



**ACADEMY OF MEDICINE
SINGAPORE**



**COLLEGE OF
OPHTHALMOLOGISTS**

CONSENSUS GUIDELINES

MANAGEMENT OF CHILDHOOD MYOPIA IN SINGAPORE

The Consensus Guidelines for the Management of Childhood Myopia in Singapore represent a landmark national effort to unify clinical practice and establish evidence-based standards in the care of myopic children up to 16 years of age. Developed through a multidisciplinary collaboration involving ophthalmologists, optometrists, public health experts, and researchers from leading eye institutions, the guidelines provide a comprehensive framework for the management of myopia across various stages of childhood development.

Formulated through a multidisciplinary consensus process, the guidelines synthesize the best available evidence with expert clinical judgment and local epidemiological insights. Key recommendations address the evidence-based interventions such as atropine therapy, optical devices with myopia control efficacy, and lifestyle modifications emphasizing increased outdoor time are detailed, with stratified guidance based on the child's age, refractive status, and rate of progression.

The guidelines further emphasize a holistic, patient-centered approach that integrates hospital- and community-based care, highlighting the importance of a multidisciplinary and ecosystem-based approach—bridging hospital, primary care, and community sectors—to ensure continuity of care. They advocate for structured follow-up intervals and documentation standards to facilitate outcome tracking and quality assurance.

By establishing these consensus recommendations, Singapore underscores its leadership role in the regional and global efforts to address the myopia epidemic. The publication serves as both a clinical reference and a policy framework, guiding clinicians, educators, and health administrators in implementing comprehensive and sustainable myopia control strategies.

The recommendations within this consensus guideline were graded according to the strength of recommendation and the quality of supporting evidence, adapted from the GRADE framework.

Definitions

- Strong recommendation: benefits clearly outweigh risks, supported by consistent evidence from randomized controlled trials (RCTs), meta-analyses, or long-term prospective studies.
- Moderate recommendation: evidence is generally supportive but may be limited by study duration, heterogeneity, indirectness, or reliance on expert consensus.
- Weak recommendation: evidence is limited, emerging, observational, or primarily based on expert opinion and clinical experience.

Treatment Aims and Monitoring

The recommended annual treatment aims are stratified by age, reflecting the differing rates of physiological ocular growth. For children younger than nine years, the target is to limit spherical equivalent (SE) progression to no more than -0.75 dioptres (D) and axial elongation to ≤ 0.3 mm per year. For those aged nine to twelve years, the corresponding goals are ≤ -0.50 D and ≤ 0.2 mm annually. Beyond twelve years of age, the targets become more stringent, with expected SE change less than -0.50 D and axial length progression ≤ 0.15 mm per year.

Routine review is recommended every six months to evaluate treatment efficacy and adherence. However, clinicians may adjust the review interval between three to nine months depending on individual risk factors, progression rates, and therapeutic response. This flexibility ensures that treatment remains dynamic and tailored to the child's evolving visual needs.

Pharmacological Therapy – Atropine

Recommendation strength: Strong

Quality of evidence: High

Atropine remains one of the most effective pharmacological interventions for myopia control. It is indicated for children aged 4 to 16 years with progressive myopia. The initial dosage typically ranges from 0.01% to 0.05% once nightly (ON), with escalation up to 1% ON in selected cases demonstrating rapid progression or inadequate response. Younger children and fast progressors may require higher dosages, though treatment must be individualized with close monitoring for potential side effects.

Atropine should be used cautiously in patients with known allergies or cardiovascular disease. Tapering is recommended upon cessation to minimize rebound effects. Discontinuation can be considered when the child is ≥ 12 years old, treated with monotherapy, and has demonstrated stable myopia for at least one year. A follow-up at six months after cessation of treatment to confirm stability of myopia is advised before discharge.

