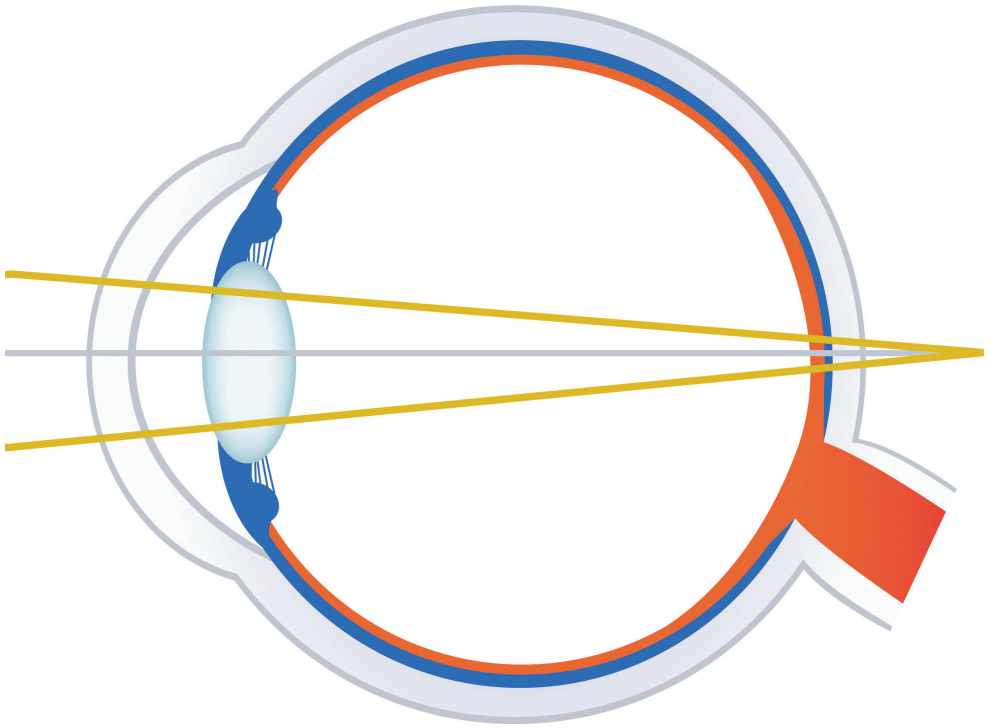
SPECIAL FEATURE

What's New for Older Eyes

Innovative Corrections Lead to New Directions



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BY JEFF HOPKINS / CONTRIBUTING EDITOR

Mankind has been grappling with the problem of presbyopia ever since people started living long enough to experience it. We are roughly 750 years into the era of reading glasses, 250 years into the multifocals era, 70 years into the progressive lens era, and 20 years into the customized progressive lens era. With all of these advancements, and particularly the explosion of technology in the past few decades, eyeglass dispensers and wearers might be forgiven for expressing some cynicism about claims of new advancements in the cause of clearer vision for presbyopes and their aging eyes.

This would be a mistake, because, despite all the advancements that have come before, there is still progress to be made, and with the aid of new technologies and scientific achievements, the eyecare industry is making it.

To better understand the new wave of products and strategies for treating presbyopia and what's driving it, *Vision Monday* spoke with leading suppliers and eyecare professionals. They offered insights about some of the latest multifocal spectacle and contact lenses as well as new pharmaceutical options, and how they can help patients see better and feel better.

As new treatments emerge not only for presbyopia but for related ocular conditions that affect aging eyes, *Vision Monday's* parent, Jobson Optical Group, recently launched a new, online publication and website titled *Review of Presbyopia and the Aging Eye*. (https://reviewofpresbyopia.com/) In addition to reporting news about these topics, the publication offers in-depth coverage of optical, contact lenses, dry eye, pharmacology, glaucoma, retina, refractive surgery, aesthetics and nutrition solutions by an experienced team of professional editors.

VM rounded up some of the newest advancements in presbyopia treatment solutions in this Special Report. ■

More →

New Developments in AI-Powered Lens Design

Capturing Visual Behavior

With the advent of freeform manufacturing in the early 2000s, lens designers were able to incorporate data unique to an individual wearer into the design of a progressive lens, including all elements of their prescription, frame size and fitting measurements. While these could yield significant improvement in visual performance, they were essentially static measures of visual needs.

Since then, the Holy Grail of lens design has been to measure key dynamic elements of the patient's visual behavior. Using highly sophisticated design software, lens companies have taken a range of approaches to capture this information.

Avatars and Digital Twins

EssilorLuxottica's latest progressive series, called **Varilux XR**, accounts for elements of visual behavior using an AI-powered algorithm that draws on a mass of wearer data in a personalized design. According to Jeff Harrell, vice president, Products for Essilor of America, "Varilux XR is a culmination of decades of R&D, and the massive amounts of data that we have about the human visual system, and not just the visual system in and of itself.

"If you think about the eyes, the brain, the neck, the trunk—how they're interacting together is the visual behavior of the individual. By having this behavioral artificial intelligence, we can closely predict the natural behavior of the individual, such that the design is going to be made to respond to their kind of visual behavior."

Personalizing the lens for the wearer's visual behavior involves the use of a computer-generated "avatar," first employed for the Varilux Comfort Maxi progressive. For the XR Series, Harrell said, "We've programmed the avatar to be what we would call a 'digital twin' of an individual based on the various combinations of prescription power that we see, to truly understand what design will give them the instantaneous sharp vision that they require, even in a dynamic environment."

