

Virtual Reality Comes to Eye Care

The New Neurolens N3 VR Experience is a Game Changer



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Relief is in Sight

Introducing the Neurolens N3: The First VR Headset to Accurately and Efficiently Measure Eye Misalignment While Providing an Engaging Patient Experience



How the Test Works

The N3 binocularity measurement test consists of a distance measurement at 1.7m, which is based on typical TV viewing distance, a key indicator of patient visual behavior; and a near measurement at 50cm, which is based on typical reading distance, also a key indicator of patient visual behavior. Each measurement consists of a base alignment and fine alignment.

The base alignment is a dissociative test where the system presents each eye with non-fusible images, and the patient is instructed to look at a fixation target that is geometrically placed at the measurement distance.

While looking at the target, the system measures the complementary eye for heterophoria. This test is done while presenting the fixation target for one eye while the complementary eye is shown unrelated graphics.

Once the patient's natural phoric posture is determined, the system presents a moving peripheral fusible image binocularly at the patient's phoric posture while instructing them to look at a fixation target that is presented to one eye at a time. This fixation target will iteratively move to neutralize eye movement and determine the optimal binocular alignment of the patient at the testing distance. This test is most similar to a fixation disparity test.

In short, N3 is a fast and accurate way for any eye care provider to measure eye misalignment down to a fraction of a prism diopter, regardless of binocular vision experience. In addition, N3 is also easy to use and staff friendly, supported by a thorough launch process and best-in-class ongoing customer support.

In another move to further redefine and advance vision care for patients and providers, Neurolens is taking a significant leap forward through the development and launch of N3, a patient experience in a Virtual Reality (VR) headset. This latest innovation from Neurolens for measuring eye misalignment builds upon years of research and comes as the company has surpassed one million patient measurements on Neurolens Measurement Devices.

The new N3 experience is powered by more than 10 billion data points on patient visual behavior and more than 10 years of proven patient outcomes already achieved by Neurolens.

Early pilot clinicians utilizing N3 have described the experience as groundbreaking, easy to use, and a practice-enhancing asset. While N3 captures the critical eye measurements clinicians have come to expect from Neurolens, it is also designed to be used in the exam lane itself and to bring patient engagement and education to a whole new level.

"One of the great findings with N3 pilot project is that when we asked the patient at the end of the test whether they want to find out more about their eye misalignment, about 80 percent said yes," said Zachary Dios, vice president of engineering. "This just makes the doctor-patient conversation much easier for the doctor because it empowers the doctor to discuss Neurolens with the patient."

N3 is designed to measure eye misalignment at distance and near using a dissociative test where the eyes are shown independent non-fusible targets, and direction of gaze is measured. This measurement is combined with an associative test where peripheral fusion is attained, and central alignment is measured. Effectively, this measurement of eye alignment is an objective measurement of the angle of strabismus and/or an evaluation of binocular vision.

N3 consists of a stereoscopic display and a sophisticated eye-tracking mechanism for an objective measurement that does not rely on subjective assessments from either the practitioner or the patient. The patient simply needs to be able to maintain a gaze at a target throughout the duration of the test, and the system does the rest.

In addition, N3 has been shown to prompt an overwhelming number of patients to ask for more information about eye misalignment after going through the experience.

As Nathan Schomas, vice president of customer experience, noted, "We're not the first optical company to bring a headset to bear in a business-to-business-to-consumer type of scenario, but we're one of the first to really bring a



graphically rich and educational experience to bear."

He added, "We've gone through iterations and pilots since January 2023 to see if we're getting that patient experience right. And while we have quantifiable metrics to confirm the testing accuracy, the pilot tests have shown that the patient experience side of N3 was well received from the beginning. The goal for N3 is to be right sized, yet informational, educational, and efficient."

