Hydrogels vs. silicone hydrogels: SiHys are the way to go!

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Soft contact lenses were first introduced to the market in the 1960s, with disposable hydrogel lenses being introduced in 1987.1 Several issues with hydrogel lenses drove the contact lens industry to develop a more oxygen permeable material, silicone hydrogel, which was first marketed in 2000.1,2 Silicone hydrogel (SiHy) lenses have since dominated the contact lens market because of their many benefits over hydrogel lenses.

1. More oxygen: The main reason SiHy lenses are so popular with eye care professionals is because of their increased oxygen permeability. Increased oxygen helps to prevent complications caused by corneal hypoxia, including microcysts, limbal hyperemia, and neovascularization.

2. Longer wear time: Because hydrogel lenses have lower oxygen transmissibility, wear time must be decreased to prevent complications. However, SiHy lenses allow for longer wearing times, including extended wear and continuous wear of contact lenses due to their high oxygen transmissibility. The minimum requirements for oxygen transmissibility (Dk/t) of extended wear contact lenses in order to prevent overnight hypoxia-induced edema was estimated to be 87 x 10^{-9} (cm x ml O2)/(s x ml x mmHg) by Holden and Mertz.4-6 More recently, a level of 125 x 10^{-9} (cm x ml O2)/(s x ml x mmHg) has been reported as a requirement to prevent stromal anoxia.4-6 SiHy materials possess Dk/t values of 110 to 175, which is six times more permeable than conventional hydrogel contact lenses.6,7

3. Easier handling: SiHy lenses are "stiffer" than conventional hydrogels, which allows for easier handling. The modulus, stiffness or rigidity of the materials is over twice that of polyHEMA and nearly four times greater than the HEMA-methacrylic acid components of the etafilcon A material.6,7

4. Less dryness: Several clinical studies have found fewer symptoms of dryness and discomfort, less end-of-day dryness and discomfort, reduced frequency and intensity of dryness symptoms, and an overall preference for SiHy lenses compared to conventional hydrogel lenses for both daily wear and overnight wear.7-10 Many SiHy wearers are able to enjoy all-day lens wear.

There are many reasons to switch patients to SiHy lenses. There are huge benefits to offering SiHy materials to patients, which is why 64 percent of contact lens patients are wearing silicone hydrogel vs. only 24 percent wearing hydrogel.11 The choice is clear — SiHy lenses are the way to go!

References


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