Patient information

Keratoconus

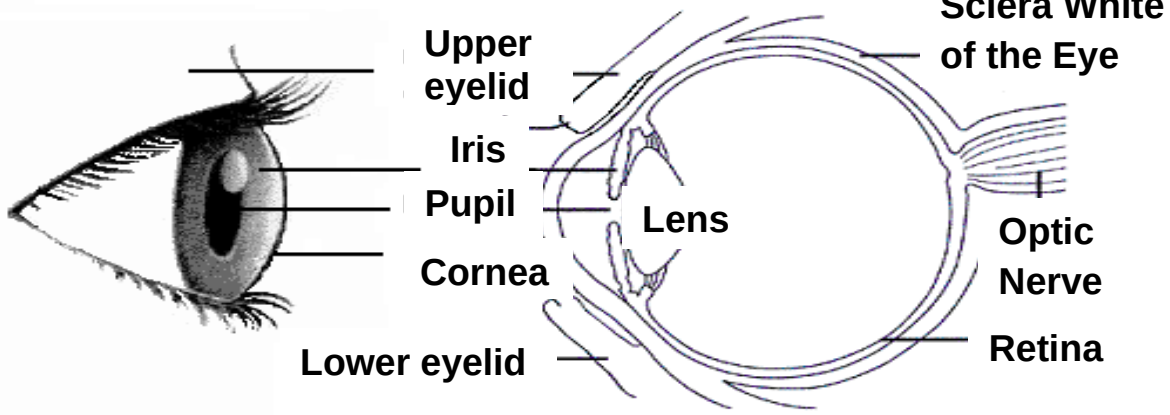
St. Paul's Eye Department -Royal Liverpool Hospital

What is Keratoconus?

Keratoconus is a complaint of the cornea.

The cornea is the clear 'window' of your eye, which is located in front of the iris.

Figure 1 Side View of the eye

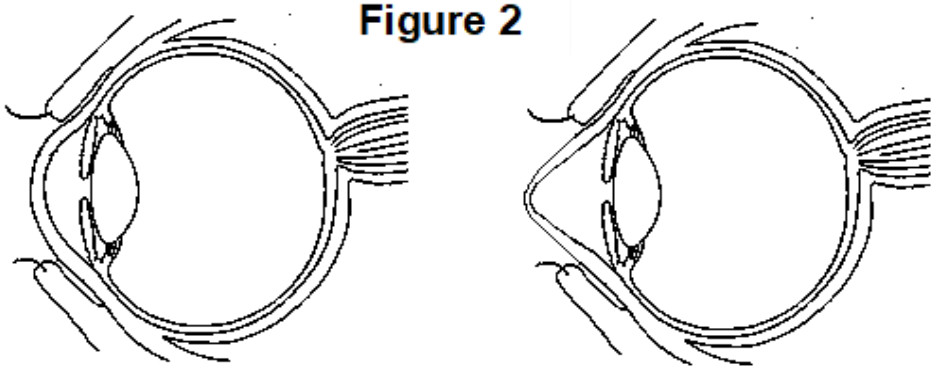


The cornea plays a large part in vision as together with the lens, it focuses images onto the retina, which then sends information to your brain, producing a "picture" (sight).

Normally your cornea is clear, smooth, and spherical in shape (see figure 1). In Keratoconus, your cornea gradually thins, starting near its centre, causing it to lose strength and bulge forwards forming a cone shape (figure 2).

This process continues to spread away from the centre with gradual bulging of the cornea. This development may not occur, and if it does, it usually takes many years.

Figure 2



The normal cornea **The cornea in keratoconus**

As the cornea bulges forward, it loses its curved dome shape, causing the eye to become more myopic (short sighted), and astigmatic (irregular), which leads to reduced vision.

What causes Keratoconus?

