It is well established that good tear exchange under a contact lens can help prevent microbial keratitis, CLARE, and lens-induced corneal edema. It makes sense from a physiologic perspective. If you have stasis under a lens, byproducts from normal corneal metabolism accumulate in the post-lens tear reservoir. The late Rob Breece (inventor of the Jupiter scleral lens) called the accumulation of debris in the post-lens tear reservoir “The Toxic Swamp” because of its biomicroscopic appearance.

While I love using scleral lenses for a variety of serious ocular conditions, the problem of tear stasis under the lens is concerning. The post-lens tear reservoir in sclerals has been implicated as a resistor to oxygen transmission to the cornea. The stasis also seems to be a source of complications ranging from decreased wear time to corneal edema. Patients who remove and reinsert their scleral lenses frequently (4-5 times daily) tend to have better results.

For these reasons, I find myself using hybrid lenses more and more. Hybrid wearers tend to be able to wear their lenses with success from morning to night without having to remove and reinsert. The reason for this is the significant tear exchange observed under the lens. Figure 1 shows times lapse photography (span of 1 minute) of an UltraHealth lens with no fluorescein placed prior to insertion on a diseased eye (post-PK with significant neovascularization into the graft). The neovascularization was present before fitting with the UltraHealth lens. You can literally watch fluorescein pumping itself under the lens with each blink.

As evidenced by the above images, UltraHealth lenses have significant tear exchange in the post-lens tear reservoir in a very short period of time. This may explain the fact that patients wearing UltraHealth are able to wear their lenses for a full-day’s wear time without having to remove and replace as in sclerars.
References:


