



MYOPIA CONTROL

Information pack for optometrists

KEY FACTS ABOUT MYOPIA

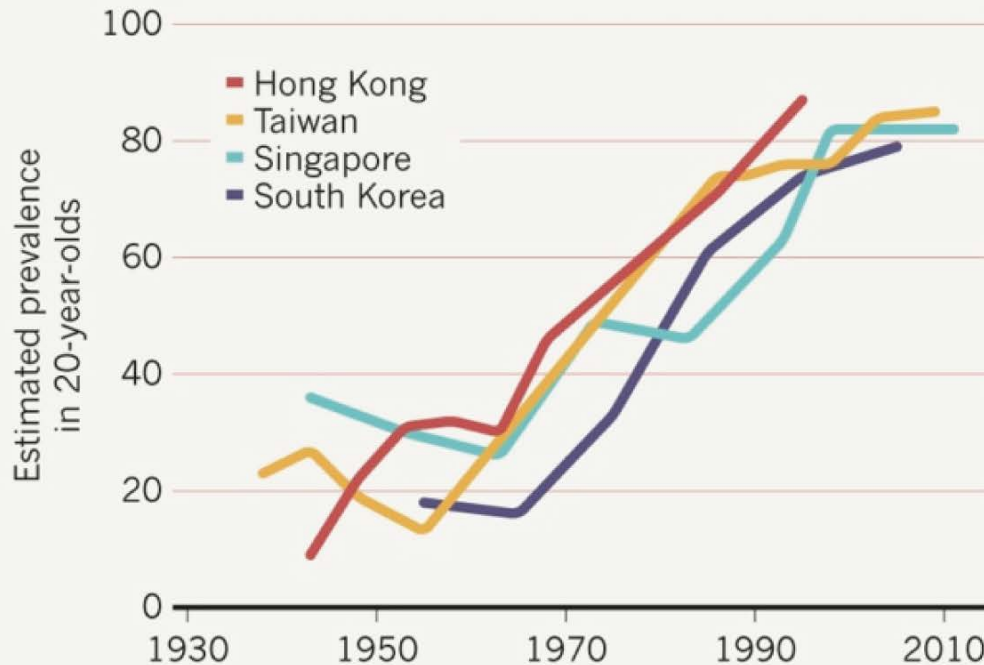
- Myopia is the fastest spreading condition in the world
- There is no safe level of myopia, any myopia carries the risk of ocular health complications (see page 5 for relative risks)
- Myopia is one of the leading causes of vision impairment and blindness in the working age population, even in Europe
- Under-correction of myopia does not slow down or prevent progression [WHO report, 2015]
- Increased outdoor time can reduce the risk of onset of myopia by 50%, with a stronger protective effect in younger children. But the protective effect appears limited in children who are already myopic (Meta-analysis by Xiong et al, 2017)
- There are effective treatment options for myopia control
- Myopia has been recognised as one of the conditions requiring immediate priority by the World Health Organization's Global Initiative for the Elimination of Avoidable Blindness



By 2050, it is estimated 1 in every 2 persons worldwide will be myopic

Global Prevalence of Myopia and High Myopia and Temporal Trends from 2000 through 2050. Brien A. Holden et al, 2016, Ophthalmology

