

# Exploring Myopia Control



**Lens designers and manufacturers are continually searching for more effective ways to control myopia progression. In this article, Dominique Jorgensen sets out the options for myopia control with spectacle and contact lenses.**

WRITER Dominique Jorgensen

**There have been** many attempts to slow down the progression of myopia over the years, including under-correcting the myopic prescription, or dispensing either executive (E-line) bifocals or short corridor progressives. While some of these methods were occasionally effective, others were never effective, and were found to increase progression.

While research in this field is continually evolving, most control options currently available are built on the idea that myopia progression results from elongated axial length due to peripheral hyperopic defocussing from myopic correction.

In other words, when an eye is corrected with a minus lens, the central vision is focussed on the retina. However, the peripheral light rays then become focussed behind the retina (hyperopically) and trigger the eye to grow bigger (or more specifically, longer) to try to bring that peripheral image into focus on the retina, thus increasing the myopia.

Currently the most common myopia control methods include specialised spectacle lenses, specific soft contact lenses, orthokeratology, and compounded atropine drops. These treatment options are provided in conjunction with discussions on the importance of time spent outside and engaging in healthy screen habits.

**SPECTACLE LENSES: THE PROS AND CONS**

Several manufacturers design specialised spectacle lenses for myopia control based on the principle of peripheral defocussing. They use a wide range of new technologies to shift peripheral vision from focussing behind to in front of the retina, while maintaining clear distance vision at the macula. Manufacturers are so confident in the efficacy of their lenses that some offer guarantees contingent on the success of the lens in reducing myopia progression over the first year of wear.

**Clear Distance Vision**

Unlike bifocals or standard progressive lenses, one of the many upsides of myopia control spectacle lenses is that they allow for clear distance vision through all parts of the lens. These lenses use different technologies to provide peripheral myopic defocussing, bringing the peripheral focus point in front of the retina.

For example, Defocus Incorporated Multiple Segments (DIMS) technology is used in HOYA's MiyoSmart lens to create the required defocus. A honeycomb-shaped array of +3.50D lenslets is arranged around a 9.4mm clear central zone, providing a 50:50 ratio between defocus and clear distance vision.

Meanwhile, Essilor uses Highly Aspherical Lenslet Target (H.A.L.T) technology to create the required defocus in its new Stellest Lens. With 1,021 lenslets arranged in 11 concentric rings around a 9mm clear central distance zone, the Stellest also provides clear distance vision between each lenslet.

**Appearance**

While these myopia control lenses have different physical structures (some that can be seen when looking at the shadows cast by the lenslets) they mostly appear like normal single vision lenses, which is a benefit for children wishing to wear 'normal' glasses. Some lenses can also be provided with different anti-reflection multicoats, photochromic capabilities, polarisation, and blue light filters, adding to the overall visual performance and appearance.



**“it’s important to account for growth patterns of children by taking new, mono-interpupillary measurements at every dispense”**

**Adaptation**

Adaptation to new lenses is always a consideration when dispensing for children. Thankfully, most myopia control lenses have very high adaptation rates; ZEISS boasts a 100% adaptation rate within one day with its MyoCare and MyoCare S lenses. Rodenstock's MyCon uses defocus in the nasal and temporal areas of the lens to provide the required defocus, while leaving the superior and inferior areas clear to aid adaptation.

**Material and Indices**

Adding to flexibility, myopia control lenses that were once only available in polycarbonate, are now becoming available in a wider range of materials and indices. Lenses that use polycarbonate material, such as EssilorLuxottica's Stellest and HOYA's MiyoSmart, add impact protection to the list of pros. Others offer high index materials, including Rodenstock's MyCon and

Opticare's Myoease – both being available in 1.6, 1.67, and 1.74 indices.

**Price Tag**

As with most things, there is a small list of cons for myopia control lenses, one being the price tag. According to the Optical Distributors and Manufacturers Association's *EyeTalk Reference Guide*, a pair of one brand's myopia control lenses cost AU\$650, which may be a barrier for some families. However, Elisse Higginbotham, a lecturer in the University of Western Australia's Doctor of Optometry program said “most parents don't like watching their child's prescription go up every six months and are relieved that there are now options that might prevent this”.

