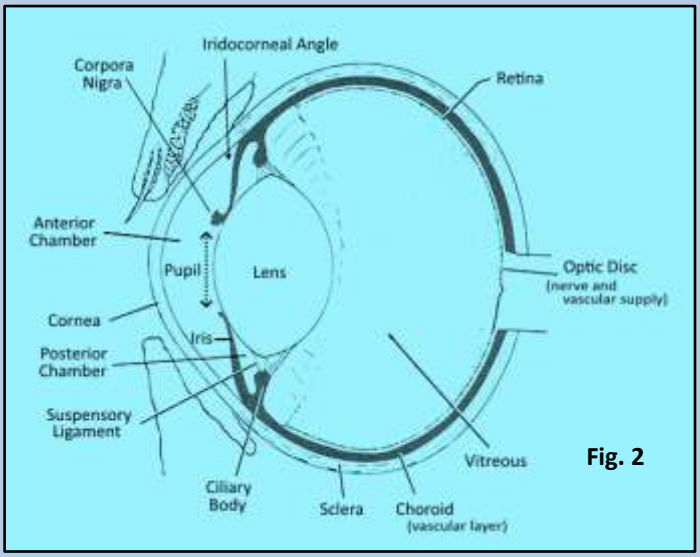



**Fig. 2**

**Fig. 2**: The globe is a sphere with 3 layers and 3 chambers. The ***sclera*** and ***cornea*** make up the outer layer; the ***uvea*** is the middle layer. It includes the ***iris*** and a vascular supply (or choroid); the inner layer is the ***retina***, made up of cells called *rods* and *cones*. These are specialized cells that are activated by light. These cells transmit impulses via the optic nerve to the brain, where images are created and interpreted. The **anterior chamber** is a fluid filled space between the iris and the cornea; the **posterior chamber** is a small area behind the iris; the '**vitreous**' is a large area behind the lens. This vitreous chamber contains a gelatin like substance. The ***lens*** is behind the iris, held in place by the ciliary bodies; it changes shape to help focus images on the retina.

**Eye problems in horses are *very often emergency* situations.**

**Signs of a painful eye include:**

- Squinting, sensitivity to light
- Tearing
- Swollen eyelids

You may also see:

- Swollen, red conjunctiva
- Ocular discharge – varies from thin/clear to thick, yellow-green
- Cornea looks abnormal – hazy/cloudy, white, or bluish.

Horses with painful eyes sometimes hold their eyelids closed so tight that it is very difficult to examine them without sedation and local anesthesia. Try to watch your horse when he/she doesn't think you are looking – see how well they hold the eye open (when they don't think you are looking!) - are they tearing and/or blinking a lot, do they appear sensitive to sunlight, do they try to rub the eye? Are the eyelids swollen?

*Probably time to call the vet….*

**Fig. 3**: Swollen, red palpebral conjunctiva in a horse with conjunctivitis

**Conjunctivitis** is inflammation and/or infection of these tissues. Normal conjunctiva is not generally visible. When diseased, swelling, redness and pain are seen and usually some ocular discharge that varies from watery (clear and thin) to mucoid (opaque) to mucopurulent (thick and white/yellowish) is present. (Fig. 3) It is caused by trauma, viral or bacterial infection, and often, irritants or allergies. Flies are a common vector of irritating substances and antigens that provoke an inflammatory response that produces conjunctivitis. Conjunctivitis is present when there is inflammation anywhere in the eye. It is often the first or most obvious sign seen with eye disease.

So, it's uncomfortable, the horse rubs at it, then it swells, then……

**Traumatic injury** to the cornea, globe, and/or the eyelids should be addressed quickly. Lacerations of the eyelids must be sutured carefully to preserve the normal structure of the eyelids, which is necessary to maintain function - protection of the cornea and inner structures of the globe. The cornea and the conjunctiva must also be examined so that these can be treated properly as well. Lacerations, punctures, and foreign body penetration of the cornea are very serious as vision can be impaired or even lost if inflammation and infection develop inside the globe. Minor corneal lacerations can be treated medically like a corneal ulcer. More severe lesions, deep punctures and foreign bodies often require referral to a veterinary ophthalmologist.