Growing prevalence in Asia

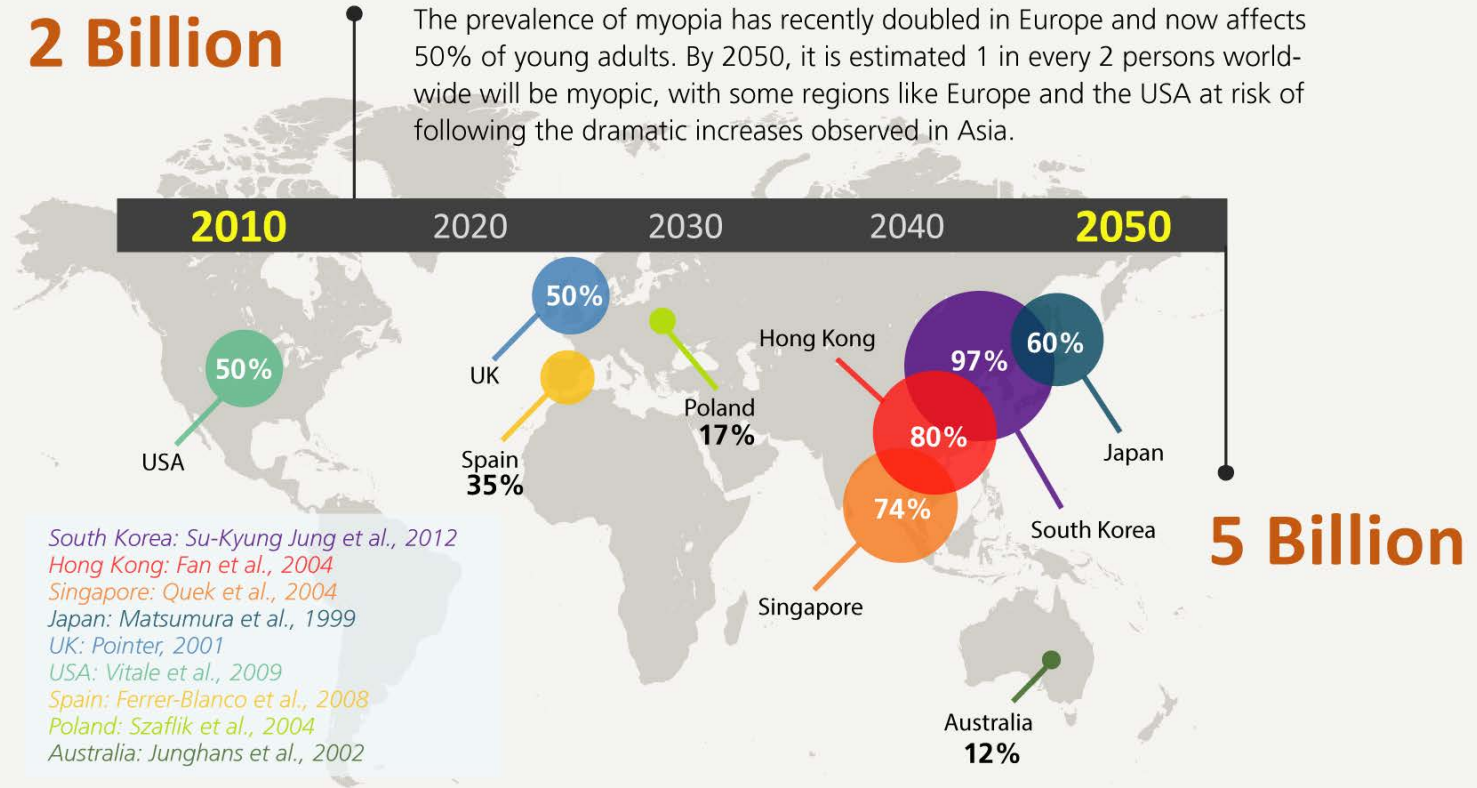


Just 60-80 years ago, only 10–20% of the Asian population was short-sighted, but today myopia affects up to 96% of teenagers and young adults in parts of Asia.

Growing prevalence worldwide

2 Billion

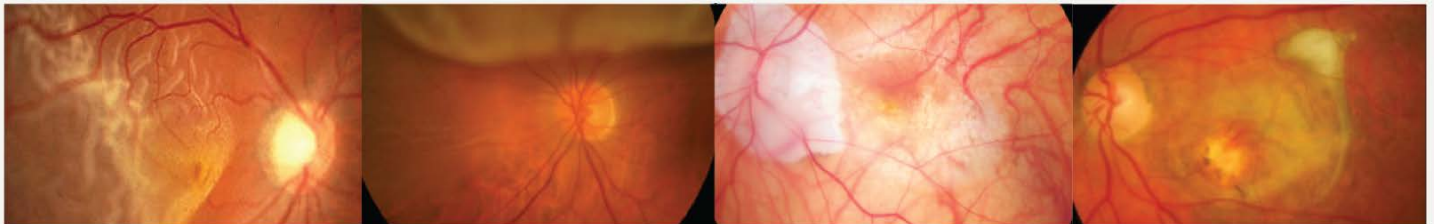
The prevalence of myopia has recently doubled in Europe and now affects 50% of young adults. By 2050, it is estimated 1 in every 2 persons worldwide will be myopic, with some regions like Europe and the USA at risk of following the dramatic increases observed in Asia.