Jeff Harrell

Chloe Tauaefa

Millicent Knight, OD

EssilorLuxottica's EyeRuler 2 measures fitting parameters as well as near vision behavior.

The top-end lens in the XR series, called XR Track, allows for more personalization by measuring the individual's wearer behavior. Harrell said, "The eyecare professional would have a device called the EyeRuler 2, and do a very quick measurement of near vision behavior." This tablet-based tool takes measurements based on factors like viewing distance, reading behavior and lateral offset.

After this test, said Harrell, "You know how they move their heads, their overall behavior allowing us to truly personalize that design for that unique individual versus leveraging the predictive model that we have based on the research."

The XR Series will launch nationally on June 27, but is currently being offered in select practices. One such practice is Creekview in Dallas, Texas. Creekview's business manager, Chloe Tauaefa, ABOC, who works with the EyeRuler 2, described her experience with the EyeRuler 2. "It is an all-in-one device enabling personalized measurements with just two photos and a near vision behavior test that takes about 45 seconds. The Varilux XR series will be available in the Canadian market starting on July 5.

"It is very user-friendly and provides monocular pupillary distance, fitting heights, vertex distance, pantoscopic tilt and wrap angle. I enjoy being able to provide each patient with a personalized experience and the EyeRuler 2 is by far the simplest digital tool I've ever used in my 36 years as an optician."

Making the case for new lens technology can be challenging, because patients often find it hard to envision a better viewing experience. Millicent Knight, OD, FAAO, FAARM, FNAP, senior vice president, Customer Development Group, EssilorLuxottica North America, recommends that ECPs "Use relatable examples from patient's everyday life to drive home the importance of upgrading their lenses. For example, your patients likely upgrade their smartphone regularly because they know technology is continually advancing and they want to enjoy the best experience. The same should be true when considering the technology they use for their most important sense: vision."

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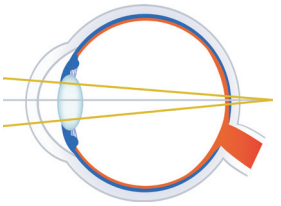

A Renewed Focus on Visual Behavior

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Using AI to Determine Patients' Visual Age

Shamir pioneered the use of artificial intelligence in lens design about seven years ago. From a design standpoint, AI allows personalization based on a higher number of parameters in a timely manner. Said Ranaan Naftalovich, CEO and president of **Shamir Insight North America**, "At Shamir we try to do things that make people's lives better, and artificial intelligence just helps us to get there faster. Autograph intelligence has 12 different designs. When you try to do a customized lens with 12 different designs, you have 430,000 options. With artificial intelligence you can do it (customization) much faster, and that's what has allowed us to bring technology into the market much faster."

Ranaan Naftalovich

In addition to the design process, Shamir also uses AI to gather wearer data that informs the design. In 2022 Shamir invested in Blink, which has developed AI-driven eye-tracking technology that allows a better understanding of visual behavior. Said Naftalovich, "We have to use artificial intelligence to understand what is actually happening to us when we're looking at the world in a dynamic situation."

This AI-derived data informs Shamir's latest progressive design, **Autograph Intelligence 2**, in which the design incorporates the idea of "visual age," which the company defines as "The physiological age of the eye (the required addition) and is generally correlated with the patient's chronological age.)" This allows them to customize Autograph Intelligence 2 based on the patient's stage of presbyopia in addition to many other factors specific to the individual wearer.

Harmonizing Binocular Vision

One of the basic problems of progressive design is achieving binocular clarity in a dynamic visual environment—binocular vision may be nearly perfect as the eye moves vertically through the lens, but vision from side-to-side is more challenging, especially in areas of the lens where peripheral astigmatism is an issue. Sophisticated design tools are required to ensure that both eyes are experiencing nearly the same optical powers at any angle of gaze, but the problem is even more complicated when the patient needs a different prescription for each eye.

Hoya has addressed this challenge through the Binocular Harmonization technology in the **id MyStyle 2** progressive design.

"Almost 70 percent of prescriptions are different in each eye," explained Warren Modlin, **Hoya Vision Care's** vice president, technical marketing. "If the eyes are looking through different prescriptions, you've got different amounts of magnification. If you're spending hours in front of a computer with different images, the brain is going to fatigue, experience migraines or headaches or dryness that often is not recognized as being the result of two eyes trying to work together in order to harmonize an image."

Modlin said Binocular Harmonization technology is "the marriage of disparate images" that result from the difference in prescription between the two eyes. "That binocular harmonization algorithm always uses two eyes in two lenses to calculate the correct amount of prescription and where it should be in the corridor length, in order to send a clear single image to the brain."

Thomas Gosling, OD, owner of Optical Matters in Littleton, Colo., uses MyStyle 2 extensively in his practice. He identifies candidates for the lens by means of a questionnaire. "I list 10 main symptoms of eyestrain. I can look at that sheet and I can see that the patient is struggling, because they're checking off boxes."

Warren Modlin

"If the eyes are looking through different prescriptions, you've got different amounts of magnification. If you're spending hours in front of a computer with different images, the brain is going to fatigue, experience migraines or headaches or dryness that often is not recognized as being the result of two eyes trying to work together in order to harmonize an image."

- Warren Modlin, vice president, technical marketing, Hoya Vision Care

To help patients understand the binocular harmonization concept, "I explained to them that when you have a prescription for the two eyes that aren't equal, there's going to be a fight. It's our brains that see, not our eyes. And the brain will tell you that it's being challenged by showing you symptoms—headaches, eyestrain and fluctuation in vision in our eyes."

