

# Introduction To Myopia

If an eye is short sighted (Myopic) the focussing system of cornea and lens is too strong for the optical length of the eye. Light will be focussed in front of the retina (Fig 1) and only a blurred image will be projected onto the retina. By modifying the optical system the focus of light can be pushed back onto the retina giving a clear image.

This adjustment of focal power can be achieved by:-

1. Minus spectacle lenses (Fig 2)
2. Minus contact lenses

Or by remodelling the cornea by:-

3. Corneal laser surgery (Fig 3)
4. Orthokeratology (Fig 4)

## Laser Refractive Surgery

Refractive surgery removes corneal tissue, flattening it and so pushing the focus back toward the retina. The changes are permanent. Success rates are very high but like all invasive surgical techniques there are risks and once done can not be undone.

Fig 1.

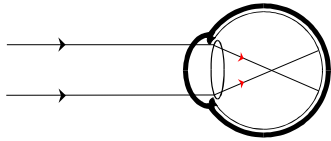


Fig 2.

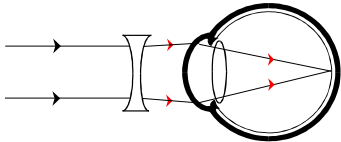


Fig 3.

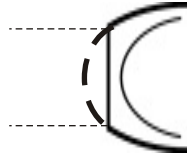
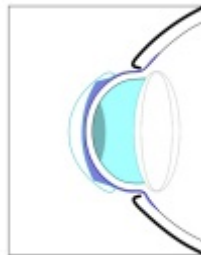
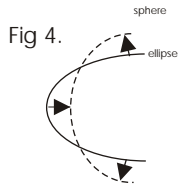


Fig 4.

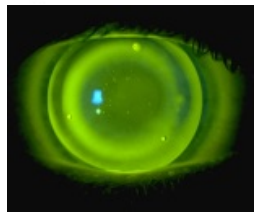


## Orthokeratology

Orthokeratology does not remove corneal tissue but rather remodels it.

Specially designed reverse geometry rigid contact lenses, worn while sleeping, generate pressure differentials across the cornea, gently remoulding the shape. The net result is reduced corneal power and myopia.

The dynamics of the process means the corneal shape cannot be changed beyond a certain point, limiting the level of myopia reduction to approximately -4.00 Dioptres.

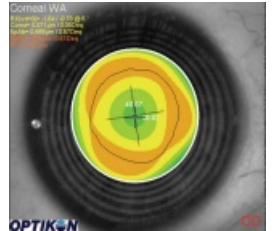


## Procedure

At the initial consultation, post an eye examination, the eyes need to be assessed for health and suitability to wear contact lenses and the corneas need to be mapped with the Scout Topographer. If the eyes appear suitable then bespoke contact lenses are ordered via the proprietary algorithm.



Once delivered, an overnight trial assesses the effect. The modern topographic models are extremely accurate and the first lens is usually correct.



Once the required result is obtained the patient becomes a more conventional, standard contact lens wearer with normal contact lens checks throughout the year.

## Goals

The ideal result would be total elimination of the myopia, giving clear vision all day and requiring Orthokeratology lens wear perhaps every second night.

Some patients are happy to simply reduce the amount of short sightedness. In this case they may wear the lenses as daily sight correcting lenses but have much improved unaided vision for swimming or sports.

## Advantages of Orthokeratology

- Freedom from contact lenses or spectacles during the day.
- Freedom from visual aids for sports, active professions such as police or those working in dusty environments.
- Non invasive / Non surgical technique.
- Totally reversible at any time.
- Both eyes can be treated simultaneously.
- Very rapid results with often total elimination of myopia after one night.

**MYOPIA CONTROL:** Orthokeratology is one of the strategies used to control myopia progression. See our Myopia Control fact sheet for full details. The Myopia Care Web App, found at <https://myopia.care/index> also gives more information.



## Disadvantages of Orthokeratology

- The highest level of myopia reduction is approximately 4 dioptres.
- Reduction in astigmatism is limited.
- The result is not permanent and if the lenses are not worn on a regular basis the cornea will revert to its original shape.