This highlights the importance of not making assumptions about your patients' situation, as many caregivers feel that myopia control is a worthwhile investment in their child's future eye health.

**Central Clear Vision**

There may also be issues with comfortable central vision if the clear vision circle is not positioned correctly in front of the eyes. This could be because the frame has been knocked or twisted, not adjusted appropriately, or the dispensing measurements were taken incorrectly, cutting either the treatment or clear zones out of the frame.

It's important to ensure that experienced and trained staff are responsible for dispensing these lenses, and that young patients are educated on how to care for their spectacles. Caregivers also need to be aware of the importance of consistent correction from an early age.

**Discussing Spectacle Lenses with Caregivers**

When discussing myopia progression spectacle treatment with caregivers, Ms Higginbotham explained, “the concern is that the eye is continuing to grow longer, which is the cause of both the prescription going up, and the reason for increased risk of eye disease in the future”.

She advises caregivers that “wearing the glasses helps to send a signal to the eye that it should stop growing. This will only be effective if the glasses are on pretty much all waking hours”. She also points out that spectacles are not a quick treatment; but rather one that needs to be undertaken full time and over several years.

Some kids love wearing their glasses; they provide clear vision, protection from wind and sometimes impact, and can be an important fashion accessory. However, at times, they can restrict a child from taking part in activities they enjoy, cause stress

for children with sensory issues, or lead to bullying. This is why some practitioners will consider other options such as contact lenses before spectacles.

#### **SOFT CONTACT LENSES: A USEFUL OPTION**

For children who require flexibility that spectacles cannot provide, or who prefer not to wear glasses, there are a handful of soft contact lenses available on the Australian market that are designed specifically for myopia control.

**“When contact lenses are the more appropriate option, ensure the child and caregiver are confident with handling and cleaning techniques”**

#### **Daily Soft Contact Lenses**

CooperVision has a range of daily disposable contact lenses that have been shown to “slow the progression of short-sightedness (myopia) in children”. Its MiSight 1 Day uses a dual focus design that contains concentric rings of +2.00D.

Another option is NaturalVue Multifocal 1 Day contact lenses by Vision Technologies Inc (VTI), which uses patented neurofocus optics technology with an extended depth of focus (EDOF) centre distance design to provide peripheral defocus. Daily contact lenses are a great option for younger children, where handling, hygiene, and frequency of wear are a concern.

Mark'ennovy, in conjunction with the Brien Holden Vision Institute (BHVI), has a range of monthly disposable silicone hydrogel contact lenses that use BHVI's patented EDOF technology to control myopia progression. These are ideal if the patient wishes to wear contacts more frequently and hygiene standards can be maintained.

#### **Insertion, Removal, and Hygiene**

Gavin Swartz, a lecturer in University of Western Australia's Doctor of Optometry program, and Fellow of the International Academy of Orthokeratology and Myopia Control, said parents usually take responsibility for inserting and removing contact lenses for young patients, depending on their age and abilities. This does allay

some caregivers' concerns about hygiene while handling, however he does point out that “the child may be out playing in dirty environments and increasing risk of infection with poor hygiene practices”. This factor needs to be carefully considered by the practitioner when prescribing soft contact lenses for children.

#### **ORTHOKERATOLOGY: A NIGHTTIME TREATMENT**

While soft contact lenses provide significant freedom from spectacles for young myopes, when looking at efficacy and practicality, Mr Swartz suggests an ideal treatment option for myopia progression is orthokeratology (OK) – specially designed Rigid Gas Permeable (RGP) lenses.

#### **Handling and Hygiene**

Unlike soft contact lenses, which are worn during the day, OK lenses are worn overnight to help reshape the cornea and prevent axial growth. Mr Swartz said the upside of OK lenses is that “the parents are in complete control of their management and the environment [in which] the child is wearing the lenses”. The lenses are inserted just before sleep, usually by the caregiver, who can ensure proper hygiene standards are maintained.

