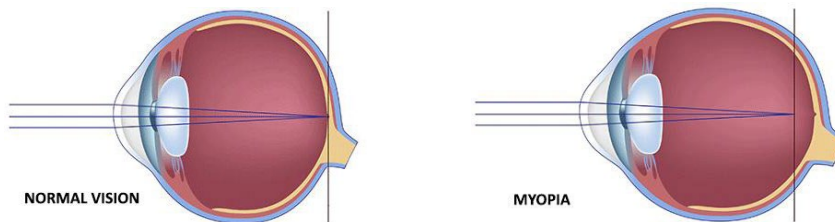


## Myopia Management Clinic

### What is myopia?

Myopia (nearsightedness) is the most common refractive error and occurs when light entering the eye is focused in front of the retina so that distant objects are blurred. Myopia is most commonly caused by the eyeball growing too long due to both genetic and environmental factors.



Once a child develops myopia, the average rate of progression is about 0.50 diopter (D) per year to 0.75 diopter per year. A diopter is the unit used to measure glasses and contact lens prescriptions. Based on expected progression rates, an average 8-year-old child who is -1.00 D may be -6.00 D to -8.50 D by the time he or she is 18 years old. Myopia generally stops progressing in the late teens to early twenties.

### What causes myopia?

- Genetic factors include **family history** and ethnicity:
  - one parent with myopia = 3x greater risk; both parents with myopia = 6x greater risk
  - higher worldwide prevalence and faster progression has been documented with Asian heritage
- Studies have show that myopia is more common in children who **spend less time outdoors**.
- Although the amount of time spent reading or other close work has not been proven to be directly related to the development of myopia, some research has shown closer working distances and long duration of near work and **screen time** may be risk factors.

### Why are we concerned about myopia?

Besides the inconvenience of being reliant on glasses and contacts, myopia carries a higher risk of eye disease, including cataracts, retinal detachment, glaucoma, and myopic macular degeneration. A normal eye length (axial length) is 22 to 24mm. When the eye grows longer than 26mm, the risk of your child suffering vision impairment in their lifetime is 25%. If the eye grows to more than 30mm, which can occur in high myopia, the risk increases to 90%.

| Level of Myopia  | Cataracts | Retinal Detachment | Macular Degeneration |
|------------------|-----------|--------------------|----------------------|
| -1.00 to -3.00   | 2 x       | 3 x                | 2 x                  |
| -3.00 to -6.00   | 3 x       | 9 x                | 41 x                 |
| -6.00 or greater | 5 x       | 21 x               | 126 x                |

## What can be done to slow the progression of myopia and reduce my child's risk of disease?

- Keeping up with **annual eye exams** for your child to assess risk factors and detect myopia as early as possible; often, the earlier the intervention the better.
- The amount of **time spent outdoors** is influential: findings indicate that daily outdoor activity of at least 90 minutes per day is likely to help prevent the onset of myopia, and possibly slow the condition naturally.
- Develop good habits when performing near tasks (reading, computer, tablets, phones etc.): take visual breaks (20/20 rule: every 20 minutes of near work take a rest by looking far off in the distance for 20 seconds), ensure that the working distance for near activities is not too close, and to try to limit near tasks outside of school to 2 hours per day.
- Partner with your Optometrist in a Myopia Management program. This is an area of children's eye care dedicated to slowing down childhood myopia progression.

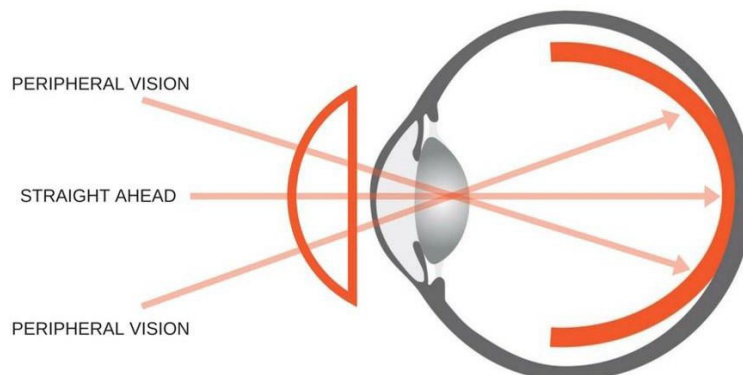
## Myopia Management Treatment Options

The research on the management of myopia is continuously developing, and at Maple Ridge Eye Care we're committed to remaining on the forefront of this research to help optimize your child's vision. The following is a summary of the current methods being used to try to slow myopic progression. Researchers have discovered there are two ways to slow down myopia progression. One is using novel contact lens and eyeglass optical lens designs. The second option is with pharmaceutical or prescription eye drops. Once we have completed a myopia management assessment, we can recommend the best options for your child.