Optical Interventions

Recommendation strength: Strong

Quality of evidence: High

Myopia Control Contact Lenses — including defocus soft contact lenses and orthokeratology—are established modalities for myopia control.⁸⁻¹⁰ They are generally indicated for children aged 6 to 16 years, with fitting guided by manufacturer specifications and professional standards. Daily disposable lenses are preferred to minimize the risk of microbial keratitis.⁸ Orthokeratology use should adhere to the *Optometrists and Opticians Board (OOB) Orthokeratology Practice Guidelines*. Treatment cessation is appropriate when the patient reaches ≥ 16 years of age and exhibits stable refraction for at least one year, followed by a review at six months prior to discharge.

Myopia Control Spectacle Lenses such as Defocus Incorporated Multiple Segments (DIMS) and Highly Aspherical Lenslet Target (HALT) have demonstrated efficacy in two-year clinical trials and are recommended as first-line optical interventions for children aged 6 to 16 years.^{11,12} Use should be avoided in cases of amblyopia, strabismus, or nystagmus. Cessation of treatment may be considered when the patient reaches ≥ 12 years of age and exhibits stable refraction for at least one year.

Combination Therapy

Recommendation strength: Moderate to Strong

Quality of evidence: Moderate

Combination therapy may be indicated in children showing suboptimal response to monotherapy or where there is a preference for enhanced myopia control.^{8-10,13} The recommended atropine dosage in combination therapy ranges from 0.01–0.05% ON as first-line, and may be increased up to 0.125% twice daily (BD) if tolerated.^{8-10,13} Combination strategies are best suited for children aged 6–16 years, and require individualized monitoring to balance efficacy and tolerability.

Environmental and Lifestyle Recommendations

Recommendation strength: Strong

Quality of evidence: Moderate to High

Lifestyle modification remains an integral component of myopia control. Children should spend at least two hours outdoors daily, either continuously or in divided sessions, to harness the protective effects of natural light exposure.^{14,16} Near work should be minimized where possible, and screen-time (outside school) should be limited according to age: no screen exposure for children under 18 months, less than one hour per day for those aged 18 months to six years, and less than two hours per day for children aged seven to twelve years.

Non-evidence-based Practices

Recommendation strength: Strong recommendation against

The guidelines explicitly discourage the use of interventions lacking clinical efficacy, including under correction, pinhole or blue-light blocking glasses, bifocal or progressive addition spectacle lenses, daytime single-vision soft or rigid gas permeable lenses, and ocular massages or eye exercises. These have not demonstrated significant benefit in controlled trials and may delay effective management.

Summary Table: Treatment Aims and Recommendations

Treatment Aims per Year			
Age Group	Spherical Equivalent (D) progression	Axial Length (mm) progression	
< 9	≤ - 0.75	≤ 0.3	
9 – 12	≤ - 0.50	≤ 0.2	
> 12	< - 0.50	≤ 0.15	
Follow-up	Review is recommended every 6 months. Note: However, the follow-up interval may be shortened to 3 months or extended to 9 months at the discretion of the eye care professional, based on the child's condition.		
Atropine eyedrops	Indications	Myopia	
	Precautions	Allergies, cardiovascular disease	
	Age	4 – 16 years old	
	Dosage	Initial dose: 0.01-0.05% ON Maximum up to 1% ON Note: Younger children and those with faster progression may require higher dosages. Dosage and frequency are case-dependent, and some children may not respond as expected.	
	Cessation	Tapering is recommended. Age ≥ 12 years old (monotherapy) AND Stable myopia for ≥ 1 year. Review at least 6 months after stopping before discharge.	
Myopia Control Contact Lenses	Types	Defocus soft contact lenses	Orthokeratology
	Indications	Myopia within lens power limits	
	Precautions	Daily disposable contact lenses are preferred due to their lower risk of infection compared to reusable lens options.	Refer to OOB guidelines*
	Age	6 – 16 years old	
	Wear frequency	Manufacturer's guidelines	Daily
	Cessation	Age ≥ 16 years old AND Stable myopia for ≥ 1 year. Review at least 6 months after stopping before discharge.	
* https://www.oob.gov.sg/publications-and-newsroom/announcements/orthokeratology-practice-guidelines			
Myopia Control Spectacle Lenses	Types	Evidenced-based lenses	

