

Keratitis

[Disclaimer](#)

COVID-19 note

The Royal Australian and New Zealand College of Ophthalmologists (RANZCO) and The Royal Australian College of General Practitioners (RACGP) have made recommendations regarding eye examination during the COVID-19 pandemic. See RANZCO – [COVID-19: Practical Guidance for General Practitioners Performing Eye Examinations](#).

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Contents

Disclaimer.....	1
Red Flags	2
Background – About Keratitis	2
Assessment	2
Practice Point	2
Management	5
Referral	6
Information	6
For health professionals.....	6
For patients.....	6
References	6
Disclaimer.....	6

Red Flags

- Corneal infiltrate, haze, or opacity
- Significantly reduced vision
- Unilateral red eye
- Red, painful eye in contact lens wearer

Background – About Keratitis

A sight-threatening condition of the corneal epithelium or stroma.

May be caused by infection (e.g. herpes simplex virus, bacteria, fungi, protozoa) or autoimmune processes.

A corneal ulcer and keratitis are not interchangeable terms because there may be an ulcer (often painful) without bacterial infection, and ulceration predisposes to infection (i.e. bacterial keratitis). Infective keratitis is usually precipitated by a change to normal corneal epithelial health e.g. by trauma, contact lens use, tear film, and/or eyelid pathology.

- Bacterial keratitis:
 - can either be marginal or microbial keratitis.
 - is a serious bacterial infection of the cornea which can, in severe cases, cause permanent loss of vision.
- See [Herpes Simplex Keratitis pathway](#).

Assessment

Practice Point

Be aware of possible keratitis

Suspect microbial keratitis if there is corneal eye opacification or failure to rapidly heal.

1. Take a history – ask about:

- use of contact lenses.
- **risk factors.**

Risk factors

- *Corneal trauma*
- *Recent corneal disease*
- *Contact lens wear, especially extended-wear lenses*
- *Reduced immunity due to diabetes, poor nutrition, or patient being frail or elderly*
- *Use of contaminated eye drops and other eye medicines*
- *Use of topical steroids*

- symptoms, including:
 - red eye.
 - photophobia.
 - blurred or decreased vision.
 - progressive eye pain (usually over 1 to 3 days).

2. Examine the eye – look for:

- severely red eye, lids may be swollen.
- hypopyon (pus in anterior chamber).
- corneal ulceration after fluorescein staining.
- signs of herpes simplex keratitis:
 - vesicles around the lids – only seen in primary childhood herpes simplex virus (HSV) infection and rarely in adults.
 - mild corneal haze – can be seen easily on examination of the red reflex at arm's length (a good way to check a child).
 - fluorescein uptake by the cornea with a branching pattern – very specific to HSV.
- corneal infiltrates (seen with a slit lamp).

3. **Measure visual acuity** and pinhole vision. In herpes simplex keratitis, this ranges from normal (peripheral dendrite) to moderately poor (i.e. around 6/48) when the defect involves the central cornea.

Visual acuity

1. Ask if the patient has distance glasses with them, and if either eye has had known poor vision i.e., a lazy eye.
2. Test their distance vision in each eye, while wearing glasses, using a 3 or 4 m chart.
3. Check each eye separately, with distance glasses if worn.
4. If acuity is subnormal, check with a pinhole.
5. If vision improves with a pinhole, and no cataract is present, then the patient requires a review of their glasses.
6. If unable to read any letters on chart, assess the following in descending order:
 - Finger counting
 - Hand movements
 - Light perception
7. Test near vision while patient is wearing reading glasses.

4. Determine the type of keratitis:

➤ **Marginal keratitis**

- Common and can be recurrent.
- Patients with *Staphylococcus blepharitis*.
- Ulcers are typically at the point where the eyelids cross the eye i.e., at 2, 4, 8, and 10 o'clock positions.
- Ulcers lie near the corneal limbus (border of cornea and sclera) but are separated from it by a thin area of clear cornea. Ulcer has a banana shape of the limbus. Initially may not stain with fluorescein.



Source: NSW Department of Health – [Eye Emergency Manual: An Illustrated Guide](#)

- **Microbial keratitis** – any patient who wears contact lenses and develops a red, painful eye must be assumed to have microbial keratitis.

