

# Orthokeratology (Ortho-K) for Myopia Management

## How Does Current Ortho-K Work For Myopia Control?

- Orthokeratology lenses will cause the central cornea to become flatter and the mid-peripheral cornea to become steeper. The reason behind how this causes a decrease in myopia varies among researchers, but a commonly agreed upon theory is that it reshapes the cornea to have an oblate curve. This, they believe, leads to myopic defocus in the periphery, which has been shown to have a strong effect on axial elongation of the eye.
- Other studies mention the impact of Ortho-K being due to a change in the lag of accommodation or increased choroidal thickness. However, further studies are needed to confirm these theories.<sup>2</sup>

## How Effective Has It Been Demonstrated To Be?

- Ortho-K was shown in several individual studies and meta-analyses to reduction the rate of myopic refractive change by 40%-60% when compared to spectacle wearing.<sup>2</sup>

## Who Is The Ideal Candidate For Ortho-K?

- Good candidates include patients who were older at the start of the Ortho-K treatment, older in age of myopia onset, having larger pupils and a smaller central treatment zone due to higher peripheral myopia.<sup>2</sup>



## How Safe Are Orthokeratology Lenses?

- This can vary widely when comparing outside vs. inside the United States and Canada, as these two countries tend to have more stringent regulations for contact lenses.
- A 2013 study showed that out of the incidence of microbial keratitis in Ortho-K users was 7.7 per 10,000 patients as opposed to 19.5 per 10,000 patients who wore soft contact lenses overnight.<sup>2</sup> In other words, the complications with Ortho-K lenses are very minimal and safe regarding ocular surface compared to soft contact lenses.

## What Are Some Other Options For Myopia Control?

- Myopia control can also be achieved with soft multifocal contact lens options, such as MiSight, which is the first multifocal contact lens that is FDA approved to reduce myopia progression by slowing down the change in spherical equivalent refraction and reducing the rate of axial length elongation.<sup>5</sup>
- Topical atropine 1% can be an excellent option especially when a child simply cannot be fit with a contact lens. It is a muscarinic antagonist that is nonselective and has been shown to reduce the change in myopia spherical equivalent refraction and axial elongation.<sup>6</sup> Further research supported that atropine 0.01% was an acceptable replacement to 1% for the treatment of myopia progression. This is helpful because it has limited side effects compared to atropine 1% and the child does not need to experience blurred vision and dilated pupils which especially in a child makes for a more comfortable and adherable treatment.<sup>7</sup>
- Decreasing the amount of near work and spending more time outdoors has been shown to reduce myopia progression in school children.<sup>8</sup>

Orthokeratology is an exciting area of myopia control that can make a huge difference in a patient's life. When thinking about all the devastating effects that myopia can have on our vision and ocular health, it is amazing that we can reduce the likelihood of adverse outcomes in our patients.

### References:

1. Dave T, Ruston D. Current trends in modern orthokeratology. *Ophthalmic Physiol Opt* 1998;18:224–33
2. Lipson MJ, Brooks MM, Koffler BH. The Role of Orthokeratology in Myopia Control: A Review. *Eye Contact Lens*. 2018;44(4):224–30. Epub 2018/06/21. PMID:29923882.
3. Three Key Areas Where Paragon CRT® Contact Lenses Make an Impact [Internet]. Paragon Vision, LLC. 2020. Available from: <https://ecp.paragonvision.com/products/crt>
4. Vision Shaping Treatment (VST) Process [Internet]. Bausch & Lomb Incorporated. 2020. Available from: <https://www.bausch.com/ecp/our-products/orthokeratology/vision-shaping-treatment>
5. Chamberlain P, Peixoto-de-Matos SC, Logan NS, Ngo C, Jones D, Young G. A 3-year Randomized Clinical Trial of MiSight Lenses for Myopia Control. *Optom Vis Sci*. 2019;96(8):556-567.
6. Chua WH, Balakrishnan V, Chan YH, et al. Atropine for the treatment of childhood myopia. *Ophthalmology*. 2006;113(12):2285-2291.
7. Chia A, Chua WH, Cheung YB, et al. Atropine for the treatment of childhood myopia: safety and efficacy of 0.5%, 0.1%, and 0.01% doses (Atropine for the Treatment of Myopia 2). *Ophthalmology*. 2012;119(2):347-354.
8. Yi JH, Li RR. [Influence of near-work and outdoor activities on myopia progression in school children]. *Chinese Journal of Contemporary Pediatrics*. 2011 Jan;13(1):32-35.