

Myopia Management - A Shifting Paradigm

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INTRODUCTION

Myopia, or nearsightedness, is a global health issue with rapidly increasing prevalence.¹ It's no longer considered a simple refractive error but a progressive condition with potentially sight-threatening complications. Fortunately, the field of myopia management has seen significant advancements in recent years, shifting the focus from simply correcting vision to actively slowing its progression.² This evolution in understanding and treatment strategies marks a significant paradigm shift in eye care.

The Growing Concern

The prevalence of myopia is projected to affect nearly half of the world's population by 2050.¹ This surge is driven by a combination of genetic predisposition and environmental factors, particularly increased near-work activities (reading, screen time) and decreased time spent outdoors. High myopia, in particular, is associated with a greater risk of developing serious eye conditions such as:

- Myopic maculopathy
- Retinal detachment
- Glaucoma

Therefore, managing myopia progression, especially in children and adolescents, is not just about improving visual acuity; it is a crucial strategy for preserving long-term ocular health and preventing potential vision loss.

Key Updates in Myopia Management

Recent research has led to the development of several effective strategies for slowing myopia progression:

Optical Interventions

Myopia control spectacles

Spectacles with specially designed lenses, such as defocus incorporated multiple segments (DIMS) lenses and highly aspherical lenslet target (HALT) lenses, create peripheral myopic defocus, which helps to slow axial elongation (the

primary cause of myopia progression). Studies have shown these lenses to be effective in slowing myopia progression in children.^{2,3}

Myopia control contact lenses

Similar to myopia control spectacles, these contact lenses (e.g., MiSight 1 day) utilize peripheral myopic defocus to slow eye growth. They offer the added benefit of providing clear vision without the need for glasses.⁴

Orthokeratology (Ortho-K)

This involves wearing specially designed rigid gas-permeable contact lenses overnight to temporarily reshape the cornea. In addition to providing clear vision during the day without glasses or contacts, Ortho-K has also been shown to slow myopia progression.⁵

Pharmacological Intervention

Low-dose atropine

Atropine eye drops, particularly at low concentrations (e.g., 0.01–0.05%), have been shown to be effective in slowing myopia progression.⁶ While the exact mechanism is not fully understood, it is believed that atropine affects receptors in the eye that are involved in eye growth.⁶

Combination Therapies

- Combining optical and pharmacological interventions, such as Ortho-K with low-dose atropine, has shown promise in providing even greater myopia control than either treatment alone.⁷

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UP JOURNAL OF OPHTHALMOLOGY

An Official Journal of Uttar Pradesh State Ophthalmological Society,
UPSOS (Northern Ophthalmological Society, NOS)

p-ISSN: 2319-2062

DOI: 10.56692/upjo.20251301edi

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How to cite this article: Mohan S, Singh A. Myopia Management - A Shifting Paradigm. UP Journal of Ophthalmology. 2025;13(1): 1-2.

Received: 20-02-25, **Accepted:** 05-04-25, **Published:** 30-04-25

Lifestyle Modifications

- Increasing time spent outdoors/ sunlight exposure has been shown to have a protective effect against the onset and progression of myopia. It is recommended that children spend at least 90 to 120 minutes outdoors daily.⁸
- Reducing prolonged near-work activities and taking regular breaks can also help to minimize the risk of myopia progression. The 20-20-20 rule (every 20 minutes, take a 20-second break to look at something 20 feet away) is often recommended. Though compliance and the predicted outcome is not very satisfying.^{1,4}

The Role of Technology

Artificial intelligence (AI) is beginning to play a role in myopia management. AI algorithms are being developed to:⁹

- Predict the progression of myopia in individual patients.
- Identify the most effective treatment strategies.
- Monitor treatment outcomes.

Looking Ahead

The field of myopia management continues to evolve due to increasing incidence, with ongoing research exploring new and improved treatment strategies. Future directions may include:

- Further refinement of optical designs to enhance efficacy and comfort.
- Development of new pharmacological agents with fewer side effects.
- Investigation of genetic factors that contribute to myopia, which could lead to personalized treatment approaches.
- Increased use of technology, such as AI, to optimize myopia management.

CONCLUSION

Myopia is a significant public health challenge, but the advancements in treatment and management offer hope for the future. By adopting a proactive approach that combines the latest evidence-based interventions with lifestyle modifications, eye care professionals can play a crucial role in slowing the progression of myopia and reducing the risk

of associated vision-threatening complications. Parents, educators, and healthcare providers must work together to raise awareness about myopia and implement effective strategies to protect the vision of future generations.

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