Clinical Practice Guide for the

Diagnosis, Treatment and Management of Anterior Eye Conditions

April 2018

Optometry Australia Anterior Eye Clinical Practice Guide

This Clinical Practice Guide provides evidence-based information about current best practice in the management of a number of anterior eye conditions. It is not a formal treatment or management protocol but a guide to aid clinicians in their diagnosis and management and does not replace advice on therapeutic management provided by regulatory agencies including the Optometry Board of Australia. It is the responsibility of all optometrists to be familiar and comply with OBA policies and competency standards about the management of these conditions.

Scope of this document

This Clinical Practice Guide covers four specific red eye conditions that require either therapeutic management or referral, depending on the severity of the presentation and the practitioner's level of experience and confidence. The conditions covered in this document are:

- Bacterial Keratitis
- Herpes Simplex Keratitis
- Acute Anterior Uveitis
- Angle Closure Glaucoma

The Clinical Practice Guide aims to aid in differential diagnosis and management of these important and sometimes not clinically obvious conditions. It will provide recommendations about when to refer based on severity, and where appropriate, the topical pharmacotherapy treatment regimen.

Introduction

Red eye presentations are common. One study conducted at a general teaching hospital in Nigeria showed that out of 4723 patients, 693 (14.8%) presented due to/with a red eye [(Lawan)]. The causes of red eye vary. Lawan et al found the most common causes at their hospital were allergic conjunctivitis (40%), microbial conjunctivitis (17%), corneal ulcer (11%) and inflamed pterygium (11%). Another study at a general hospital in Northern Iran found eye abrasions the most common presentation (57%) followed by watery eyes (49%) and swollen eye lids (30%) [(Farokhfar)]. Red eye presentations can vary depending on the geographic location, occupation, and age of the patient. It is essential to understand the risk factors associated with each demographic. Other risk factors might include pre-existing medical condition, use of other medications and exposure to particular environments.

In infective causes of red eye, there may be a need for microbiological testing and analysis. According to Performance Criteria 3.3.1 of the 2014 Optometry Australia competency standards*, practitioners should understand the process and be aware of the correct procedure in collection and storage of samples for microbiological testing. In some instances, referring to a hospital setting with access to quick and efficient laboratory testing may be the best option.

Management of red eye presentations may range from simply waiting for a self-limiting condition to resolve, to therapeutic management with multiple medications. Ophthalmology referral is indicated in instances which require surgical or other medical management outside the scope of the individual treating optometrist. It is important that optometrists recognise and practice within their scope to ensure the best health outcome for the patient.

Optometrists must be confident and competent in assessing patients who present with red eye conditions, and be able to provide evidence-based management and advice. This includes appropriate communication, diagnosis and referral when indicated, and where the practitioner is therapeutically endorsed, management of the condition in accordance with the Optometry Board of Australia's guidelines.

Patient History

A thorough patient history is vital in the assessment of red eye presentations in order to elucidate the nature and cause of the red eye episode. Some of these questions may include the following:

Unilateral or bilateral involvement	**Previous ocular surgery**
Onset and duration of symptoms	**Previous trauma**
Types and amount of discharge	**Presence of allergies**
Visual changes	**Presence of systemic disease**
Severity of pain	**Current systemic medications**
Photophobia	**Use of contact lenses**
Previous treatments	**Prior episodes**

Clinical Examination

After patient history, comprehensive clinical examination is required. External examination of the eyelids and surrounding area is important to note any oedema, discharge, and visible signs of trauma or pupil abnormalities. Other important clinical tests to assess a red eye include:

Clinical Test	Notes
Visual acuity	Where possible based on presentation
Pupil responses	To look for neurological and inflammatory causes
Slit lamp Biomicroscopy	• Eye lid margins • Conjunctiva • Sclera • Cornea • Anterior chamber • Anterior vitreous • Contralateral eye • Lid eversion
Intraocular pressure	Where possible, measure both eyes
Gonioscopy	If angle closure suspected
Examination of the posterior segment	To exclude posterior segment involvement
Corneal scraping for culture where appropriate	If infective keratitis is suspected and there are atypical signs, symptoms or response to initial treatment
Corneal sensitivity	To assess for hypoesthesia and herpetic conditions
Preauricular Nodes	To assess for viral eye disease