		Preciso: Certain lenses, including Defocus Incorporated Multiple Segments (DIMS) and Highly Aspherical Lenslet Target (HALT), are supported by longer-term studies of two years or more.	
	Indications	Plano till lens power limit	
	Precautions	Amblyopia, Strabismus, Nystagmus	
	Age	6 – 16 years old	
	Cessation	Age \geq 12 years old AND Stable myopia for \geq 1 year.	
Combination of atropine eyedrops with myopia control contact lenses or spectacle lenses	Indication	1) Suboptimal response to monotherapy 2) Patient preference	
	Age	6-16 years old	
	Dosage of atropine	First Line: 0.01-0.05% ON Maximum: up to 0.125% BD as tolerated	
Environmental	Outdoor	2 hours a day or more (daytime) , either continuously or in divided sessions.	
	Near-work	Near work should be minimised as much as possible.	
	Screen-time (outside school)	Below 18 months	0
		18 months to 6 years	<1 hour
7 to 12 years		< 2 hours	
Non-evidence Based Treatment	<ul style="list-style-type: none"> • Non-correction/Under-correction • Pinhole glasses • Blue light blocking glasses • Bifocal glasses • Progressive addition spectacle lenses • Daytime single vision soft contact lenses / rigid gas permeable contact lenses • Ocular massages • Eye exercises 		

REFERENCES

- (1) Chua WH, Balakrishnan V, Chan YH, Tong L, Ling Y, Quah BL, et al. Atropine for the treatment of childhood myopia. *Ophthalmology*. 2006;113(12):2285-2291. doi:10.1016/j.ophtha.2006.05.062.
- (2) Chia A, Chua WH, Cheung YB, Wong WL, Lingham A, Fong A, et al. Atropine for the treatment of childhood myopia: safety and efficacy of 0.5%, 0.1%, and 0.01% doses (ATOM2). *Ophthalmology*. 2012;119(2):347-354. doi:10.1016/j.ophtha.2011.07.031.
- (3) Li Y, Yip M, Ning Y, Chung J, Toh A, Leow C, et al. Topical atropine for childhood myopia control: the Atropine Treatment Long-Term Assessment Study. *JAMA Ophthalmol*. 2024;142(1):15-23. doi:10.1001/jamaophthalmol.2023.5467.
- (4) Zhang XJ, Zhang Y, Yip BHK, Kam KW, Tang F, Ling X, et al. Five-year clinical trial of the low-concentration atropine for myopia progression (LAMP) study: phase 4 report. *Ophthalmology*. 2024;131(9):1011-1020. doi:10.1016/j.ophtha.2024.03.013.
- (5) Foo LL, Htoon HM, Farooqui SZ, Chia A. Part-time use of 1% atropine eye drops for prevention of myopia progression in children. *Int Ophthalmol*. 2020;40(7):1857-1862. doi:10.1007/s10792-020-01356-4.
- (6) Yam JC, Jiang Y, Tang SM, Law AKP, Chan JJ, Wong E, et al. Low-concentration atropine for myopia progression (LAMP) study: a randomized, double-blinded, placebo-controlled trial of 0.05%, 0.025%, and 0.01% atropine eye drops in myopia control. *Ophthalmology*. 2019;126(1):113-124. doi:10.1016/j.ophtha.2018.05.029.
- (7) Yam JC, Zhang XJ, Zhang Y, Wang YM, Tang SM, Li FF, et al. Three-year clinical trial of low-concentration atropine for myopia progression (LAMP) study: continued versus washout: phase 3 report. *Ophthalmology*. 2022;129(3):308-321. doi:10.1016/j.ophtha.2021.10.002.
- (8) Tan Q, Ng ALK, Cheng GPM, Woo VCP, Cho P. Combined 0.01% atropine with orthokeratology in childhood myopia control: a 2-year randomized clinical trial. *Cont Lens Anterior Eye*. 2023;46(1):101723. doi:10.1016/j.clae.2022.101723.
- (9) Xu S, Li Z, Zhao W, Wang Y, Liu X, Li Y, et al. Effect of atropine, orthokeratology and combined treatments for myopia control: a 2-year stratified randomised clinical trial. *Br J Ophthalmol*. 2023;107(12):1812-1817. doi:10.1136/bjo-2022-322309.
- (10) Yu S, Du L, Ji N, Wang X, Li Y, Wang J, et al. Combination of orthokeratology lens with 0.01% atropine in slowing axial elongation in children with myopia: a randomized double-blinded clinical trial. *BMC Ophthalmol*. 2022;22(1):438. doi:10.1186/s12886-022-02662-y.
- (11) Lam CSY, Tang WC, Tse DY, Tang YY, To CH. Defocus incorporated multiple segments (DIMS) spectacle lenses slow myopia progression: a 2-year randomised clinical trial. *Br J Ophthalmol*. 2020;104(3):363-368. doi:10.1136/bjophthalmol-2018-313739.
- (12) Zhang Z, Zeng L, Gu D, Wang B, Kang P, Watt K, et al. Spectacle lenses with highly aspherical lenslets for slowing axial elongation and refractive change in low-hyperopic Chinese children: a randomized controlled trial. *Am J Ophthalmol*. 2024;269:60-68. doi:10.1016/j.ajo.2024.08.027.
- (13) Sim BX, Loh KL, Htoon HM, Sri Y, Balakrishnan M, Chan PLP, et al. Additive effect of highly aspherical lenslet target spectacles in children inadequately controlled by atropine monotherapy. *Ophthalmol Sci*. 2025;5(4):100753. doi:10.1016/j.xops.2025.100753.
- (14) He M, Xiang F, Zeng Y, Mai J, Chen Q, Zhang J, et al. Effect of time spent outdoors at school on the development of myopia among children in China: a randomized clinical trial. *JAMA*. 2015;314(11):1142-1148. doi:10.1001/jama.2015.10803.