### Optical Therapy (glasses or contact lenses)

By changing the focus of light in the periphery (side vision), these optical designs have shown to slow eyeball growth (axial length). Central vision remains clear with minimal impact to overall vision.



## Three Optical Options

1. **Spectacle lenses:** Single vision lenses that have traditionally been prescribed for myopia DO NOT slow progression. New optical lens designs that incorporate **peripheral zone defocus** show efficacy with myopia management. They have demonstrated up to 52% reduction of progression in clinical trials. Some adaptation may be required, but most children adjust to the new lenses easily.
2. **Soft daily disposable contact lenses:** These novel contact lenses are worn throughout the day (no overnight wear). They have a customized optical profile to alter the focus of light coming from the periphery (side vision). They offer the same benefit as traditional daily disposable contact lenses with the added benefit of slowing myopic progression. Depending on the brand, these lenses slow down the rate of myopia progression by between 59 – 70%.
3. **Orthokeratology:** Ortho-K utilizes specially designed rigid gas permeable contact lenses that are inserted at nighttime and removed upon awakening. This gently reshapes the surface of the eye, attempting to take your child's prescription to zero (plano). This has the benefit of decreasing the need for traditional glasses or contacts during the day, as well as the added benefit of reducing myopia progression by about 50%.

## Pharmaceutical Therapy

Low dose Atropine eye drops: Atropine has been used in eye care for over 100 years to help eye doctors view inside the eye and treat certain eye conditions. To control myopia, researchers have discovered that low concentration Atropine may reduce progression by approximately 50%. In fact, since 2015 the WHO (World Health Organization) has recommended that low concentration Atropine be considered as a potential first line treatment for myopia.<sup>1</sup> Low concentration Atropine needs to be compounded by a pharmacist. The drops are taken once per day, at night before bed.

## Myopia Management Clinic Services

The team of doctors, opticians and technicians at Maple Ridge Eye Care are passionate about protecting the future visual health of your children. We stay up to date with the latest in research, products and diagnostic equipment. We have invested heavily in new technology to help us determine which option(s) are best for your child and if the therapy is working.

We look forward to working with you and your child to protect the future of their vision. Please feel free to reach out to any doctor or member of our team for more information or visit the Myopia Management Portal on our website at [mapleridgeeyecare.ca/myopia-management-portal](http://mapleridgeeyecare.ca/myopia-management-portal).

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<sup>1</sup> WHO – The Impact of Myopia and High Myopia 2015

## Myopia Control Options Summary Table

| Optical Therapies                          |   |   |  | Pharmaceutical Therapies  |
|--|---|---|--|---|
|  | Ortho-K   | Soft Daily Disposable CLs   | Glasses  | Low Dose Atropine   |
| Summary                                    | Rigid gas permeable lens worn at night - FDA approved since 2002                    | Soft contact lenses worn during the day. (MiSight, Acuvue Abiliti & NaturalVue)                       | Specially designed optics, worn full time during the day. (Miyosmart, MiSight Spectacle, Stellest)       | Atropine, one drop taken at night before bed, used off-label  |
| Ideal Candidates                           | -1.50 to -5.00 D<br>Astigmatism <1.50   | -1.00 to -6.00 D<br>Astigmatism <1.00   | Any level of myopia / astigmatism  | Any level of myopia / astigmatism   |
| Effect on prescription change <sup>2</sup> | 40 - 70%  | 59 - 70%  | 20 - 60%   | 50 - 60%  |
| Advantages                                 | No glasses or contacts worn during the day  | Freedom from glasses (while contact lenses are worn)  | Controls myopia much better than traditional eye glasses. Can be used in combination with Atropine drops | Easy to use and can be combined with other therapies  |
| Disadvantage                               | Overnight CL wear, slight increased risk of infections over CL worn during the day* | Possible discomfort or dryness during the day, slight increased risk of infection while wearing CL's* | None   | Possible allergic reaction to the drops, reduction in near focusing, pupil dilation (light sensitivity). Must be compounded by pharmacist |

\* Through proper fitting of these custom designed lenses and thorough education on proper lens hygiene and care, we can greatly minimize the risk of infection. Regular follow-up with our Optometrists also helps reduce infection risk.

<sup>2</sup> <https://calculator.brienholdenvision.org/>