

# Sondheimer On Sight: What In The World Is Keratoconus?

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Keratoconus is a progressive disease that causes the outermost layer of the eye, known as the cornea, to become steeper, thinner, cone shaped, and distorted. The name "Keratoconus" is derived from the Greek words "Kerato" meaning cornea and "Conus" meaning cone shaped. Keratoconus usually affects both eyes but it can be far more advanced in one eye or the other. An ophthalmologist can determine steepening of the cornea through the use of corneal topography (a topographical map of the cornea) or keratometry (an optical instrument that measures the steepness, flatness, astigmatism, and regularity of the cornea). Patients with keratoconus have increasing amounts of astigmatism, which can become "irregular" and cannot be corrected with glasses. In severe cases, the irregular astigmatism cannot be corrected with contact lenses.

Keratoconus affects about one out of 2000 people. Its inheritance is poorly understood, although about 13.5 percent of people with keratoconus have blood relatives with the disease and are thought to have a hereditary form of the condition. Heavy eye rubbing and rigid contact lens wear may contribute to the development of keratoconus. Many patients are found to have keratoconus in adolescence. In many cases the condition stabilizes for people in their 30s or 40s.

Some people have vulnerabilities that cause them to develop a keratoconus- like disease called "corneal ectasia" when they have eye surgeries that weaken the cornea such as LASIK or PRK (photorefractive keratectomy) to treat nearsightedness, farsightedness, or astigmatism. An ophthalmologist should be able to detect most, but not all, patients that are likely to develop corneal ectasia following LASIK by performing special tests such as corneal topography or corneal tomography. Some candidates for refractive surgery to lessen dependence on glasses or contact lenses are discouraged from having surgery because of elevated risk factors for developing post-operative ectasia such as young age, thin corneas, or significant nearsightedness.

Patients with keratoconus commonly complain of decreased vision. Some see multiple images. Initially, in milder cases glasses or soft contact lenses correct a patient's vision. In more severe cases, when glasses no longer correct vision acceptably, vision may be corrected with gas permeable or hybrid contact lenses. Plastic corneal implants called Intacs may help improve vision. In severe cases, corneal transplant surgery may be required to restore vision.

Internationally, and in the United States, there are new treatments including Corneal Crosslinking that can stop the progression of keratoconus and post-LASIK and post-PRK ectasia of the cornea. Dr. Theo Seiler of Germany invented Corneal Collagen Crosslinking in the 1990's. In some cases, Corneal Collagen Crosslinking lessens the steepening and irregularity of the cornea caused by keratoconus or ectasia. In Corneal Collagen Crosslinking, the cornea is first treated with drops of Vitamin A (Riboflavin) that is absorbed by the cornea after receiving successive drops over time. Originally, the soft outer covering of the cornea (the epithelium) was removed before administration of the drops; but now many patients are treated without disrupting the corneal epithelium. Next, ultraviolet light is focused on the cornea. The ultraviolet light focused on the riboflavin-treated cornea causes it to form new "crosslinks" that stiffen the cornea and stop the progression of keratoconus and corneal ectasia. A contact lens is placed on the eye after treatment and antibiotic and anti-inflammatory eye drops are used post-operatively. Corneal Cross linking can also treat bacterial infections of the cornea that are resistant to antibiotics. This treatment is welcome news to people dealing with keratoconus and is indicative of the progress being made in modern ophthalmology.

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