Microbial keratitis

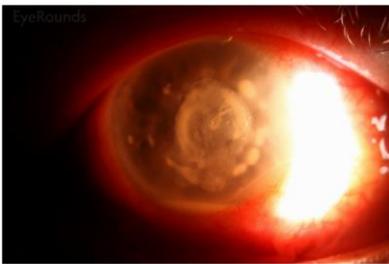
- Typically presents with a 1 to 3 day history of a red eye (ciliary flush), with an area of corneal opacification (known as an infiltrate), and with an associated epithelial defect, photophobia, pain, and lid oedema.
- Frequently associated with mucopurulent discharge.
- Clinical features include pain and photophobia with an area of corneal opacification (known as an infiltrate) with a matching area of fluorescein staining over this, and lid oedema.
- Visual acuity is frequently reduced.
- Can progress rapidly to severe pain and markedly decreased vision.
- Hypopyon – a sinister sign of inflammation of the internal, anterior eye and a "pus" level in the anterior chamber.
- Risk factors:
 - Corneal injury
 - Contact lens wear
 - Compromised ocular surface e.g., lid-malposition, dry eye, VII nerve palsy
 - Immunocompromised patients



Microbial Keratitis

Source: NSW Department of Health – [Eye Emergency Manual: An Illustrated Guide](#)

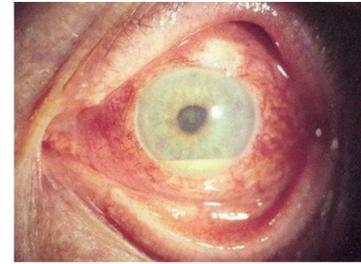
➤ Herpetic simplex keratitis/dendritic ulcer



Corneal infiltrate
© EyeRounds



Severe bacterial keratitis
Copyright 2018 [EyeRounds.org](#)



Hypopyon
by EyeMD (Rakesh Ahuja, M.D.).
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Management

1. If suspect bacterial or marginal keratitis, do not treat with antibiotics as this will prevent a useful culture being taken.
2. Seek [ophthalmology advice](#) if:
 - significantly reduced vision with severe eye pain and/or fluorescein staining of cornea.
 - visible corneal opacity, infiltrate, or haze.
 - suspected bacterial keratitis (microbial, marginal).
3. If contact lens wearer with microbial keratitis:
 - If severely painful red eye or if fluorescein staining of the cornea, seek [ophthalmology advice](#), without starting antibiotic drops.
 - If mild painful red eye and no fluorescein staining, advise the patient:
 - not to use their contact lenses.

- to arrange [optometry assessment](#) as soon as possible.
- 4. If diagnosis is clear, manage as per [Herpes Simplex Keratitis / Dendritic Ulcer](#) pathway.
- 5. Provide pain relief and advise the patient to wear dark glasses.
- 6. Refer for [optometry assessment](#) if concerns from visual acuity check.

Referral

- Seek [ophthalmology advice](#) if:
 - significantly reduced vision with severe eye pain and/or fluorescein staining of cornea.
 - visible corneal opacity, infiltrate, or haze.
 - suspected keratitis (microbial, marginal).
 - contact lens wearer with severe painful red eye or fluorescein staining of cornea.
- Refer for [optometry assessment](#) if
 - concerns from visual acuity check.
 - mild painful red eye and no fluorescein staining of cornea in a contact lens wearer.

Information

For health professionals

Further information

- Australian Family Physician – [A Painful Red Eye](#)
- Australian Prescriber – [Common Eye Infections](#)
- NSW Government, Agency for Clinical Innovation – [Eye Emergency Manual: Red Eye](#)
- NSW Health – [Eye Emergency Manual: Acute Red Eye, Painful, Cornea Abnormal](#)

For patients

- Centers for Disease Control and Prevention (CDC) – [Healthy Contact Lens Wear and Care: Germs & Infections](#)
- Patient – [Eye Infection \(Herpes Simplex\)](#)

References

- Centers for Disease Control and Prevention (CDC) – [Healthy Contact Lens Wear and Care: Germs & Infections](#)
- Patient – [Eye Infection \(Herpes Simplex\)](#)

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