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## Complications of Contact Lens Wear

### I. Introduction:

“In 1970, practitioners believed that contact lens fitting was simple. Our only clinical concerns were edema, distortion of the cornea, and 3/9 o’clock staining...”  
Brian Holden 1982

Corneal edema, then defined by central circular clouding (CCC)  
Corneal distortion, then defined by distorted K readings and spectacle blur  
3/9 staining, cause and treatment then only partially understood

### II. Complications of CL wear are now known to include:

Lid problems

Meibomian gland dysfunction (MGD)  
Blepharitis  
Parasites  
Inflammation  
Giant papillary conjunctivitis (GPC)  
Ptosis

Tears

Poor quantity  
Poor quality  
Debris

Corneal edema

Epithelial

Microcysts  
Microcystic edema  
Edematous corneal formations (ECF)  
Distortion => spectacle blur, corneal warpage

Stromal:

Acute thickening (CCC) => striae (4-6%) => striate  
keratopathy (10-15%) stromal swelling  
Chronic thinning/loss of GAGs  
(Neo-)vascularization  
pannus  
deep stromal vessels ?=> lipid infiltrates, scarring  
Acidosis  
Keratocyte apoptosis  
Myopic (creep) shift

Endothelial:

Blebs  
Polymegathism  
Endothelial bedewing

Infiltrates

Non-infectious

Epithelial vs stromal  
Allergic  
Toxic  
Hypoxia

Indirect infectious

Viral (adenovirus, herpes)  
Bacterial (chlamydia, 2° Staph blepharitis)

Epithelial staining

3/9 (“juxtapositional”)  
Pseudoepithelium or vascularized limbal keratitis (VLK)  
Dellen  
Contact lens peripheral ulcers (CLPU)  
Foreign body  
Inferior arc “smile” (dehydration)  
Inferior band ?=> DE, toxicity  
Superior epithelial arcuate lesion (SEAL)  
Cluster  
Dimple veil  
Mucin balls  
Pan-corneal (toxic?)

## Abrasions

Coalesced stain and/or epithelial defect, with or without symptoms

## Generalized responses

Acute red eyes (ARE or CLARE)

Toxic  
Tight lens syndrome  
Indirect infectious

Microbial keratitis (MK): characterized by associated epithelial defect(s) associated with infiltration, pain, discharge, and inflammation of associated tissues: anterior chamber reaction, lid swelling, conjunctival injection etc

Bacteria: principally *Pseudomonas* sp (gram -) or *Staphylococcus* sp (gram +)

Other bacteria: pneumococcus, bacillus, etc

Virus: adenovirus, herpes

Fungi

Acanthamoeba

## III. Treatment protocols

Tear problems  
Toxic reactions  
Ocular allergies  
“Sterile” infiltrates  
Hypoxia  
Corneal staining  
Abrasion  
MK

## IV. Six learning objectives

1. Learn the various major (vision threatening) and minor physiological complications of contact lens wear

2. Learn management of corneal infiltrates, especially distinguishing between infectious and non-infectious infiltrates.
3. Learn identification and management of contact lens driven corneal hypoxia.
4. Learn identification and management of anterior segment toxic and hypersensitivity responses.
5. Learn modern management of giant papillary conjunctivitis.
6. Learn management of various forms of corneal abrasion