Optical interventions to slow the progression of myopia

Bifocal spectacles, progressive addition spectacles, dual focus contact lenses and orthokeratology each appear to reduce myopia progression.

People with myopia need vision correction (single vision glasses or contact lenses) to see objects that are far away. If their amount of myopia is increasing over time, there is a range of options to slow down the progression of myopia. This article will review the optical options that may be available where you work.

Myopia management is a challenge, because:

- We have an incomplete understanding of what causes myopia to develop and progress.
- Myopia usually starts early in life and people have to live with it for a long time.
- Myopia can progress over many years or even decades.

Eye care practitioners should stay up to date with the latest available evidence and involve patients and their families in deciding what treatment is best for them. Explain that current methods can slow down the progression of myopia, not stop or reverse it.

Recommended interventions

Progressive addition lens spectacles
Progressive addition lens (PAL, or multi-focal) spectacles provide distance correction and a near addition without a visible line in the lenses, meaning they can correct myopia and reduce accommodative strain in a cosmetically appealing form. Practitioners who thought accommodative strain was the main cause of myopia progression expected that PALs would reduce progression; however, research results have been disappointing.

PALs have been assessed in well-sized, randomised (between PALs and single vision spectacles), double masked, multi-centre trials with robust testing procedures. The studies used +2D near additions over each participant’s distance refraction and monitored progression over 3 years. Findings included:

- Lower compliance and higher drop out in the PAL spectacles group compared to the single vision spectacles group, suggesting that some children did not like wearing the PALs.
- Across all participants, there was statistically significantly slower myopia progression in the PAL group in the first year, followed by equivalent progression between PAL and single vision spectacles.
- Across a subset of participants (children with high accommodative lag and near esophoria), there was an ongoing, cumulative, statistically significant reduction (24% on average) in myopia progression in the PAL spectacles group compared to single vision spectacles group.

Bifocal spectacles
Similar to PALs, bifocal spectacles provide a distance correction and a near addition, but with a visible line in the lenses, meaning bifocals are generally considered less cosmetically appealing. The near section of bifocal lenses can have different shapes (e.g., round- or flat-topped) and widths (e.g., 28 mm, 35 mm or executive/full width). If reduced accommodation strain is responsible for the small but significant reduction in myopia progression seen in specific children wearing PAL spectacles, results should be similar with any bifocal spectacles. However, myopia progression results may be different between PALs and various bifocal options if some other factor (e.g. dioptric demand across the visual field or peripheral focus) is more important in optically-mediated myopia control.

A randomised, controlled, but unmasked study compared myopia progression in Chinese Canadian children wearing executive bifocal spectacles compared...
Myopia, once present, progresses over a number of years. It is worthwhile considering the following optical interventions that reduce myopic progression as well as correct myopia:

- **PAL spectacles with +2D near addition** reduce progression by 24% over three years, but only for children with accommodative insufficiency and convergence excess.

- **Executive bifocal spectacles with +1.5D near addition** reduce progression by 50% over three years, but results need to be replicated in a multi-centre trial with masking.

- **Specially-designed contact lenses** can reduce myopia progression by up to 50% over 2 years. These tend to be expensive and are available mainly in high-income settings.

References