Assessing patient satisfaction with a lens can be difficult, because it is easier to notice the pres-

ence of symptoms than their absence. Dr. Gosling explained, "They may say, 'I got an inexpensive second pair just to have as a backup, but I can't wear them.' You check the prescription and you tell them, it's the same prescription, but the lens is not compensating for the problems that you're having."

Virtual Reality for Real-Life Vision

Horizon Optical, an optical technology company based in Barcelona, Spain, has developed its own approach to measuring patient's visual behavior using an immersive visual reality experience called **Mimesys**. Pau Artus, Horizon's innovation director, began with an examination of various progressive designs in the market, starting with the well-known distinction between "hard" and "soft" designs (Artus referred to these as "European" versus "Asian" designs, based on what he sees as the general preference among designers in those two continents.)

"We started to see that some people would prefer one philosophy, one design over the other, but then the following person would prefer the opposite. All of them were really good designs—top, top, top brands. So we're wondering, What's behind that? Why would some people prefer softer designs, and some people would prefer harder?' And the preferences were clear in most of the cases."

From there, he said, "We started to wonder if the way you look around and gaze at your surroundings had something to do with these preferences, not only in a static way, but also in a dynamic way." Researchers thought categorizing wearers as head or eye movers could be a good starting point.

"But we needed to go further, because you may not be looking the same way when you look at objects that are far from you, as other objects that might be near to you." Researchers also considered that physical restrictions (e.g., shoulders and neck problems), might also play a role.

Since the design preferences couldn't be predicted, a test was needed to determine how people interacted with their visual environment. Said Artus, "We came up with the idea of using VR. It was affordable, but precise enough that we could track eye and head movements in a controlled environment. We measure the way interact with your environment while we project objects moving around, and we are able to calculate with precision the frequency of use for each of each part of the lens plane."

The result was the Mimesys system, which is currently available only in selected European countries, and was presented to the U.S. market this year at Vision Expo East. Wearing the VR headset, the patient chooses between two flying objects (a hummingbird or a drone).

Artus said, "All you're asked to do is just follow the follow the object flying around. In this way we are able to measure all the three significant distances for a progressive lens system we can then relate to some optical feature of the lens, and we have enough data to personalize." The personalization process involves "morphing" the design on a continuum between hard and soft designs. "So we are able to smoothly transition from one design philosophy to the other in each part of the lens."

Brandon Butler

The Science of Wearer Satisfaction

It goes without saying that the goal of any progressive lens is to provide the most satisfying visual experience. But how does one measure that? The obvious way is by having wearers self-report their subjective experience through wearer trials. But **Tokai Optical Company, Ltd**, a Japanese lens manufacturer with a history dating back to 1939, has taken a different approach with its **NeuroSelect** progressive lens series—measuring brain activity to develop a more satisfying lens.

Magnetoencephalogram measures responses at the visual cortex.

A Tokai spokesperson explained the process this way. "NeuroSelect lenses are designed to maximize a patient's emotional response based on wearing scenarios. The NeuroSelect lens series was designed using brain activity measuring, which is essentially subjective feedback measured qualitatively.

"This technology allows us to measure degrees of satisfaction and adaptation beyond self-reported and limited feedback scales of 1 to 5. It also allows a much broader scope of analytics; meaning this methodology allows us to research so many more scenarios and situations."

Brain activity was originally monitored using an electroencephalogram that measured alpha, beta and theta waves. According to the spokesperson, "This technology allowed us to analyze human sensibility into into 'stress,' 'satisfaction,' 'sadness' and 'relaxation'. Using a single vision lens as a baseline, "Design modifications are introduced until the patient's physiological and emotional response, measured by neurological feedback, provides the closest results to the control.

"Using this control allows Tokai to have a realistic measure of success—lenses that are as close to SV as possible." The company is now using a magnetoencephalogram to measure responses at the

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Innovations in Presbyopia Treatment

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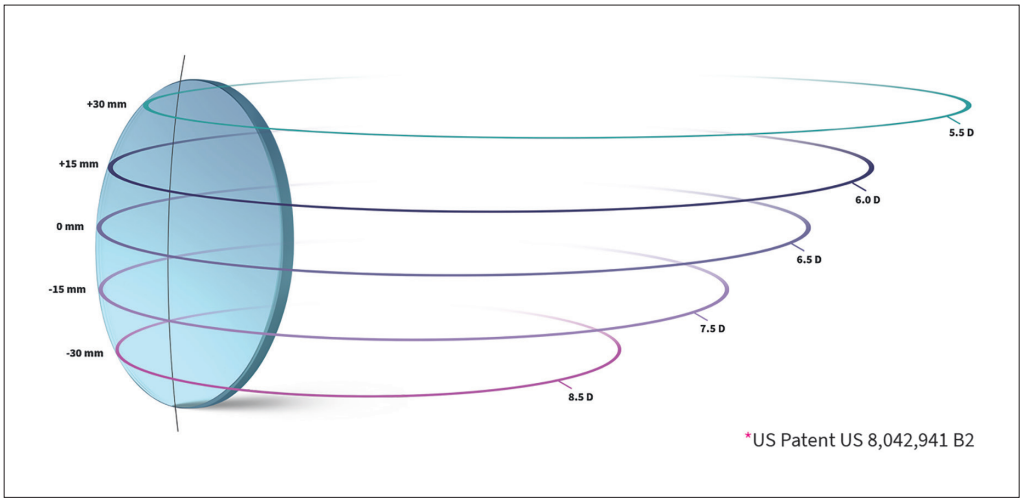
visual cortex.

