PRAIRIE VISION

2 – 2802 15 Ave. Wainwright, AB T9W 0A4 | 780.842.6123
www.prairie.vision | hello@prairie.vision

Informed consent resource for myopia management

What is myopia?

Myopia is blurry long-distance vision, often called 'short-sightedness' or 'near-sightedness'. A person with myopia can typically see clearly up close – when reading a book or looking at a laptop screen – but words and objects look fuzzy on a whiteboard, on television, across the room, when looking outdoors or when driving.

Why is myopia a concern?

The rate of myopia is growing across the world, increasing from 22% of the world's population in 2000 to 33% in 2020 – half of the world's population is expected to be myopic by 2050.[1] Most myopia is caused by the eye length growing too quickly in childhood. The eyes are meant to grow from birth until the early teens and then cease, but in myopia, the eyes grow too much and/or continue growing into the teenage years. Once a child becomes myopic, their vision typically deteriorates every 6-12 months, requiring a stronger and stronger prescription. Most myopic children tend to stabilize by the late teens and early 20s.[2] Excessive eye growth raises concern because even small amounts of stretching can lead to an increased likelihood of vision-threatening eye diseases in later life, such as myopic macular degeneration, retinal detachment, and cataract.[3,4]

Why manage myopia in children?

Myopia progresses fastest in younger children, especially those under age 10.[5] This means that the most important opportunity to slow eye growth is when children are younger. Myopia management aims to apply specific treatments to slow excessive eye growth to a lesser rate. Experts agree that myopia management should be commenced for all children under age 12,[6] and typically continue into the late teens.[7]

The short-term benefit of slowing myopia progression is that a child's prescription will change less quickly, giving them clearer vision for longer between eye examinations. **The long-term benefit** is reducing the lifetime risk of eye disease and vision impairment. This risk increases as myopia does[3] with the good news being that reducing the final level of myopia by only 1 dioptre reduces the lifetime risk of myopic macular degeneration by 40% and the risk of vision impairment by 20%.[8]

$100 is required for the program's initiation, including the initial evaluation, axial length measurement, corneal topography, and consultation. Follow-up visits will include checking the prescription, measuring the shape of the eye, and other myopia-related structures, and measuring pupils and focusing ability.

Follow-up exams during the first year are typically done at 1 month and 6 months to ensure best results but may be adjusted to individual needs for optimal results. Follow-up exams during subsequent years are typically reduced to once every 6 months. At the 6-month exams, axial length measurements will need to be repeated at a cost of $40.

PRAIRIE VISION

2 – 2802 15 Ave. Wainwright, AB T9W 0A4 | 780.842.6123
www.prairie.vision | hello@prairie.vision

Treatments for slowing myopia progression

Standard, single-focus long-distance spectacles or contact lenses do not slow down the progression of childhood myopia.[8] Instead, specific types of spectacles, contact lenses, and eye drops called atropine have been proven to slow myopia progression in children.[6]

The best option for your child will depend on their current prescription and other vision and eye health factors determined in their eye examination. Your eye care practitioner will discuss the options with you to determine the best option. Treatment options vary across the world due to availability, supply, and regulatory reasons. **It is important to note that no treatment can promise the ability to stop myopia progression in children, only to slow it down.**

Spectacles

Standard single-focus spectacles do not slow the worsening of childhood myopia but specific designs do. Myopia-controlling spectacles can both correct the blurred vision of myopia and work to slow down myopia progression. They are safe to wear, and adaptation is typically easy, with the only side effects being related to the limitation's spectacles pose for sports and active lifestyles. After receiving the new lenses there will be a follow-up appointment at 1 month and then routine follow-ups every 6 months.

Contact lenses

Standard single-focus contact lenses do not slow the worsening of childhood myopia, but specific designs do. These specific designs can both correct the blurred vision of myopia and work to slow down myopia progression. The options include soft myopia-controlling contact lenses and orthokeratology.

Risks and safety

Contact lens wear increases the risk of eye infection compared to wearing spectacles, with the risks being:

- 1 per 1,000 wearers per year for reusable soft contact lenses or overnight orthokeratology lenses[9,10]
- 1 per 5,000 wearers per year for daily disposable soft contact lenses[9]

With proper hygiene and maintenance procedures, this risk can be well managed – especially by avoiding any contact with water with contact lenses or accessories.[11] Other side effects of contact lenses to control myopia can be a temporary adaptation to the different experiences of vision, which typically resolves in 1-2 weeks.

