

NaturalVue Multifocal: A Multifocal that Matters in Clinical Practice

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Introduction

Approximately 45 million Americans wear contact lenses¹. While the number of active contact lens wearers by age remains relatively stable between 25 and 40, it begins to decline around the onset of presbyopia and continues to do so with increasing age². With a growing population of over 100 million presbyopes in the United States, effectively prescribing contact lens solutions to address the age-related loss of accommodation is a critical opportunity for today's eye care professionals³.

Presbyopic patients lead active, varied lifestyles which often demand excellent visual acuity and stereoacuity while simultaneously requiring the ability to rapidly switch between focal points. Multifocal contact lenses represent one way to address these demands, providing simultaneous focus of distance and near visual tasks. However, as many as 85 percent of patients wearing traditional multifocal designs experience compromised vision⁴. Of patients who are dissatisfied with their multifocal lenses, vision is the most common complaint, with inadequate near vision specifically being the largest factor⁵.

Multifocal Technology

Several strategies exist to provide a clear, simultaneous image of objects at multiple distances in a soft contact lens. The simplest strategy involves two zones – one central and one peripheral, one optimized for distance vision and one for near. This hypothetical design represents a true bifocal contact lens, since the near zone is assigned a constant relative spherical ADD power which corresponds with a specific near working distance (e.g. 2.00 D and 50 mm). A “distance center” design channels parallel distant light rays through the center of the lens, while focusing divergent near light rays through the peripheral aspect of the lens. A “center near” design does the opposite⁶. The concentric multifocal approach is an evolution of the basic bifocal-type design in which several concentric rings of varying power are implemented in order to provide clear vision at several near focal points. A concentric design can be center distance or near and the number, size and relative ADD power of each ring can be modulated by the manufacturer⁶.

Aspheric multifocal lenses utilize varying power across the optical profile of the lens to provide simultaneous vision at multiple object distances. In other words, relative plus or minus power is implemented moving from the center to the periphery of the lens. Most aspheric designs are zonal, meaning they consist of a central distance or near zone and one or more aspheric zones which provide multifocal optics. As a result, these designs technically use a combination aspheric-concentric approach⁷. Extended-depth-of-focus optics are a further evolution of aspheric designs, in which the power of the lens is modified in a smooth and continuous approach from the center to the periphery⁸. Thus, extended depth of focus lenses are neither concentric nor zonal designs, since the transition from distance to near is gradual and non-segmented. Extended depth of focus designs may provide superior high contrast visual acuity, stereoacuity, and overall visual satisfaction compared with some alternative commercially available designs⁸.

NaturalVue Multifocal: Design

NaturalVue Multifocal features an innovative distance-center, extended depth of focus optical design which is unique to presbyopic contact lens correction⁹. It is the only extended depth of focus soft contact lens available in the United States *and* the only daily disposable distance-center multifocal lens on the U.S. market. Starting from the center of the lens, the design employs a smooth and continuous increase in relative plus power with no distinct “distance” or “near” zones. This technology allows the lens to employ a single, universal ADD, facilitating a streamlined fitting process and enabling more efficient fitting than some other designs¹⁰. In addition, since there are no optical zones in NaturalVue Multifocal’s design, the patient enjoys clear, uninterrupted vision throughout the entire range of visual tasks. The lens also employs the largest continuous power range of any daily disposable multifocal on the market, with availability in quarter diopter steps from +4.00 to -12.25⁹.

NaturalVue Multifocal: Clinical Results

Vision

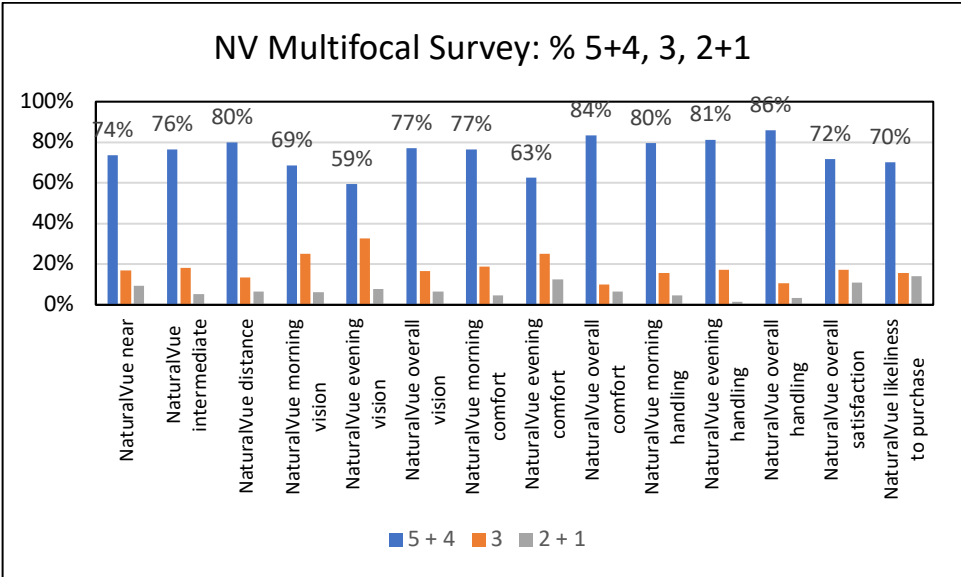
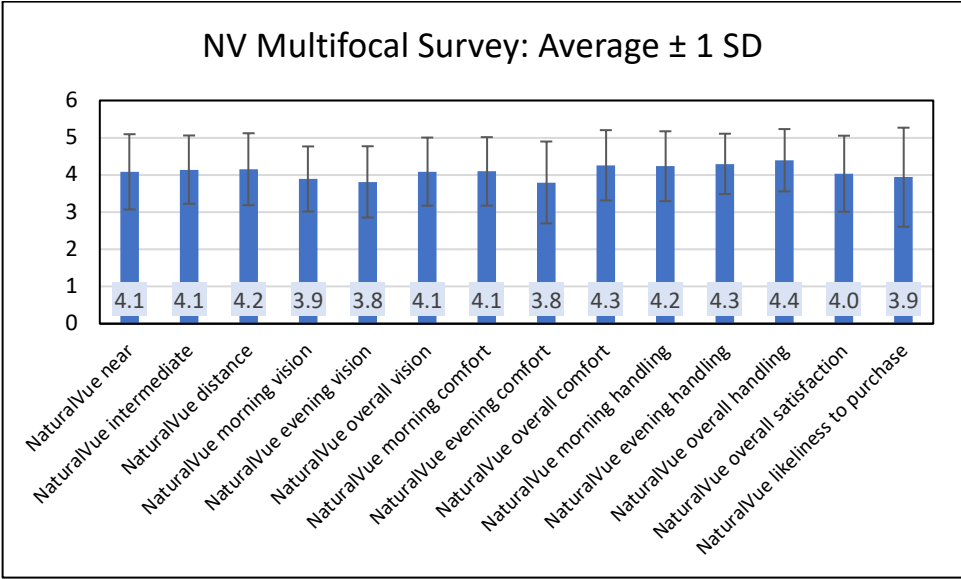
NaturalVue Multifocal’s unique design delivered a highly rated visual experience which balanced distance, near and intermediate vision as reported by patients. Overall vision with the lens was rated an average of 4.1 out of 5, with patients rating vision highly both in the morning and in the evening¹¹. The balanced vision across all distances noted in the trial may be due to the non-zonal design which does not prioritize certain focal distances, instead smoothly transitioning power from distance to near across the lens surface. Balanced vision is critical for success with a multifocal lens because it minimizes compromise, thereby maximizing the likelihood of fit success.

