

Information for Patients

Corneal Collagen Cross-Linking (CXL)

The Condition

Keratoconus is an eye condition in which the cornea begins to change shape (keratoectasia) into a cone-like shape so eyesight is blurred and distorted. This condition usually starts in adolescent years and can get worse over time. It occurs in approximately 1 in 1000 people. Eye rubbing is a common cause of progression of keratoconus; thus, it is important to treat any allergies or hay fever you may have.

Glasses and contact lenses are used by the majority of individuals to manage their keratoconus, however, rarely in severe cases, a corneal transplant is needed. Corneal collagen cross-linking (CXL) is a treatment for keratoconus that has been shown to strengthen the cornea and prevent further progression.

What is corneal collagen cross-linking (CXL)?

The normal cornea is made up of many layers of collagen that are linked together to provide strength to the cornea. In keratoconus, the layers are irregular and there are fewer of these links. The cornea becomes too flexible and so the shape can change, causing loss of focus and blurry vision.

CXL aims to make the cornea stronger to reduce the chance of any further shape change. CXL uses vitamin B2 (riboflavin) drops and ultraviolet light (UVA) to strengthen the cornea. The combination of the drops and ultraviolet light causes the collagen fibres in the cornea to cross-link/bond more tightly. This treatment mimics normal age-related stiffening of the cornea, which is known as natural cross-linking.

After cross-linking the corneal shape will change but will hopefully remain more stable. You must cease eye rubbing after crosslinking otherwise the keratoconus will continue to progress.

Who is corneal collagen cross-linking offered to?

CXL is offered to patients whose keratoconus is progressing. Your eye doctor considers your spectacles prescription, your corneal topography (corneal shape scan), the thickness of your cornea, your vision and your age when making the decision to offer CXL.

Natural cross-linking occurs with age, so CXL may not be necessary in patients in their mid-twenties onwards if there is no worsening of the condition. CXL cannot be offered to those who are pregnant and to anyone whose cornea is too thin or too scarred.

Has this treatment been reviewed and checked?

The National Institute for Health and Care Excellence (NICE) has reviewed and found the procedure to be safe and successful for the majority of patients. Patients are advised to read the guidance and information for patients accessed from the NICE website www.nice.org.uk/IPG466.

What are the risks?

Approximately 3% of patients can have reduced vision due to corneal scarring, corneal haze, and corneal infection. If this occurs other treatments can restore or improve your vision.

Complications/risks include:

- Infection
- Scarring
- Corneal haze
- Delayed healing of the surface
- Dry eyes
- Failure of CXL and the need of further treatment
- Temporary or permanent loss of vision
- Ultraviolet light is potentially harmful to the innermost layer of the cornea (the endothelium). If this occurs then it can be treated with corneal transplantation.
- Progression of the condition: this can happen, but because the rate of progression of keratoconus is relatively slow, it will be a minimum of 12 months before we will know if the procedure has been effective.

Will I have both eyes treated at the same time?

As per NICE guidance we only treat one eye at a time. If you require treatment for both eyes, a further appointment will be given for the other eye after the first eye has settled and healed.

How can I prepare for the treatment?

- **Reading** – please read this information leaflet and the NICE guidelines.
- **Accompanying person** – the majority of CXL treatments are performed under topical anaesthesia (numbing eye drops), so you will be awake. The procedure is performed as a day-case, so please bring a responsible adult with you so that they can assist you on the way home. Your accompanying person will not be able to go into the treatment room with you. You may benefit from someone staying with you for a couple of days after the treatment, as your vision will be blurred.
- **Eating and drinking** – you can eat and drink as normal on the day of treatment, but we recommend a light meal.
- **Contact lens wear** – please do not wear a contact lens in the eye to be treated for a week before your treatment.
- **Medication** – please continue with any medications that you are taking.
- **Make-up and Jewellery** – on the day of treatment, you should not wear any make-up around the eyes. We also ask that no jewellery is worn on the face, ears or around the neck.

