

# Understanding Keratoconus & the Importance of Early Diagnosis

Not long ago, a diagnosis of progressive keratoconus left patients with few treatment options.

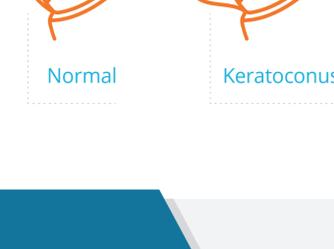
Today, Glaukos' iLink procedure with Photrexa® Viscous (riboflavin 5'-phosphate in 20% dextran ophthalmic solution), Photrexa® (riboflavin 5'-phosphate ophthalmic solution), and KXL® system are FDA-approved and provide patients with a one-time, minimally invasive therapeutic treatment to limit the progression of their condition.

## What is Keratoconus?

### Keratoconus

[ker-uh-toh-koh-nuh s]

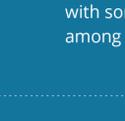
1. Keratoconus or "KC" is a non-inflammatory eye condition in which the normally round dome-shaped cornea progressively thins causing a cone-like bulge to develop. This results in significant visual impairment.<sup>1</sup>



Normal

Keratoconus

## Who's Affected by Keratoconus?



**Keratoconus Affects Both Genders** although it is unclear whether significant differences exist between males and females<sup>2</sup>

**The Disease is Also Found in All Ethnic Groups** with some studies showing higher incidence rates among Asian populations, in particular<sup>3</sup>



## Keratoconus is estimated to occur in

**1 OUT OF EVERY / 2,000**

persons in the U.S. population<sup>4</sup>

## Signs & Symptoms of Keratoconus<sup>5</sup>

usually first appear in the late teens and early twenties<sup>6</sup>



Excessively Rubbing Eyes



Mildly Blurred Vision



Difficulty Seeing at Night



Frequent Changes in Eyeglass Prescription



Frequent Headaches



Vision that Cannot Be Corrected with Glasses

## Risk Factors for Keratoconus



While the **exact cause** of keratoconus is **unknown**, it is believed that genetics, the environment and the endocrine system all play a role<sup>7</sup>

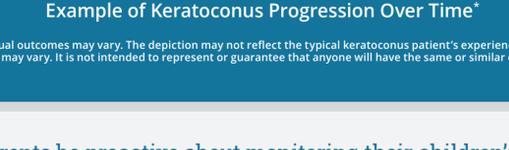
Some KC cases have a **hereditary component** and studies indicate that

**~10% OF PATIENTS HAVE AFFECTED RELATIVES<sup>8</sup>**



## Importance of Early Detection

KC is a progressive condition which worsens over time, so early diagnosis is critical



Example of Keratoconus Progression Over Time<sup>9</sup>

\*Individual outcomes may vary. The depiction may not reflect the typical keratoconus patient's experience and the timeline may vary. It is not intended to represent or guarantee that anyone will have the same or similar outcomes.

## How can parents be proactive about monitoring their children's eye health?



If they have a family history of keratoconus and the children start needing glasses, I would recommend getting screened for KC - especially starting at age 12.

- Dr. Darcy Wolsey, Eye Institute of Utah



Don't wait to call the eye doctor if you notice changes in your child's vision! Ask about iLink FDA-approved cross-linking, clinically proven to limit the progression of this sight-threatening disease.

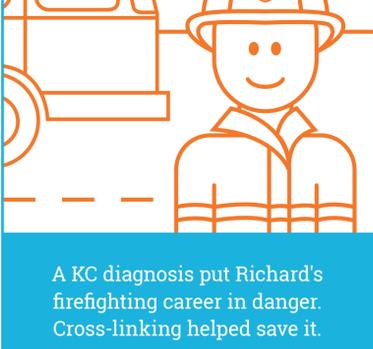
## Treatment Options for Keratoconus

Treatment options for keratoconus include eyeglasses or soft contact lenses, rigid gas permeable contact lenses, scleral contact lenses, intracorneal ring segment implants, corneal cross-linking or corneal transplant surgery.<sup>9</sup>