Relative risks

Myopia Level (D)	Glaucoma	Cataract	Retinal detachment	Myopic Maculopathy
<i>-1.00 to -3.00</i>	2.3	2.1	3.1	2.2
<i>-3.00 to -5.00</i>	3.3	3.1	9.0	9.7
<i>-5.00 to -7.00</i>	3.3	5.5	21.5	40.6
<i>Above -7.00</i>	-	-	44.2	126.8

Patients with even 1.00D of myopia face an increased lifetime risk of developing glaucoma, posterior subcapsular cataracts, retinal detachment and myopic macular degeneration.



Change begins with you

Parents and children are not aware of the risks associated with myopia or the benefits of myopia control. Optometrists, as primary eyecare practitioners, are ideally positioned to change this. You can take a leading role by adopting the TEAM approach.

TEAM
Talk Engage Advocate Manage



TALK about myopia control

It is no longer acceptable to simply prescribe spectacles for myopia and ignore the risks of long term ocular health damage. Would you ignore the risks of ocular hypertension with any patient? Even if you are not in a position to offer a myopia control therapy, educating patients about the risks of myopia and discussing possible lifestyle modifications for myopes or those at risk of myopia are important first steps. Patients can then make fully informed decisions about how their myopia is managed.

ENGAGE in myopia control research

If you or your practice are interested in actively participating in future clinical trials or research opportunities at CERl please contact the CERl team at ceri@dit.ie.

ADVOCATE for myopia control

Public health interventions and behaviour change are fundamental to how we tackle the myopia epidemic. Optometry as a profession needs to advocate for policy & practice change that empowers society to reverse current trends in the spread of myopia.

MANAGE myopia differently

Let's start to TREAT myopia. It is now time to manage the risks rather than just the visual symptoms of myopia. Assessing the risk for onset and progression of myopia, providing lifestyle advice, fitting myopia control contact lenses or spectacles or referring for treatment with atropine are some of the actions Optometrists can take to control the risk of future complications

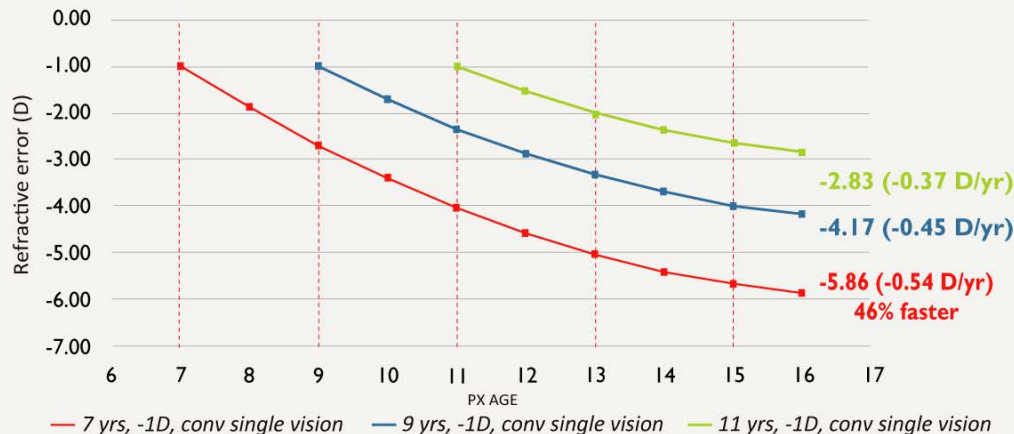
How to slow myopia progression

1 Prevent or delay the onset of myopia

Identify those at risk (strong family history, poor lifestyle habits or less hyperopic than normal for age) and provide suitable advice

2 Slow the rate of progression

Initiate myopia control therapy at the earliest opportunity



If we delay myopia onset (through lifestyle advice for example), later onset coupled with a slower progression rate (children developing myopia at a younger age progress faster typically) will lead to a lower final Rx, better quality of life and decreased risk of complications and blindness.

Guidelines for myopia management

Assessment of risk

01 NEAR WORK

- Too much near work (books, smartphone, tablet use etc)

03 OUTDOOR TIME

- Low levels of outdoor activity, particularly when coupled with high levels of near activity

05 REFRACTIVE ERROR

- Less hyperopic or more myopic than normal for age

06 REFRACTIVE PROGRESSION

- Active progression greater than 0.50D per year

02 FAMILY HISTORY

- One or both biological parents are myopic

04 ETHNICITY

- Children of East Asian descent are likely to develop myopia at a younger age and to progress more rapidly

07 AGE

- 9 years old or less. Earlier onset is associated with an increased rate of progression.