The Effects of Too Much Screen Time

Testing for eye strain and misalignment has become more important as more than two in three people acknowledge they experience the symptoms of eye misalignment. This number continues to grow as more people shift to remote locations for work and learning. Indeed, an average American adult spends about eight hours per day using their digital devices, and staring at screens for too long is negatively impacting vision and comfort.

Even small eye misalignments can cause painful symptoms, but Neurolens' patented contoured prism technology can provide dramatic relief.

N3: Talking to Patients

Amanda Nanasy, OD, director of the Florida Institute of Sports Vision and a partner at The Eye Center of Pembroke Pines in Pembroke Pines, Fla., said among the features of N3 that have stood out are the time-saving aspect and "the wow factor" with patients. N3 also offers more flexibility while maximizing the test capabilities of the hardware.

"The patients are truly impressed with the technology, which then carries over, or transfers, a higher value to our practice in their minds," said Dr. Nanasy, who was among the first ECPs to pilot N3 in the U.S. and Canada.

Because of N3's headset design and patient education component, Dr. Nanasy said the device makes it easy and efficient to administer the test in the exam lane, typically



Engaging Patients with VR Technology

Dr. Trevor Miranda of Cowichan Eyecare, which has several practice locations near Vancouver in British Columbia, described N3 as “wild new technology,” and he noted that N3 saves staff time and provides the practice more flexibility. He pilot tested N3 in three of the Cowichan locations and found its “flexibility and efficiency” as key quality traits.

“It also has a feature [during testing] where it asks the patient if they are interested in finding out more information,” he said. “This is a good way to prompt further conversation before the doctor even sees the patient.”

Dr. Miranda said N3 and NeuroLenses allow his practice to go beyond “troubleshooting-type solutions” to provide more of a premium offering to patients who want the most comfort and best support for their eye muscles, especially when they’re doing near tasks.

“With a virtual reality headset, I think one of the most remarkable parts is that it is so impressive to a large number of patients, who seem keen to try it,” Dr. Miranda added.

Joseph Krall, OD, of Krall Eye Clinic in Mitchell, S.D., said he found N3 to be “a positive experience both for our staff and our patients.” Dr. Krall – who also has worked with the NeuroLens second-generation nMD2 and earlier nMD1 model – said having the N3 experience within his practice’s workflow has provided patients a better understanding of vision misalignment and its overall impact on their health and well-being. In less than five minutes, the patient will complete their binocularity testing AND be educated on what the measurements mean and why they matter.

One positive difference Dr. Krall experienced is that most of the time patients, after undergoing the N3 experience in the exam lane, are more likely to ask if vision misalignment could be the reason they are suffering from headaches and neck pain. He also noted that this leads to a deeper conversation and education opportunity using the NeuroLens portal. “It has been just a great experience [with N3]. It has sold itself, for me personally, the last several days,” he added.

Emphasizing the Need ‘To Dig a Little Deeper’

Dr. Kiran Ramesh, owner of the multi-doctor Vision Care Centre in Scarborough, Ontario, said she and her ECP colleagues found N3 engaging and very instructive for patients. “I think it really made clearer to the patient what the potential problem [of eye misalignment] could be ... and it

without requiring supervision. “N3 talks to the patient and walks them through what they are doing,” she said. “And then at the end, it educates them. This gives me a different starting point when discussing eye misalignment with a patient, because instead of starting an explanation from scratch, the patient already experienced the test and education of N3 and says, ‘Right, I just learned about this.’”

Another advantage, according to Dr. Nanasy, is that having a sophisticated, high-tech experience such as N3 in the exam lane serves to reinforce the innovative nature of NeuroLenses overall. “If I’m trying to prescribe really high-tech sophisticated solutions, especially a lens, then I want to have a sophisticated measurement device to go with it. N3 is one of my most impressive pieces of equipment in the eyes of the patient.”

Seeking Outcomes Beneficial to Patients

The development process for N3 had to incorporate and balance elements of both the eye care provider’s and the patient’s experience – without sacrificing any test or measurement accuracy. The NeuroLens team believes it has accomplished both objectives with N3, vice president of customer experience Schomas said.

