Cross Linking for Keratoconus

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This leaflet has been designed to give you important information about your condition / procedure, and to answer some common queries that you may have and explain your treatment in more detail.
Your treatment explained in more detail

A variety of procedures exist for the treatment of Keratoconus but one of the newest is Corneal Cross Linking. In a normal eye the clear window at the front of the eye (cornea) has the strength to keep a regular curve shape. This curvature of the cornea helps to focus the image on the light sensitive layer (retina) at the back of the eye.

Why does Keratoconus occur?

An eye with Keratoconus lacks this strength and tends to warp progressively over time. The result is that the cornea becomes thinner and the centre protrudes forward forming a cone shape. This leads to a blurred image on the retina and the need for spectacles or contact lens to sharpen it.

In some cases the inner layers of the weakened cornea can split, causing scarring or too much water in the cornea.

The condition tends to stabilise after 30 to 40 years of age but by then the spectacle lens or contact lens prescription has become quite complex and a cornea transplant may be necessary to improve vision.

Aim of the treatment

The aim of Cross Linking is to reach that period of stability before the condition has had a chance to progress to the advanced stages (i.e. needing corneal transplant).

In cases where keratoconus is identified, the maturing process (which occurs naturally) can be brought on artificially by Cross Linking technique using a special ultra-violet light (similar to a sun bed). Once it has been confirmed that your keratoconus is progressing and that your eye measurements meet certain criteria, you can be considered for the treatment.

Suitability for the technique

Cross linking is selected for patients with progression of the corneal curvature (level of protrusion). Typically a progression of 1.5 dioptre (a unit of measurement of the optical power of a lens) or more in a year is considered to be significant and with the patient being under the age of 35 years although there can be variations in this.

Ideally the patient should have less than 58 dioptres of corneal steepening (any more than this is likely to give limited benefits). However, this technique can be considered with for patients with 58 dioptres or more, prior to moving on to more invasive surgical options, such as corneal transplant.

To perform Cross Linking safely we require a minimal corneal thickness of 400 microns after removal of the surface layer or corneal cells (epithelium) at time of surgery. In order to obtain this, typically patients with less than 425 microns thickness with the surface layers of cells in tact prior to surgery are generally not included.

Please remember, your true suitability for this treatment can only be known on the day of the proposed treatment when the thickness of your cornea has been measured after the removal of the surface corneal cells.

How the technique is performed

The procedure is performed under a local or general anaesthetic (to be discussed with your surgeon) and as a day case.

After all the measurements have been confirmed, the surface layer of your eye is bathed with special drops whilst you lie on the theatre table. The ultra-violet light is then
focused on the surface of the eye for a total of 30 minutes (done in several sessions).

**What to expect afterwards**

After your treatment and recovery you will be given "Take Home" antibiotic drops, dilating drops (make your pupil large) and artificial tear drops. The procedure should not be painful but the eye will become "sore" afterwards and this will last for a few days.

**Going home advice**

The antibiotic and dilating eye drops are stopped in approximately one week but the artificial tear drops will need to be continued for a while longer.

There will be a contact lens (a special bandage contact lens) in the treated eye for approximately one week to enable the eye to settle and be more comfortable.

You will normally attend for a check-up a week after treatment and your drops will be reduced over time.

Lubricating eye drops should be used for several months and you will need to attend for further check-ups and measurements in this time.

**DO NOT** get any non-sterile water in the eye until the healing process has been completed (washing face, hair and showering needs to be done with care).

Your surgeon will advise when to come for your follow-up checks and when your healing process has completed. Remember to use the drops that were given to you as recommended and the eye should be kept clean and not rubbed.

The vision will be blurred in the early days after surgery but will gradually improve.

**Emergency advice**

If your vision drops dramatically or there is significant pain or discharge you must report to the Accident and Emergency department (weekends and after business hours) or contact the Eye clinic during normal clinic hours for advice.

**Final advice**

All surgical procedures carry a degree of risk with them and the surgeon will discuss the risks and benefits of each of the procedures with you before you decide on a course of treatment.

Patient studies on eyes that have undergone this procedure have demonstrated improved stability without evidence of further changes in their condition over a five year period although it is not known exactly how it works and how long the benefits of the procedure last.

**Reference Section**

This is the section which lists all the main reference sources used in the leaflet.

Photochemical corneal collagen cross linkage using riboflavin & ultraviolet A for keratoconus & keratectasia found at: https://www.nice.org.uk/guidance/IPG466/IPF/chapter/The-condition

Keratoconus found at: http://www.davidobrart.co.uk/Keratoconus.html

Information for patients and visitors

Corneal Collagen Cross-Linking found at:
http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2880370/

Medical terms explained

Riboflavin (Vitamin B2): The vitamin B2 and low dose UV light produce a chemical change in the clear skeleton of the cornea. The process makes new structural bonds.

Collagen: A type of protein that makes up a lot of the connective tissue in the body.

Cornea: The clear covering of the eye – needed for focusing. Average central thickness is approximately 545µ (approximately 0.5mm).

Epithelium: The layer of cells covering the outside of the eye.

UV: Ultraviolet light. There are 3 types: UV A, UV B and UV C. UV A is responsible for skin tanning and the production of vitamin D in the body.

Dioptre: A unit of measurement of the optical power of a lens.

Contact details for Further Information

Ring the hospital switchboard: (Diana, Princess of Wales Hospital), 01472 874111 and ask to be put through to the eye clinic to speak to a Specialist Nurse or if not available at time of calling, leave a message with Mr Goel’s secretary.

Concerns and Queries

If you have any concerns / queries about any of the services offered by the Trust, in the first instance, please speak to the person providing your care.

For Diana, Princess of Wales Hospital
Alternatively you can contact the Patient Advice and Liaison Service (PALS) on (01472) 875403 or at the PALS office which is situated near the main entrance.

For Scunthorpe General Hospital
Alternatively you can contact the Patient Advice and Liaison Service (PALS) on (01724) 290132 or at the PALS office which situated on C Floor.
Alternatively you can email: nlg-tr.PALS@nhs.net

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