PRAIRIE VISION

2 – 2802 15 Ave. Wainwright, AB T9W 0A4 | 780.842.6123
www.prairie.vision | hello@prairie.vision

Benefits

1. There are many benefits to children wearing contact lenses:
Wearing contact lenses improves children's self confidence in school and sport, and their satisfaction with their vision – as much as it does for teens[12]
2. Children aged 8-12 years appear to be safer contact lens wearers than teens and adults, with a lower risk of eye infection[13]
3. Children only take 15 minutes more to learn how to handle contact lenses than teens[14]

Orthokeratology contact lenses are worn overnight and removed upon waking, such that no spectacles or contact lenses are required for clear vision during the day. They can require more appointments for fitting than other types of myopia control treatment. Adaptation to the lens-on-eye feeling can take 1-2 weeks but shouldn't affect sleep.[17] There are significant benefits for water sports and active lifestyles, and since the contact lenses are only worn at home there is a low risk of them being lost or broken during wear. If orthokeratology lenses are decided on for your child a fitting appointment will be booked with additional training on the insertion and removal of the lenses. The fitting fee is not included in the myopia management fee, it will also include a 1 day, 1-week, 1 month, and 3 month follow-up before returning to routine 6-month follow-ups. Note that at times there may be a 2-week follow-up needed or more depending on the nature of the eye's response to the lens.

Soft myopia-controlling contact lenses are worn during waking hours. They may be daily disposable, or reusable for up to a month. They typically require more appointments for fitting than spectacles but less than orthokeratology. Adaptation to the lens-on-eye feeling typically occurs in a few days. There are benefits in safety with daily disposables being the safest modality, and the number of lenses retained meaning loss or breakage is less of a practical issue. First-time contact lens wearers will need to book a fitting appointment that includes training on the insertion and removal of the lens. The contact lens fitting fee is not included in the myopia management fee. They will then have a one-week and one-month follow-up appointment. After the prescription has been approved, they will then return to 6-month regular follow-ups. If the child has worn contact lenses previously a refit appointment will be needed to trial the new lenses, no training is required however follow-up will be the same as previously mentioned.

Atropine eye drops

Atropine eye drops in strong concentrations (typically 0.5% to 1%) are used to temporarily dilate the pupil of the eye and stop the focussing muscles from working in a variety of clinical applications. Atropine eye drops for myopia control, though, are a low concentration (0.01% to 0.05%) with much fewer side effects. Atropine has been found in several studies to reduce the progression of myopia, meaning that children who were given the medication did not become as myopic as the children without the medication.

PRAIRIE VISION

2 – 2802 15 Ave. Wainwright, AB T9W 0A4 | 780.842.6123
www.prairie.vision | hello@prairie.vision

In Canada, atropine is not approved for myopia control but is used "off-label", meaning that the doctor can decide to use an approved drug for a non-approved reason. Low-dose daily aspirin for protection against heart problems is probably the most cited example of "off-label" use of a drug but there are many others. Diluted atropine drops can only be made by specialty compounding pharmacies. Adverse effects with 1% atropine (highest dosage) include hypersensitivity or discomfort at 4.5%, glare at 1.5%, and blurred near vision at 1%.

These adverse effects will be monitored at follow-up visits and the dosage can be altered to minimize any adverse effects. If the program is beneficial to your child, we will typically continue treatment during your child's growth years as determined by the doctor. Therapy typically continues until age 18 or until the patient shows stability in their prescription (indicated by two years without significant change). In some cases, therapy may continue beyond age 18. Atropine drops will be tapered at the end of the treatment, and there may be a small increase in myopia called a rebound effect. Spectacles or contact lenses are still needed to correct the blurred vision from myopia, as atropine only acts to slow myopia progression.

The pharmacy alone determines the cost of these eye drops and is not included in the management fee.

Risks and safety

The risks and side effects of atropine are as follows:

- Potential side effects of increased sensitivity to light due to larger pupil size, which is typically resolved with light-sensitive glasses or sunglasses. One study found around a third of children requested these types of glasses, but this was the case even in the placebo (untreated) group.[15]
- Problems with close-up focussing, which is typically resolved with glasses providing a stronger power for reading. One study found this only occurred in 1-2% of children treated with low-concentration atropine.[15]
- Eye irritation or mild allergy, which can occur in 2-7%,[15] although this can depend on the formulation of the atropine.

Atropine can be toxic and even fatal to small children if it is ingested in high quantities by mouth, but high-quantity absorption via the eye is unlikely.[16] Medication safety in the home is extremely important.

Benefits

Atropine eye drops are typically used at night-time, before sleep, so are only utilized in the home environment. They are also ideal if the effective spectacle or contact lens options for myopia control are not suitable or not available for your child.

