



## How to Achieve Effective Topical Medical Therapy in Eye Disease

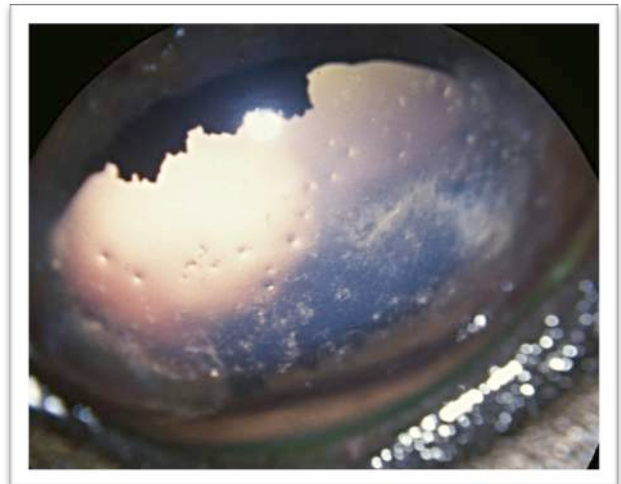


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- Topical instillation of drug onto the ocular surface is the mainstay of medical therapy in most eye disease.
- Topical therapy will target the lids, conjunctiva, cornea and anterior chamber.
- **However, poor compliance and inappropriate selection of drug formulations are the two most significant reasons for failure of topical medical therapy in eye disease.**
- Most horses are compliant with direct installation of drugs onto the ocular surface for variable periods, but most ultimately come to resent the procedure, markedly increasing the likelihood of therapeutic failure as the owners earnestly squirt the drug somewhere in the general region of the eye.
- Direct instillation of a liquid formulation from a dropper bottle onto the ocular surface is very difficult to achieve effectively and repeatedly in most horses.



- A **simple and effective** means of delivering topical drug in solution or suspension is to gently ‘spray’ the drug onto the ocular surface from a distance of several centimetres using a 0.5 or 1ml disposable insulin syringe with the needle removed by carefully breaking off at the hub (Fig 2). Most owners can be taught to do this.



Fig 1. 1ml disposable insulin syringe with needle removed at hub

- **All horses with acutely painful eyes and any difficult and non-compliant horses require to be medicated via a subpalpebral lavage delivery system.**

#### Volume and Retention of Drug Instilled

- The adult horse is estimated to be able to retain 700ul of drug in solution on the ocular surface and conjunctival fornices. Therefore optimally, using the syringe direct instillation method, 0.1ml of drug should be sprayed onto the eye. In practice ‘filling’ the eye to overflow is the pragmatic approach.
- **Drug in solution is retained on the ocular surface for only 7 minutes.** This has implications for drug selection and ‘polypharmacy’ protocols.
- If using multiple medications in solution, it is best to leave at least 7 minutes between instillations to avoid sequential washouts. This is a hassle, but can mean the difference between effective and failed therapy. **Mixing medications together prior to instillation should not be done**, unless it is known the medications are compatible (very few are!).
- Ointment and gel formulations are likely to be retained on the ocular surface for 4-6 hours, and will deliver therapeutic levels of drug for that time. Because of the wide lacrimal drainage system in the horse, drugs in suspension (eg Maxitol Suspension) are best treated as *per* solutions.

#### Selecting a Drug Formulation

- Because of the short retention time, as solutions dose dependent bacteriocidal antibiotics should be selected eg. Fluoroquinolones, Aminoglycosides.
- **Lipid insoluble drugs will not pass through intact corneal epithelium.** Therefore to target the corneal stroma (deep abscesses) or anterior chamber (uveitis) where the corneal epithelium is intact, optimally select lipid soluble antibiotics eg. Fluoroquinolones, Chloramphenicol, or ester corticosteroid preparations eg. Prednisolone acetate.

In general, **with planning** topical medication can be very effective in treating eye disease in the horse. The above are general rules which will enhance therapeutic efficacy. As a last point; **although fluoroquinolones are very effective ophthalmic antibiotics in the horse, they must not be used for routine topical prophylaxis.** Use ‘Triple’ antibiotic (neomycin, polymixin, bacitracin) or chloramphenicol.