

# Letter to the Editor Concerning “Common Ophthalmic Preservatives in Soft Contact Lens Care Products: Benefits, Complications, and a Comparison to Non-Preserved Solutions” [Letter]

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## Dear editor

This letter is regarding the article titled “Common Ophthalmic Preservatives in Soft Contact Lens Care Products: Benefits, Complications, and a Comparison to Non-Preserved Solutions”.<sup>1</sup>

We read this article with great interest and thank the authors for providing an excellent review on the current preservatives in multipurpose solution (MPS) products for soft contact lenses. In the interest of thoroughness, we would like to add a few factors not mentioned in the article which support the authors’ conclusions advocating the use of non-preserved solutions.

Several in-vitro and in-vivo studies have demonstrated that multipurpose solutions (MPSs) containing polyquaternium-1 are inflammatory and induce oxidative stress to the ocular surface cells in various degrees.<sup>2</sup> Furthermore, polyquaternium-1 damage the barrier function of the corneal epithelial cells by affecting the localization of ZO-1 at tight junctions in response to Tumor Necrosis Factor Alpha (TNF- $\alpha$ ) secretion.<sup>2</sup> Additional research has shown that certain MPSs containing PHMB and borate show amplified corneal staining and are injurious to comfortable soft contact lens wear, particularly in specific lens and solution combinations.<sup>2</sup>

The authors highlight the complexity of the effect of preservatives in-vivo which can be influenced by the type of lens. As scleral lens wear has gained momentum around the globe, we would like to draw attention to the possible influence of these preservatives in that environment. While the accepted preferred recommendation is to fill the lens with unpreserved saline and disinfect with peroxide-based (H<sub>2</sub>O<sub>2</sub>) products,<sup>3</sup> many clinicians and patients have shifted from this formula to disinfecting with alternatives or using a more viscous fluid for lens filling.<sup>4</sup> This modification is preferably also unpreserved, yet sometimes includes MPS formulas originally intended for soft lens use, in 3–7% of wearers in one study.<sup>4</sup> Reasons for this include wettability issues, or in an attempt to solve “midday fogging”, caused by numerous possible etiologies.<sup>3,4</sup> This can potentially elicit a corneal response.<sup>3</sup> As mentioned in the article, the combination of ingredients in a solution and the combination of a solution with a particular lens material may

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be pertinent to the development of corneal staining, or, as discussed in Alves et al,<sup>5</sup> affect the optical properties of the lens. While it may not directly be a result exclusively of the preservative in the MPS and also associated with biochemical and biophysical interactions, the H<sub>2</sub>O<sub>2</sub> product was more resistant to change when combined with a variety of materials.<sup>5</sup> Though these influences have not yet been examined in the scleral lens environment, they may or may not have clinical importance there as well. These considerations should evoke careful deliberation weighing the pros and cons carefully pending a recommendation to use an MPS with scleral lenses.

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