

HOW PRESBYOPIA CORRECTION DROPS WILL CHANGE MY TREATMENT REGIMEN



One drop is close to market, potentially bringing a new option to many patients.

BY DAMIEN F. GOLDBERG, MD

How often does a new patient walk through your door and ask, “Doctor, why do I need three pairs of glasses, one for distance, one for computer, and one for reading?” or, “Doc, I can’t stand my progressive lens. Is there anything you can do to help me?” Then there’s my personal favorite, “Doctor, this is it! Am I finally ready to have laser vision correction and get rid of my reading glasses?” When faced with those

loaded questions, I always feel the need to backpedal a bit and launch into a full explanation of the aging process and presbyopia.

Coincidentally, as I’m now in my late 40s, I find myself feeling the same frustrations as my patients. Like them, I am none too fond of the aging eye phenomenon and the inevitable weakening of my near vision.

Nonetheless, these conversations with patients continue. I educate

them on the options at our disposal, including reading glasses, monovision contact lenses, and surgical solutions. If the patient seems interested in surgical correction, our discussion moves to monovision LASIK, inlays, and refractive lens exchange (RLE).

For patients in the 55-to-60-year age range with incipient cataracts, no concomitant eye disease, and an interest in surgical solutions, I feel comfortable recommending RLE. If

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the patient is a high myope, I caution about retinal detachment, and I tell hyperopic patients that RLE can be very effective for them. Many of my patients have experienced satisfying outcomes with monovision IOLs, low-add multifocal IOLs, extended depth of focus (EDOF) IOLs, accommodating IOLs, and, most recently, trifocal IOLs.

A DIFFERENT STORY

For 40-to-55-year-old patients, however, it's a different story. This patient population is active, and these patients still have their accommodation. As a conservative surgeon, I believe that RLE may be too aggressive in these cases. Alternative surgical solutions may be better suited for these patients, but the downside is that the results of those procedures are finite and may last only 5 to 10 years.

Some patients will remain motivated and pursue monovision LASIK or corneal inlays, but others

won't. Rather, they'll opt to continue to wear their readers because the available solutions just aren't compelling enough.

Enter a pharmacologic solution for presbyopia. We are about to see, for the first time, medications come to our presbyopic patients' aid. These rapid-onset eye drops will help reestablish near sight without compromising distance vision.¹⁻⁷ This is a truly remarkable feat that I expect early-stage presbyopes to embrace because they will be able to maintain their binocular distance and near vision without sacrificing accommodation. What's more, if they dislike the effects of the drops, they can discontinue their use. In a nutshell, having presbyopia correction drops available to my patients will change my treatment regimen, especially for patients with early-stage presbyopia.

FIRST TO BE OFFERED

The first presbyopia eye drops to become available will be miotics that

provide patients with more near vision because of the larger depth of focus (DOF) with smaller pupils. Just as with a camera when the shutter size is decreased, the DOF for near objects becomes extended.

The trick will be balancing a smaller pupil to improve DOF without compromising vision in mesopic and scotopic lighting conditions. Some patients may note the loss of contrast with the smaller pupil and a compromise in distance vision. Another potential side effect of miotics is brow ache caused by the contraction of the ciliary muscle.

Luis Felipe Vejarano, MD, of Popayan, Colombia, internationally pioneered one of the first medications for presbyopia, FOV Tears.^{1,2} As he explained to me, most patients will not have these complaints because the miotic concentrations in many of these

A



B



Figure. EyeFocus (A) and EyeFocus+(B) packages.

presbyopia eye solutions are far lower than earlier versions of pilocarpine used for glaucoma. The reality, he said, is that most patients will notice a significant improvement in near vision and feel that it works well.

MORE TO COME

Companies developing miotic drops include Allergan, Presbyopia Therapies, Orasis Pharmaceuticals, and OSRX (an affiliate of Ocular Science). OSRX's EyeFocus is expected to be available via prescription in the United States in the second quarter of this year. The drop is a compounded combination solution that will be offered in two strengths, EyeFocus and EyeFocus+ (Figure).

Dr. Vejarano, who collaborated with OSRX to develop the soon-to-launch drop, predicts that EyeFocus will be similarly effective to FOV Tears, triggering decreased pupil size caused by miotics and improved accommodation at the ciliary body.

Other pharmacologic presbyopia solutions coming down the pipeline will

focus on softening the aging lens. There is strong evidence that presbyopia occurs due to disulfide bonds causing protein crosslinking and eliciting lens stiffening. UNR844 (previously EV06; lipoic acid choline ester 1.5%, Novartis), still in clinical trials, can reduce and potentially break the disulfide bonds and make the lens more elastic, hence restoring some accommodation.

(Editor's note: For more on miotic drops in the pipeline, see the article by Sheri Rowen, MD, FACS, on page 66.)

POTENTIAL USE

My impression is that presbyopia-correcting medications will be impactful for many of our patients who want freedom from reading glasses. I believe that patients who are not quite ready to commit to refractive surgery will find these reversible eye drops that can maintain their accommodation very attractive, and my plan is to start with these patients when introducing these agents into my clinical practice.

I expect that presbyopia drops will gain traction as the general public

learns that a noninvasive solution can maintain binocular vision without affecting accommodation. We will have to be mindful of side effects, but, overall, many of our presbyopic patients stand to benefit from this innovation. ■

1. Renna A, Vejarano LF, De la Cruz E, Alió JL. Pharmacological treatment of presbyopia by novel binocularly instilled eye drops: a pilot study. *Ophthalmol Ther.* 2016;5(1):63-73.
2. Vargas V, Vejarano F, Alió JL. Near vision improvement with the use of a new topical compound for presbyopia correction: a prospective, consecutive interventional non-comparative clinical study. *Ophthalmol Ther.* 2019;8(1):31-39.
3. Colin J, Robinet A, Cochener B. Retinal detachment after clear lens extraction for high myopia: seven-year follow-up. *Ophthalmology.* 1999;106(12):2281-2284; discussion 2285.
4. Montés-Micó R, Charman WN. Pharmacological strategies for presbyopia correction. *J Refract Surg.* 2019;35(12):803-814.
5. Renna A, Alió JL, Vejarano LF. Pharmacological treatments of presbyopia: a review of modern perspectives. *Eye Vis (Lond).* 2017;4:3. Erratum in: *Eye Vis (Lond).* 2017;4:9.
6. Abdelkader A. Improved presbyopic vision with miotics. *Eye Contact Lens.* 2015;41(5):323-327.
7. Donofrio Angelucci D. Presbyopia eye drop targets miosis and accommodation. *Refractive Surgery Outlook.* February 2016. <http://isirs.ao.org/resources/february-2016>. Accessed January 29, 2020.

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