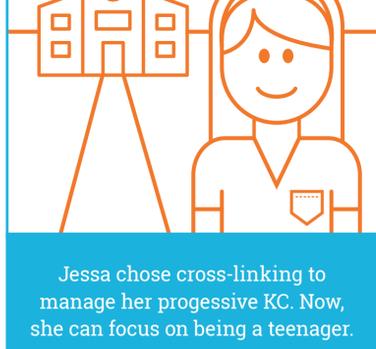
	Eyeglasses or Soft Contact Lenses	Specialty Contact Lenses (RGP, Scleral, Hybrid)	Corneal Cross-Linking (CXL)	Intracorneal Ring Segments (ICRS)	Corneal Transplant Surgery
<b>Description</b>	Prescription glasses or disposable/reusable contact lenses	RGP lenses are small diameter rigid contact lenses that are placed on the corneal surface. Scleral lenses are large diameter lenses that rest on the sclera (white of the eye) and vault over the cornea. Hybrid lenses are RGP lenses with a soft contact lens surround	Minimally invasive outpatient procedure using riboflavin eye drops plus UVA light	Specially designed implants, made of medical plastic, surgically placed under the surface of the cornea	Surgery to replace part of cornea with donor tissue
<b>Goals</b>	Improve vision while wearing	Improve vision while wearing	Slow progression of keratoconus	Improve corneal shape	Improve corneal shape and/or clarity
<b>How it Works</b>	Eye glasses and soft contact lenses bend rays of light to focus images on the retina inside of your eye.	Rigid and specialty lenses create a smooth, uniform surface. Your natural tears or a saline solution fill in the space between the lens and the cornea, "masking" the irregular corneal shape.	Riboflavin (Vitamin B2) eye drops are activated with UVA light to create additional cross-link bonds in the cornea, making it stiffer.	Intracorneal ring segments are implanted into the cornea to flatten the steep part of the cone into a more regular shape.	Irregular or scarred corneal tissue is replaced with donor tissue from a cornea without keratoconus. Usually used for advanced cases when contact lenses can no longer be tolerated or vision is severely compromised.
<b>Challenges</b>	As keratoconus progresses, the cornea becomes more irregularly shaped. Eye glasses and soft contact lenses can not correct for the irregular corneal shape.	Lenses must be precisely fit by to maintain comfort, enable stable vision and avoid damaging the eye. As keratoconus becomes more advanced, contact lens fitting becomes more challenging, and some patients may no longer tolerate contact lens wear.	CXL does not restore visual function that has already been lost, and does not eliminate the need for glasses or contact lenses. Patients may experience haze, inflammation, eye pain, decreased and/or blurred vision.	Do not slow keratoconus progression. Glasses or contact lenses are usually still needed. Patients may experience infection, inflammation, and/or visual symptoms such as glare or halos.	Recovery after corneal transplantation can be lengthy, lasting up to 1 year. Glasses/contacts are usually still needed, and visual rehabilitation can take several years. Possible complications include graft rejection, graft failure, infection.

## Impact Over Lifetime

Early diagnosis and treatment allowed Richard and Jessa to be able to continue to do the things they do



A KC diagnosis put Richard's firefighting career in danger. Cross-linking helped save it.



Jessa chose cross-linking to manage her progressive KC. Now, she can focus on being a teenager.

## Advancements in KC Treatment



Now that cross-linking is available clinically, FDA approved, it is a very exciting time to be a cornea specialist and be able to have a treatment that is effective for progressive keratoconus.

- Dr. Kathryn Hatch, Massachusetts Eye and Ear Institute



Find a Corneal Cross-Linking Specialist That is Right for You at [LivingWithKC.com](http://LivingWithKC.com)

### IMPORTANT SAFETY INFORMATION

**APPROVED USES**  
Photrexa® Viscous (riboflavin 5'-phosphate in 20% dextran ophthalmic solution) and Photrexa® (riboflavin 5'-phosphate ophthalmic solution) are used with the KXL® System in corneal cross-linking to treat eyes in which the cornea, the clear dome shaped surface that covers the front of the eye, has been weakened from the progression of the disease keratoconus or following refractive surgery, a method for correcting or improving your vision.

Tell your healthcare provider if you are pregnant or plan to become pregnant.

### IMPORTANT SAFETY INFORMATION

Ulcerative keratitis, a potentially serious eye infection, can occur. Your doctor should monitor defects in the outermost corneal layer of the eye for resolution.

The most common ocular side effect is haze. Other ocular side effects include inflammation, fine white lines, dry eye, disruption of surface cells, eye pain, light sensitivity, reduced sharpness of vision, and blurred vision. The risk information provided here is not comprehensive. To learn more, talk to your healthcare provider.

Go to Prescribing Info to obtain the FDA-approved product labeling. You are encouraged to report all side effects to the FDA. Visit [www.fda.gov/medwatch](http://www.fda.gov/medwatch), or call 1-800-FDA-1088.

### SOURCES

- 1-<http://www.nkcf.org/about-keratoconus/>
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- 3-<https://www.nature.com/eye/journal/v14/n4/pdf/eye200154a.pdf?origin=pub>
- 4-Kennedy R. H., Bourne W. M., Dyer J. A. A 48-year clinical and epidemiologic study of keratoconus. The American Journal of Ophthalmology. 1986;101(3):267-273. doi: 10.1016/0002-9394(86)90817-2.
- 5-<http://www.nkcf.org/living-keratoconus/>
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