

Frequently Asked Questions Regarding Corneal Crosslinking

What does CXL do and who can benefit from this treatment?

The normal cornea is made of structural fibers called collagen that form layers similar to that of plywood. While generally quite strong, there are a number of conditions where structural weakness develops resulting in the outward bulging of the cornea (ectasia), surface irregularity and reduced vision. Naturally occurring keratoconus and ectasia following refractive surgery are the two most common situations where this is seen. These are problems that are not well corrected by glasses and sometimes are difficult to correct with contact lenses. The progressive nature of both of these conditions leads to increasing vision problems, greater difficulties wearing contact lenses and in some cases results in the need for a corneal transplant to restore vision. Corneal crosslinking strengthens the bonds between collagen fibers and can stabilize the corneal structure by making it more rigid and less distortable. The **goal of treatment** is to treat early enough to **prevent progression** or to **stabilize the cornea contour** so that one will not require specialty contact lenses or corneal transplant surgery. Early studies suggested some flattening (and potentially improved vision) occurred with treatment. However, subsequent studies indicate that this is an unpredictable occurrence.

Can CXL be performed for everyone with keratoconus or post-refractive surgery ectasia?

As we have already noted the **goal of treatment** is to treat early enough to **prevent progression** or to **stabilize the cornea contour** so that one will not require specialty contact lenses or corneal transplant surgery. Progression is the hallmark of keratoconus in those in their teens and 20's. Slower progression is often seen in the 30's with stability frequently being achieved in the mid 40's. Progression in keratoconus and post-refractive surgery ectasia is typically determined by demonstrating increased corneal steepening on corneal topography (mapping). Once natural stability is achieved the benefits of corneal crosslinking appear to disappear. The thinness of the cornea and the presence of central corneal scarring will also determine one's suitability for this treatment.

Do I have to stop wearing contacts before having CXL?

We recommend that you stay out of contact lenses for a week or two if possible before your consultation visit to see if you might benefit from the CXL procedure. This can vary based on how difficult it is for you to see without your contacts. We often suggest patients not wear their lenses for 3 days before their CXL procedure.

How is CXL performed?

Corneal crosslinking is an outpatient procedure performed in our Southfield office under eye drop anesthesia, similar to that used when we check your eye pressure. After being positioned in a reclining chair, the corneal epithelium, a thin layer of clear, protective tissue that covers the cornea, is removed. Vitamin B12 eye drops (riboflavin) are then instilled in the eye every 2 minutes for 60 minutes. A special blue (ultraviolet) light treatment will be administered for the last 30 minutes of this period. A bandage contact lens is applied after the procedure to promote healing and reduce discomfort. This will be kept in for about 1 week. You will be given prescriptions for eye drops and an oral pain medication to help with discomfort and reduce the risk of postoperative infection and inflammation.

How long does the procedure take?

The treatment itself takes about an hour. Let your driver know that you will be at the office for about 2 hours altogether.

Does the CXL procedure hurt?

No. Anesthetic eye drops are used to avoid any discomfort during the cross-linking procedure itself. However, following the procedure there is discomfort for 3-5 days. A bandage contact lens is applied after the procedure to promote healing and reduce this post-operative discomfort.

What can I expect after surgery and what are my activity restrictions?

You will be sent home after your corneal crosslinking procedure with a bandage contact lens on the operated eye. Please try not to rub the eye so that the contact lens doesn't fall out. We will check your eye the following day, at one week at which time the lens is usually removed, and at 1 month and 3 months. The antibiotic eye drop that you use after surgery is usually stopped at 1 week. The steroid eye drop will be continued for at least 1 month. Protection of the eye and keeping it clean are crucial to good healing post-operatively. You may place a cotton pad over the eye for added protection if you are so inclined. You may resume most physical activity, with the exception of swimming, as soon as your eye is comfortable. Sunglasses may be helpful to reduce glare when both inside and outside.

When can I resume wearing contact lenses?

Contact lens wear can be resumed 2 to 6 weeks after having the cross-linking procedure. Your surgeon will guide you as to how long this should be.

Will I see a change in my vision after CXL? Will I need new glasses or contacts after CXL?

Corneal surface irregularity is very common after CXL treatment and usually persists for 2-4 weeks. Some corneal haze is present in all patients and this and the surface irregularity will typically cause a worsening of your vision while present. Stromal haze can occasionally persist for 6 months or longer, but on clearing usually results in the return of pre-treatment level vision. While the goal of CXL is to prevent progression of keratoconus or ectasia, some patients may see a mild flattening effect which can result in some visual improvement. If this occurs, it happens gradually over a 6-12 month period. You can generally continue to wear your current glasses or contact lenses after the treatment.

Does insurance cover CXL treatment?

Corneal cross-linking was approved by the US Food and Drug Administration (FDA) in June 2016 for the treatment of keratoconus and progressive corneal thinning following refractive surgery. FDA approval is required before most insurance companies will consider covering the procedure. Even then, insurance companies may not include coverage in all of the policies they sell. It is best to contact your insurance company with your specific policy information. The diagnostic code for keratoconus is H18.623; for post refractive surgery ectasia is H18.713. The only treatment code for corneal crosslinking is 0402T.

What are the potential complications associated with CXL?

As with any surgical procedure involving the eye, surface and treatment site healing, control of inflammation and the prevention of infection are important to maintaining the health of the eye and protecting vision. We will have you use various drops both before and after your treatment to reduce the risk of these problems developing. If you are prone to recurrent infections or have a history of recurrent herpes simplex viral involvement of the eye it is important to let your surgeon know this prior to surgery. Special precautions can be taken to reduce the risk of these acting up. Corneal scarring, persistent corneal swelling (pump cell failure) and progression of the

underlying condition for which crosslinking is being performed (treatment failure) can on rare occasions occur.

Can corneal cross linking be repeated?

Eight to ten (8-10) year follow up studies suggest stabilization of keratoconus and post-refractive ectasia in about 85% of patients. Repeat crosslinking treatment has been tried in some of the treatment failures and seems to be beneficial; however, there have not been any large long-term studies of retreatment published. Corneal crosslinking does not prevent one from undergoing other treatment such as Intacs or corneal transplantation at a future time if they should be needed.

If CXL works for me and stops my vision from getting worse, can I have laser vision correction or Intacs afterwards?

There are a number of European centers that have looked at combining crosslinking with excimer laser treatment (PRK) or Intacs. Some are trying this as a single procedure while others are doing it in a step-wise fashion. For the time being, we feel that one should wait to be sure your CXL treatment is successful and no progression occurs for at least one year. We do not have enough data on the long-term risks of this yet to advise you at this time.