○ Increased risk of onset

○ Increased risk of progression

Note: Risk factors should be assessed collectively to determine the overall level of risk and develop an appropriate management strategy.

Myopia calculator

Myopia calculator is a very useful tool to explain to patients the potential benefits of myopia control. The tool shows the various management options / scenarios and demonstrates the possible benefits, over time, of starting to treat myopia progression, including the possible final Rx with and without therapy.



The online myopia calculator is free and available from: <https://calculator.brienholdenvision.org/>

Guidelines for myopia management

Management options

No myopia

Reduce risk

- Increase time outdoors
- Advise frequent breaks from near work

Myopia

How to choose a myopia control strategy

Consider:

- Patient suitability
- Risk of progression
- Patient/carer preference
- Effectiveness of strategy
- Access to strategy

Myopia control options

- Contact lenses:
 - Multifocal
 - Extended depth of focus
- Orthokeratology
- Progressive addition spectacles
- Executive bifocals
- Peripheral defocus spectacles
- Atropine (low dose, available in Ireland through clinical trials at CERi)

MiSight (or alternative multifocal contact lenses)

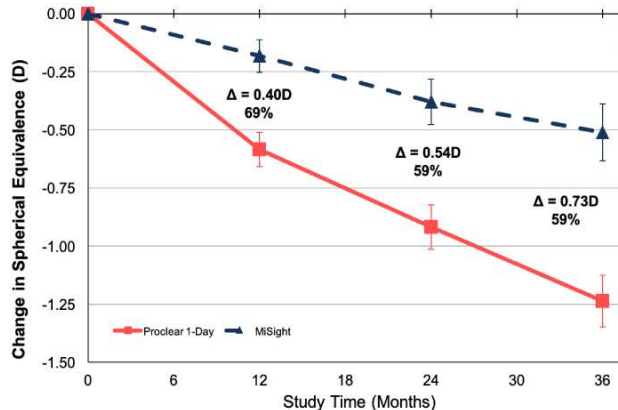
What is it?

Coopervision MiSight daily disposable soft contact lenses have been specifically designed to help slow the progression of myopia. The hydrogel lenses have a centre distance zone and peripheral concentric treatment zones. MiSight is fitted in the same way as any other soft daily disposable lens, with the centre of the lens corrected for distance. It is suggested MiSight contact lenses are worn 14 hours a day, 7 days per week to get the maximum treatment effect.

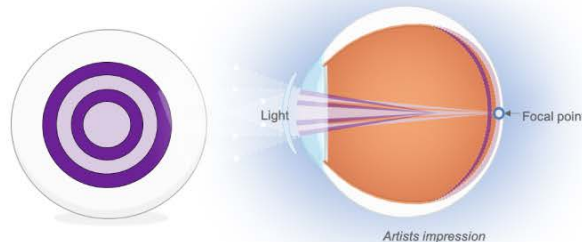
Multifocal contact lenses are licensed for presbyopic contact lens fitting, and are indicated as off-label for myopia control use. Multifocal contact lenses have been shown to reduce the progression of myopia in children and teenagers.

How do MiSight and Multifocal Contact Lenses control the progression of myopia?

Hyperopic defocus on the peripheral retina is a proposed risk factor for myopia in humans. The peripheral portion of MiSight contact lenses, or of centre-distance soft multifocal contact lenses, presents myopic blur to the retina, and help slow myopia progression.



59% reduction in the rate of progression after 36 months



■ treatment zones creating myopic defocus
■ correction zones

Advantages

- No specialist fitting set or equipment required
- No need for cleaning or disinfecting daily disposable MiSight lenses
- Spectacle free for the majority of the day

Disadvantages

- MiSight are more expensive than single vision contact lenses
- Risk of infection with any contact lens
- Not available in toric form
- Not available in powers over -6.00D
- Children may be aware of a slight shadowing of images due to the concentric treatment zones
- May not be suitable for younger children due to inability to insert and remove lenses

Orthokeratology (Ortho-K)

What is it?

Orthokeratology contact lenses are small hard contact lenses worn during the night to reshape the curvature of the cornea. They are then removed in the morning to yield a moulded cornea that permits clear vision throughout the day without the need for spectacles or contact lenses. The lower the myopic prescription the longer the clear vision is sustained throughout the day.

How does Ortho-K control the progression of myopia?

Hyperopic defocus on the peripheral retina is a proposed risk factor for myopia in humans. The reshaped cornea in orthokeratology contact lens wearers reduces the amount of peripheral hyperopic defocus on the retina, thus slowing down myopia progression.

