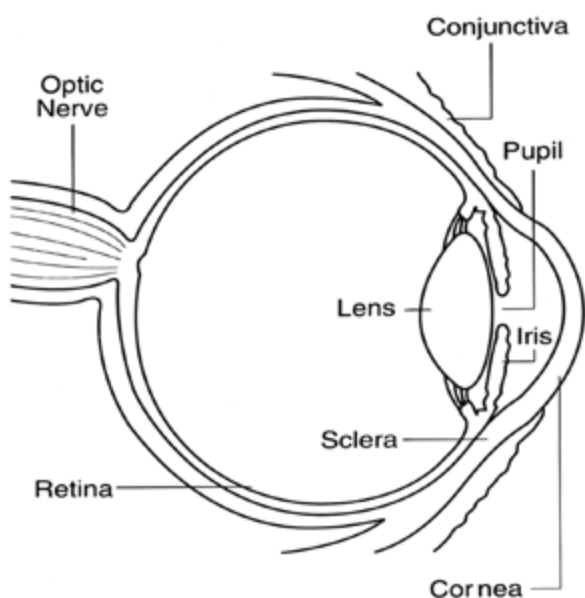


## Keratoconus



### How does keratoconus affect the eyesight?

The abnormal shape of the cornea creates an irregularity in the focussing of the eye and therefore the vision is blurred. In severe cases the cornea can also become scarred.

### How common is Keratoconus?

The true prevalence is unknown but Keratoconus may affect approximately 1 in 100 to 1 in 2000 people.

### What causes Keratoconus?

Although it may sometimes run in families keratoconus is not a clearly inheritable condition. It can also be associated with allergic diseases such as asthma and eczema. There is also an association with eye-rubbing so **patients with keratoconus should avoid rubbing the eyes.**

If there are signs of allergic reaction which is causing irritation and eye rubbing, eye drops may be prescribed to help control the allergy. This should keep the eyes more comfortable so you feel less inclined to rub them.

**The Cornea** is the clear window at the front of the eye.

Keratoconus is a condition of the cornea which causes it to become gradually thinner and bulge. The cornea develops a more conical and uneven shape. The change in shape tends to progress from adolescence until middle age, when the condition becomes more stable. The rate of change varies. For this reason regular monitoring is highly recommended. If progression is identified, corneal cross-linking may be indicated (see below).

The condition almost always affects both eyes but usually one eye is more affected than the other. It is not unusual for mild cases of keratoconus to be undetected until later in life.

# Can the eyesight be improved?

There are two arms to the management of keratoconus.

## 1. Optical management

In the early stages of keratoconus, spectacles can often improve the eyesight. If the eyesight cannot be improved by spectacles, specialist contact lenses may help. In some patients for whom contact lenses are unsuitable, specialist surgical procedures can be carried out to reshape the front of the eye. These are outlined later in this leaflet.

If all the above are unsuitable or unsuccessful, a corneal transplant may be needed. The usual indications for corneal transplant are an inability to see well despite contact lenses or scarring of the cornea.

## 2. Management of progression

If progression of keratoconus is detected, a treatment called corneal crosslinking may be offered which aims to stabilise the shape of the cornea and prevent future worsening of the condition, although it does not usually improve the eyesight.

Treatments which MAY IMPROVE the eyesight (optical correction)	Treatments that MAY STOP the progression of keratoconus
Spectacles Contact lenses ICRS Corneal transplant	Corneal cross linking  (Avoidance of eye-rubbing is also recommended)
<b>However, these do not stop the progression of keratoconus</b>	<b>However, these do not improve the eyesight</b>

A combination of the above treatments may be needed.

## Contact lenses

Contact lenses do not cure or treat keratoconus, but they may improve the vision. The smooth outer surface of the contact lens focuses the incoming light more evenly than the uneven cornea and thus allows the eye to see more clearly. Some eyes, particularly with mild keratoconus, can be fitted with standard contact lenses by community optometrists/opticians. Some eyes can be difficult to fit with contact lenses, but many specialised types of contact lenses have been developed. They may need to be fitted by a specialist contact lens practitioner. In some circumstances this is undertaken in the hospital setting. Several fittings requiring several visits may be needed to find a lens with the best comfort and vision.

