



THE AUSTRALIA AND NEW ZEALAND CHILD MYOPIA REPORT 2022/23

Reducing the Risk
to Vision

About the Australia and New Zealand Child Myopia Working Group

The Child Myopia Working Group is a collaboration of leading optometrists and ophthalmologists from Australia and New Zealand. The Group was established in 2018 to deliver a recommended Standard of Care for the management of myopia in children with the aim of slowing its progression.

Members are (in alphabetical order):

- **Dr Rasha Altaie**, Ophthalmologist, Vice President of the Cornea and Contact Lens Society of New Zealand, Auckland, New Zealand.
- **Luke Arundel**, Optometrist, Chief Clinical Officer, Optometry Australia, Melbourne, Australia.
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This report is an adjunct to the inaugural report published by the Child Myopia Working Group in 2018. That report, entitled The Australia and New Zealand Child Myopia Report – A Focus on Future Management, recognised the need for a recommended Standard of Care for managing myopia. This 2022/23 adjunct report seeks to highlight the shift in trends, awareness and understanding of myopia since then and presents the Group's recommended Standard of Care.

The establishment of the Australia and New Zealand Child Myopia Working Group has been enabled by CooperVision Australia & New Zealand.

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Any enquiries about, or comments on, this publication should be directed to CooperVision Australia & New Zealand at hello@au.coopervision.com.

Note: Geographic and racial references used in this report reflect those used in the research studies referenced.

For further information about child myopia, visit www.childmyopia.com.

Contents

Foreword.....	4
Myopia: What is it and what should we be doing about it	5
2018 to now: What has changed	7
What needs to be done	10
Global collaborative approach	11
Child myopia in Australia and New Zealand	12
Summary	14
References.....	15



Foreword



Professor Ian Flitcroft

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In 2018, the Australia and New Zealand Child Myopia Working Group published *The Australia and New Zealand Child Myopia Report – A Focus on Future Management*, which recognised the need for a recommended Standard of Care for managing myopia. This is such a fast-moving field that I am delighted to see an update to this valuable document. This new adjunct report highlights the shift in trends, awareness and understanding of myopia over the last few years. It presents the recommended best practice Standard of Care from the Child Myopia Working Group, outlining what we need to do to continue to help prevent, manage and reduce its impact both locally, in Australia and New Zealand, and globally.

Global collaborative action is needed to increase worldwide acceptance of the importance of myopia management in children. Progress has certainly been made since 2018 in raising much-needed awareness of myopia and how to help manage it. The optometry profession’s understanding of myopia also continues to advance, with the latest evidence and data continually informing best practice.

However, it’s fair to say that few of us would have predicted a global pandemic in that time. The coronavirus pandemic has had a significant impact on the progression of child myopia in those populations who endured extended lockdowns, bringing the issue of myopia to the attention of a wider audience than ever before.

I have long advocated for a change in the Standard of Care for myopic children away from simple refractive correction to a comprehensive program of myopia management.

I therefore sincerely hope that the Australia and New Zealand Child Myopia Working Group’s recommended Standard of Care for myopia management, published in this report, will be embraced by the region. If so, it will help bring about more informed discussions in the practice setting with parents or carers, helping them to consider the available options that can be used to manage myopia and what may work best for their child. Most importantly, setting a new Standard of Care is critical to moving myopia management from a service offered by a minority of eye care practitioners to being universally available. Only then will the full public health benefits of reducing the prevalence and impact of myopia be achievable.

Now is the time for optometrists, ophthalmologists, parents and carers, educators and other healthcare professionals to collaborate effectively on behalf of the children for whom we have the privilege to care.