#### **Comfort and Adaptation**

Mr Swartz also noted that adaptation to OK lenses is usually quick. This is partly due to the larger diameter of the lens when compared with standard RGP lenses, which makes OK lenses move around a lot less. Quick adaptation is also partly because the lenses are worn at night while the child is asleep and lid interaction is reduced.

#### **Price Tag**

Again, myopia treatment often comes with a significant price tag, with OK lenses ranging from around \$300 to \$600 each. Keeping in mind that with all being well when refraction, ocular health, and axial length are reviewed, these lenses are replaced on average around every two years and sometimes end up less expensive than soft contact lenses. In addition, some health funds may pay benefits towards OK, making this treatment option more financially accessible than it first appears.

#### **ATROPINE EYE DROPS: A THERAPEUTIC CHOICE**

If the young patient is not interested in full-time correction, OK treatment, or only has low myopia now, there are always compounded atropine eye drops. According to Ms Higginbotham “atropine eye drops are a great option and are regularly prescribed by ophthalmologists and optometrists”.

With only minimal side-effects in modern therapeutic doses, and long-term data on safe use, the drops offer a low-cost, first-line treatment for families unable to afford other control options. Compounded atropine eye drops have shown to be an excellent option, especially when used in conjunction with another control method.

#### **DISPENSING CONSIDERATIONS**

As with all dispenses, the success of the optical aide and treatment is highly dependent on the practitioner's experience and attention to detail. Excellent communication from all involved is essential to find an appropriate option for the child – the child's temperament, hygiene, preferences, lifestyle, and the family's budget should all be taken into consideration.

If spectacles are the most suitable choice, it's important to account for growth patterns of children by taking new, mono-interpupillary measurements at every dispense. Diligence during the frame styling process will ensure a comfortable fit, and that standard vertex distance, wrap, and pantoscopic tilt measurements are appropriate. Heights should be taken using the centre of rotation rule, especially if using an aspheric lens design. Make sure to check with your lens supplier for any additional fitting information required.

When contact lenses are the more appropriate option, ensure the child and caregiver are confident with handling and cleaning techniques. They also need to be educated on what to expect, and more importantly, what to do if they suspect something is wrong.

During discussion on myopia progression and control options, it's important to remember that your patient, the child, is relying on your knowledge and expertise to help them avoid significant ocular problems in the future. Whether you're an optometrist, optical dispenser, or other eye care professional, your continued learning and recommendation of control options are crucial for these children's development. As a high-myope, and the mother of a myopia progression patient, I'm eternally grateful for your work.

**“As a high-myope, and the mother of a myopia progression patient, I'm eternally grateful for your work”**

Dominique Jorgensen is an Assessor for the Australasian College of Optical Dispensing (ACOD), and Optical Dispensing Instructor and Technical Officer for the University of Western Australia's Doctor of Optometry Program. She is a qualified optical dispenser with 10 years' experience in practice.



# The first age-related myopia management solution from ZEISS.



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- ClearFocus design ensuring clarity of vision in all directions of gaze whilst effectively managing myopia progression.
- Available in a wide range of materials and indices.

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# Spectacle Lenses for Myopia Management

## ZEISS MyoCare

ZEISS MyoCare is the first age-related myopia management solution from ZEISS. Since its official launch in China over a year ago, ZEISS has sold over one million pairs. Now also available in Australia and New Zealand, ZEISS MyoCare comes with an anti-glare coating, blue protect coating, or hard coated only.

The product availability includes 1.5, 1.59, and 1.6 index. ZEISS MyoCare is built on the principle of simultaneous competing defocus that is achieved by its Cylindrical Annular Refractive Elements (CARE) in the functional zone and also includes a point-by-point free form back surface design to ensure that the optimal refractive correction and the intended myopic defocus are maintained for all gaze directions.

**Contact: ZEISS Account Manager**

ZEISS



CR Labs



## MyoMe by CR Labs

MyoMe uses innovative Myo Freeform technology to offer an exciting approach to managing the pandemic of childhood myopia.

MyoMe is a peripheral defocus lens with a near addition. The lens has a clear central zone. The nasal and temporal sides of the lens incorporate areas of asymmetrical positive defocus to ensure light is focussed in front of the retinal plane, effectively preventing axial elongation, and slowing down myopia progression.