Traditionally, contact lenses for keratoconus have been the 'hard' or rigid gas-permeable variety, although some manufacturers are producing specialised

'soft' lenses and more oxygen permeable silicone hydrogel lenses. These often require specialist fitting and the visual outcome can vary.

Some patients also find good vision correction and comfort with a "piggyback" lens combination, in which gas-permeable rigid lenses are worn over soft lenses, both providing a degree of vision correction.

Scleral lenses are sometimes prescribed for cases of severe keratoconus; these lenses cover a greater proportion of the surface of the eye and hence can offer improved stability.

**There is a risk of infection when wearing contact lenses and the risk becomes much greater if the lenses are not kept clean. Regular visits to the contact lens practitioner are essential.**

## Corneal cross-linking

This process stiffens the cornea which stops the keratoconus from getting worse. In the most common type of cross linking procedure the corneal surface is numbed with anaesthetic and removed temporarily. The eye is treated with a vitamin B substance called riboflavin and ultraviolet light. It usually does not improve the eyesight, so contact lenses may still be needed. Cross linking is available on the NHS where there is evidence of progression. At present the hospitals offering cross linking closest to Exeter are Bristol Eye Hospital and Moorfields in London although we are in the process of setting up this service in Exeter.

Corneal cross linking has not yet been fully researched, but early results from research studies are very promising has an excellent

success rate, stabilising the condition in nearly 100% of treated eyes. As with any procedure, not all cases benefit and in some cases the eyesight may be made worse. The risks of the procedures are low but scarring and/or infection are the main concerns. The very long-term results are not known as the treatment has only been used for 10-20 years, and cross linking may need to be repeated if it is not successful the first time round.

## Other surgical procedures

There are various surgical procedures which are suitable for some very specific cases of keratoconus where contact lenses are not suitable. These include Intracorneal Ring Segments (ICRS), Implantable Collagen Lenses (ICL), and laser Photorefractive Keratectomy (PRK) to name a few. These are not always suitable for all cases and your eye specialist will discuss these options in more detail if they would be suitable for your condition.

## Corneal transplantation

A minority of cases of keratoconus can progress to a point where vision correction with glasses or contact lenses is no longer possible. Corneal transplantation can be used to create a better corneal shape and improve vision in these cases.

Full visual rehabilitation after a corneal transplant usually takes 1 to 2 years. Corneal transplantation usually improves the eyesight but an absolutely perfect result from surgery is unlikely and there is a strong possibility that the eye will still need to be fitted with a contact lens afterwards. Surgery is therefore not a shortcut to perfect eyesight and is not a way of avoiding contact lens wear.

The operation is commonly performed under a general anaesthetic (asleep). All cases require regular follow-up with an eye specialist, usually for many years. A corneal transplant can last for many years but may not last forever. Repeat surgery may be needed.

## Related disorders

Several other non-inflammatory eye disorders, generally rarer than keratoconus, also cause thinning of the cornea:

### Keratoglobus

Keratoglobus is a very rare condition that causes corneal thinning primarily at the edges of the cornea.

### Pellucid marginal degeneration

Pellucid marginal degeneration causes thinning of a narrow band within the lower part of the cornea. It causes blur that can often be corrected by spectacles, and may cause glare.

## Further information

- <http://www.keratoconus-group.org.uk/>
- <http://www.nkcf.org/>

## Summary

Keratoconus can affect people in a variety of different ways. Several treatment options are available. Not all options are suitable for everyone. More than one consultation with more than one specialist

is often needed to determine which options may best suit a patient's needs.

More than one treatment may be needed. Good vision can often be achieved, although the eyesight may not be perfect. Keratoconus very rarely results in blindness. In many cases time and patience are required to obtain a good result, with regular visits to an eye specialist.

Developments in contact lenses, treatments and research are ongoing.

The Trust cannot accept any responsibility for the accuracy of the information given if the leaflet is not used by Royal Devon staff undertaking procedures at the Royal Devon hospitals.

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