Despite continuing research, the underlying cause of Keratoconus is unknown. A number of possible links have however been identified:

- Keratoconus does occasionally run in families (less than 10% of patients), although so far no report of a genetic linkage has been shown.
- Keratoconus does seem to occur more often in people with a history of allergy, especially hay fever, eczema, and asthma. This however, may suggest a link rather than a cause.
- Some research has shown that long term wearing of hard, or gas permeable contact lenses may trigger the onset of Keratoconus in some people.
- Keratoconus has also been found to occur more frequently with other medical conditions, which include Down's syndrome and Marfan's syndrome.

Despite these links, Keratoconus can happen without any of the above factors being present.

How common is Keratoconus?

Keratoconus is a rare condition. It affects between 1 in 2,000 and 1 in 10,000 people.

How does it progress?

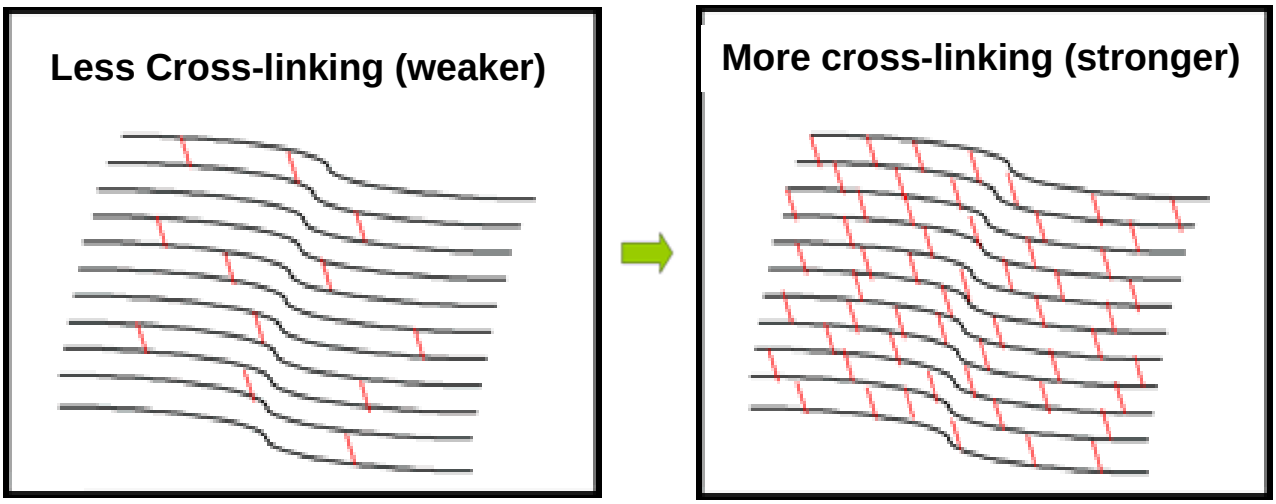
The first symptoms you may notice are blurred and irregular vision, together with increased sensitivity to light and glare. Keratoconus is usually diagnosed in the teens or twenties and will normally progress over a 10 to 20 year period. It almost always affects both eyes, but the rate of development varies from person to person, and is different in the two eyes. One eye may be affected before the other.

As Keratoconus develops, your cornea is stretched and thinned, and the normally transparent (clear) tissue may scar, causing a further reduction in vision. Rarely, in severe cases if a sudden stretching of the cornea happens, it can lead to a temporary condition called hydrops (or waterlogging).

This is when the cornea becomes so fragile that a deep layer of the cornea tears causing the cornea to swell (The cornea never becomes so stretched and thin that it actually bursts). It leads to your eye having a cloudy appearance, together with a sudden reduction in vision. It rarely results in further problems, and your cornea will heal itself over several weeks without any treatment.

How is Keratoconus treated?

Corneal cross linking can be performed. By removing the corneal epithelium and applying Riboflavin drops to the eye. After the cornea is saturated with the riboflavin, the eye is exposed to an ultraviolet (UVA) light. This UVA light interacts with the riboflavin, producing reactive oxygen molecules which cause the formation of chemical bonds between and within the corneal collagen fibrils, making them stiffer.