- (15) Wu PC, Tsai CL, Wu HL, Yang YH, Kuo HK. Outdoor activity during class recess reduces myopia onset and progression in school children. *Ophthalmology*. 2013;120(5):1080-1085. doi:10.1016/j.ophtha.2012.11.009.
- (16) Saw SM, Chua WH, Hong CY, Wu HM, Chan WY, Chia KS, et al. Nearwork in early-onset myopia. *Invest Ophthalmol Vis Sci*. 2002;43(2):332-339
- (17) Chung K, Mohidin N, O’Leary DJ. Undercorrection of myopia enhances rather than inhibits myopia progression. *Vision Res*. 2002;42(22):2555-2559. doi:10.1016/S0042-6989(02)00258-4.
- (18) Adler D, Millodot M. The possible effect of undercorrection on myopic progression in children. *Clin Exp Optom*. 2006;89(5):315-321. doi:10.1111/j.1444-0938.2006.00055.x.
- (19) Walline JJ, Lindsley KB, Vedula SS, Cotter SA, Mutti DO, Ng SM, et al. Interventions to slow progression of myopia in children. *Cochrane Database Syst Rev*. 2020;1(1):CD004916. doi:10.1002/14651858.CD004916.pub4.

ACKNOWLEDGEMENTS

This document was drafted by members of the College of Ophthalmologists, Academy of Medicine, Singapore, and was endorsed by the College Council, as well as members from the Opticians and Optometrists Board and the Singapore Optometric Association.

We would like to express our deepest gratitude to Dr. Doric Wong for his invaluable guidance, unwavering support, and exemplary leadership, which were instrumental in the development and completion of this consensus.