Myopia

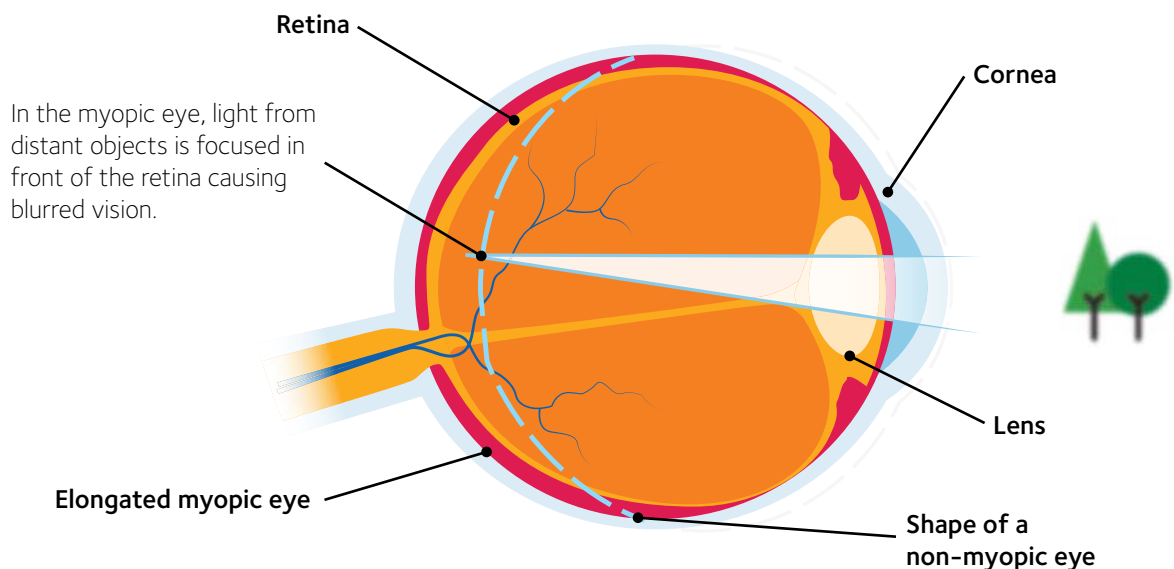
What is it and what should we be doing about it?

Myopia, also known as short-sightedness, is a common eye condition which causes blurred distance vision. For the purpose of this report, child myopia refers to myopia in children up to the age of 17 years, unless otherwise specified.

The myopic eye

Eyeball growth occurs through childhood and adolescence. Myopia arises if the eyeball grows too long for the focusing power of the eye. Myopia typically starts in childhood and progresses until maturity.

There are two reasons why myopia causes blurred distance vision:



There are two main risk factors for a child developing myopia: lifestyle and family history.

Lifestyle

Modern lifestyles may influence the development of myopia. These include:



Low levels of outdoor activity¹



Low levels of light exposure²



Prolonged near tasks³
such as reading and gaming on portable devices

Family history

The likelihood of developing myopia, particularly high myopia, increases when one or both parents are myopic⁴. However, the exact link between a family history of myopia and the development of childhood myopia remains uncertain⁵.

Impact on school learning

Good vision is essential for a child's learning and development. As a child grows, his or her vision passes through key developmental phases which are profoundly integrated with their overall development. Vision can therefore often become the key to understanding how a child is progressing through important milestones.

With 80% of classroom learning being visual⁶, early detection, especially in children with a strong family history of myopia and especially a family history of high myopia, is critically important. Not just for the educational development of a child but also for their social, behavioural and physical development.

School vision screenings are basic eye tests that help identify whether a child has a problem with their vision, but they don't test for eye diseases or the underlying causes of any vision problem. Myopia or pre-myopia needs to be diagnosed by an eye examination by an optometrist. Worryingly, 30% of Australian children and 28% of New Zealand children (aged 17 years and under) have never been to an optometrist to have an eye examination⁷.

Time to act

Each year of delay in developing myopia substantially reduces the chance of a child developing high myopia in adulthood⁸. The Child Myopia Working Group implores parents or carers to have children's eyes examined by an optometrist regularly, even if there are no known problems. Children may be unaware their vision is not as it should be and, in the case of pre-myopia, vision can be perfectly normal.

Eye care practitioners can diagnose myopia and now have a range of evidence-based management options which mean they can not only provide clear vision but also help to slow the progression of myopia.

Optometry Australia and the New Zealand Association of Optometrists recommend that all children have a full eye examination with an optometrist before starting school, and then regular visits as they progress through primary and secondary school, to help ensure good vision for life.

“As a child's eye grows, their focus changes. This means children can become myopic at any stage of childhood. Regular eye exams are critical to ensure a child's eye health and normal visual development.”

Dr Loren Rose

Paediatric Ophthalmologist and founding member of the Child Myopia Working Group

The burden of myopia

Although a common eye health condition, myopia is a serious global public health concern. Evidence is mounting that myopia is growing around the world⁹ and by 2050 it is estimated that more than 50% of the world's population will have myopia and 10% will have high myopia¹⁰.

This is of significant concern as myopia is not just a vision condition. Increasing myopia (and elongation of the eyeball) may lead to serious eye health problems in the future, including myopic maculopathy, glaucoma, cataract and retinal detachment. These eye conditions can all potentially lead to reduced vision at best and blindness at worst¹¹.