To develop N3, NeuroLens partnered with the Swedish company Tobii AB, a global leader in eye-tracking technology that delivered the world’s first remote eye tracker 20 years ago.

“There’s one place where the doctor-patient needs overlap, and that is providing an outcome that’s beneficial to the patient,” Schomas said. “So, it was foremost for us to make sure that we were providing guidance to the doctor that is then going to benefit the patient and their vision.”

allows practitioners a greater sense of responsibility to actually acknowledge the responses that are coming versus, 'Okay, there's another measurement.'"

She added, "Within the optometric field, or any medical field, there are so many measurements that are done, and there are so many things that get overlooked. N3 really emphasizes that there's something we need to dig a little deeper into. I think Neurolens did a fantastic job."

'The Footprint is Zero'

Brenda Montecalvo, OD, of Nova Vision Care in Beavercreek, Ohio, said N3 provides a superior patient experience, as well as delivering a consistent and more-detailed message about eye misalignment to each patient. She also appreciates the small footprint of the N3 and the ease at which staff members have been trained and mastered operation of it. The small footprint and ease of use are both crucial factors enabling N3 to make such a powerful impact on patients in the exam lane. "The footprint, basically, is zero," she noted. "We've trained a lot of people very quickly," she said, and the process is completed in as little as five minutes. (Her practice has been a leading prescriber of Neurolenses nationally for the past few years.)

"We've had several weeks [of testing] with N3, and so far, it's going very well," Dr. Montecalvo added. "We're very, very excited about it, and it's been really helpful for educating our patients about what types of things Neurolenses can do for them."

Stacie Virden, OD, FAAO, of Waco Vision Source in Waco, Texas, who was among the first ECPs to participate in a pilot test of the new N3, said the experience has been "absolutely amazing" for her Vision Source practice.

"I don't know that we've ever had technology like this in our office that has made such an impression on the patients," Dr. Virden said. "It definitely has made a difference."

After testing with N3, patients, according to Dr. Virden, react with comments such as, 'What was that!?' and 'I've never seen anything like that before!'

"So even beyond what N3 does for us as a practice, and for making it easier to prescribe Neurolenses in general, it also really makes an impression on the patients who don't adopt Neurolenses. So, we're just optimistic about their next visit, and we'll run the test again next year and see if we can convert them then," Dr. Virden said.

Accurate, Repeatable, and Objective

While N3 brings the patient experience to a whole new level, ECPs can still rely on the accuracy, repeatability, and objectivity of the measurement results that are at the core of bringing symptom relief to patients. "Traditional binocular assessments all involve a high degree of subjectivity and are not able to accurately identify small phorias (less than 2-3 prism diopters)," said Chase Cutler, director of channel marketing for Neurolens. "With N3, ECPs can now confidently measure phorias down to a fraction of a prism diopter and help bring relief to their patients with even small phorias that are causing symptoms."

Another key advantage to utilizing N3 is that it is designed to be part of the exam lane – instead of in pre-testing – which allows the patient to participate in an innovative VR experience in the presence of the ECP. "The moment the patient takes off the headset, the doctor is right there and in position to have a conversation about Neurolenses and how it can help the patient," Cutler said.

Continuing to Raise the Bar for Patients and Eye Care

As Dr. Nanasy of Florida Sports Vision acknowledged, N3 is just the next move in terms of innovation and advancing eye care on the part of Neurolens. "I guess I shouldn't have been surprised when Neurolens came out with this technology because Neurolens has already taken what we thought was a great pair of glasses to prescribe for the patient and elevated it to the next level. I should have expected that Neurolens would only elevate its testing equipment as well."

(Note: Neurolens will continue to support the NMD2 device, including software updates and various troubleshooting, as practices transition to the more streamlined and patient-driven experience that N3 offers).