Tokai is now entering the U.S. market for the first time through an exclusive distribution agreement with Portland-based Pacific Artisan Labs. According to lab CEO Brandon Butler, this represents the first time Tokai has licensed an independent lab anywhere in the world.

Butler said he was drawn to the Tokai's NeuroSelect series as a differentiator. "Most people look at the frame fit—the panto, the vertex and those kinds of things. And that's how they adjust vision. Tokai looked at how the brain responds when you put these glasses on your face. It just makes a ton of sense, and I think that's why they lead the world in terms of non-adapt ratio."

Butler expects to go live with the NeuroSelect series, and Tokai's proprietary 1.76 lens materials, in early June.



Camber lens blank with changing curvature.

New Design Approaches

Today, progressive lenses are the most popular form of vision correction, and, as we've seen, continue to evolve as researchers and designers find new ways to increase wearer satisfaction. At the same time, optical companies are pursuing innovations, that, in one way or another, stand outside the mainstream of eyeglass lenses for presbyopes.

John Gustafson

"The clarity of the lens is phenomenal. There's very, very little swim very little swim in the lens at all. When I first tried it, it really felt more like I was wearing a single vision lens. It's just a very smooth lens."

- John Gustafson, ABO-AC, optical manager at Southwest Vision in St. George, Utah

Rethinking the Curve

One of the basic principles of ophthalmic optics is that there is an ideal curve for every prescription power. But the essence of progressive design is that the curvature of the lens changes from top to bottom in order to allow clear focus on objects in the foreground. This change in curvature has always been achieved by applying progressive optics to a lens blank with a standard, symmetrical base curve.

Camber technology, developed by **Younger Optics**, changes this approach by applying the concept of changing curvature to the lens blank itself. A Camber lens blank does not consist of a single symmetrical curve, but one that constantly changes from top to bottom.

Barcelona-based **IOT**, a lens design company, has now launched **Camber Steady Plus**, a new progressive lens using Younger's Camber technology. According to Tina Lahti, IOT's vice president of sales and marketing, using the Camber technology "means the front curve remains closer to the ideal for best optics as the patient's power increases. Patients experience a wider near viewing area and improved cosmetics, especially for plus powers.

"IOT's latest designs for Camber lens blanks include Digital Ray-Path 2, which is groundbreaking technology, and Steady Plus Methodology, an improvement on our patented Steady methodology for control of unwanted mean power in the periphery. In addition to an excellent balanced design, Camber Steady Plus progressive lenses are also available in alternate configurations so opticians and optometrists can choose designs created for near, distance, or Intermediate vision.

"These are by far the most technologically advanced progressive lenses ever offered by IOT and the response from eyecare professionals and

their patients has been tremendously positive," Lahti said.

John Gustafson, ABO-AC, is the optical manager at Southwest Vision in St. George, Utah, recommends Camber Steady Plus to many patients. "The clarity of the lens is phenomenal. There's very, very little swim very little swim in the lens at all. When I first tried it, it really felt more like I was wearing a single vision lens. It's just a very smooth lens," he said.

When talking to patients about the lens, "I try not to get too technical. The doctors, the other opticians and I will just let them know that this is a lens that has the latest technology built into it just to give them the best optics possible. We tell them that they're going to have a great experience when they come and pick these lenses up."

In Gustafson's experience, "The response has been pretty phenomenal. We haven't had anybody who's had any issue with this lens so far." He cited the example of a patient in his 60s who ordered a clear pair and a sunglass pair. "He's never been happy with progressives before. He put them on and he started looking around. He got up he walked around a little bit and he came back he said, 'This will be the first time I've picked up a progressive lens where I'm actually going to walk out the door wearing them.' When I followed up with him a week or so later, he said that he said these lenses are working great."

Addressing the 'New Normal'

While every presbyope's visual behavior is different, the "digital lifestyle" that we live today has created a general shift in visual behavior that was not addressed in previous generations of multifocals, resulting in new designs to meet new visual demands.

Zeiss Vision Care has recognized that digital device usage is an all-day activity that must be addressed in all-day progressives, as they have in their SmartLife line of customized progressives. According to Matt Woelbern, head of marketing for Zeiss Vision Care US, "**Zeiss SmartLife** is a complete lens portfolio, including innovative progressive lens designs to address the visual needs of today's connected and on-the-move lifestyle. Frequent gaze changes to and from smart devices can lead to eyestrain. Zeiss SmartLife lenses are specially designed to support quick and easy peripheral vision for all-day comfort. Zeiss SmartLife lenses are made with freeform technology, customized to the patient's Rx, and have four different levels of advanced technology."

Zeiss SmartLife lenses are designed for a digital lifestyle.

Woelbern noted that Zeiss also offers **Zeiss Light**, an all-freeform progressive lens portfolio with three different technology levels, ranging from fixed fitting heights to an automatic variable corridor lens. Plus, Zeiss offers progressives for specialized activities, like **DriveSafe** lenses. Said Woelbern, "Zeiss DriveSafe Lenses are an everyday driving lens specifically designed to meet the visual needs of drivers while also being a great all-day lens solution."

For near and mid-distance viewing, Zeiss offers the **Officelens**, a complete portfolio of freeform computer/office lenses that are easily personalized for preferred working distances.

Reimagining Multifocal Design

While progressive designs have improved enormously since they were first developed and offered to the public, they all have the same basic hourglass shape. But is this the only way to provide a continuous distance-to-near viewing experience? Not according to Michael Walach, CEO of **Quest Vision Care Specialty Lab** and inventor of the **Broadview Natural Accommodation Lens (NAL)**.