**Keratitis** is inflammation of the **cornea**, the clear part of the eye. Any change in the color of the cornea is a potentially serious problem. The most common problem we see in horse eyes is traumatic damage to the cornea, most often resulting in an erosion or **ulcer** (Figs. 4 & 5); however there are other causes including immune mediated disease. The signs of an ulcer include pain than can be severe, discharge, swelling, etc. The ulcer itself may not obvious without a special stain of the corneal epithelium. Fluorescein stain is applied to the cornea – this substance will adhere only to inner layers that are exposed when an ulcer is present. The fluorescein is orange but changes to green when it binds to the damaged tissue. Excess stain is flushed out of the eye and damaged areas will be highlighted by the green color (Fig. 4b). When deemed necessary, a gentle "scraping" of the lesion will be performed and examined under a microscope to see if there is evidence of fungal infection. The area under the lids and third eyelid will also be examined to check for foreign bodies that may have caused the ulcer.

**Figure 4**

**4a.** Painful eye in an older gelding. **Signs:** eye is closed tightly, eyelids swollen, excessive tearing

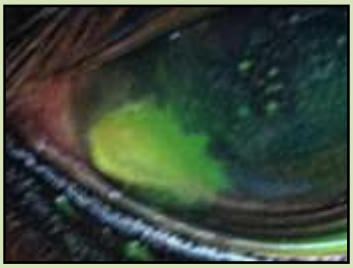
**4b**. Fluorescein stain of cornea; green color indicates damage; stain binds only to inner layer - identifies injury/tissue damage. This ulcer is fairly superficial. Note swelling of palpebral conjunctiva inside upper eyelid.

*Photo courtesy Dr. E. Allison*

**4c.** Same horse as above, original ulcer is much better, a lot shallower as indicated by the very pale staining. Unfortunately, the horse caused another ulcer by rubbing his eye (below and to right).

Treatment for an ulcer generally consists of broad spectrum antibiotic +/- atropine applied directly to the cornea. These are ointments or solutions specially made for the eye. A non-steroidal anti-inflammatory medication, usually flunixin meglumine (Banamine®) is also given systemically. In Georgia, fungal infection of corneal ulcers is common, so a topical anti-fungal is often added. Other treatments used may include equine serum, EDTA, and other anti-inflammatory and anti-protease medications to help prevent further damage to the cornea and encourage healing.

**Fig 5**. Severe ulceration with fungal infection (left); An SPL system in place for treatment (right); this mare's eye healed after 2 months of treatment; some scarring remains.



A close up of a corneal ulcer that is ***melting.*** The green drop at the lower left is epithelium that is actually sliding off the cornea. This indicates severe infection; chemical mediators are liquefying the cornea; this must be treated ***ASAP.*** *Image courtesy Dr. E Allison*

In most cases, small, uncomplicated ulcers will heal in a few days to a week or so. Complicated (infected) ulcers will usually heal with a couple weeks of diligent treatment. However, cases with fungal infection or resistant bacteria often require prolonged treatment and further diagnostics such as a culture for specific bacteria/fungi. Because of the discomfort, many horses become resistant to repeated manual treatment when long term therapy is necessary. In these cases, a *subpalpebral lavage* (SPL) system may be used (Figs. 5 & 6). SPL tubing is a long, small diameter, flexible silicone tube that is placed with one end secured inside the upper or lower eyelid. This end is flared and sits high above or below the cornea under the upper or lower eyelid. The tubing is secured to the horse's head in several spots and then run back through the mane to keep it in place. A treatment port is connected at the far end of the tubing away from the horse's eye. Liquid medication is administered through the tube directly onto the cornea. The caretaker never has to touch the eye during treatment. An SPL system makes treatment much easier and more effective. Use of an SPL has saved many horse eyes.


**Fig. 5**: Stromal abscess in a 19 yr gelding; the yellow area below is a pool of white blood cells inside the anterior chamber, called *'hypopon'*. Blood vessels at top are infiltrating the cornea, to help it heal. *Image courtesy Dr. S Rice*

A **stromal abscess** (Figs. 5 & 6) **develops** when infection occurs within the inner layer of the cornea. Bacteria +/or fungal organisms become trapped in the stromal layer under the epithelium causing pain and inflammation which is can be severe. Many of these are treated medically; use of an SPL system is common. However, some cases may require surgery to minimize damage and resolve completely. Scarring in the cornea can occur as a result of a stromal abscess.