Learn more about becoming a Neurolens provider at neurolens.com



Many ECPs Are Taking Advantage of the Neurolens Rewards Program and Encouraging Others to Explore the Benefits



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♦ REWARDS ♦

How Neurolens Rewards Works

The more Neurolenses an ECP sells, the more points earned in Neurolens Rewards. (Note: A net of 10 Neurolens orders in a month is required to begin earning points.)

ECPs may choose the redemption option that they believe is right for their practice. The options are:

- Free Neurolenses (in the form of a lab credit) for the practice to maximize profitability.
- Cash in the form of a prepaid debit card.
- 8-week digital marketing program to bolster a practice's advertising efforts and to make sure patients know they offer Neurolens technology.

Rollover points, or unused points, are carried over to the following month. In addition, Neurolens Rewards makes available on-demand product and device training to participating practices.

For the point equivalent of 10 qualifying pairs in a month (1,100 points), a practice can redeem for either

a Neurolens Single Vision lens credit or a \$250 prepaid debit card. For additional points, the practice can also redeem for a Neurolens Office lens credit, a Neurolens Progressive lens credit, or sign up for an 8-week digital marketing campaign.

ECPs can choose to take advantage of Neurolens Rewards in a variety of ways. Many leverage Neurolens Rewards to maximize their profitability on Neurolenses sold by taking advantage of the lens credit options.

Another interesting strategy, like that used by Dr. Alli Markowski of Connecticut Vision Associates in Suffield, CT, is to identify patients that may need financial assistance in purchasing Neurolenses and use Neurolens Rewards to help provide Neurolenses at a reduced price to these patients. "It's literally amazing," she said. "One of my patients, a woodworker, was so grateful that he literally built us a bench as a 'thank you.' He got Neurolenses that relieve his symptoms, and now we have a beautiful bench outside where we can eat lunch."

Eye care professionals are not at a loss for words when it comes to describing the advantages of participating in the recently launched Neurolens Rewards program.

Beneficial. Exciting. A win-win experience. Exceeding expectations. These are just a few of the words ECPs are using to describe Neurolens Rewards, which launched to eye care practices in January 2023.

How Neurolens Rewards Works

Neurolens Rewards is designed to provide rewards points to enrolled ECPs once they order 10 qualifying pairs of Neurolenses in a month (net of credits, returns, and free pairs redeemed). Once a practice reaches 10 orders in a month, it will be eligible to receive 110 Neurolens Rewards points per pair (approximately \$25 per pair), starting from pair one.

Each month, the order count will reset. For the point equivalent of 10 qualifying pairs in a month (1,100 points), a practice can redeem for either a free pair of Single Vision Neurolenses or a \$250 prepaid debit card. For additional points, the practice can also redeem for a Neurolens Office lens, a Neurolens Progressive lens, or an 8-week digital marketing campaign. Free Neurolenses will be redeemed in the form of a lab credit, which will appear on the practice's lab statement the following month.

User-Friendly Dashboard Monitoring

As Dr. Stacie Virden of Waco Vision Source in Waco, Texas, noted, Neurolens Rewards is very simple to utilize, does not require a significant amount of attention to monitor, and is easy to follow via NeurolensRewards.com.

"We didn't realize it was going to work as well as it did," Dr. Virden said. "It has been more beneficial than we thought it was going to be. Sometimes you hear about a rewards program and it's just not what it's cracked up to

"We didn't realize it was going to work as well as it did. This one has met and exceeded our expectations."

Dr. Stacie Virden, Waco Vision Source, Waco, Texas



"[Neurolens Rewards is] very straightforward and very easy to understand ... the more Neurolenses that we prescribe, the more rewards we get back. "

Dr. Evie Lawson, Eyes on You Seattle, Seattle, Wash.



be. This one has met and exceeded our expectations."

She added, "And another thing that's nice is that Neurolens Rewards points are issued monthly. They're significant enough that it makes a difference. Sometimes, with other rewards programs, you have to wait six to eight months to get enough points to even be able to use the points for something small. But Neurolens has made a significant investment in this program. So, the rewards are attention getting."