Walach described the design as "funnel-shaped" rather than "hourglass-shaped." Instead of stable distance, a short corridor of power acceleration, and a stable near area, the NAL design changes power continuously in small increments through a continuous set of lateral aspheric power bands aligned vertically along the spine of the lens.

Describing the difference between the PAL and NAL designs, Walach said, "All progressive lenses have a corridor of approximately eight millimeters. If the add is 2.00, for every millimeter going down, you increase the power by quarter diopter."

Michael Walach

With the NAS design, the acceleration ramp is approximately 24 millimeters long and the power change per millimeter is imperceptible to the brain. In short, he said, "We mimic a natural accommodation from 20 feet all the way to 1.1 feet." In the periphery, instead of unwanted astigmatism is replaced by peripheral defocus, Walach said, "So you are losing focus slightly, but it's not weighty. And you don't realize it that you are losing the focus, because it's so little."

Surprisingly, the lens does not require a fitting height measurement. Walach explained that the lowest point of the lens varies."What stays the same is that the upper wire is just with your eyebrows. So we start from the top because it's incred-

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Vuity: The First Pharmacological Presbyopia Treatment

Up to now, presbyopia treatment has almost always involved the use of a lens, with laser surgery being the one exception. But in what can only be described as a major breakthrough, a new type of treatment has arrived in the form of a prescription medication—**Vuity**, which was developed by **Allergan**.

Vuity, of course, is not a "cure" for presbyopia, but it can reduce a patient's need for reading glasses or multifocal lenses. It does this by reducing pupil size, increasing depth of focus and improving near vision while not affecting distance vision.

While you might think Vuity would primarily benefit younger presbyopes with low adds, according to Sarika Sood, Allergan's TA head, U.S. Medical Affairs, Eye Care, "Clinical studies evaluated Vuity in participants in their 40s and 50s who have mild, moderate and advanced presbyopia. Subgroup analyses demonstrated improvements regardless of age, emmetrope status, and baseline severity."

Chris Lievens, OD, chief of Internal Clinics at Southern College of Optometry, has a great deal of experience with Vuity, having been heavily involved with clinical research, and with patients since the drug was approved by the FDA. He said that he brings it up with almost all of his presbyopic patients, regardless of age.

"The data may say it's not going to be as effective on a 65- or 69-year-old, but a 69-year-old patient may not need the same impact that a 45-year-old may need to see some quality of life improvements. Spectacle correction, contact lens correction and now a pharmaceutical correction, can comprise a synergistic potential treatment."

While younger patients may not need additional correction while using Vuity, "As you get a little bit older, I think you do need to supplement the drops with some something else. It delivers additional reading comfort while you're in your glasses or contact lenses, building fatigue less quickly," Lievens said.

The FDA has recently approved Vuity for twice-a-day use. Said Sood, "Twice-daily dosing may extend duration up to nine hours to better meet patients' needs," but in Lievens's personal experience, the benefits last even longer. "I typically get at least six to eight hours of effect on the first dose. I put in a second drop three to six hours from the first, and it lasts not only through my work day, but even through my leisure activities at the end of the day."

Vuity is not a "cure" for presbyopia, but it can reduce a patient's need for reading glasses or multifocal lenses.

According to Lievens, Vuity can relieve not just the visual symptoms of presbyopia, but also the anxiety that younger wearers experience along with these symptoms—especially as the onset of symptoms is occurring at a younger age for many. "It could be one of the first aging feelings in your lifetime, and that carries this undercurrent of anxiety and depression. Anything that we can do to provide more freedom from this dependence on glasses is beneficial."

But since it works by shrinking the pupil, does it degrade night vision? According to Sood, "Vuity may cause dim or dark vision temporarily, so patients are advised to use caution when it comes to night driving or doing any potentially hazardous activities with low lighting." However, in Lievens's experience, it may provide some enhancement at night.

Lievens noted that, "I do make sure that every patient I prescribe this medication to I see myself for a full comprehensive eye exam. Including an eye dilation. I do think it's critical to make sure the eye is in pristine condition and there's no concerns anywhere just to make sure this drug is safe for use. He also feels that patient education is very important when prescribing Vuity.

"Unlike a lot of medications and drops after routine use for a new user, at least two weeks is needed for maximum visual effects of this medication. There appears to be some form of adaptation the body and the eye goes through while getting used to this drop. If we don't tell our patients this, they may actually give up too soon, not knowing that it was only going to get better and better and better." ■

Advances in Multifocal Contact Lens Technologies

BY DAVID SCHAEFFER, OD, FAAO / CONTRIBUTING EDITOR

It seems that nearly every year, contact lens manufacturers are trying to innovate and release new products to market, and this year is no different. Many of the products that have either recently launched or that are soon-to-launch are targeted at the growing presbyopic population.

Multifocal optics are being introduced to popular modern contact lens materials and completely new multifocal optic designs have been released as well. This article will discuss the newest contact lens technologies from the major manufacturers aimed at tackling one of the more challenging fits–the presbyopic patient.

CooperVision released the **MyDay Daily Disposable Multifocal** in the spring of 2023 that incorporates a brand new Binocular Progressive System optic design that aims to optimize vision at all distances with its unique fitting strategy. Fitting this lens is made easy by its add and power selection. What makes this lens's fitting guide unique is that the dominant eye will always have a low add. The only adjustment ever made to the add is to the non-dominant eye.

