

# Corneal Cross-linking

## TREATMENT FOR CORNEAL DEGENERATION

Corneal cross-linking (CXL) is a treatment that can strengthen and stabilize tissue in degenerative corneal diseases such as keratoconus, pellucid marginal degeneration and ectasia. The underlying cause of these diseases is weakened and thinning corneal tissue that allows the cornea to bulge, swell and distort vision.



### INTRODUCTION

Cross-linking occurs naturally in our body's collagen fibers as part of the aging process. This normal process increases rigidity and decreases elasticity of connective tissue and is thought to contribute to wrinkling of the skin. Now, eye surgeons are accelerating cross-linking of corneal tissue to increase its strength and slow or halt the effects of debilitating diseases.

### GOAL OF TREATMENT

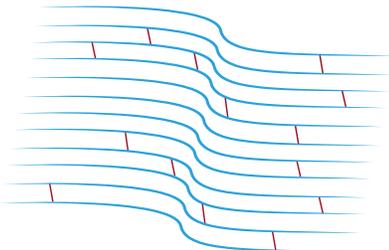
The goal of CXL is to halt progression of degenerative corneal disease and reduce or eliminate the future need of a corneal transplant. Treatment is successful in about 90% of cases. Although CXL can have a highly positive impact in peoples' lives, it cannot reverse the effects of corneal disease. Previous corneal distortions are expected to remain and glasses or contact lenses will still be required, although the prescription may change.

### HISTORY

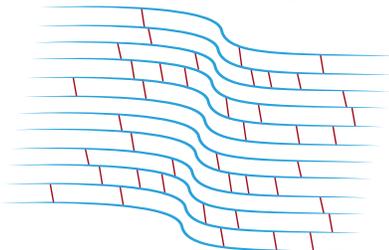
Developed in Germany in the late 1990s, CXL is widely used in Canada, Europe and Asia. The procedure utilizes riboflavin (vitamin B-2) drops and low-dose ultraviolet A light to create chemical bonds (crosslinks) that bind corneal collagen fibers together. These additional crosslinks in the clear corneal tissue strengthen and stabilize it by holding the fibers together and making it more solid.

Numerous international studies have shown that CXL can increase the human cornea's strength and rigidity by 300% or more.

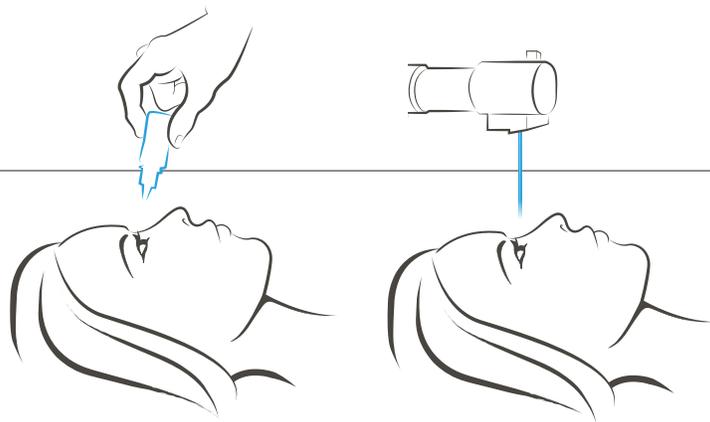
Before CXL (Weaker)



After CXL (Stronger)



Treatment increases the number of anchors that bind corneal collagen fibers.



### HOW TREATMENT WORKS

CXL is a minor outpatient procedure that only requires numbing eye drops and a mild sedative. It involves 4 main steps:

- Epithelial cells covering the cornea are gently removed
- Riboflavin drops saturate the cornea for 15 to 20 minutes
- Corneal tissue is exposed to UVA light for 5 to 30 minutes
- A soft bandage contact lens is placed on the eye for comfort and healing

### AFTER TREATMENT

During the first 24 hours, you will be instructed to avoid sunlight. After that, wear UV protection sunglasses when outside. Contact lenses will need to be left out for 2 weeks and instructions will be provided for a number of eye drops. Vision is usually blurrier for about 3 months as the eye heals, and then gradually improves. It should stabilize within 6 months. You will need to update your prescription for contact lens or glasses 6 to 9 months after treatment.

### CANDIDATES

- In general, 15 to 35 years old
- Progressive corneal ectasia
- Adequate corneal thickness
- No corneal scars that significantly affect vision
- No prior or current ocular herpes infection
- No autoimmune disorders
- Not pregnant or nursing

### ADVANTAGES

- Improves corneal rigidity
- Stabilizes the cornea
- Slows or stops disease progression
- May prevent need for corneal transplant
- May reduce nearsightedness and astigmatism
- May improve comfort of contact lenses

### TEMPORARY SIDE EFFECTS

- Watery eyes
- Some discomfort
- Sticky eyelids (from eye drops)
- Fluctuating vision
- Halos around lights
- Light sensitivity

### POTENTIAL COMPLICATIONS

- Delayed regrowth of surface cells
- Corneal haze
- Inflammation
- Infection
- Increased eye pressure
- Endothelial cell damage
- Treatment failure could require retreatment

### QUESTIONS

If you have questions about this procedure, or would like to proceed with treatment, call our corneal cross-linking surgery counselors or talk with your optometric physician.

*Pacific Cataract and Laser Institute  
Corneal Cross-linking Surgery Counselors*

**800-884-7254**  
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