The impact of myopia appears set to increase with myopia starting earlier in life; its progression becoming more rapid; a general increase in prevalence; longer life expectancies and; the significant costs of managing treatable pathological conditions such as glaucoma, cataract and retinal detachment¹².

It is therefore time to change how myopia is managed with intervention starting as soon as possible.

2018 to now | What has changed?

Myopia prevalence

The COVID-19 pandemic appears to have had a dramatic impact on the progression of myopia. Myopia prevalence rose significantly in young school children during the COVID-19 pandemic, according to a large Chinese study, which found prevalence increased almost 400% in six-year-olds¹³. This substantial myopic shift (approximately -0.30 dioptres) has not been seen in any other year to year comparison, making the cause possibly due to the unusual occurrence of home confinement in 2020.

Researchers also hypothesised that the impact was greater for younger children, those aged six to eight years old, as they are more sensitive to environmental change, given they are in an important life stage for the development of myopia. The findings of this research are important as worldwide children have completed months of homeschooling during the pandemic, including in Australia and New Zealand where schools were closed and sports cancelled.

Environmental insights

The evidence of the protective effect of time outdoors, on myopia, continues to grow. Low levels of outdoor activity may influence the development of myopia¹⁴, so balancing screen time with green time for children is imperative. Spending time outdoors, with or without requiring physical activity or direct sunlight exposure, appears to have a protective effect against myopia onset¹⁵.

According to Optometry Australia, children need to spend at least 90 minutes per day outside to help prevent myopia from developing and progressing¹⁶. Ethnic and geographical differences in terms of myopia prevalence also need to be acknowledged as influencing factors, as does the urban or rural environment in which an individual resides¹⁷.



- There are myopia prevalence differences between people living in south Asia (which includes Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and, more recently, Afghanistan), compared to migrant south Asian populations. For example, myopia rates for Indians living in Singapore are more aligned with rates for the Singaporean Chinese population than for Indians living in India. Similarly, south Asian children residing in Australia and England are approximately five times more likely to be myopic than their counterparts living in Nepal or India. At age 15, around 40% of migrant south Asians develop myopia, compared to 9% of indigenous south Asians¹⁸.
- It is estimated that children living in predominantly urban environments have 2.6 times greater chance of developing myopia than those living in rural environments¹⁹.
- Regions that have undergone rapid economic transition, south and east Asia for example, have also experienced a rapid rise in rates of myopia²⁰.

“Spending time outdoors appears to have a protective effect against myopia onset. Given that outdoor play is free, ‘more green time less screen time’ is a timely reminder for moderation in an increasingly digital world.”

Jagrut Lallu

Optometrist and founding member of the Child Myopia Working Group

Myopia management Standard of Care

The optometry profession's understanding of myopia continues to advance, with the latest evidence and data continually informing best practice.

In 2018, the Australia and New Zealand Child Myopia Working Group recognised the need for a recommended Standard of Care for managing myopia. The Standard of Care describes the key elements that they believe must be included without prescribing how or when to employ specific options or techniques.

The Group recommends a shift from not only correcting vision but to also include a discussion between the eye care practitioner and the parents and carers that explains what myopia is, lifestyle factors that may impact myopia, the increased risks to long-term ocular health that myopia brings, and the available approaches that can be used to manage myopia and help to slow its progression.

Since 2019, the profession's peak body, Optometry Australia, has undertaken a review of the Entry-Level Competency Standards for Australian optometrists. These Standards do not provide management techniques or protocols of specific diseases such as myopia, as these should be available to the profession through avenues other than the Entry-Level Competency Standards. Optometry Australia recognises that best practice for myopia management, supported by the contemporary evidence base, should be followed.

“The recommended Standard of Care for myopia management, designed to help slow its progression, is an important step in reducing the significant negative impacts of this condition.”

Luke Arundel

Chief Clinical Officer, Optometry Australia and founding member of the Child Myopia Working Group



The Australia and New Zealand Child Myopia Working Group recommended Standard of Care for myopia management

The Child Myopia Working Group is dedicated to changing how myopia is managed with intervention starting as soon as possible. It is committed to encouraging all parents and carers across Australia and New Zealand to have their children's eyes examined by an optometrist before starting school and regularly thereafter. This will enable every child diagnosed with myopia to be managed with the recommended Standard of Care.

