The Makeup Factor: Expanding the Definition of “Deposit Resistance”

Cosmetics on the surface of a soft contact lens can affect wettability, fit, and, ultimately, comfort— but in vitro testing shows that not all lenses are equally affected. Gina Wesley, OD, MS, FAAO

Many contact lens wearers use cosmetics on and around the eye, but the impact of these products on contact lenses has received little attention. Recent in vitro research, however, has shown that hand creams, mascaras, and makeup removers can alter contact lens shape and optics and, over time, interfere with lens comfort and performance.

EFFECTS OF COSMETICS
Investigators at the University of Waterloo Centre for Contact Lens Research measured the effect of commonly used cosmetic products on silicone hydrogel contact lenses.1,2 Following in vitro exposure to test products (hand cream, mascara, and eye makeup remover), lenses were assessed for change in surface appearance and physical and optical parameters. Lenses were then cleaned with a commercially available hydrogen peroxide contact lens solution and reevaluated. Among the products tested, mascara was associated with the greatest degree of surface deposition, as observed by researchers and quantified by mean pixel brightness using darkfield microscopy.1 Cleaning with hydrogen peroxide only partially removed these deposits, with those left by waterproof mascara least responsive to cleaning. Liquid makeup removers induced the greatest changes to lens diameter, sagittal depth, and base curve.2

Of the seven lens materials tested, AIR OPTIX® AQUA (lotrafilcon B) contact lenses demonstrated the greatest resistance to surface deposition from mascara.1 The same lenses underwent the least conformational change when exposed to makeup remover.2 Furthermore, these lenses demonstrated the fewest changes in optical performance metrics (lens power and image quality index).2

THE AIR OPTIX® DIFFERENCE
The hydrophobic domains in silicone hydrogel lenses attract tear film lipids as well as the oil components of cosmetic products used on the eye.3 Because of this, developers of silicone hydrogel lenses have employed various strategies to render them more water-loving.4 Some lenses are made more wettable by embedding hydrophilic polymers within the lens material or in the soaking solution, others by surface modification.3

Cosmetic products can deposit onto and affect silicone hydrogel contact lens performance
Mascara—especially waterproof—and eye makeup removers are particularly prone to lens deposition
In in vitro studies, cleaning with hydrogen peroxide removes some, but not all, cosmetic deposits, and AIR OPTIX® contact lenses were least affected by tested cosmetic products
The uniform plasma surface treatment keeps AIR OPTIX® contact lenses wettable and deposit resistant

AIR OPTIX® is the only family of lenses with a unique, permanently bonded plasma coating that creates a uniform and uninterrupted hydrophilic surface. Both the chemical composition of the plasma coating and its uniformity across the lens surface are likely contributors to these lenses’ greater wettability and lipid deposit resistance compared to other silicone hydrogel lenses.4

CLINICAL RELEVANCE
The lipid deposits and lens changes induced by cosmetics may interfere with contact lens shape and optical performance.1,2

One obvious way to reduce buildup of cosmetic residues is to use daily disposable lenses. But when this is not an option, selecting a lens material that maintains wettability and resists deposits—of both tear film lipids and of cosmetic products—may increase the likelihood of successful lens wear.

In addition to appropriate lens selection, contact lens exposure to cosmetics can be further minimized by giving patients clear instructions about cosmetic application and removal. In addition to thoroughly washing and drying hands prior to handling their lenses, patients should insert lenses before applying eye makeup and remove lenses before using makeup remover. Patients who believe their lenses have been damaged due to cosmetics exposure should be instructed to replace their lenses with a new pair.

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REFERENCES

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