

CORNEAL CROSSLINKING

Frequently Asked Questions

IS CORNEAL CROSSLINKING (CXL) A NEW TREATMENT FOR KERATOCONUS?

CXL was introduced in Canada by the surgeons of the Bochner Eye Institute over 4 years ago. In Europe, where the procedure was pioneered, it has been performed for over 14 years ago. There are many long-term studies that demonstrate the efficacy and safety of the procedure.

WHAT IS THE MAIN GOAL OF CXL?

The purpose of the treatment is to strengthen corneas so as to prevent progressive bulging and thinning that can interfere with vision. With a stronger and more stable cornea the risk of requiring a corneal transplant is practically eliminated.

WHAT IS THE SUCCESS RATE OF CXL?

At the Bochner Eye Institute over 3,000 eyes have been treated with CXL over the past 4 years. This is more than any other centre in the world. Patients have travelled from all over North America. The success rate at preventing progressive bulging and thinning has been over 98%.

CAN CXL BE REPEATED?

In rare cases (less than 2%) where CXL is not successful in stabilizing a cornea, a repeat treatment can be performed. There is no charge for this procedure at the Bochner Eye Institute.

IS THERE AN IDEAL AGE FOR CXL?

Usually, the younger the patient the greater the chance of preserving vision with CXL. Patients treated at the Bochner Eye Institute have ranged in age from 10 to 60 years age. With treatment, the corneal contour is preserved, and therefore it is best to have CXL when the shape is only mildly distorted. Patients with advanced disease can have CXL but the vision may be less than ideal with glasses or soft contact lens necessitating the use of a rigid contact lens.

ARE SOME KERATOCONUS PATIENTS NOT GOOD CANDIDATES FOR CXL?

Patients must have satisfactory corneal thickness for the procedure to be performed. A thickness of 400 microns is required prior to the ultraviolet light application. Corneas with a thickness between 320 microns and less than 400 microns can usually be treated by using specialized hypotonic drops to swell the cornea to 400 microns or greater prior to the ultraviolet light application. Also, corneas with significant central scarring that interferes with vision are not good candidates for CXL.

CAN VISION BE IMPROVED WITH CXL?

Although the main goal of CXL is to stabilize the cornea, 60% of patients actually have an improvement in their vision. This is due to the fact that the corneal surface becomes less irregular with CXL as the steep areas are flattened and the flat areas are steepened.

HOW IS THE PROCEDURE PERFORMED?

The procedure is divided into 3 steps. Most patients find the procedure very easy and are comfortable. Anesthetic drops are instilled, which numbs the surface of the eye, and makes the procedure pain free. The first step of the procedure is the removal of the central corneal epithelium. A very gentle brush is used to polish away the soft cells of the front of the cornea referred to as the epithelium. The second part of the procedure is the instillation of specialized drops containing Riboflavin. Drops are typically used for 20 minutes. The third part of the procedure is the use of ultraviolet light, which is typically used for 10 minutes.



40 Prince Arthur Avenue
Toronto, ON M5R 1A9
Phone: 416-960-2020
Bochner.com

BOCHNER
EYE • INSTITUTE

WHY DOES THE ULTRAVIOLET LIGHT TREATMENT TIME VARY FROM CLINIC TO CLINIC?

The original treatment protocol in Europe was the use of ultraviolet light for 30 minutes at an energy level of 3mw/cm². With the development of new CXL devices the energy level can be increased which shortens the treatment time.

CAN THE CORNEAL EPITHELIUM BE LEFT INTACT OR DOES IT HAVE TO BE REMOVED?

The long-term clinical studies have shown outstanding results when the epithelium is removed prior to CXL. New techniques are being developed to perform a transepithelial CXL approach in which the epithelium is left intact. It is essential for the success of this technique that the Riboflavin drops penetrate an intact epithelium to reach the deeper layers of the cornea in a high enough concentration. Early results with this technique are encouraging but we do not know the long-term results.

WHAT IS REQUIRED AFTER THE TREATMENT?

Immediately after the procedure a soft bandage contact lens is inserted which is worn for approximately 5 days. This allows enhanced comfort and promotes healing of the corneal epithelium. An antibiotic drop is used for 5 days and a steroid drop is used for 2 weeks. Artificial tears can be used as needed for comfort.

IS THE VISION BETTER IMMEDIATELY AFTER THE PROCEDURE?

Usually the vision is slightly blurrier during the first month and then gradually improves. The blurred vision is related to the healing time of the corneal epithelium. Initially when the epithelium becomes intact it tends to be somewhat rough. With time it undergoes thickening and thinning in different areas to smooth the corneal contour.

HOW DO I KNOW IF THE TREATMENT IS SUCCESSFUL?

Repeat corneal mapping is performed to demonstrate corneal stability or flattening. The mapping is typically performed at 4 to 6 months postoperatively and then annually. Sophisticated mapping techniques can evaluate both the front and back surfaces of the cornea to determine stability, improvement, or progression.

WHAT ARE THE POTENTIAL COMPLICATIONS OF THE TREATMENT?

The complication rate is extremely low with CXL. The risk of infection is rare. In fact ultraviolet light can be used to kill bacteria and parasites in patients with corneal infections. Occasionally there is a delay in the healing of the corneal epithelium, which can delay the return of best vision.

WHEN CAN I START WEARING CONTACT LENSES?

After the procedure it is best to wait 2 weeks before returning to contact lens wear. If you have never worn contact lenses and would like to start lens wear it is best to wait at least one month before a consistent refraction can be obtained and lenses fitted.

HOW CAN I IMPROVE MY VISION SO THAT I DO NOT NEED RIGID CONTACT LENSES?

There are two surgical options to reduce the irregular astigmatism so that you can see better without rigid contact lenses. An intracorneal ring (Intacs) can be performed in which one or two rings are inserted into the cornea to flatten steep areas. The other option is a topographically-linked photorefractive keratectomy (PRK) in which an excimer laser is used to flatten the steep cornea and steepen the flat cornea to enhance vision. Both these procedures can be performed at the same time as CXL or at later date.