A recent clinical trial, due to be published in early 2024, investigated the efficacy of the MyoMe lens in European children with myopia. The preliminary results of the study

found that at the 12-month review, MyoMe had reduced axial elongation by 39%, compared with children wearing single vision lenses.

**Contact: CR Labs Account Manager**

## Essilor Stellest

Essilor Stellest lenses provide an innovative lens for optometrists to correct vision and help fight myopia progression in children.

Clinical trial results show that after two years, Essilor Stellest lenses slow down myopia progression by 67% on average, compared with single vision lenses, when worn 12 hours a day.\*

Essilor Stellest lenses don't compromise on the aesthetics of the lens and cover a large range from plano to -10.00D sphere and plano to -4.00D cylinder. Made in Airwear, a durable polycarbonate, Essilor Stellest also provides the safety a child needs in the rough and tumble of the playground.

**Contact: Essilor Account Manager**

\*Compared with single vision lenses, when worn 12 hours a day. Two-year prospective, controlled, randomised, double-masked clinical trial results on 54 myopic children wearing Stellest lenses compared with 50 myopic children wearing single vision lenses. Efficacy results based on 32 children who declared wearing Stellest lenses at least 12 hours per day every day. Bao, J., et al., (2021). Myopia control with spectacle lenses with aspherical lenslets: a 2-year randomised clinical trial. *Invest. Ophthalmol. Vis. Sci.*; 62(8):2888.

Essilor



# Myo **ME**

## Myo-Freeform Technology Meets Myopia Management

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that offers the next generation of  
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\*Faria-Ribeiro, M., Queirós, A., Lopes-Ferreira, D., Jorge, J. and González-Méjome, J.M., 2013. Peripheral refraction and retinal contour in stable and progressive myopia. Optometry and Vision Science, 90(1), pp.9-15.



## MiyoSmart by HOYA

The award-winning<sup>1-3</sup> MiyoSmart spectacle lenses have been shown to slow myopia progression by 60% in children aged eight to 13.<sup>3</sup> Importantly, a six-year follow-up study proved the MiyoSmart spectacle lens myopia control effect is sustained over time for children wearing the lens, with an average cumulative myopia progression less than 1.00D and axial elongation 0.6mm over six years in children that wore MiyoSmart for the duration of the study.<sup>5</sup> The study also showed no rebound effects.<sup>5</sup>

MiyoSmart solutions are now available in clear and sun options – MiyoSmart Chameleon is a photochromic spectacle lens<sup>6,7,8</sup> while MiyoSmart Sunbird is a polarised spectacle lens.<sup>7,10</sup>

**Contact: HOYA Account Manager**

References available at [mivision.com.au](http://mivision.com.au)

## MyoEase by Opticare

MyoEase features a multi-pinhole, micro-transparent lens defocus design. The pinholes are evenly arranged in a ring to form an optical defocus area, which is integrated into the physiological curvature of the retina to slow the growth rate of the eye axis. The MyoEase is available in 1.56, 1.6, 1.67, and 1.74 clear, Blue Guardian and Skye multicoating.

MyOnic, a freeform lens designed in Italy by ProCrea Tech, uses para-central hyperopic defocus to reduce axial length growth, correcting myopia at the fovea and



simultaneously defocussing the peripheral hyperopia. MyOnic is available in 25 different materials including 1.56, 1.6, and 1.67 with Blue Guardian and Skye multicoating.

**Contact: Opticare (AUS) 02 9748 8777**

## MyCon by Rodenstock

With Rodenstock's MyCon myopia control lens, peripheral defocus areas are placed to the sides of the lens, where they slow the progression of myopia the most, leaving the main vision zones of the lens undisturbed for sharp vision.

An independent clinical study examining myopia progression in Caucasian children

over a period of five years has shown that myopia control lenses built on the principles of Rodenstock MyCon are effective in reducing the progression of myopia.

Rodenstock MyCon lenses are available in index 1.5, 1.6, 1.67, and 1.74, which make the lenses both thinner and sleeker than many other myopia lenses on the market and well suited to high prescriptions. Also available tinted and with all Rodenstock coatings.

