





A Quick Guide to Corneal Ulcers



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1. **CLASSIFY** A thorough eye exam will allow classification of the ulcer as either SIMPLE or COMPLICATED
2. **CAUSE** The eye exam should also attempt to identify an UNDERLYING CAUSE for the corneal ulcer
3. **TREAT** A proper TREATMENT PLAN including EyeQ™ will reduce infection, inflammation & pain
4. **HEAL** EyeQ™ AMNIOTIC EYE DROPS create a superior environment for rapid ulcer healing
5. **RECHECK** Serial exams document ULCER HEALING and allow for modifications to the therapeutic plan

1. CLASSIFY THE CORNEAL ULCER

SIMPLE CORNEAL ULCERATION	COMPLICATED CORNEAL ULCERATION
 <p data-bbox="159 1197 734 1222"><i>A superficial corneal ulcer with irregular edges (white & cobalt blue light)</i></p>	 <p data-bbox="831 1197 1510 1222"><i>An infected, melting ulcer; a perforated ulcer; a vascularized ulcer with severe edema.</i></p>
<ul style="list-style-type: none"> > Remains superficial > No evidence of infection > No neovascularization or corneal melting > Heals quickly (7-10 days) with appropriate treatment > No scar formation 	<ul style="list-style-type: none"> > Loss of part or all of corneal stroma > Appearance of infection, corneal melting, neovascularization > Often associated with an underlying ocular condition > Requires aggressive medical and/or surgical therapy > May threaten vision or integrity of the eye

2. IDENTIFY THE UNDERLYING CAUSE

MECHANICAL	PRIMARY CORNEAL DISEASE	INFECTIOUS
<p data-bbox="256 1596 375 1621">Traumatic</p> <ul style="list-style-type: none"> > Bite or claw injury > Shampoo, chemical burn > Foreign body 	<p data-bbox="688 1596 886 1621">Tear Film Disease</p> <ul style="list-style-type: none"> > KCS > Qualitative tear deficiency > Neurogenic KCS 	<p data-bbox="1263 1596 1321 1621">Viral</p> <ul style="list-style-type: none"> > Feline Herpes Virus-1 (common) > Canine Herpes Virus-1 (rare)
<p data-bbox="207 1730 423 1755">Eyelid Abnormality</p> <ul style="list-style-type: none"> > Ectropion > Entropion > Eyelid mass > Lagophthalmos 	<p data-bbox="695 1730 880 1755">Corneal Deposits</p> <ul style="list-style-type: none"> > Lipid > Cholesterol > Calcium 	<p data-bbox="1237 1730 1344 1755">Bacterial</p> <ul style="list-style-type: none"> > Secondary infection common with: <ul style="list-style-type: none"> o <i>Staphylococcus</i> o Beta-hemolytic <i>Streptococcus</i> o <i>Pseudomonas</i>
<p data-bbox="217 1898 415 1923">Cilia Abnormality</p> <ul style="list-style-type: none"> > Distichia > Ectopic cilia > Trichiasis 	<p data-bbox="704 1898 873 1923">Corneal Edema</p> <ul style="list-style-type: none"> > Glaucoma > Uveitis > Endothelial dystrophy/degeneration 	<p data-bbox="1250 1898 1331 1923">Fungal</p> <ul style="list-style-type: none"> > Rare in dogs and cats

3.