	Bacterial Keratitis	Herpes Simplex Keratitis	Acute Anterior Uveitis	Acute Angle Closure Glaucoma
Common Symptoms	Symptoms • Redness • Pain • Photophobia • Reduced vision • Lid Swelling • Mucopurulent discharge • "White spot on eye"	Symptoms • Redness • Pain/Discomfort • Photophobia • Reduced vision • Lid swelling • Mild Watery Discharge • Reduced corneal Sensitivity	Symptoms • Redness • Pain • Photophobia • Reduced vision • Copious Watery Discharge	Symptoms • Redness • Pain • Photophobia • Reduced vision • Haloes around lights • Nausea/vomiting • Headaches • Cloudy vision
Clinical Presentations	Signs ✓ Irregular focal lesion, may be >1mm in size ✓ Epithelial defect ✓ Discharge ✓ Anterior chamber reaction – cells & flare ✓ Lid swelling ✓ Infiltrate ✓ Posterior synechiae ✓ Conjunctival injection	Signs ✓ Epithelial disease (dendritic or geographic ulcers) ✓ Stromal disease ✓ Neurotrophic keratitis ✓ Endotheliitis ✓ Conjunctivitis (mild) ✓ Skin lesions ✓ Anterior chamber reaction ✓ Conjunctival injection ✓ Preauricular node	Signs ✓ Circumlimbal flush ✓ Anterior chamber reaction – cells and flare ✓ Miotic pupil ✓ Keratic Precipitate ✓ Hypopyon ✓ Abnormal IOP ✓ Corneal oedema ✓ Posterior Synechia	Signs ✓ High IOP (typically over 40mmHg) ✓ Mid-dilated pupil ✓ Corneal oedema ✓ Shallow Anterior Chamber ✓ Anterior chamber reaction (mild) ✓ Glaucomflecken (anterior sub-capsular opacities)

	Bacterial Keratitis	Herpes Simplex Keratitis	Acute Anterior Uveitis	Acute Angle Closure Glaucoma
Risk Factors	**Age** • 15-64 years (Trauma and Contact Lenses) • ≥60 years – Previous ocular surgery **External** • Contact lenses (e.g. extended wear, poor hygiene, inadequate disinfection, sharing of lenses , use of tap water) • Trauma • Previous ocular surgery • Immunosuppression • Substance abuse **Internal** • Tear-film deficiencies • Viral Keratitis • Recurrent corneal erosion **Systemic Conditions** • Diabetes • Atopic dermatitis • Blepharoconjunctivitis • Gonococcal infection • Vitamin A deficiency	• Long-term Corticosteroid inhalers • Long-term corticosteroid creams • Asthmatic patients • Cardiovascular disease • Immunosuppressed patients • Atopic patients • Multiple previous episodes	• HLA-B27 positive • Rheumatoid conditions • Inflammatory Bowel conditions • Trauma • Keratitis • Idiopathic • Ulcerative Colitis • Crohn's Disease • Syphilis • Behcet's disease • Sarcoidosis • Tuberculosis • Multiple Sclerosis	• Females • Asian ethnicity • Older age • Hyperopia • Anterior chamber depth <2.5mm • Increased lens volume • Increased choroidal thickness

	Bacterial Keratitis	Herpes Simplex Keratitis	Acute Anterior Uveitis	Acute Angle Closure Glaucoma
Differential Diagnosis	• Sterile peripheral infiltrate • Marginal keratitis • Fungal keratitis • Herpes Simplex Keratitis • Exposure keratopathy • Neurotrophic • Acanthamoeba keratitis • Shield ulcer • Dellen • Phlyctenular keratitis	• Acanthamoeba keratitis • Herpes Zoster Ophthalmicus • Recurrent corneal erosion • Healing abrasion	• Glaucoma (acute angle closure) • Fuchs Heterochromic iridocyclitis • Endophthalmitis • Posner-Schlossman Syndrome • Lens induced uveitis • Intraocular foreign body	• Acute conjunctivitis • Trauma • Episcleritis • Scleritis • Uveitis • Primary open angle glaucoma • Secondary open angle glaucoma • Optic neuropathies
Triggers for Referral and Appropriate timing	**Same Day/within 24 hours** • Larger (>2mm), more central or deeper lesions – risk of scarring and/or perforation • Consider referral for culture/corneal scrape to identify causative organism • Non-responding cases: be aware of bacterial resistance to antibiotic treatment • Consider non-bacterial causes **Within 72 hours** Cases that do not respond to initial treatment or slow/inadequate healing	**Same Day/within 24 hours** • Stromal and endothelial involvement • Bilateral cases • Large geographic ulcers **Within a week** Cases that do not respond to initial treatment	**Same Day/within 24 hours** • Severe cases e.g. significant posterior synechiae, poor view of posterior pole, atypical inflammation • Hypopyon • Bilateral • Posterior segment involvement • Recent surgery • Presence of drainage bleb • IOP >30mmHg **Within 72 hours** Cases that do not respond to initial treatment Refer to Medical Practitioners (GP,	**Immediate action required** • Acute angle closure is an ophthalmic emergency – refer immediately and also may initiate treatment with advice of ophthalmologist/GP