It is a 45-60 minute procedure; wherein Riboflavin drops (vitamin B2 commonly used in food) are applied to the cornea at regular intervals and activated by ultraviolet radiation to induce cross-links

Contact Lenses

When spectacles (glasses) can no longer correct your vision, rigid contact lenses may be considered. Rigid lenses cover the cornea providing a regular, spherical surface.

Soft contact lenses tend not to be used as they mould to the cornea, following its irregular shape, and so do not correct the problems caused by the conical cornea.

As Keratoconus progresses, it may be necessary for you to attend for frequent lens alterations, to maintain good fit and vision, as a poorly fitting contact lens may itself lead to corneal scarring and development of keratoconus.

Contact lens wear increases the risk of eye infection. It is very important that strict hygiene of hands, lenses, and the lens case is followed

Surgery

The majority of patients with Keratoconus **do not** need surgery, and manage well with spectacles (glasses) and/or contact lenses.

In certain cases however, where good vision can no longer be attained with contact lenses, if contact lenses cannot be comfortably worn for most of the day, or if corneal scarring is badly interfering with your vision, then surgery may be indicated, either INTACS, cross-linking or corneal transplantation.

If there is a possibility you do need surgery, the decision will only be made after a full discussion with your ophthalmologist.

Feedback

Your feedback is important to us and helps us influence care in the future.

Following your discharge from hospital or attendance at your outpatient appointment you will receive a text asking if you would recommend our service to others. Please take the time to text back, you will not be charged for the text and can opt out at any point. Your co-operation is greatly appreciated.

For further information on corneal transplantation, we have an information leaflet available, or you can discuss this with the corneal nurse specialist.

Further information

Corneal nurse:
Tel: 0151 706 3928 or 0151 706 2000
Bleep 724
Text phone number: 18001 0151 706 3928
Or 18001 0151 706 2000 Bleep 724

Keratoconus self help and support group:
Anne Klepacz
The Keratoconus Group,
PO Box 26251
London W3 9WQ
www.keratoconus-group.org.uk

All Trust approved information is available on request in alternative formats, including other languages, easy read, large print, audio, Braille, moon and electronically.

يمكن توفير جميع المعلومات المتعلقة بالمرضى الموافق عليهم من قبل ائتمان المستشفى عند الطلب بصيغ أخرى، بما في ذلك لغات أخرى وبطرق تسهل قراءتها وبالحروف الطباعية الكبيرة وبالصوت وبطريقة برايل للمكفوفين وبطريقة مون والكترونياً.

所有經信托基金批准的患者資訊均可以其它格式提供，包括其它語言、 易讀閱讀軟件、大字體、音頻、盲文、穆恩體（Moon）盲文和電子格式，敬請索取。

در صورت تمایل میتوانید کلیه اطلاعات تصویب شده توسط اتحادیّه در رابطه با بیماران را به اشکال مختلف در دسترس داشته باشید، از جمله به زبانهای دیگر، به زبان ساده، چاپ درشت، صوت، خط مخصوص کوران، مون و بصورت روی خطی موجود است.

زانیاریی پێوەندیدار بەو نەخۆشانەی لەلایەن **تراستەوە** پەسەند کراون، ئەگەر داوا بکرێت لە فۆرماتەکانی تردا بریتی لە زمانەکانی تر، ئیزی رید (هاسان خوێندنەوە)، چاپی گەورە، شریتی دەنگ، هێڵی موون و ئەلێکترۆنیکی هەیە.

所有经信托基金批准的患者信息均可以其它格式提供，包括其它语言、 易读阅读软件、大字体、音频、盲文、穆恩体（Moon）盲文和电子格式，敬请索取。

Dhammaan warbixinta bukaanleyda ee Ururka ee la oggol yahay waxaa marka la codsado lagu heli karaa nuskhado kale, sida luqado kale, akhris fudud, far waaweyn, dhegeysi, farta braille ee dadka indhaha la', Moon iyo nidaam eletaroonig ah.

Hospital: Royal Liverpool Hospital
Author: Claire Britten, Corneal Nurse
Review date: April 2026