This maintains excellent distance vision while still providing near vision quality.[1] CooperVision's studies boast an 83 percent fit success rate with the first lenses tried and 98 percent success with two or fewer lenses[1], which enables prescribers to be able to be efficient with fitting their presbyopic patients and reduce as much chair time as possible. The MyDay Multifocal strives to provide great comfort with its low modulus, high Dk, and high water content in a silicone hydrogel lens thanks to their Aquaform Technology. It also has the widest range of parameters in a daily disposable multifocal[2]–from +8.00 to -12.00 in Low, Medium and High adds–allowing practitioners to fit a majority of their patients in this lens.

CooperVision released the MyDay Daily Disposable Multifocal in the spring of 2023.

Johnson and Johnson's Acuvue 1-day Oasys Max Multifocal features three specific designs.

Johnson and Johnson debuted the **Acuvue 1-day Oasys Max Multifocal** late in 2022 and included three specific designs—Pupil Optimized Design, TearStable Technology, and OptiBlue Light Filter—that make this lens special. The Pupil Optimized Design, which is also found in their 1-day Moist and Oasys Multifocal lenses, aims to provide the clearest vision at all ranges by adjusting the optics across all parameters based on the patient's age and refraction.

TearStable Technology refers to the technique used to distribute the wetting agent across the surface and throughout the lens to provide tear film stability and all-day comfort. In clinical trials, 94 percent of patients reported comfort throughout the day and 90 percent reported good end-of-day comfort.[3]

Lastly, the OptiBlue Light Filter is a high-energy visible light (HEVL) filter that reduces blue-violet light exposure that can come from digital devices and fluorescent lights. Acuvue 1-day Oasys Max Multifocal is the first major brand multifocal to include an HEVL filter.[4] The fitting guide is the same as the 1-day Moist and 2-week Oasys Multifocals, making it simple for practitioners and allowing for a seamless upgrade to the 1-day Oasys Max MF from other Acuvue products. Parameters are available from +6.00 to -9.00 in low, mid and high adds.

Bausch + Lomb will have released the **Infuse One-Day Multifocal** at presstime. The Infuse material is revolutionary with ProBalance Technology that was developed in response to findings from the TFOS DEWS 2 report about tear film homeostasis. Infuse lenses include electrolytes, osmoprotectants, and moisturizers that aid in maintaining tear film protein activity and ocular surface homeostasis under hyperosmotic stress, as well as a three-silicone backbone with a high Dk, low modulus and high water content.[5]

All of these technologies are aimed to provide all-day comfort and reduce symptoms of contact lens related dryness. To this next-generation silicone hydrogel lens, B+L incorporated the 3-Zone

Progressive Design found in its Ultra for Presbyopia that is specifically designed to maximize distance, intermediate, and near vision clarity. The progressive design was optimized for seven biometric factors including pupil size, anterior chamber depth, axial length, higher-order aberrations, corneal topography and diameter, residual accommodation, and subjective refraction all within just 2 add powers across the parameter range.[6] Parameters are available from +6.00 to -10.00 with Low and High adds.

Alcon has plans to produce a multifocal for their **Total30** line of contacts in the near future. This lens is the only monthly contact of its kind in its own category of contact lens materials—Permanent Water Surface lenses. Total30 contains Alcon's Water Gradient Technology that features a gradual transition in water content from 55 percent in the core to nearly 100 percent at the surface of the lens, which provides excellent comfort from day 1 to day 30.[7]

Also newly introduced in this lens is Alcon's CELLIGENT Technology that creates a lens surface that biologically mimics the corneal surface to selectively attract small molecules like water, but repel larger ones like lipids and bacteria to prevent deposits and bacterial adhesion for a clean lens.[8] Lastly, all Total30 products include an HEVL filter that blocks 34 percent of blue-violet light. Unfortunately no release date for a Total30 multifocal has been specified as of yet, but more information about the release is on the horizon.

With so many new presbyopic products either on the market or soon-to-be on the market, it is a very exciting time to be an eyecare provider. Long gone are the days of dreading the presbyopic contact lens fit. There are so many tools at our disposal to combat the struggles of our aging population that we should be able to find an excellent visual solution for anyone who walks into our office.

Bausch + Lomb will have released the Infuse One-Day Multifocal at presstime.

Alcon has plans to produce a multifocal for their Total30 line of contacts in the near future.

Disclosure: Dr. David Schaeffer receives financial compensation for speaking on behalf of CooperVision.

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Natural Accommodation and Adaptive Optics

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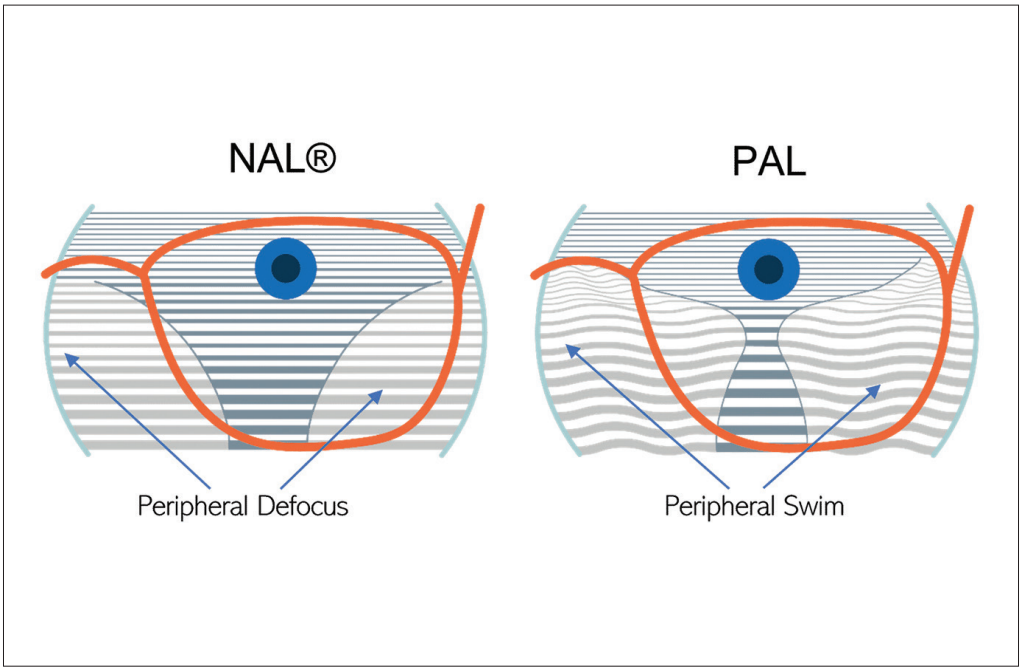
ibly consistent: one to three millimeters. Of course, lens shapes are different, but once we trace the frame, we adjust the design height.

