

Contact Lens Update

CLINICAL INSIGHTS BASED IN CURRENT RESEARCH

Summary: Report of the Contact Lens Materials, Design and Care Subcommittee

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Jones L, Brennan NA, González-Méjome J, Lally J, Maldonado-Codina C, Schmidt TA, Subbaraman L, Young G, Nichols JJ. The TFOS International Workshop on Contact Lens Discomfort: Report of the Contact Lens Materials, Design, and Care Subcommittee. Investigative Ophthalmology and Vision Science 2013 54:TFOS37-TFOS70.

It is generally well accepted that the property of a contact lens material and the composition of a lens care solution will play a major role in determining contact lens comfort.

Contact lens materials

Few physical properties of soft lenses seem to be convincingly related to contact lens discomfort, but the following factors appear to have the closest connection:

Replacement frequency: Many studies have reported improved comfort with frequent replacement lenses, with improved comfort linked with increasing replacement frequency.

Surface friction/lubricity: Friction is a quality that is of emerging importance in the contact lens field; recent evidence shows an association with comfort.

Lens design: Thin, tapered edge designs interact less with the lids thereby resulting in improved comfort.

Lens fit: Increased lens movement results in reduced comfort; lower mobility results in increased comfort.

Water content: High water content materials are associated with an increase in contact lens discomfort.

A number of factors have only weak links with contact lens discomfort, including oxygen transmissibility, wettability, deposition, modulus and lens dehydration.

Contact lens care solutions

A lens care solution is composed of several components, including biocides, surfactants and chelating agents.

It would be erroneous to conclude that any individual component in a care solution will have a direct impact on subjective symptoms, but the incorporation of surfactants or wetting agents into lens care products may improve subjective comfort, possibly by improving lens hydrophilicity, making the lenses feel “moist”.

Few studies have reported that using a care solution preserved with a specific biocide can improve comfort.

Lens-solution interaction

Contact lenses interact differently with multipurpose solutions depending upon their polymeric makeup. The uptake and release of lens care components by soft contact lenses can affect corneal staining and subjective comfort.

Much of the published work on this subject has been poorly conducted, with inappropriate or missing controls. Future work should incorporate well controlled, randomized, cross-over studies in which all variables (replacement period, care system, wearing time etc.) are considered. This field requires fundamental studies investigating the effects of isolating a single change in a material, design or solution.

For further details, please refer to The TFOS International Workshop on Contact Lens Discomfort: Report of the Contact Lens Materials, Design and Care Subcommittee.