For the practice setting, it is recommended that the following key elements should be included when managing a patient's myopia:

- 1 Use a myopia management program** for patients with pre myopia or myopia based on the best available evidence.
- 2 Explain to patients** and their parents or carers what myopia is and discuss the increased risks to long term ocular health associated with myopia.
- 3 Discuss, formulate, and implement an agreed management plan** with the parent or carer and patient (child), including discussion of the evidence-based available myopia management options to mitigate axial length elongation; risks (lifestyle and family history) of myopia progression; provision of verbal and written information describing the risks and benefits of treatment, duration of treatment, review frequency, when to cease treatment and rebound effects.
- 4 Document a review/recall for patients** with myopia that demonstrate progression.
- 5 Monitor the impact** of treatment.
- 6 Recognise personal limitations and refer** patients to a suitable optometrist or ophthalmologist if the required myopia management services cannot be provided.

A myopia management Standard of Care is critical, given that each year of delay in developing myopia substantially reduces the chance of a child developing high myopia in adulthood²¹.

What needs to be done

Eye examinations should become a routine part of a child's regular health checks because understanding the early signs of myopia may help delay the onset of myopia and slow progression.

There are three key actions parents and carers can take:

- Have children's eyes tested by an optometrist.
- Be aware that myopia can be managed.
- Know the questions to ask and start a conversation with the optometrist.

As research and technological innovations continue, eye care practitioners now have a range of new, evidence-based management options which mean they can not only provide clear vision but slow down the progression of myopia. Parents and carers can familiarise themselves with myopia management options that are now available to have an informed discussion with the optometrist or ophthalmologist about the evidence supporting each and what may suit their child best.

The following management options all have a role to combat child myopia to maintain better eye health:

- Certain soft contact lenses featuring a special optical design which are worn during the day.
- Orthokeratology (ortho-k) contact lenses which reshape the front surface of the eye during overnight wear and are then removed during daytime.
- Certain spectacle lenses featuring a special optical design that are designed especially for myopia management.
- Low-dose atropine eyedrops, of varying concentrations, which are usually instilled at night before bed.

If your child has myopia, it should be managed. Monitoring myopia progression should then occur regularly, and the effectiveness of treatment evaluated at regular visits throughout the school years.

Here are three questions for parents and carers to start the conversation with their optometrist:

1. Should my child undertake myopia management?
2. Which proven myopia management options do you offer? (See management options above).
3. How often do you monitor and decide whether the treatment is working effectively for my child?

“It's important to be aware of the different management options now available, because slowing the progression of myopia in children may prevent the development of high myopia. High myopia can cause serious eye health problems later in life.”

Margaret Lam

Optometrist and founding member of the Child Myopia Working Group



Myopia Vision Simulator

A useful tool for explaining myopia to family, friends and patients is the Myopia Vision Simulator. Accessed via www.childmyopia.com, the vision simulator enables the viewer to experience the main symptoms of myopia. It shows what vision looks like without changing spectacles or contact lenses and whilst short-sightedness increases.



Global collaborative approach

The Australia and New Zealand Child Myopia Working Group, enabled by CooperVision Australia & New Zealand, is underpinned by the belief that global collaborative action is needed to increase worldwide acceptance of the importance of myopia management in children.

CooperVision Australia & New Zealand's global myopia commitment supports the work undertaken by The Global Myopia Awareness Coalition (GMAC). Formed in early 2019, GMAC is composed of leading ophthalmic companies and eye health associations that agree on a clear need for greater public awareness about childhood myopia. It also serves as an advisory board under the World Council of Optometry (WCO).

The public health burden posed by myopia extends beyond the direct costs associated with the optical correction of refractive error and includes the socioeconomic impacts and diminished quality of life associated with visual impairment. The increasing prevalence of myopia and corresponding clinical and societal impacts necessitate a coordinated global response²².

“A global, collaborative approach is needed to increase worldwide acceptance of the importance of myopia management in children.”

Dr Rasha Altaie

Ophthalmologist and founding member of the Child Myopia Working Group

Child myopia in Australia and New Zealand

The prevalence of myopia and high myopia continues to rise worldwide, with a disproportionately greater increase in the prevalence of high myopia²³.

For Australia and New Zealand, the forecast rate of myopia by 2050 is estimated to be 55% and it is predicted that we currently have an estimated 36% of the population affected²⁴.

Furthermore, Australia is expected to have 4.1 million high myopes and New Zealand over 600,000 high myopes by 2050, unless myopia management is implemented by everyone, and many more children have eye examinations at five to six years of age. These forecasts highlight the scale of the problem that is looming given Australia in 2020 had an estimated 1.1 million, and New Zealand over 200,000 high myopes²⁵.