CO-AUTHORS

Co-Authors	Designation & Institution
Dr Foo Li Lian	Clinical Director, Consultant, Clinical Assistant Professor Myopia Service, Cataract and Comprehensive Ophthalmology Singapore National Eye Centre, Duke-NUS Medical School
Dr Ng Wei Yan	Consultant, Clinical Assistant Professor Paediatric Ophthalmology & Adult Strabismus Singapore National Eye Centre, Duke-NUS Medical School
Clinical Associate Prof Quah Boon Long	Senior Consultant Paediatric Ophthalmology & Adult Strabismus Singapore National Eye Centre, Duke-NUS Medical School
Ms Pauline Chan	Principal Optometrist Myopia Centre, Singapore National Eye Centre
A/Prof Audrey Chia	Senior Consultant, Paediatric Ophthalmology & Adult Strabismus, Singapore National Eye Centre Co-Head, Myopia research, Singapore Eye Research Institute
Dr Saadia Zohra Farooqui	Consultant, Paediatric Ophthalmology & Adult Strabismus Singapore National Eye Centre Head and Consultant, KKH Eye Centre
Dr Catherina Goenadi	Consultant Ophthalmologist, Paediatric Ophthalmology & Strabismus Surgery National University Hospital
Mr Koh Lian Buck	Optometrist, Pearl's Visioncare Board Member, Optometrists and Opticians Board, MOH Co-Chair, (COCS) Working Committee, MOH
Dr Koh Liang Hwee	Optometrist, Pearl's Optical Co. Pte Ltd Former OOB Board Member, Past SOA President
Dr Koh Yan Tong	Head and Consultant, Paediatric Ophthalmology & Adult Strabismus Deputy Head, Comprehensive Eye Care Tan Tock Seng Hospital, NHG Health
Dr Yien Lai	Consultant Ophthalmologist, Paediatric Ophthalmology & Strabismus Surgery, National University Hospital Deputy Programme Director, National University Hospital
Dr Janice Lam	Senior Consultant Ophthalmologist, Paediatric Ophthalmology & Strabismus surgery, National University Hospital Asst. Professor & Deputy Director, NUS Yong Loo Lin School of Medicine

	Co-Lead, Optometry Education, NUS Centre for Innovation & Precision Eye Health
Mr Lee Kang Lian	President Singapore Optometric Association
Dr Leo Seo Wei	Medical Director Dr Leo Adult & Paediatric Eye Specialist Pte Ltd
Ms Cheryl Leow	Optometrist Myopia Centre, Singapore National Eye Centre
Dr Blanche Lim	Consultant Ophthalmologist, National University Hospital, Alexandra Hospital Asst Professor, NUS Yong Loo Lin School of Medicine Clinical Director, Community Eye Services, National University Health System and Ophthalmology, Alexandra Hospital
Dr Loh Kai-Lyn	Consultant Ophthalmologist, The Children's Eye and ENT Centre/ Focal Eye Centre Visiting Consultant, Singapore National Eye Centre
Dr Cheryl S Ngo	Medical Director, Adult & Child Eye (ACE) Clinic Visiting Consultant, Eye Surgery Centre, National University Hospital Adjunct Assistant Professor, NUS School of Medicine
Ms Ong Lisa	Senior Principal Optometrist, Head of Allied Health Professional Singapore National Eye Centre
Dr Jayvee Rivera	Clinical Myopia Fellow Singapore National Eye Centre
Prof Saw Seang Mei	Distinguished Wallace Foulds Professor Duke-NUS Medical School, Singapore Eye Research Institute
Dr Bryan Sim	Consultant, Myopia Service, Cataract and Comprehensive Ophthalmology Singapore National Eye Centre Co-Lead, Optometry Education, Singapore National Eye Centre
Dr Sun Chen-Hsin	Consultant Ophthalmologist Paediatric Ophthalmology & Strabismus Surgery, National University Hospital Clinical Assistant Professor, NUS Yong Loo Lin School of Medicine
Dr Tan Kah Ooi	Co-founder and Director of Business Development, nthalmic Technology Pty. Ltd. President, Asia Optometric Management Academy
Ms Tan Li Shan	Optometrist, Paediatric Refractive service National University Hospital
Ms Tan Zhen Kiat	Senior Principal Optometrist, Optometry Service Lead Singapore National Eye Centre
Mr Ken Tong	Founder, Optometrist, eyesight.sg Board Member, Optometrists and Opticians Board, MOH
Ms Yang Huixian Adeline	Founder, Optometrist International Eye Institute

PUBLISHED: 19 MAY 2026

College of Ophthalmologists
Academy of Medicine, Singapore
81 Kim Keat Road
#11-00 NKF Centre
Singapore 328836