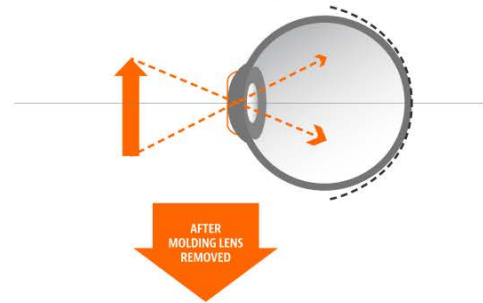
Advantages

- High success rate in controlling myopia progression
- No contact lens or spectacle wear for the most part of the day, thus convenient for sporting activities and swimming
- Problems, such as dry eye, arising from normal day time contact lens wear can be avoided

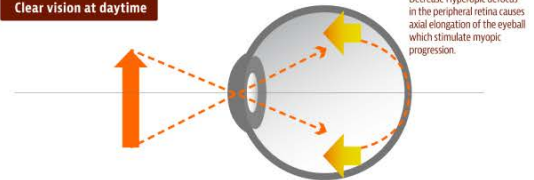
Disadvantages

- The lenses must be cleaned and disinfected each day
- Ortho-K contact lenses are expensive and should be replaced every 6 months
- Risk of infection
- Topographer and specialist expertise required to best fit the lens and monitor the cornea

Orthokeratology: Nighttime Molding Lenses



Clear vision at daytime



Atropine

What is it?

Atropine eye drops have been used safely for decades by ophthalmologists to treat eye disorders in children. However atropine, at both high and low concentrations, is also the most effective intervention to slow down the progression of myopia in children. Recently, lower-concentration atropine eye drops have been proven to be the most effective dose for long term myopia control, due to fewer side effects and less myopia progression on cessation of the drop. Researchers at CERl are using this lower concentration of atropine (0.01%) to slow myopia progression in children, as well as investigating how atropine slows/halts myopia progression, which is not yet fully understood.



	Myopia Progression	% Reduction
ATOM 1		
Placebo	-1.20 D	
Atropine 1%	-0.28 D	77 %
ATOM 2		
Atropine 0.5%	-0.30 D	75 %
Atropine 0.1%	-0.38 D	68 %
Atropine 0.01%	-0.49 D	59 %

Advantages

- The most effective intervention to control the progression of myopia
- Suitable for all minus prescriptions, including children >-6D
- Suitable for children with astigmatism
- Suitable for patients of any age including very young children
- The CHAMP MOSAIC clinical trials are free to participate
- Lower dose atropine has minimal side effects
- Available in single dose minims, greatly minimising the risk of infection
- Preservative free
- Suitable to wear with single vision contact lenses