"The message for eyecare practitioners is that the NAL is not your enemy, but your friend."

- Michael Walach, CEO of Quest Vision Care Specialty Lab and inventor of the Broadview Natural Accommodation Lens (NAL).

"We always put the engraving marks in the middle of the frame, regardless how we adjust the height. The prism reference point like on progressive lenses is also a reference point like on a single vision lens." Walach believes this makes it a viable multifocal option for e-commerce, but that it provides opportunities both for brick-and-mortar locations and for the increasing number of practices who also have an online presence. "The message for eyecare practitioners is that the NAL is not your enemy, but your friend."



Layout of Broadview NAL vs. traditional PAL.

The Disappearing (Add) Act

Reading glasses offer a wide, clear view of up-close objects. Multifocals provide ample, but smaller, areas of near power with the convenience of never having to change glasses. The optical industry has long sought what might be considered the best of both worlds—a lens with reading power that can be activated when it's needed, but disappears when it's not.

Deep Optics, based in Petah-Tikva, Israel, has developed and marketed a lens that delivers this type of adaptive optics.

Add power is generated by means of a thin layer of adaptive liquid crystals between two glass substrates. The crystals are activated electrically when the wearer swipes the lenses diagonally. As reported recently in *Vision Monday's* affiliate *Medscape*, "When the lens is turned off, it has no optical function, and when it is turned on, it can be tuned to any relevant optical power, researchers reported at the Association for Research in Vision and Ophthalmology (ARVO) 2023 Annual Meeting."

The lenses are currently being marketed under the name **32°N**, with a price tag of about $500. While these lenses are plano when deactivated, and require no prescription for purchase, a prescription version is in the works.

Continual Innovation Takes Many Forms

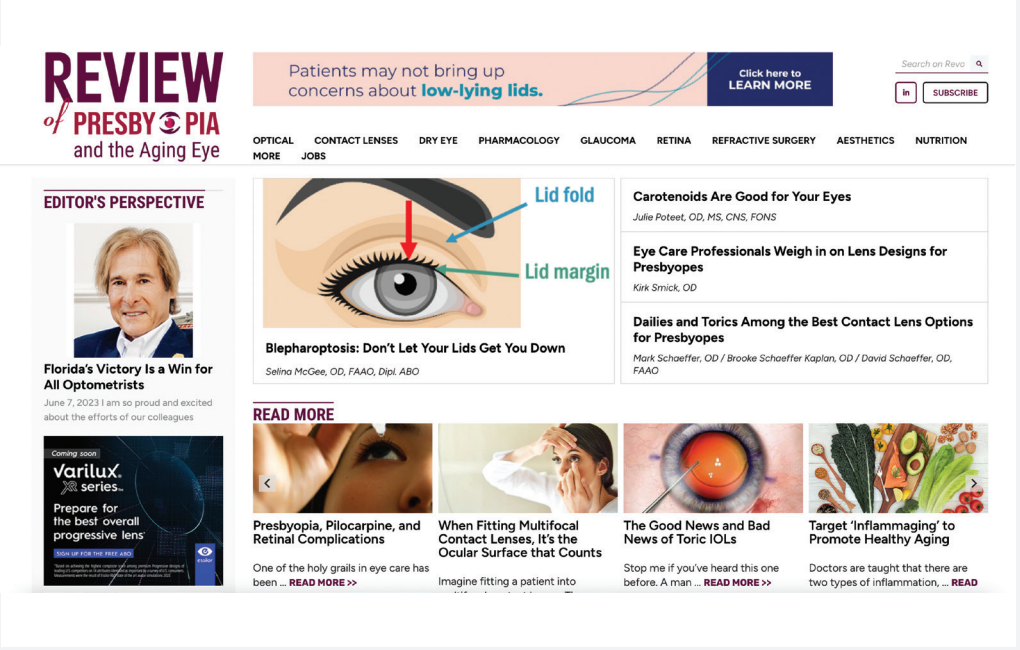
Charles Holland Duell, commissioner of the U.S. Patent Office at the end of the 19th century, is alleged to have said, "Everything that can be invented has been invented." No doubt many have expressed a similar sentiment about the treatment of presbyopia throughout its long history. But it should be clear by now that the evolution of treatments continues, and runs the gamut from AI-driven refinements to radically new designs, and even to prescription medications. And since many of these innovations would have been hard to anticipate even a decade ago, it seems likely that there are many more just over the horizon. That's good news for the industry, and for the patients it serves.