PRAIRIE VISION

2 – 2802 15 Ave. Wainwright, AB T9W 0A4 | 780.842.6123
www.prairie.vision | hello@prairie.vision

Informed consent for treatment

I have had the available myopia management treatment options for my child explained to me, including which treatment may be best for my child, and been offered the opportunity for discussion. As such I now understand that:

- The risks and benefits of the various treatments as outlined above
- Whilst these treatments are approved for treatment and vision correction only some are approved specifically to slow the progression of myopia
- The results for each child can vary and there is no guarantee of the effectiveness of any treatment for an individual
- In some cases, the evidence basis is for young children or specific prescription ranges, but older children may also require myopia control

I have read and understand the above program and out-of-pocket costs and agree to bring my child for all required visits. I understand there are no guarantees as to the effectiveness of this treatment and I understand the potential side effects. This program can be discontinued as recommended by the doctor or by my parental decision at any time, but NO refunds for testing, office visits, glasses, or contact lenses will be issued.

Child's name _____

Parent's name _____

Parent's signature _____

Practitioner name _____

Date _____

For more scientifically based, independent advice on childhood myopia and its management, go to mykidsvision.org.

Full Reference List

PRAIRIE VISION

2 – 2802 15 Ave. Wainwright, AB T9W 0A4 | 780.842.6123
www.prairie.vision | hello@prairie.vision

1. Holden BA, Fricke TR, Wilson DA, Jong M, Naidoo KS, Sankaridurg P, Wong TY, Naduvilath TJ, Resnikoff S. Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050. Ophthalmology. 2016 May;123(5):1036-42.
2. COMET Group. Myopia stabilization and associated factors among participants in the Correction of Myopia Evaluation Trial (COMET). Invest Ophthalmol Vis Sci. 2013 Dec 3;54(13):7871-84.
3. Flitcroft DI. The complex interactions of retinal, optical, and environmental factors in myopia aetiology. Prog Retin Eye Res. 2012 Nov;31(6):622-60.
4. Tideman JW, Snabel MC, Tedja MS, van Rijn GA, Wong KT, Kuijpers RW, Vingerling JR, Hofman A, Buitendijk GH, Keunen JE, Boon CJ, Geerards AJ, Luyten GP, Verhoeven VJ, Klaver CC. Association of Axial Length With Risk of Uncorrectable Visual Impairment for Europeans With Myopia. JAMA Ophthalmol. 2016 Dec 1;134(12):1355-1363.
5. Chua SY, Sabanayagam C, Cheung YB, Chia A, Valenzuela RK, Tan D, Wong TY, Cheng CY, Saw SM. Age of onset of myopia predicts risk of high myopia in later childhood in myopic Singapore children. Ophthalmic Physiol Opt. 2016 Jul;36(4):388-94.
6. Brennan NA, Toubouti YM, Cheng X, Bullimore MA. Efficacy in myopia control. Prog Retin Eye Res. 2020 Nov 27:100923. doi: 10.1016/j.preteyeres.2020.100923.
7. Gifford KL, Richdale K, Kang P, Aller TA, Lam CS, Liu YM, Michaud L, Mulder J, Orr JB, Rose KA, Saunders KJ, Seidel D, Tideman JWL, Sankaridurg P. IMI - Clinical Management Guidelines Report. Invest Ophthalmol Vis Sci. 2019 Feb 28;60(3):M184-M203. doi: 10.1167/iovs.18-25977.
8. Bullimore MA, Brennan NA. Myopia Control: Why Each Diopter Matters. Optom Vis Sci. 2019 Jun;96(6):463-465.
9. Stapleton F, Keay L, Edwards K, Naduvilath T, Dart JKG, Brian G, Holden BA. The Incidence of Contact Lens Related Microbial Keratitis in Australia. Ophthalmol. 2008;115:1655-1662.
10. Bullimore MA, Sinnott LT, Jones-Jordan LA. The risk of microbial keratitis with overnight corneal reshaping lenses. Optom Vis Sci. 2013;90:937-944.
11. Arshad M, Carnt N, Tan J, Ekkeshis I, Stapleton F. Water Exposure and the Risk of Contact Lens-Related Disease. Cornea. 2019 Jun;38(6):791-797.
12. Walline JJ, Gaume A, Jones LA, Rah MJ, Manny RE, Berntsen DA, Chitkara M, Kim A, Quinn N. Benefits of contact lens wear for children and teens. Eye Contact Lens. 2007;33(6 Pt 1):317-321.
13. Bullimore MA. The Safety of Soft Contact Lenses in Children. Optom Vis Sci. 2017;94(6):638-646.
14. Walline JJ, Jones LA, Rah MJ, Manny RE, Berntsen DA, Chitkara M, Gaume A, Kim A, Quinn N. Contact Lenses in Pediatrics (CLIP) Study: chair time and ocular health. Optom Vis Sci. 2007;84:896-902.