Wettability of the Contact Lens Surface

On-eye Performance is What Matters Most

There is a lot of chatter these days about contact lens surface wettability, especially associated with new lens care solutions. Synthetic surfactants and humectants as well as naturally occurring humectants and lubricating agents are packaged with new lenses and are included in multipurpose solution and lubricating drop formulations. The goals, of course, are better wettability and comfort while maintaining consistently good vision throughout the wearing period. We're striving to find the best lens wetting system.

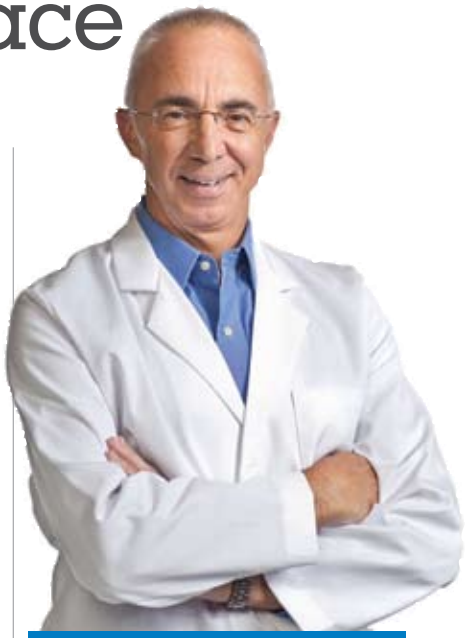
Many variables need to be considered in developing the best lens wetting system. Elements of the ocular system such as the glycocalyx, mucins, tear proteins, lipids, pH, osmolarity, surface tension, and blink rate vary from patient to patient and are not typically stable throughout the day. Contact lens surfaces vary from lens to lens and can change depending upon the environment. Hydrogel and especially silicone hydrogel lens surfaces can become relatively hydrophobic in dry environments and preferably hydrophilic in hydrated environments.

Many techniques are available to measure wettability in vitro and in vivo, including sessile drop and captive bubble; however both of these techniques are subject to high levels of variability associated with even minor changes in methodology. An alternate technique is to measure the desorption of wetting agents from a contact lens that has been soaked in packaging solution or in a lens care solution. This method may allow for a more real-world assessment of lens wettability.

> Today's contact lens multipurpose solutions are more sophisticated than ever.

I've said many times that maintaining healthy, comfortable, maximum contact lens wearing time takes a multi-factorial approach. Ideally the lens surface, conditioned by the lens care solution, will wet as well as the eye. Along with a clean, wettable contact lens surface, maintaining a healthy ocular environment is important for promoting healthy, comfortable contact lens wear.

Today's contact lens multipurpose solutions are more sophisticated than ever. All the components in the formulation need to act synergistically, like a high-performing biological system, to optimize biocompatibility and comfort, and to provide unsurpassed disinfection. Another key factor is the logical belief that the longer a lubricating humectant remains on the lens, the more likely it is to maintain long-term comfort.



JOE'S VIEW
with Joe Barr, OD, MS, FAAO
Bausch + Lomb

It seems intuitive that the addition of a naturally occurring humectant such as hyaluronic acid to the surfactants routinely used in MPS will improve their wettability beyond what is achievable with surfactants alone. Evidence exists that hyaluronic acid can remain on the contact lens surface for 20 hours and it absorbs water up to 1,000 times its weight.[1,2]

Yes, wettability matters, and maintaining wettability in a bio-inspired way.

Joe Barr

Joe Barr, OD, MS, FAAO
Vice President
Global Clinical & Medical Affairs
and Professional Services
Vision Care
Bausch + Lomb

[1] Scheuer CA, Fridman KM, Barniak VL, Burke SE, Venkatesh S. Retention of conditioning agent hyaluronan on hydrogel contact lenses. *Cont Lens Anterior Eye*. Dec 2010;33 Suppl 1:S2-6.
[2] Hargittai I, Hargittai M. Molecular structure of hyaluronan; an introduction. *Struct Chem*. 2008;19:697-717.

ADVERTORIAL
© 2011 Bausch & Lomb Incorporated. ®/™ denote trademarks of Bausch & Lomb Incorporated. Other product/brand names are trademarks of their respective owners . PNS05531 HL5130