



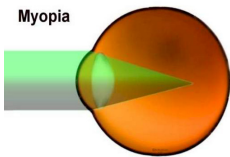
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## WHAT IS ORTHOKERATOLOGY?

Orthokeratology is a safe, non-surgical contact lens procedure to reduce or eliminate nearsightedness and astigmatism, dramatically improving natural vision. Orthokeratology is a procedure that was developed in 1962 and has provided corrective eye care to thousands of patients through the therapeutic use of contact lenses. A series of ortho-k lenses are fitted in progressive stages to gently reshape the eye's front curvature (the cornea) to improve visual errors. Advanced design orthokeratology lenses can reshape the eye overnight, while sleeping, and can be removed for excellent vision during the day without the use of glasses or contacts.

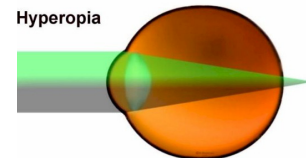
Like all human systems, the visual mechanism is subject to defects. However, most of these defects can be optically corrected with eyeglasses and contact lenses and are not related to disease. In the same sense that teeth may be straightened with braces, structural irregularities of the eye (called refractive errors) can be reduced or eliminated by the use of contact lenses.

For a normal visual system with no refractive error, there is, for every point in space, a focusing of that point on the retina (the light sensitive portion of the eye).



In a **nearsighted eye (myopia)**, instead of the light focusing to a point on the retina, it is brought to a focus at a point in front of the retina. When the light reaches the retina, instead of producing a point, there is a blurred circle, resulting in poor vision. Myopia is a common problem in young children, adolescents and college students.

In cases of **farsightedness (hyperopia)**, instead of the light rays focusing on the retina, they would come to a point behind the retina.



The third refractive error is **Astigmatism**. It is a condition in which there is more than one point of focus for a point in space. Curvature of the cornea is usually the primary cause of Astigmatism.

## THE ORTHOKERATOLOGY PROCEDURE

A series of Ortho-K contact lenses are fitted in progressive stages to gently reshape the pliable cornea towards less curvature and a more spherical shape. This reduces nearsightedness and astigmatism, dramatically improving natural vision. The corneal changes are so gradual, the patient enjoys clear and comfortable vision at all times. Ortho-K contact lenses consist of a high oxygen permeable material with a special design that encourages corneal curvature changes. The procedure involves thorough examinations, lens changes, and/or lab modifications, each 2-6 weeks until maximum desired results occur. Retainer contact lenses are then worn as necessary to stabilize the newly acquired shape and improved visual performance.

## **RESULTS**

*Myopia (nearsightedness)*--mild and moderate degrees of myopia--20/200 or better unaided visual acuity, may be corrected to 20/20-20/30. Higher degrees of myopia may achieve dramatic improvements, allowing that person to have functional vision without lenses, which would have been previously impossible.

*Astigmatism*--Most mild astigmatic conditions can be reduced dramatically or eliminated. Higher amounts of astigmatism may be partially improved enhancing visual performance.

*Hyperopia (farsightedness)*--may be improved to a very limited degree.

With new contact lens designs and oxygen permeable materials and computerization, results have improved dramatically. Many patients utilizing these lenses in conjunction with newer techniques, such as wearing the Ortho-K lenses only at night while sleeping, are able to see improved results in much shorter periods of time.

## **SAFETY**

Four university level research studies have been completed on Orthokeratology.

These studies include:

- 1) University of Houston Optometry School (5 years)
- 2) University of California at San Diego Medical School (7 years)
- 3) University of California at Berkeley Optometry School (3 years)
- 4) Pacific University Optometry School (5 years)

All studies found the procedure to be safe, without harmful side effects, and effective. It was stressed that proper care and continued monitoring of patients under treatment is required. Only experienced practitioners in the field of contact lens therapy should utilize the procedure.

## **BENEFITS**

- After correction, you simply see better without help from glasses or contact lenses.
- Vision improvements occur in months, weeks, or even days.
- Free of surgical risk, the process is convenient and comfortable. since many lenses can be worn overnight, therefore, not disrupting your visual performance as your eyes are being improved.
- All ages benefit
- Natural vision for recreation, sports, and leisure is enhanced dramatically.
- Occupational, unaided vision demands may be met for careers such as pilots, policemen, firemen, or any job that requires better visual acuity.
- Preventive vision care for children is highly beneficial.

The basic purpose of Orthokeratology is to improve visual function. Not everyone can presently benefit by these procedures, but for many there is now a safe, non-surgical approach to improving and restoring vision.

## FREQUENTLY ASKED QUESTIONS

- What type of contact lenses are used in Orthokeratology fitting?  
High oxygen permeable rigid contact lenses. The firmness of the lens is necessary to reshape the corneal contour. As a rule, soft contact lenses do not hold their shape well enough to reshape the cornea.
- How many lens changes are involved in the process of Orthokeratology?  
Generally, the average number is between 3-5 pairs of contact lenses to achieve myopia control results and improved vision. Lower prescriptions usually require less while higher prescriptions can require more.
- What are "retainer" lenses?  
Once functional vision is attained, your eye doctor may prescribe retainer lenses to maintain the shape of the cornea. Your doctor will determine the wearing schedule for you based on his/her findings.
- Is the correction of myopia or astigmatism permanent?  
Orthokeratology is non-invasive and reversible. Some patients are able to go longer periods of time without using the lenses and maintain good vision, but most patients need to wear retainer lenses on a regular basis for their myopia correction.
- Does every eye doctor offer Orthokeratology therapy?  
No. The National Eye Research Foundation founded Orthokeratology and the Pioneer Section between 1950-60 and continues to maintain a referral directory of its membership for the benefit of the public.
- What is astigmatism?  
Nature is not perfect, and it rarely creates a perfectly spherical optical surface. The cornea varies in thickness, and any irregularity of the surface causes astigmatism. Your eye doctor may explain that it is a football-shaped eye: curvatures up and down vary from the curvatures side to side. The shape on an egg is a good example of a "toroidal curve", similar to a football. As a rule, the astigmatism of the eye can be corrected along with the myopia, as it is generally present in this combination. Your eye doctor will explain how Orthokeratology therapy works to straighten the cornea.
- What is meant by functional vision?  
In the Orthokeratology process, there is a point of "functional vision" where one functions well within the greatly improved parameters. For patients whose vision cannot be restored to an exact 20/20 state due to a high degree of myopia or astigmatism, seeing the alarm clock during the night without being dependent on any type of corrective lenses is a typical example of functional vision.
- Should I expect pain or discomfort?  
No more than in the fitting and wearing of regular contact lenses. For many, overnight wear of Ortho-K lenses is more comfortable than daily wear since the eyelids are closed.
- Does age make a difference in the success of Orthokeratology treatment?  
Specialists in Orthokeratology typically strive to catch myopia early, usually when the young patient is mature enough to handle the contact lenses, which is normally between 7-9 years of age. However, age does not appear to be a factor as far as successful corneal reshaping is concerned. Seniors over 65 have other factors to consider such as the overall health of their eyes, and their willingness to tolerate a treatment that requires the use of contact lenses.