MYOPIA CONTROL

How common is myopia?

The number of children developing myopia is increasing sharply. While in developing nations, uncorrected myopia can be a serious disability, in western, developed countries it is mostly regarded as an inconvenience, easily corrected by spectacles or contact lenses and dismissed. However, very high levels of myopia can lead to serious eye conditions.

What causes myopia and can it be prevented?

For many years, the professional consensus was that reading had a significant impact on the onset and development of myopia. Current research, however, has dispelled these beliefs, discounting such effects as minimal. What is now apparent is that spending time outside has positive protective effects against the onset of myopia. Many studies have confirmed this 'outdoor protective effect'. The same studies have also shown that the effect is not dependent on the type of activity that the child engages in, and that the effect is evident in children where both parents are myopic. Investigations are ongoing as to what factors might influence this, and candidates include vitamin D and ambient light. It is, however, apparent that outdoor activity has no protective effect once a child is myopic, leaving them with the same increased risks in adulthood.

What is Myopia Control?

Myopia control is the attempt to slow or halt the progression of myopia. This process has been attempted for many years and employed varying methods. These methods include the use of RGP lenses, under-correction of patients and the use of bifocal lenses. While the use of RGPs has now been shown to have no effect, the method of under-correcting patients has actually been shown to have direct detrimental consequences. The use of bifocal lenses has also been shown to be mostly ineffective.

The weight of evidence now suggests that orthokeratology is the best solution for children, and parents looking to act early to try and take control of myopic progression.

Ortho-k for myopia control

The current consensus suggests that it is the effect of peripheral light rays on retinal mechanisms, which create the myopia control phenomenon. This is outlined in the Peripheral Rays Theory. Rays of light hitting the peripheral retina affect axial length growth.

This can be summarised by the illustrations.

Figure 1:
Corrected Myope

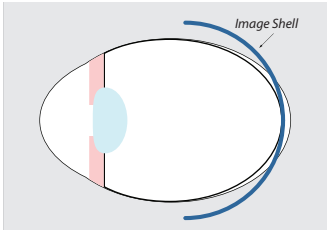

Figure 2:
Under-Corrected Myope

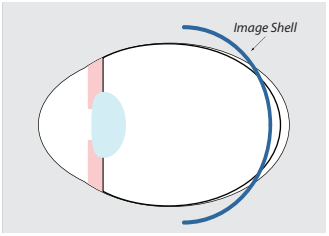

Figure 3: Optimal Correction
- Eye corrected by orthokeratology

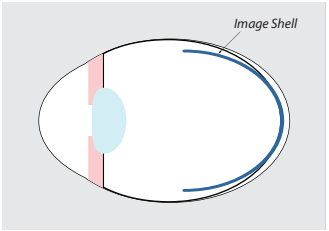

Figure 1 shows a corrected myopic eye. It is apparent in this image that while the rays at the fovea (the central aprt of the eye) are in focus, in the periphery the image shell falls behind the retinal plane. An under-corrected eye, as illustrated in **Figure 2** results in both out-of-focus rays at the fovea and an image shell that is behind the retina. **Figure 3** shows an eye corrected by an Orthokeratology lens. This image illustrates how the unique optics created by an ortho-k lens, allow for the fovea to receive in-focus rays, while creating an image shell that falls within the retina.

Many studies have now successfully demonstrated the ability of ortho-k to control myopic progression. More information about these studies is available at www.myopiaprevention.org

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