	Bacterial Keratitis	Herpes Simplex Keratitis	Acute Anterior Uveitis	Acute Angle Closure Glaucoma
			Ophthalmologist) following 2nd episode	
Pharmacological Management	**Topical ciprofloxacin or ofloxacin** **Loading dose:** Q1h for 2 days then (if good response) QID until completely resolved. Considerations: • Fluoroquinolones (ciprofloxacin and ofloxacin) cover both gram positive and gram negative pathogens • Ciprofloxacin has enhanced activity towards gram positive – may be preferred in hot climates in contact lens microbial keratitis • Ofloxacin in cooler climates for *Staph* species • Atropine – (prevent ciliary spasm) if significant pain and oral analgesia insufficient. • Corticosteroids – limit scarring during healing • Steroid treatment should be introduced only after 2-3 days of progressive improvement of the ulcer.	**Epithelial and Geographic** 3% Acyclovir* ointment *5 times/day for 7 days* then *3 times/day for next 7 days* (*Can be toxic to ocular surface. Cease 1-2 days after resolution and consider non-preserved lubricants to help with ocular surface toxicity) Consider cycloplegic agent with anterior chamber reaction **Stromal Keratitis** Topical corticosteroids with oral prophylactic antivirals ***Considerations*** Topical steroids will worsen Herpes Simples Keratitis HSK epithelial disease Oral Antivirals may be indicated in patients with many recurrences, e.g. Valacyclovir 500mg 1xday Acyclovir 400mg 2x/day Consider referral for medical opinion.	Topical Steroids with good intraocular penetration: Predforte or Maxidex. May require loading dose • Q1h waking hours (consider overnight based on severity) for 2 days, then (if improvement) Q2h for 2 days, then (if improving) • Qid for 1 week, then • Tid for 1 week, then • Bid for 1 week, then • Qd for 1 week, then stop. Monitor IOP while treating with topical steroids to identify steroid responders Atropine (bid – tid) until anterior chamber reaction under control.	Immediate IOP Lowering 500mg oral Diamox[1] AND 1 drop of Beta blocker, Alpha Agonist or Carbonic Anhydrase Inhibitor After consultation with Ophthalmologist, 1 drop of Pilocarpine if IOP has decreased[2] [1] Prescribed by Medical Practitioner (Ophthalmologist/GP) via telephone order to Pharmacist [2] Pilocarpine contraindicated if ACG due to retrolenticular or lens induced mechanism

	Bacterial Keratitis	Herpes Simplex Keratitis	Acute Anterior Uveitis	Acute Angle Closure Glaucoma
Review	Daily until ulcer shows improvement. Weekly until complete resolution Clinical discretion should be applied. Review schedule should be considered on a case by case basis. Factors to consider include: • Severity of infection • Risk of side effects • Reliability of patients to comply with instructions	1-2 days until HSK is improving Weekly until complete resolution Clinical discretion should be applied. Review schedule should be considered on a case by case basis. Factors to consider include: • Severity of infection • Risk of side effects • Reliability of patients to comply with instructions	Review on first or second day after commencing treatment. Clinical discretion should be applied. Review schedule should be considered on a case by case basis. Factors to consider include: • Severity of inflammation • Risk of side effects • Reliability of patients to comply with instructions	Ophthalmological. Needs surgery (peripheral laser iridotomy and/or cataract extraction if appropriate). Ensure the patient has received appropriate care once referred.