

# Improve Comfort with the Right Combination

Gary Andrasko, OD, MS

Understanding how contact lens and multi-purpose disinfection solution combinations impact comfort can help improve your patient's lens wearing experience.

Contact lens patients typically want two things from their lenses: great vision and optimal comfort. While patients may sometimes tolerate a little blur, they rarely accept discomfort, at least not for long. Among patients who discontinue lens wear, discomfort is cited more often than any other reason.<sup>1</sup> Ensuring the biocompatibility of contact lenses and care solutions is critical to help patients stay comfortable.

## DISTINGUISHING DISCOMFORT

For contact lens wearers it is important to distinguish end-of-day discomfort from discomfort on insertion. End-of-day discomfort is relatively common and can result from multiple patient-, lens-, and lens care-based factors.

Discomfort that is most pronounced at insertion or shortly thereafter, on the other hand, can be the result of an interaction between the contact lens, and lens care solution.

## SOLUTION-INDUCED STAINING

Mounting evidence indicates that, to varying degrees, soft contact lenses can absorb the biocide preservatives contained in lens care solutions.<sup>2</sup> Preservatives can then release from the lens into the tear film.

If the preservative is sufficiently cytotoxic and its uptake and release by the lens sufficiently high, diffuse punctate corneal staining, a phenomenon called solution-induced corneal staining (SICS), can occur.<sup>3</sup> When it is mild, the corneal compromise may be small and transient enough to go unnoticed. In my research, moderate to severe staining was associated with lower patient comfort ratings after two hours of wear time.<sup>3</sup> A

study presented at AAO in 2012 by CCLR, School of Optometry and Vision Science, University of Waterloo, also found SICS to be associated with specific symptoms of stinging and burning after two hours of wear time.<sup>4</sup>

## DEVELOPING THE STAINING GRID

Around the year 2000, I became curious about numerous anecdotal reports of staining and discomfort when certain lens care solutions were paired with certain lenses. A few published reports investigated the phenomenon, which mainly appeared to involve the preservative polyhexamethylene biguanide (PHMB) and certain lens materials.<sup>5,6</sup>

I decided to quantify the staining induced when popular lens materials were paired with each of the lens care solutions then available in the US. The results were striking, and it was readily apparent that the important factor in determining staining (or lack of it) was the pairing of specific solutions with specific lens materials.

To gain a readily apprehensible picture of the staining induced by each lens/solution combination, I charted a grid comparing relative amounts of staining. Cells within the grid indicate minimal (under 10% of the cornea), moderate (10% to 20%), or excessive (over 20%) staining.<sup>7</sup> Subjective comfort ratings correlate inversely with corneal staining area—particularly among patients with severe (>20%) staining at 2 hours.<sup>3</sup>

## INSIGHTS FROM THE GRID

Looking at the grid, differences between solutions are stark. Multi-purpose disinfecting solutions containing POLYQUAD® and ALDOX® dual disinfection system consistently show minimal staining across all lens types tested (as does hydrogen peroxide).<sup>7</sup> In contrast, solutions that contain PHMB show less consistency—patients experienced more moderate to severe staining in combination with many of the lenses tested.<sup>7</sup> The staining grid can help determine an initial care solution recommendation for biocompatible lens wear.

- Contact lenses can absorb and release preservatives from care solutions.
- Severe SICS can be associated with discomfort.
- A grid showing lens-solution combinations demonstrates this phenomenon.
- In general, some PHMB disinfection solutions show more staining than those with the POLYQUAD® and ALDOX® dual disinfection system or hydrogen peroxide.
- Since patients are the ones who must buy and use solutions, a clear recommendation (written down and reiterated at follow-up visits) is imperative.

A challenge remains in conveying the importance of lens/solution biocompatibility to contact lens wearers, many of whom believe that all lens care solutions are alike. To maximize the chances of success, practitioners must make a specific (and, ideally, written) recommendation of the lens care system to be used. Because this requires patient cooperation and understanding, giving a clear solution recommendation—and an explanation of why it is important—is as essential as prescribing the right lens.



Gary Andrasko, OD, MS, leads a private research practice in Columbus, OH. He serves as a lecturer, consultant, and researcher to the contact lens industry.

## REFERENCES

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