

# Contact Lens Update

CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

## Epidemiology of contact lens-induced infiltrates: an updated review

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Dr. Robin Chalmers has studied and published on contact lens complications for more than 20 years. She is very involved with the American Academy of Optometry and is an Assistant Editor for *Contact Lens & Anterior Eye*, the journal of the British Contact Lens Association.

*Epidemiology of contact lens-induced infiltrates: an updated review. Steele KR, Szczotka-Flynn L. Clin Exp Optom. 2017, 100(5):473-481.*

Why should clinicians be interested in an updated review of contact lens induced corneal infiltrative events (CIEs) and how does increased understanding of CIEs help in clinical practice? First of all, the review's conclusion begins with a strong statement about how daily disposable (DD) lenses have reduced the incidence of CIEs and a call to action for eye care practitioners to "disseminate information already known about the epidemiology of CIEs to at-risk individuals". So, let's walk through the information presented in this manuscript section by section.

### Incidence and Classification of CIEs

The incidence of any condition is dependent on how the condition is classified in a study. Contact lens wearers can present with a painful adverse event that we classify as a CIE or they can come in for a routine checkup with no symptoms and have milder CIEs present. The incidence of symptomatic CIEs in the reviewed studies ranges from about 2.5% to 6% per year of wear for reusable soft contact lenses and is much lower for DD lenses at less than 0.4% per year.

In your clinical practice, the CIE incidence among your patients will depend on the types of patients you fit and the types of lenses that you prescribe for those patients. For example, if you allow patients to sleep overnight in their soft lenses, or don't actively discourage this practice at each follow-up visit, you will be treating more CIEs, very likely more serious CIEs, and have patients that are also at higher risk for sight-threatening microbial keratitis. This is not a good plan. On the other hand, if you use this information to discuss with patients the clinical evidence of a 10 times lower CIE rate with DD lenses, then you can help many types of patients avoid CIEs. The patient is in your chair to hear what you know about the safest way that they can wear contact lenses. The Steele review paper gives you tools for this discussion.

The modified Aasuri CIE classification system shown in Table 2 of the review is very useful in practice to provide a visit-by-visit scoring of the severity of the CIE. Only by carefully documenting the features in the scheme can the clinician precisely determine whether the patient is improving over time with the treatment plan. The system assigns points for patient symptoms, lid swelling, conjunctival redness, the shape of the infiltrate, the size of the largest infiltrate, the number of infiltrates, fluorescein staining, corneal edema around the site, endothelial debris, hypopyon and whether discontinuing lens wear improves the situation. The utility of this scoring grid is that it can describe the full range of events from the asymptomatic infiltrates that may be observed at routine visits, to the all-important differential diagnosis between a CIE and an infectious microbial keratitis. (Table 2 in paper available here: <https://onlinelibrary.wiley.com/doi/full/10.1111/cxo.12598>. Free access, available online and as a pdf)

Operationally in a clinical setting, if your electronic medical record does not have the ability to capture the Aasuri score, it could be scored on a separate grid and the score summarized in a comments section. Filling out the score step by step also helps the clinician make sure that they have considered all of these features that can indicate a non-infectious inflammatory CIE event or point to an infectious form of keratitis. Some items like lid swelling and corneal edema may be overlooked but are important indications of a possible microbial keratitis, if present.

### **Review of Risk Factors**

Epidemiology studies patterns of disease in large populations, but clinicians treat one patient at a time. Understanding the risk factors for CIEs will help practitioners decide where their patient fits into the at-risk population of contact lens wearers. Table 3 of the Steele review gives a good synopsis of risk factors for CIEs. Salient factors include patient age, sex, high refractive error, prior history of eye events, smoking, overnight wear, use of reusable (not DD) lenses, use of a multi-purpose lens care system, silicone hydrogel lens wear and eye redness when they are not having an adverse event. The patient-related factors cannot be changed, but the way they wear lenses (no overnight wear) and the choice of lenses can be changed to lower the risk of CIEs. The only risk factor from this literature that a clinician can't assess directly is whether the patient has a high level of bacterial bioburden on their lids. This list is very user friendly in a clinical setting. (Table 3 in paper available here: <https://onlinelibrary.wiley.com/doi/full/10.1111/cxo.12598>. Free access, available online and as a pdf)

Remember, each of these risk factors usually stack on top of each other, so a person aged 20 who smokes and wears their reusable lenses overnight will have a much higher risk of problems than a non-smoker in their late 30s wearing DD lenses. In discussions with patients, point out to them that you have taken into consideration of their personal risk factors in order to make the best prescribing recommendation on how to avoid problems with their lens wear. A person can't change being a 20 year old, but can choose DD lenses as a way to wear lenses in the healthiest way.

It is also important to note that the largest single risk factor for the development of CIEs is the use of reusable contact lenses, which account for a 12.5 times higher risk compared to wearing DD lenses. As Steele discusses, this may be due to contamination of contact lens storage cases or interactions with lens care systems, but regardless of the reason, patients who use their DD lenses and discard them after each use will reduce their chance of a CIE by an order of magnitude. Recently, contact lens companies have vastly expanded the range of lens prescriptions available in the DD replacement modality to include all types of toric, multifocal and extended range powers. The vast majority of patients can be corrected with this type of lenses nowadays.

One factor that is not presented in Table 3 is the exposure of soft contact lenses to water. In addition to being a risk factor for the development of *Acanthamoeba* keratitis, the Contact Lens Assessment in Youth (CLAY) study team has shown that showering while wearing soft lenses increases the risk of CIEs by 3.1 times, rinsing lenses in tap water and any other water exposure each double the risk. Zimmerman has published results of CLAY's work in collaboration with the US Center for Disease Control and Prevention that shows that patients are largely ignorant of water use as a risk for contact lens complications; about 90% of soft lens wearers shower and 60% swim while wearing lenses. This exposure to tap water is even worse for rigid lens wearers, 90% rinse lenses with tap water and many shower and swim while wearing their lenses as well. Talk to your patients during each after care visit about how they can reduce their exposure to water during lens wear.

In summary, Steele's well-written and complete review of the epidemiology of contact lens-induced corneal infiltrates will give you great tools to help counsel your existing and new contact lens wearers toward a successful and safe wearing experience. It will also help highlight why your personalized care is a necessary part of their eye care.