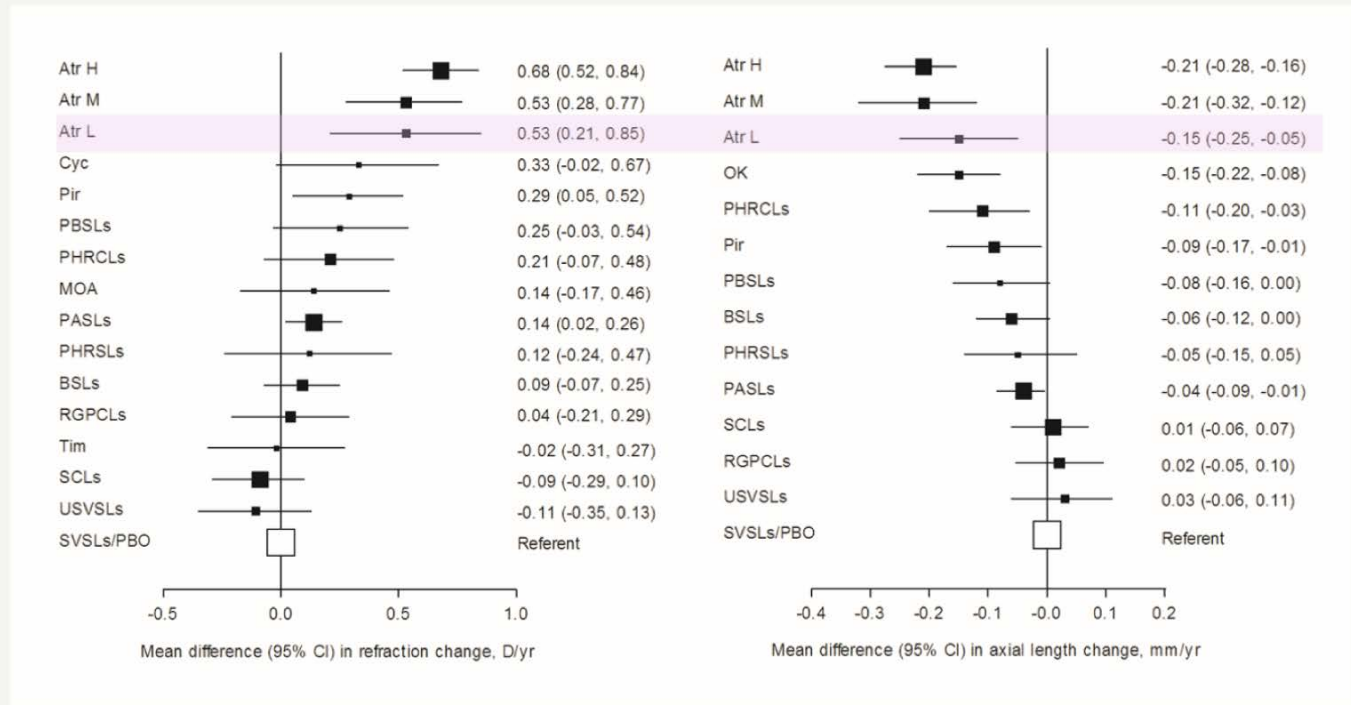
Disadvantages

- At higher doses atropine can cause blurred near vision and glare
- Not suitable for children with certain pre-existing conditions (e.g. keratitis, allergy to atropine)



Efficacy comparison

Atropine at any dose is the most effective treatment option. But Ortho-K and multifocal soft lenses are also effective.



Efficacy Comparison of 16 Interventions for Myopia Control in Children: A Network Meta-analysis, Huang J Wen D Wang Q McAlinden C Flitcroft I et. al. Ophthalmology 2016 vol: 123 (4) pp: 697-708

Trial info MOSAIC

Primary objective

To evaluate the capacity of 0.01% preservative free atropine eyedrops to reduce the rate of progression of myopia amongst European children.

Design

Placebo controlled trial

Children aged 6 to 16 - Progressive Myopes
2 year initial treatment & 1 year crossover

Participants are more than twice as likely to be on atropine from the start. The participants who do not receive atropine initially will start on atropine treatment later, meaning all participants will ultimately receive atropine treatment.

Study treatment

Eye drop once nightly in both eyes for 2 years + crossover for a further 12 months. Participants are reviewed at 6 monthly intervals.



INTERESTED/WANT MORE INFO?

Please contact the CERi team at mosaic@dit.ie or ceri@dit.ie - for both MOSAIC and CHAMP trials



Trial info CHAMP

Primary objective

To evaluate the safety & efficacy of 2 concentrations of atropine sulfate ophthalmic solution (0.01% & 0.02%) compared to placebo (vehicle) for the reduction of progression of myopia over a 3-year treatment period.

Design

Placebo controlled trial

Children aged 6 to 10 - Progressive Myopes
3 year initial treatment & 1 year crossover

Participants are more than twice as likely to be on atropine from the start (Atropine 0.01% & Atropine 0.02%). The participants who do not receive atropine initially will start on atropine treatment later, meaning all participants will ultimately receive atropine treatment.

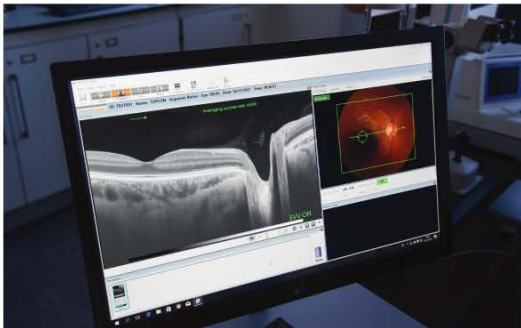
Study treatment

Eye drop once nightly in both eyes for 3 years + crossover for a further 12 months after the initial phase. Participants are reviewed at 6 monthly intervals.



Children aged 6-16 inclusively
Healthy
Astigmatism less than -2.50
Myopic
Please contact mosaic@dit.ie

**All participants in both CHAMP
and MOSAIC trials will
ultimately receive atropine
treatment.**



Contact info

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