Wouldn’t it be great if your vision was corrected while you slept? It might sound far-fetched, but it’s a reality for some people and is available throughout the country.

Here’s how it works. When you sleep, you wear special contact lenses that gently reshape the surface of your eye, so you can see clearly even after you remove the lenses. You really cannot feel the lenses with your eyes closed. The effect is temporary; but once fully corrected, will last longer than twenty-four hours. For best results, you should wear the special lenses each night.

The human eye functions like a living camera. Light enters through the cornea and the pupil, passes through a lens behind the iris, and projects an image on the back of the eye, the retina. From there, the image is transmitted by the optic nerve to a region of the brain known as the primary visual cortex, where the signals from both eyes are combined into a single three-dimensional picture.

When the curvature of your cornea or the length of your eye is greater than average, the image is focused in front of your retina and you are myopic. Despite what your high school science teacher probably told you about the cornea merely being the clear cover over the iris and pupil, the fact is that it has much more focusing power than the lens behind your pupil. If the cornea is relatively flat, farsightedness can result, necessitating glasses for

Figure 1. Ocular anatomy. The relationship between the cornea and the lens in the eye.

Figure 2. The cornea. All of the changes of shape created by the Ortho-K lens take place in the epithelium.
reading and other activities. If there’s a steeper curvature of the cornea, nearsightedness results. Like a movie presented out of focus, the light from distant objects converges before hitting the retina, turning sharp pixels into fuzzy objects.

**Orthokeratology (Ortho-K for short)** corrects myopia by nudging tissue from the central part of the cornea out to the periphery. The Ortho-K lens exerts downward and outward pressure on the epithelium. This flattens the central cornea and sharpens the focus of the image projected on the retina. With the cornea being such a strong focusing instrument, it does not take much movement of the epithelium to have a major effect on the amount of nearsightedness present. Once the flattening of your cornea is stable, this process will eliminate the need for glasses and any hassles associated with regular contacts.

The method essentially reverses the usual contact-lens cycle: After being fitted with the lenses, a patient puts them in before bedtime and removes them in the morning. Within a few days, unaided vision normally improves, often dramatically. People with mild to moderate myopia - those who can recognize faces but can’t see well enough to drive at night - often achieve 20/20 vision, and even people with severe myopia can gain some benefit.

**What to Expect When You Begin**

We will begin by measuring the curvatures of your corneas using an instrument called a corneal topographer — it’s like a photograph that takes a few minutes and produces a “topographical map” of your cornea. We will then place trial Ortho-K lenses on your eyes to determine if they will center properly. Proper centration is mandatory if your prescription is to be reduced in a predictable and regular fashion. If not centered, your vision will be less clear and more changeable during the day. Custom-made *Reverse Four Zone* lenses are then ordered from the measurements taken during the trial fitting.

You may need a series of temporary soft lenses to see properly late in the day until you reach the desired prescription. During the first few weeks, the molding effect of the Ortho-K lens will tend to wear off a little late in the day.

**How Long Does It Take And What Are The Early Changes I May Experience?**

Ortho-K can reshape a myopic cornea in two weeks or less. During the time your eyes are being reshaped, you may experience side effects. In the beginning, you may have glare and halos that will be reduced with time. A few patients may always have a little glare and halo, especially at night.
Once your eyes reach the desired prescription, you will need to wear the lenses when you sleep to maintain your prescription. Discontinuing lens wear altogether causes your corneas to gradually return to their original shape.

Ortho-K is not permanent; your eyes will go back to the way they were soon after the treatment is discontinued. Ortho-K also tends to be slightly less expensive than LASIK, with charges between $1,000 and $1,500 for the fitting, lenses, and follow-up visits. Like LASIK, Ortho-K is not covered by insurance. Most health plans will allow only the patient’s annual contact lens allowance - generally about $100.

Who Is a Candidate?

Ortho-K is for people of any age who are nearsighted. The FDA has approved over-night Ortho-K lenses for people with up to six diopters of myopia (-6.00 on your prescription); you may also have up to 1.75 diopters of astigmatism. Many doctors believe the best candidates are people who have low amounts of myopia, about -4.00 diopters or less. Ortho-K can be performed on practically anyone of any age, as long as their eyes are healthy.

What Results Can You Expect?

We usually aim for 20/20 vision, but 20/40 vision (the legal visual minimum for driving in most of the United States) is typically considered acceptable. In the FDA clinical study for approval of over-night Ortho-K lenses, 93% of patients achieved 20/30 vision.
or better, and 67% achieved 20/20 or better. The study included 205 patients that were followed over a nine-month period.

Ortho-K works best for people who don’t want to wear glasses or contact lenses all day every day — but don’t mind wearing contact lenses from time to time. The advantage of Ortho-K over surgery is that most refractive surgery procedures are permanent. If you discontinue Ortho-K, your corneas will return to their original state, since no tissue is removed.

As with all contact lenses, there are potential side effects of irritation and corneal abrasions. These are usually easily managed as long as you notify us immediately when you become aware of discomfort, redness or blurred vision.

Should You Do Ortho-K Instead of LASIK?

If your primary goal is to be glasses and contacts free during the day, then corneal reshaping should be a good alternative for you. However, if you want to eliminate the bother of contacts altogether, then corneal reshaping is not likely to satisfy you.

As already noted and unlike LASIK, Ortho-K is reversible. If you try reshaping Ortho-K contacts and later decide you want laser eye surgery instead, you can do that. Your surgeon will have you stop wearing your contact lenses for several months so that your corneas can return to their normal shape. **What are other benefits of Ortho-K?**

- Better vision without help from glasses or contact lenses within days to weeks;
- Free of risks and concerns associated with laser surgery;
- Occupational vision demands may be met for careers such as pilots, policemen, firemen or any job that requires better visual acuity without correction.

**Reasons to consider Ortho-K for your child or teen**

- May reduce progression of near-sightedness in children;
- You can’t always control how your child might use, or misuse, his glasses or contacts.
  - With Ortho-K, you regain control;
- The lenses are worn during sleep and don’t leave your home during the day, so losing them is unlikely.
- You don’t have to worry about eyeglass loss or breakage during sports.
- Just think: you will never have to run contact lenses or eyeglasses to your child at school again!
- You’ll no longer worry about your child’s vision in the classroom.
  - They will always be able to see the board.

The evaluation to determine if you can be successfully fit with Ortho-K contact lenses requires an office visit with a refraction, corneal topography (like a photo), tear film analysis, biomicroscopy and ophthalmoscopy. There will be a charge for the office visit, but there is no charge for the trial fitting. If interested, please speak with our front office staff or call Robert M. Scharf, M.D., P.A. at (972) 596-3328.