**Contact: Rodenstock (AUS) 02 9748 0988**

### Reference

1. Tarutta, E.P., Proskurina, O.V., Tarasova, N.A., et al., (2019) Long-term results of perifocal defocus spectacle lens correction in children with progressive myopia. *Vestn Oftalmol.* 2019;135(5):46-53.



Opticare



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SPECTACLE LENSES  
WORLDWIDE<sup>(1)</sup>

# Essilor® Stellest™ lenses slow down myopia progression by 67% on average\*



**Essilor® Stellest™ lenses**  
slow down myopia progression by 67% on average\*,  
compared to single vision lenses, when worn 12 hours a day.



\*Compared to single vision lenses, when worn by children at least 12 hours every day. Bao, J., Huang, Y., Li, X., Yang, A., Zhou, F., Wu, J., Wang, C., Li, Y., Lim, E.W., Spiegel, D.P., Drobe, B., Chen, H., 2022. Spectacle Lenses With Aspherical Lenslets for Myopia Control vs Single-Vision Spectacle Lenses: A Randomized Clinical Trial. JAMA Ophthalmol. 140(5), 472-478. <https://doi.org/10.1001/jamaophthalmol.2022.0401>.



# Contact Lenses for Myopia Management

## NaturalVue by CLCA

NaturalVue (etafilcon A) Multifocal 1 Day contact lenses are indicated for the correction of myopia, presbyopia, and myopia progression control.

The lens is a centre distance, extended depth of focus (EDOF) design, with +6D to +8D of relative plus power in the periphery. The high amount of rapid continuous plus power in the design creates the EDOF channel and defocus zones.

The design is easily adapted by the brain without sacrificing vision quality. For presbyopes, the lens delivers spectacle-level visual acuity and better stereoacuity. For myopes, the lens provides excellent vision and is proven effective in reducing myopia progression.

**Contact: CLCA Account Manager**

CooperVision



## EyeSpace

The goal at EyeSpace is to make rigid contact lenses easy. Contact the EyeSpace team to book in a training session on Forge orthokeratology, or find out about EyeSpace Bespoke – daily wear right contact lenses with complete customisation to aid in the management of myopia.

**Visit: [www.eyespace.com](http://www.eyespace.com)**



## MiSight 1 Day Starter Kit

The MiSight 1 day starter kit is the perfect way to give your patients the best start when it comes to using MiSight 1 day contact lenses. These free kits are available with trial lenses and are designed to help your patients effectively learn how to use their contact lenses. The starter kit includes essential information on MiSight 1 day contact lenses and quick tips on application and removal via a QR code.

It comes in a handy zip-up case and includes a getting-started booklet, paper soap, handball, and hand mirror. Kits are free to order with any new MiSight 1 day trial lenses.

**Contact: CooperVision Account Manager**

## Menicon Bloom

Menicon Bloom is a complete treatment plan for childhood myopia that features two contact lenses that are CE-approved specifically for myopia control: Menicon Bloom Night, innovative orthokeratology contact lenses, and Menicon Bloom Day, soft daily disposable contact lenses.

Combined with specially-formulated Menicon Bloom lens care solutions, state-



of-the-art fitting software and an innovative Menicon Bloom App, Menicon Bloom offers a holistic treatment plan to help slow down the progression of childhood myopia.

**Contact: Menicon Account Manager**

## Alcon Aosept



**Contact: Alcon Account Manager**



## Gelflex

Gelflex has developed an orthokeratology (OK) lens design that provides optometrists with a more customisable fit for their patients.

With an extended diameter range and a toric periphery option now available, the company reports that lens comfort and first fit success rates have improved.

Back optic zones are adjustable, enabling more solutions and a more targeted effect. A simple two-factor fitting process (topography and spectacle prescription) is all that's needed to start you on your OK journey with no diagnostic set required.

With offices in Melbourne and Perth, Gelflex offers unparalleled technical support and customer service for every step of the fitting process.

**Contact: Gelflex (AUS) 03 9792 3127 [mi](http://www.gelflex.com)**