So congratulations to Charles Holland Duell for being far too discerning to say what is, ironically, the only thing he is remembered for. (The quote actually comes from the British humor magazine Punch.) Instead, he said something that is sadly overlooked by history, but far more accurately reflects the continually evolving science of presbyopia treatment: "I almost wish that I might live my life over again to see the wonders which are at the threshold." ■

Presbyopia Treatment Update

Presbyopia Management In-Depth

Jobson recently launched a new online journal called *Review of Presbyopia and The Aging Eye* (https://reviewofpresbyopia.com/). *Vision Monday* asked the journal's clinical editor, noted optometrist and educator Jack Schaeffer, OD, FAAO, and chief clinical editor of the publication, to talk about the journal's intent and scope.



Home page of reviewofpresbyopia.com.

VM: Why is now the time to launch a new journal about presbyopia?

Dr. Schaeffer: *Review of Presbyopia and the Aging Eye* was created to address the continued influx of new treatment options for our patients and the optical and medical needs and concerns of people as they age. We coined the term "Generation 45+", because we know that in any practice, patients, as they get older, are going to have increased medical issues due to aging, whether they be optical, clinical, or aesthetic.

It's important to remember that *Review of Presbyopia* addresses not just presbyopia, but presbyopia and the aging eye. The nine subject areas that the journal covers are optical, contact lenses, dry eye, pharmacology, glaucoma, retina, surgery, aesthetics and nutraceuticals. We are also informing doctors on the ability of creating a fee-for-service and medical reimbursement practice.

VM: Are there new developments in each of these areas?

Dr Schaeffer: Yes. First, presbyopes need reading glasses or some type of bifocal or progressive lens, and that area is exploding with new technology. Second, we know that the multifocal contact lens market is not performing as it should: only 16 percent of contact lenses sold to presbyopes were multifocal, which is extremely low, because practices that adopt a comprehensive multifocal contact lenses philosophy are enjoying 80 percent to 90 percent success rates.

Then we move into medical specialties—dry eye, glaucoma and retina. When a patient is 45 years old, the incidence of dry eye grows exponentially, and treatments for dry eye continue to evolve—for example, there are many new drugs coming to treat demodex and blepharitis. We are seeing not only new pharmacological treatments, but also new instruments and processes like Intense Pulsed Light (IPL) treatment that can be used to treat dry eye.

Also, we're seeing a burst of medications for the treatment of glaucoma, and in optometry, we now have the use of lasers available in over 11 states. Because of the influx of so many new medications, we have an entire section on pharmacology and all the new pharmaceutical additions to our treatment options.

Optometry has always been involved in co-management of ocular surgery. But now we're involved in the co-management and the selection of many specialty lenses that require additional knowledge and education, like multifocal and toric IOLs. This is imperative so we can help patients make decisions for what is the best choice for their lifestyle and visual expectations.

Jack Schaeffer, OD, FAAO

VM: Aesthetics and nutrition seem fairly far removed from what we normally think of as the

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Presbyopia Management In-Depth

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scope of optometry. How are they relevant?

Dr. Schaeffer: Aesthetics is the new frontier in eyecare, and there are so many practices adding this specialty to their practice. Our 45+ patients obviously need optical corrections, but these patients are also concerned about their appearance as they age, so practices are now moving into these areas with treatments like Botox and fillers.

Finally, there's nutrition. Optometry and all eyecare practices need to understand it, because most of us prescribe nutraceuticals for dry eye, but now we have nutraceuticals to help with other conditions. We don't just treat eyeballs—we seek to treat people.

VM: What you're suggesting here is a significant broadening of the scope of optometric practice.

Dr Schaeffer: It's more than that. This opens up the opportunity for a new business model. Optometry and ophthalmology are finally asking, "Why aren't we like dermatology or plastic surgery?" In optometry, we have two kinds of managed care: vision care and medical Insurance. Glaucoma, retina, surgery, dry eye, all utilize medical insurance rather than vision care. But now we have all these opportunities to move away from managed vision care and move into a fee-for-service model.

Contact lenses have always had a fee-for-service component, but now we're adding pharmacology, and these new medications require a unique workup process for patient success. This creates an opportunity for the practice. Aesthetics is totally fee-for-service, and patients are willing to pay for the procedures. This creates a new profit center for eyecare practices.

VM: How are you able to cover all of these areas in one journal?

Dr. Schaeffer: if you look at most journals, there are different writers each month. We decided to appoint nine specific editors for our nine different subject areas. We have a key opinion leader as editor for each section who will write the majority of the articles, so we have continuity. The articles will be archived, so a doctor wanting to stay abreast of what's happening in a particular area can read all of the articles in a series without repetition.

Contact Lenses

Crossing the Presbyopia Chasm

By Meredith Bishop, OD, MS, FAAO / Kurt Moody OD, FAAO, FBCLA / Drew Hotte

Sample article from "Review of Presbyopia and the Aging Eye.

> **"Aesthetics is the new frontier in eyecare, and there are so many practices adding this specialty to their practice."**
>
> **- Jack Schaeffer, OD, FAAO**

I truly believe we have assembled the finest group of writers and educators for all of these areas. I feel that we have what can be the premier journal to help our profession to stay up to date on what's happening, and also move practitioners into the fee-for-service model and the medical management model. This journal can elevate eyecare, but more importantly it can help those who are already working at the top level of eyecare practice.

VM: Who do you see as the readership for this journal?

Dr. Schaeffer: This journal is designed for the thousands of optometrists and ophthalmologists who are working in these areas, who want to keep up with what's new and stay at the forefront of their specialties. We're dealing with evidence-based medicine and evidence-based performance. ■