### Definition

**Infection** of the cornea by microbes, characterised by excavation of the corneal epithelium, Bowman's layer and stroma with infiltration and necrosis of the tissue.\(^1\)

**Inflammatory reaction** of the cornea, characterised in its active stage by focal excavation of the epithelium, infiltration and necrosis of the anterior stroma. Bowman's layer, however, is intact.\(^1\)

### Occurrence

<table>
<thead>
<tr>
<th><strong>Microbial Keratitis</strong></th>
<th><strong>Contact Lens Peripheral Ulcer</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence of Microbial Keratitis (MK) in lens and non lens wearers is limited to few individuals per 10,000 wearers (4 to 5 events with daily wear; 20 to 21 with low DK extended wear)(^3,4)</td>
<td>Rare in non-lens wearers; 25 times more frequent with DW in comparison to MK; 50 times more frequent with extended wear in comparison to MK (CCLRU/LVPEI data)</td>
</tr>
</tbody>
</table>

### Symptoms

**Symptoms**

- Moderate to severe pain of rapid onset
- Severe redness (‘meaty’ appearance)
- Decreased visual acuity if the lesion is on the visual axis
- Discharge (mucopurulent), tearing
- Photophobia
- Puffiness of lids

**Symptoms**

- Ranges from moderate to severe pain, foreign body sensation, irritation to asymptomatic
- Moderate to severe redness
- Tearing

### Signs

#### Infiltrate

- **size**: Commonly >1mm, can be multiple focal infiltrates
- **shape**: Any shape; commonly irregular
- **location**: Mainly central or paracentral, sometimes peripheral
- **depth**: Anterior to mid-stroma, may involve entire depth
- **surrounding cornea**: Involved, ranges from edema with diffuse infiltrates to satellite lesions or ring infiltrate
- **overlying epithelium**: Full thickness loss (when active)
- **endothelial involvement**: None

**Common, ranging from flare to hypopyon**

**Usual**

**Severe**

**Usually unilateral**

**Signs**

<table>
<thead>
<tr>
<th><strong>Anterior chamber reaction</strong></th>
<th><strong>Lid edema</strong></th>
<th><strong>Bulbar and limbal redness</strong></th>
<th><strong>Unilateral / bilateral</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Usual, usually small, single, circular, focal infiltrate (up to 2mm)</td>
<td>Circular, well-circumscribed</td>
<td>Peripheral or mid-peripheral</td>
<td>Usually unilateral</td>
</tr>
<tr>
<td>Rare</td>
<td>Usually small, single, circular, focal infiltrate (up to 2mm)</td>
<td>Circular, well-circumscribed</td>
<td>Usually unilateral</td>
</tr>
<tr>
<td>Moderate, localized</td>
<td>Often</td>
<td>Usually small, single, circular, focal infiltrate (up to 2mm)</td>
<td>Usually unilateral</td>
</tr>
<tr>
<td>Rare</td>
<td>Usually small, single, circular, focal infiltrate (up to 2mm)</td>
<td>Usually small, single, circular, focal infiltrate (up to 2mm)</td>
<td>Usually unilateral</td>
</tr>
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<td>Usually unilateral</td>
</tr>
</tbody>
</table>

### Aetiology

- **Microbial invasion and infection** (bacteria, fungus, parasites)\(^3\)

**Risk Factors**

- **Trauma**\(^6\), poor contact lens hygiene\(^4,9\), overnight contact lens wear\(^8,10\), immunocompromised states\(^9,10\), swimming\(^8\)

**Risk Factors**

- **Toxins released by S.aureus colonising the contact lens surface**\(^7\), bacteria not found on scraping or biopsy\(^7\)
- **Overnight contact lens wear, lens material interaction with corneal surface**

### Course & Management

- **Immediately discontinue lens wear**
- **Progressively worsens without treatment**
- **Corneal scrapings and antimicrobial therapy** (e.g. fluoroquinolones) mandatory
- **Monitor daily**
- **Resolves with scar, may be vascularised, vision loss may occur**

**Course & Management**

- **Discontinue lens wear until resolution**
- **Normally heals rapidly without intervention**
- **Close monitoring required** (eg. within 24hrs on Day1)
- **Antibiotics** (if monitoring not possible)
- **Resolves with scar (‘bullseye’ appearance)**
### Microbial Keratitis (MK)

<table>
<thead>
<tr>
<th>Best Corrected VA</th>
<th>No loss</th>
<th>&lt;1 line loss</th>
<th>1-2 line loss</th>
<th>2-3 line loss</th>
<th>&gt;3 line loss</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Conjunctival Redness</strong></td>
<td>None</td>
<td>None</td>
<td>1 quadrant</td>
<td>2 quadrants</td>
<td>3 quadrants</td>
</tr>
<tr>
<td><strong>Chemosis</strong></td>
<td>None</td>
<td>None</td>
<td>Watering</td>
<td>Slight</td>
<td>Present</td>
</tr>
<tr>
<td><strong>Discharge</strong></td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>Slight</td>
<td>Moderate</td>
</tr>
<tr>
<td><strong>Lid edema</strong></td>
<td>None</td>
<td>Very Slight</td>
<td>1</td>
<td>2 quadrants</td>
<td>None</td>
</tr>
<tr>
<td><strong>Infiltrate</strong></td>
<td>None</td>
<td>None</td>
<td>Pericate</td>
<td>Mid-peripheral</td>
<td>3 line loss</td>
</tr>
<tr>
<td><strong>Anterior Chamber</strong></td>
<td>None</td>
<td>None</td>
<td>Endothelial dusting</td>
<td>Flare/Cells</td>
<td>None</td>
</tr>
</tbody>
</table>

### Contact Lens Peripheral Ulcer (CLPU)

<table>
<thead>
<tr>
<th>Shape</th>
<th>Pericanthus</th>
<th>Entire stroma</th>
<th>Central stroma</th>
<th>Mid-stroma</th>
<th>0.5-1.0</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ocular Adnexa</strong></td>
<td>None</td>
<td>None</td>
<td>0.5-1.0</td>
<td>1.1-2.0</td>
<td>&gt;2.0</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>Anterior stroma</td>
<td>Punctate</td>
<td>Round</td>
<td>Mid-peripheral</td>
<td>2</td>
</tr>
<tr>
<td><strong>Overlying epithelial staining</strong></td>
<td>Intact</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>

### Probability index for MK

- **>25** - High probability of MK; needs urgent medical attention; corneal scrape and therapy mandatory
- **15 - 25** - Possible early MK or severe CLPU; refer immediately for medical attention
- **<15** - Low probability of MK; monitor at frequent intervals over 24 hours; if condition stable or improving, continue frequent follow ups; if condition worsens, refer for medical attention immediately.

**Note:** For all events discontinue lens wear and do not patch the eye. Save lens case/solutions for microbiological analysis.

### References:

7. Grant T, Coker WB, Wood J. None | Central stroma | None | None | None |

### Acknowledgements:

This brochure was compiled from data collected by the CCLRU and LVPEI Clinical Research Teams. Contributions from i-media communications is gratefully acknowledged.