Metrics Show Rewards Program's Success

Indeed, the results of Neurolens Rewards this year indicate ECPs are benefitting in several ways. As of August 31, 2023, practices participating in Neurolens Rewards average 45 percent more sales of Neurolenses than non-enrolled practices. As of August 31, over 550 locations have enrolled.

Also, through August, practices have redeemed Rewards points for more than \$190,000 in value, with roughly 84 percent of redemption value coming in the form of Neurolens lab credits. Of practice locations that have redeemed points, the average is \$1,943 in redeemed value. Average redemption value of the top five enrolled practices is more than \$7,100 year-to-date through August.

Dr. Evie Lawson of Eyes on You Seattle in Seattle, Wash., said she believes Neurolens Rewards – with some recent updates to the program -- works well for everyone, and she described the program as "very straightforward and very easy to understand."

Dr. Lawson added, "Neurolens Rewards works the way I want a rewards program to work. The more Neurolenses that we sell, the more we do, the more rewards we get back. We utilize those rewards to get lens credits on our lab statement to maximize our profitability with Neurolens."

Something To Strive For

Dr. Alli Markowski of Connecticut Vision Associates in Suffield, Conn., said one of the elements of Neurolens Rewards that she finds most beneficial is that it gives ECPs a goal to strive for each month. “I absolutely love it anytime there’s something like a carrot or a reward for me to strive for. It just excites me and my staff. So, I love this kind of incentive program.”

Dr. Markowski added, “I’m a pretty goal-oriented person, but it’s always nice when I don’t have to be creative myself [as it relates to goal setting]. When Neurolens set up these goals, that was a nice place to start. That’s why the minimum goal every month for me and my staff is to be selling 10 Neurolenses.”

Typically, Dr. Markowski said she redeems the Neurolens Rewards points for lens credits. “I tend to save the points for lenses because there’s so many great benefits to Neurolenses. And what I have tried to do

“When I see a patient who would greatly benefit from Neurolenses but might not be in the best financial state to afford them is...use the points toward free lenses for that patient.”

Dr. Alli Markowski of Connecticut Vision Associates in Suffield, Conn.



— since I am big in terms of supporting my community and giving back — is that when I see a patient who would greatly benefit from Neurolenses but might not be in the best financial state to afford them, is to use the points toward free lenses for that patient.”

Dr. Markowski said she also appreciates that all the details of the program are administered by Neurolens and that Neurolens makes the overall process transparent to the practice.

“It’s so easy,” Dr. Markowski said. “The nice thing is that there’s a link to NeurolensRewards.com directly from the Neurolens portal, which is what I’m using daily to explain Neurolens benefits to patients, including what their measurements are and how their eyes are aligned versus how they should be aligned. There’s just a tab off to the side [with the Neurolens Rewards link]. At any point

any day, I have easy access to see how many rewards points I’ve been awarded, how many I’ve redeemed, how many are remaining, and how I want to use them. So, it’s as transparent as possible and super easy to use and take advantage of.”

Updates Benefit ECPs and Patients

Matt Dixon, OD, of Advanced Eyecare Center in Perry, Ga., said he believes the Neurolens Rewards program is very positive and that earning the rewards truly comes down to performance. “[Neurolens] has tried to figure this out and has made some changes that look pretty good right now,” Dr. Dixon noted.

Dr. Dixon said he also likes the efficiency of Neurolens Rewards and that it is accessible directly from the Neurolens portal, which provides the ECP patient data and measurements. Within the portal, there is a link to NeurolensRewards.com, where the ECP can log in and view their up-to-date Neurolens Rewards information.

“It’s truly a reward, meaning that you have to go out there and hustle and earn it,” he said. “Neurolens is making you perform, but it’s a fair system.”

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Matt Dixon, OD, of Advanced Eyecare Center in Perry, Ga.



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