DESIGN TREATMENT PLAN

Drug Class	SIMPLE CORNEAL ULCER	COMPLICATED CORNEAL ULCER
ANTIBIOTIC	<ul style="list-style-type: none"> › Broad-spectrum drop or ointment <ul style="list-style-type: none"> ○ Dog: NPB/NPG¹, Terramycin, Ciprofloxacin ○ Cat: Erythromycin, Ciprofloxacin › Applied every 6-8 hours for 7-10 days <ul style="list-style-type: none"> ○ Until fluorescein stain negative › <i>Oral antibiotics not indicated</i> 	<ul style="list-style-type: none"> › Targeted Gram+ and Gram- coverage <ul style="list-style-type: none"> ○ Gram + coverage <ul style="list-style-type: none"> ▪ Ofloxacin, Moxifloxacin, Cefazolin² ○ Gram- coverage, esp. Pseudomonas <ul style="list-style-type: none"> ▪ Gentamicin, Tobramycin › Frequent application necessary <ul style="list-style-type: none"> ○ Every 2-4 hours for first 2-3 days ○ Slow reduction in frequency weekly ○ BID therapy recommended 1-2 weeks beyond ulcer being fluorescein stain negative › Oral antibiotics often indicated <ul style="list-style-type: none"> ○ Doxycycline 10 mg/kg PO q24, x10-14 days <ul style="list-style-type: none"> ▪ Also an anti-collagenase & anti-inflammatory ○ Amoxicillin-clavulanic acid or enrofloxacin <ul style="list-style-type: none"> ▪ If corneal perforation is impending or present
ANTI-INFLAMMATORY	› Oral NSAIDs x 3-5 days prn ³	› Oral NSAIDs x 7-14 days prn ³ <ul style="list-style-type: none"> ○ For reflex uveitis (aqueous flare, hypopyon)
ANTI-COLLAGENASE	› <i>Not indicated</i>	› Topical serum indicated for melting ulcers <ul style="list-style-type: none"> ○ Every 2 hours for first 24-48 hours ○ Then every 4 hours for 3-5 days ○ Then every 6 hours prn until melt fully resolved › Harvested from patient or donor⁴
ATROPINE	<ul style="list-style-type: none"> › Indicated only if pupil is miotic › Single application may be sufficient › Only use ointment in cats (↓ salivation) 	› Indicated for miosis and reflex uveitis <ul style="list-style-type: none"> ○ Every 12-24 hours prn for pupil dilation › Only use ointment in cats (↓ salivation)
ANALGESIA	› Additional pain control PO prn	› Additional pain control is recommended <ul style="list-style-type: none"> ○ PO: Gabapentin, tramadol, buprenorphine (OTM) ○ Inj: Methadone, buprenorphine, hydromorphone

Rethink Healing: Combine EyeQ™ Amniotic Eye Drops with traditional therapy for more RAPID healing!

AMNIOTIC EYE DROPS

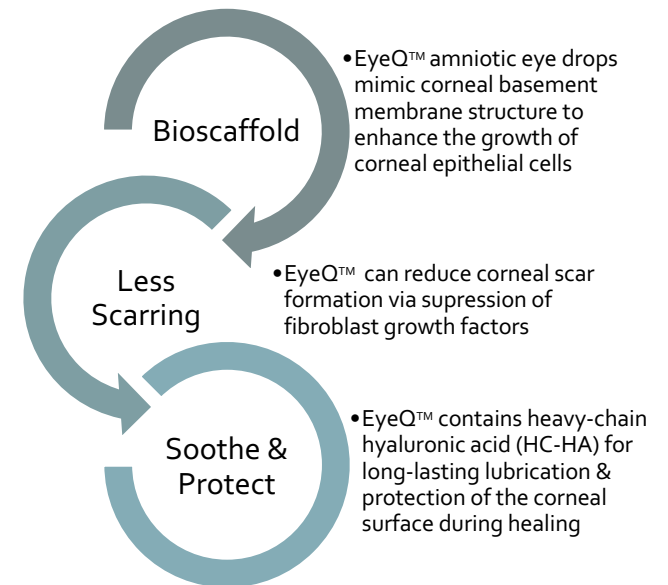
- › EyeQ™ Amniotic Eye Drops can be used for simple or complicated ulcers
 - Delivers natural **ANTI-MICROBIAL** & **ANTI-INFLAMMATORY** components to aid traditional therapies
 - Provides a **BIOSCAFFOLD** to enhance corneal cell growth & migration⁵
- › Unique, powderized amniotic membrane drop rapidly delivers components to the ulcer
 - Dual-chamber bottle provides for extended shelf life and simple, on-demand product preparation
 - Convenient dropper bottle tip allows for easy administration by pet owners
- › Applied every 6-8 hours, separated from other medications by ~ 5 minutes
 - Duration of treatment depends upon severity of ulceration and rate of healing
 - Complicated ulcers often require 1-2 months of therapy (approximately 2-3 bottles of EyeQ™)



¹Neomycin-Polymixin B-Bacitracin ointment / Neomycin-Polymyxin B-Gramicidin solution. Do NOT recommend for use in cats.
²Topical cefazolin eye drops are made by combining 16.7 mL of 0.9% saline with 1g of cefazolin, resulting in a 60 mg/mL solution. Keep refrigerated, discard after 10 days.
³Topical NSAIDs are contraindicated in most cases of corneal ulceration, especially infected or melting ulcers.
⁴Intra-species use is acceptable. Keep refrigerated, discard after 10 days.
⁵EyeQ™ Amniotic Eye Drops do not provide immediate structural support and are not meant to replace tectonic surgical grafts

4.

PROMOTE BETTER HEALING



5.

RECHECK & MODIFY PLAN

12y DSH with a complicated (deep, infected, chronic) corneal ulcer