To gain insight into consumer perceptions of child myopia, CooperVision Australia & New Zealand commissioned a survey of Australian and New Zealand parents. This online survey was conducted by YouGov across Australia and New Zealand from 16–24 June 2022. The sample comprised 1,039 Australian parents and 513 New Zealand parents with a child/children aged 17 years or younger living at home.

*Myopia in Australia and New Zealand: 2022 Consumer Perceptions Survey*²⁶ captures the shift in trends, awareness and understanding of myopia since the inaugural 2018 *Child Myopia in Australia and New Zealand – consumer perceptions* survey was conducted.

Overarching data trends emerging since the 2018 survey





- Awareness of myopia is on the rise. Australian parents (40%) and New Zealand parents (42%) are now more likely to know that myopia refers to short-sightedness compared to 2018 (Australian parents 35% and New Zealand parents 31% respectively). However, most parents are still either unsure or simply don't know that myopia refers to short-sightedness.
- There have been some improvements since the 2018 study in Australian and New Zealand parents' understanding of the health risk that myopia poses, although awareness is still alarmingly low (29% and 20% respectively).
- Diagnosis of myopia has increased since the 2018 survey but testing rates have remained largely the same.

“Eye examinations should be included as part of a child’s regular health checks just like their dental visits, because understanding the early signs of myopia may help delay the onset and slow progression.”

Andrew Sangster

Optometrist and founding member of the Child Myopia Working Group

Myopia in Australia and New Zealand: 2022 Consumer Perceptions Survey

		Australian findings ²⁷	New Zealand findings ²⁸
Awareness			
	% of parents (with children 0-17 years old) who do not know that myopia refers to short-sightedness, i.e. when a child can see clearly close-up but not at a distance.	60% ▼5% (2018: 65%)	58% ▼11% (2018: 69%)
Myopia and health risks			
	% of parents (with children aged 17 and under) who recognise the health risk that their children might develop later in life from myopia, understanding that child myopia can lead to a higher risk of eye health issues.	29% ▲17% (2018: 12%)	20% ▲8% (2018: 12%)
Visiting the optometrist			
	% of children (17 years and under) who have never been to an optometrist to have an eye test.	30% ▼1% (2018: 31%)	28% - (2018: 28%)
	% of children who have not been to an optometrist to have an eye test before their ninth birthday.	49% ▲5% (2018: 44%)	41% ▲1% (2018: 40%)
Diagnosed with myopia			
	% parents who have a child diagnosed with myopia	26% ▲9% (2018: 15%)	21% ▲6% (2018: 15%)

Green denotes favourable finding.
Red denotes unfavourable finding.
Grey denotes no change.

Summary

There is an urgent need for a greater focus on preventing and managing myopia and increasing awareness of the importance of children having regular eye examinations. Only by encouraging Australian and New Zealand parents and carers to establish regular and ongoing eye examinations for their children can we identify the early signs of myopia, work to delay onset, and slow progression.

Expected increases in myopia prevalence are likely to cause increased public health and economic problems in the future unless action is taken using evidence-based approaches to prevent, delay and manage the condition.

Understanding the economic burden of vision impairment associated with myopia is therefore critical to addressing myopia as an increasingly prevalent public health problem. For example, it is known that the potential productivity loss associated with vision impairment and blindness resulting from uncorrected myopia is substantially greater than the cost of correcting myopia²⁹. Recent evidence also reveals that the prevalence of high myopia is growing at a faster rate than the prevalence of overall myopia³⁰.

Advances since 2018 however should be recognised. The establishment of the Child Myopia Working Group has enabled the development of an industrywide recommended best practice Standard of Care for managing myopia and driven much needed awareness among Australian and New Zealand families. Technological advances are also paving the way for more effective options for managing myopia. But work needs to continue.

The importance of ongoing research to understand the real incidence of myopia, foster collaboration among researchers, healthcare organisations, and industry internationally to develop novel interventions for myopia management is key³¹.

It is hoped that this report will motivate a coordinated approach to public health initiatives. Such initiatives should inform healthcare practitioners, families, educators and policymakers about the public health burden and personal risks imposed by myopia and motivate parents and carers to get their children's eyes tested and, if diagnosed, talk about its management.

“The Child Myopia Working Group’s recommended best practice Standard of Care for managing myopia is to be applauded. It will provide a valuable framework for practitioners when managing a patient’s myopia.”

Scientia Professor Fiona Stapleton
School of Optometry and Vision Science
UNSW, Sydney, and Chair of the
Child Myopia Working Group

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