Comfort

A comfortable wearing experience which does not diminish over the course of the day is critical for all contact lens wearers since discomfort is the primary driver of contact lens dropout¹². Study subjects rated the comfort of NaturalVue Multifocal highly, assigning an average of 4.3 out of 5 for overall comfort. Of note, the lens was rated at highly for comfort in the evening, a time when many patients note discomfort with their lenses¹¹. Furthermore, due to the lens’ daily disposable modality, comfort concerns associated with reusable lenses (such as multipurpose solution sensitivity and discomfort associated with end of wear cycle lens deposition) are avoided.

Handling

Patients enjoyed the ease of handling NaturalVue Multifocal, which may be an under-reported area of dissatisfaction among contact lens wearers. Nearly nine out of ten patients rated overall handling of the lens highly, with many subjects remarking that the study lenses were easier to insert and remove than their habitual lenses¹¹. Furthermore, the lens’ daily disposable modality also maximizes convenience and compliance among wearers⁹. Ease of handling is particularly important for new contact lens wearers and patients with reduced dexterity, meaning NaturalVue Multifocal may be a good choice for these individuals.



Discussion

With over 100 million presbyopes in the United States, there is a huge opportunity for practitioners to provide effective contact lens solutions for patients with varying visual demands. Previous studies have shown NaturalVue Multifocal provides spectacle-level visual acuity *and* stereoacuity, which is important for active presbyopes^{10,13}. The data presented here reflect an agreement between that objective data and the subjective experience of patients wearing the lenses. Patients rated their overall vision highly, with no significant preference reflected for distance, intermediate, or near vision. This may be due to the unique, extended depth of focus optics NaturalVue Multifocal employs. Combined with the best-in-class parameter range of this lens, NaturalVue Multifocal represents a natural evolution in multifocal technology which has the potential to revolutionize the presbyopic contact lens market.

1. Centers for Disease Control and Prevention. Healthy Contact Lens Wear and Care Fast Facts. Available at <https://www.cdc.gov/contactlenses/fast-facts.html#two>. Accessed 29 June 2019.
2. Akerman, DH. 40 is the New 20/20: Presbyopia Equals Opportunity. *Contact Lens Spectrum*. March 2010. Available at <https://www.clspectrum.com/supplements/2010/march-2010/presbyopia-opportunity/40-is-the-new-20-20-x2014;-presbyopia-equals-opp>. Accessed 29 June 2019.
3. American Optometric Association. Care of the Patient with Presbyopia. Available at <https://www.aoa.org/documents/optometrists/CPG-17.pdf>. Accessed 29 June 2019.
4. VTI data on file (2013).
5. Dinardo A, Smiley G. *Causes of Multifocal Contact Lens Dissatisfaction. Presented at the American Academy of Optometry*. (2016). Program #165109
6. Dave T. Understanding Multifocals and getting them to work. *Optician* (2015); 249;6505:12-17.
7. Eon K, Bakaraju R, Ehrmann K. Power profiles of commercially available multifocal soft contact lenses. *Optometry & Vision Science*. 2017 Feb;94(2):183-196.
8. Bakaraju RC, Tilia D, Sha J, Diec J, Chung J, Kho D, Delaney S, Munro A, Thomas V. Extended depth of focus contact lenses vs. two commercial multifocals: Part 2. Visual performance after 1 week of lens wear. *J Optom*. 2018 Jan-Mar;11(1):21-32.
9. Tyler's Quarterly. March, 2019.
10. VTI data on file (2015).
11. VTI data on file (2018).
12. Nichols JJ, et al. The TFOS International Workshop on Contact Lens Discomfort: Executive Summary. *Invest Ophthalmol Vis Sci*. 2013;54:TFOS7–TFOS13.
13. Saladin JJ. (2005). Stereopsis From a Performance Perspective. *Optometry and Vision Science*, 82(3): 186-205.

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