WHAT YOU NEED TO KNOW

Symptoms:
- Infection of compromised cornea (epithelial break, hypoxia) from invasion of bacteria (especially pseudomonas spp. - principally aeruginosa), virus, fungus or amoebae with excavation of corneal epithelium, Bowman’s layer and stroma with infiltration and necrosis of tissue

• Severe pain with rapid onset, photophobia, epiphora, severe redness, reduced vision (depends on location), discharge, lid puffiness
• No improvement after lens removal, pain usually increases

Incidence:
- RGP DW 0.03%, hydrogel DW 0.05%, hydrogel EW 0.96%, SiH EW 0.2% (Morgan et al, 2005)
- RGP DW 0.01%, hydrogel DW 0.02%, SiH DW 0.12%, hydrogel EW 0.20%, SiH EW 0.25% (Stapleton et al, 2008)

Aetiology:
Infection of compromised cornea (epithelial break, hypoxia) from invasion of bacteria (especially pseudomonas spp. - principally aeruginosa), virus, fungus or amoebae with excavation of corneal epithelium, Bowman’s layer and stroma with infiltration and necrosis of tissue

Risk factors:
EW, hypoxia, poor compliance and hygiene, swimming/showering in lenses, tap water, not storing case dry, male, smoking, trauma, poor general and ocular health (diabetes, respiratory disease), warm climates, socio-economic class, longer wearing periods, delay seeking treatment, high ametropia (>5D), younger age (15-25 years), lens case contamination, environmental influences

Grading:

Staining of ulcer

Active ulcer

Central ulcer scar

Large central ulcer

Ulcer caused by Pseudomonas

Ulcer caused by Acanthamoeba

Area of corneal staining overlaying stromal opacity 0: No 1: Yes. Record location (S/I/N/T), size and shape

How to manage patients with MK (Microbial Keratitis)

Slit Lamp Viewing:
1. With fluorescein, cobalt filter and yellow barrier filter. Optical section to assess depth
2. Medium/high magnification (16 - 25x)
3. Direct illumination

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WHAT YOU NEED TO RECOMMEND TO YOUR PATIENTS

**Recommendations:**

- Immediate discontinuation of lens wear — lenses and case not to be reused
- Ocular emergency — urgent referral for ophthalmological investigation; corneal scrape, close monitoring and medical treatment
- Intensive round the clock treatment, with possible hospital admission (antimicrobial, cycloplegic, analgesic, topical steroids only when infection under control)

- No patching
- Advise about risk factors — improve hygiene, care regimen and avoid tap water
- Case replacement and hygiene (including rubbing & tissue wiping)
- Refit with DD, advise against overnight wear

**Prognosis:**

- Variable — often resolves with scar and vascularisation; depends on causative organism
- Improved with rapid intervention
- 14% lose 2 lines or more best corrected VA; depends on scar location and severity of infection
- Vision loss is less likely to occur in DD than in reusable soft CL users

**Differential Diagnosis:**

Contact Lens Peripheral Ulcer (CLPU), dense corneal staining (epithelial plug), corneal abrasion

![Active CLPU](image1)

![Corneal Abrasion](image2)

NOTE: Microbial keratitis is also known as infected corneal ulcer, corneal abscess, suppurative keratitis, infectious keratitis, ulcerative keratitis

HOW TO FIND OUT MORE

- Click [here](#) for a general refresher on slit lamp techniques
- Click [here](#) to watch our educational video on slit lamp examination using optical section
PATIENT CASE STUDY

Patient JC is a 20-year-old male student who has worn monthly replacement hydrogel lenses for the past three years. He attends for an emergency appointment late afternoon wearing his lenses and complaining of a very painful, watery red eye since this morning. He is suffering from intense photophobia making examination difficult.

JC reports he has been wearing his lenses regularly overnight.

Quiz:

1. What slit-lamp techniques might you use to examine this patient's cornea?
   A. Fluorescein and cobalt blue filter
   B. Direct illumination and medium/high magnification
   C. Optical section
   D. All of these

2. Which of the following features of suspected microbial keratitis would you record?
   A. Shape and size of ulcer
   B. Location
   C. Underlying stromal opacity
   D. All of these

3. What is the most likely risk factor associated with MK in this patient?
   A. Poor lens fit
   B. Overnight wear
   C. Delay seeking treatment
   D. Trauma

4. Which of the following management options would you be most likely to choose?
   A. Advise to leave lenses out for a week then resume
   B. Refit with silicone hydrogel lens and continue wear
   C. Refer urgently for ophthalmological investigation
   D. Patch the eye and see again in two days’ time

Correct answers:
1. D. All of these techniques have a role in assessing microbial keratitis and in differential diagnosis.
2. D. All of these features, ideally supported by ocular photography, should be recorded.
3. B. Overnight wear is the most obvious risk factor involved although the aetiology may be multi-factorial.
4. C. Refer urgently as an ocular emergency for corneal scrape, close monitoring and medical treatment.
**FURTHER READING/REFERENCES**

**Bacterial keratitis**

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