The Procedure

CXL is performed as a day-case procedure and is pain-free. On arrival, the doctor will explain the procedure and ask you to sign a consent form. You can ask any questions at this point. A nurse will give you a hat to wear to cover your hair. An anaesthetic drop will be put into the eye to be treated, which will sting for a few seconds. The skin around the eye will then be cleaned with an iodine solution.

You will be taken into the treatment room and will be asked to lie down on the theatre bed. Your identity will be checked. A speculum (a clip) will be put in to keep your eyelids open, so you do not need to worry about keeping your eyes open. We will take measurements of the thickness of your cornea. You will not feel this as the eye will be numb from the anaesthetic drops.

The epithelium, the outer covering layer of the cornea will then be removed with a specialised instrument. Riboflavin (vitamin B2) drops will then be instilled onto the cornea

every minute for 20 minutes. The thickness of the cornea will then be checked again to ensure it is at a safe thickness to proceed. Then the UV light will be shone onto the cornea for 9-10 minutes. Antibiotic and steroid drops are then instilled into the eye. Altogether the treatment will take between 45 – 60 minutes.

After the procedure you will be given a plastic eye shield. The nurse will then explain the aftercare regime, follow up appointment and discharge information to you and your accompanying person and you will be able to go home.

What will my eye be like afterwards and will there be pain?

The anaesthetic drops will wear off after approximately 20 minutes. Your eye may then become painful as there effectively is a large abrasion (the epithelium which was removed) on the surface of the eye that needs to heal. The pain may last up to 48 hours until the epithelium has healed. You will be given oral analgesic tablets and anaesthetic drops to take home to use. You will only be given a small supply of these because using them too frequently can delay the healing response. In addition there will be sleeping tablets supplied for 2 nights to help you sleep if there is a need. As well as having pain, your eye will be red and may feel gritty for up to a week.

Are there any specific dos and don'ts?

You will be given a few different eye drops to use afterwards. Please ensure you wash your hands prior to use and ensure you follow the drop regimen given. Your eyelids may become puffy and your eye will water. Your other eye may also water. This is all normal and will gradually improve over 48-72 hours.

Do not engage in strenuous activity. You can eat and drink as normal. Your vision will fluctuate for the first few weeks after the procedure. You can shower and wash your hair, but keep your eye closed when there is chance of getting water into it. You may be more light-sensitive following your surgery. Wear sunglasses in bright light to alleviate this. Do not wear any eye makeup for 3 weeks and do not swim for 6 weeks. Please ask about any other sports.

When can I return to work/study?

You will need a week off work as the surface is healing. You may need 2 weeks off if your job involves a lot of computer work, as your vision may be blurred. Please ask if you require a medical certificate from the doctor. You can self-certify for the first week.

When will my follow up appointment be?

It will be 1-3 weeks after your treatment.

When can I wear my contact lenses again?

Please do not wear your contact lens until you have checked with your doctor at your follow up appointment. Usually, you are advised not to wear your lens in the operated eye for a few weeks and you may need a new one especially if the shape changes.

Who can I contact if there is a problem?

Although it is unlikely that you will develop any serious complications after your surgery, if you have any concerns or if you develop:

- Increasing, unrelieved pain after 48 hours
- Increasing redness
- Yellow, green discharge
- Sudden loss of vision

Then please contact:

- Corneal specialist nurse (0161) 701 4819 Monday - Friday 8.00am - 4.00pm. Answerphone available; leave your name and contact details and your call will be returned.
- Emergency Eye Department (0161) 276 5597 every day from 8.00am - 8.00pm, including public holidays.

If your problem is urgent and the department above is closed or you are unable to get an answer, please contact Ward 55 through the hospital switchboard (0161) 276 1234. They are available 24 hours every day.

Please note:

Because each patient is different, the information contained in this leaflet is a general guide only.