**Fig. 6:** Note hazy area on left next to limbus, an early stromal abscess, not as severe. A small area of vascularization is present along the right edge. This lesion still took many weeks to heal;

**Uveitis** is inflammation that occurs inside the globe, specifically of the uvea – the inner layer of the eye that includes the iris. This condition unfortunately is very common in horses (Fig. 7). Signs of uveitis are ocular pain, swollen conjunctiva, and a white or slightly blue haze in the anterior chamber caused by the presence of inflammatory debris. Sometimes the color of the iris actually changes, taking on a greenish hue. In severe cases, the cornea may be opaque from edema and inflammation; the anterior chamber may have hyphema (hemorrhage) and contain white to yellowish exudate. Uveitis can have many different causes; trauma, viral, parasitic, and bacterial infection have been identified. The primary cause is often unknown. A delayed autoimmune response is thought to be the underlying cause of the disease and is responsible for the recurrent flare-ups that are seen in many horses. The immune system is sensitized by the presence of a foreign antigen and mounts a response to eliminate it. Later, the primary cause is long gone but the immune system doesn't realize this. This form of uveitis is called equine recurrent uveitis; common names are "moon blindness", "periodic ophthalmia", etc. It is seen very often in Appaloosas but can occur in any horse.

**Fig. 7**: Uveitis in 2 horses;
**L** – early case; this horse normally has a *BLUE* iris; inflammation causes the iris to change color*;* vessels are invading the cornea.
*Image courtesy Dr. L Sandmeyer*.
**R** – Appy with improving uveitis, still see debri inside the anterior chamber and inflamed conjunctiva.
*Image courtesy Dr. S Rice*

Treatment for uveitis consists of topical and systemic medication. Horses are usually treated with flunixin meglumine (Banamine™) systemically, and topically with atropine and an ophthalmic medication containing both antibiotics and a steroid. The steroid is included only if there are no corneal lesions. The cornea should be examined prior to each treatment for ulceration as the use of steroids can encourage or exacerbate infection if present and greatly prolong healing. Ultimately, with repeated episodes of uveitis, irreversible damage occurs that can result in loss of vision.

**Squamous cell carcinoma** (SCC) is a type of skin cancer that often occurs on the surfaces of the eye - sclera, the cornea, the third eyelid and the eyelids, especially in animals with white or pink skin (Fig. 8). Damage from UV radiation in sunlight is thought to activate this type of cancer. Although it does not spread to distant tissues, it can be very problematic in and around the eye as it does spread locally and can be difficult to treat due to the location. Appaloosas and paint horses are very prone to develop this type of cancer. It will usually appear as a pink, small, raised mass on the eye or eyelids or a thickened area or ulcerated area on the eyelids. Treatment should be pursued as soon as possible to prevent it from spreading and damaging the globe and the periocular tissues.

**Fig. 8**: Small pink mass on the 3rd eyelid of an Appaloosa; this should be biopsied or removed as this breed is very prone to the development of SCC.

**8b**: The pink, nobby looking mass on is a SCC on a horse's eye.
*Image courtesy of Dr. Lynne Sandmeyer*

***PROMPT treatment*** of ocular problems is necessary to relieve pain, minimize healing time and cost, and produce a favorable outcome, including restoration of or prevention of loss of vision.

**As a last resort**, when medical therapy fails, surgery is not an option, or the eye is damaged beyond repair, it can be removed. This procedure is called ***enucleation.*** Horses function well with only one eye, as long as this eye is healthy, of course. Enucleation is performed standing or under general anesthesia.

Check out the following links for more information about equine vision and eye problems;
*Understanding Equine Vision and Eye Disease*, Canadian Horse Journal
Dr. Lynne Sandmeyer, a veterinary ophthalmologist:
https://www.horsejournals.com/understanding-equine-vision-and-eye-disease

*Understand Your Horse's Eyesight*; Karen Hayes, DVM:
https://horseandrider.com/horse-health-care/horse-vision-and-eyesight
If you have any questions about eye problems in horses, call the clinic anytime and we'll help you any way we can.

Thanks for reading!

The folks at Maggie's Menagerie Veterinary Services:

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