

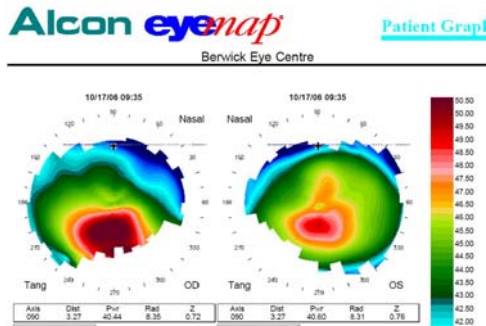
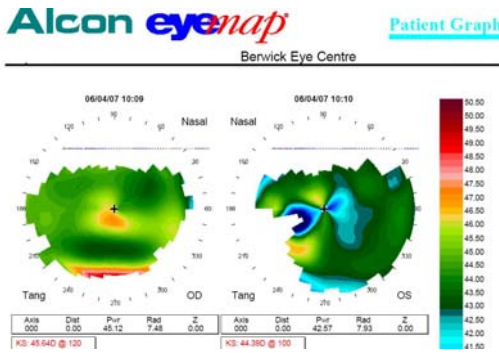
The EyeMap machine.

Corneal topography is the most accurate tool available for measuring corneal curvature. It produces a map of the surface of the cornea and provides essential information about the cornea's shape, distortions, and astigmatism for patients considering refractive surgery or who are suffering from keratoconus. At Berwick Eye Centre we use the Alcon EyeMap® EH-290, a state-of-the-art corneal topographer from one of the leading manufacturers of ophthalmic instruments.

The EyeMap machine may look intimidating with its black-and-white spiral, but don't worry -- it's a fast, easy and painless test. All you have to do is place your hands on the table, rest your chin on the ledge and lean your head on the bar. The technician will ask you to blink a few times so the natural tear film on your eye is as uniform as possible, and then to open your eye wide. The machine will buzz a little and snap a picture. You'll see bright rings of light, and that's all.

Those light rings are shining into your eye and reflecting back into the EyeMap machine. Distortions in your cornea bend the rays of light, so when they bounce back, they arrive in slightly different positions.

Computer software analyzes the shifted light, calculates the surface characteristics of your cornea, and produces a highly detailed image. Within a few seconds you'll be able to see the image on the monitor. Different colors represent irregularities on the surface of the cornea like mountains and plains in a landscape. Blue and green indicate flatter sections of your cornea, while pink and red signify steeper areas.

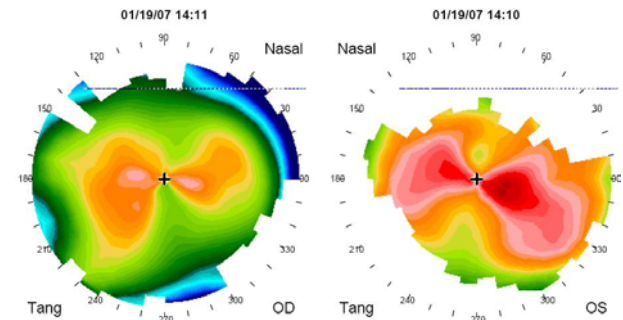


Cost of Corneal topography

Corneal topography costs \$55.00 in addition to the consultation fee. It is not rebateable from Medicare at present.

CORNEAL TOPOGRAPHY

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Corneal topography is a process for mapping the surface curvature of the cornea, similar to making a contour map of land. The cornea is a clear membrane that covers the front of the eye (See Anatomy of the Eye) and is responsible for about 70 per cent of the eye's focusing power. To a large extent, the shape of the cornea determines the visual ability of an otherwise healthy eye. A perfect eye has an evenly rounded cornea, but if the cornea is too flat, too steep, or unevenly curved, less than perfect vision results.

The purpose of corneal topography is to produce a detailed description of the shape and power of the cornea. Using computerized imaging technology, the 3-dimensional map produced by the corneal topographer aids an ophthalmologist in the diagnosis, monitoring, and treatment of various visual conditions.

How does corneal topography work?

The corneal topographer is made up of a computer linked to a lighted bowl that contains a pattern of concentric rings. The patient is seated in front of the bowl with his or her head pressed against a bar while a series of data points are generated on a placido disk, which has been projected on the cornea. Computer software digitizes these data points to produce a print-out of the corneal shape, using different colors to identify different elevations.

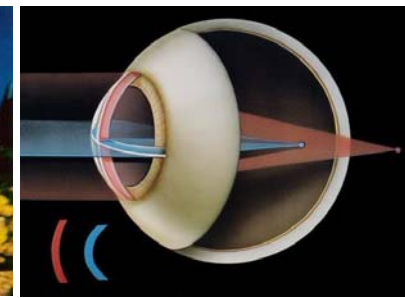
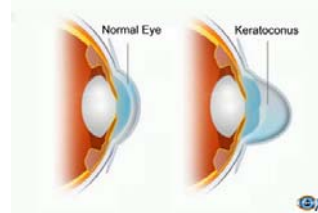
The procedure itself is painless and brief. It is a non-contact examination that photographs the surface of the eye using ordinary light. The greatest advantage of corneal topography is its ability to detect conditions invisible to most conventional testing.

What are the uses of corneal topography?

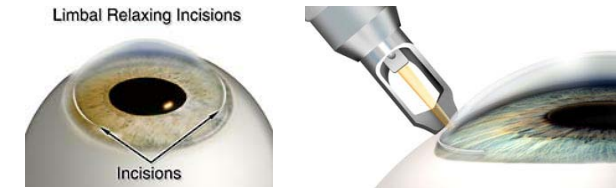
Corneal topography is not a routine test. Rather, it is used in diagnosing certain types of problems, in evaluating a disease's progression, in fitting some types of contact lenses, and in planning surgery. It is commonly used in preparing for refractive eye surgery. The corneal topography map is used in conjunction with other tests to determine exactly how much corneal tissue will be removed to correct the visual defect.

Corneal topography is used in the diagnosis and management of various corneal curvature abnormalities and diseases such as:

- Diagnosis of hidden astigmatism
- Keratoconus, a degenerative condition that causes a thinning of the cornea
- Corneal transplants
- Corneal scars or opacities
- Corneal deformities
- Fitting contact lenses
- Irregular astigmatism following corneal transplantation
- Planning cataract surgery
- Planning refractive surgery



Uncorrected astigmatism impairs both distance and near vision. Depending on the degree of astigmatism, objects may appear distorted.



Limbal relaxing incisions (LRI) Limbal relaxing incisions (LRI) are truly a modification of astigmatic keratotomy (AK), which is a procedure to treat astigmatism. Astigmatism is present when the cornea is not spherical, i.e., it is steeper in one meridian than the opposite meridian 180 degrees away. The cornea with astigmatism may be thought of as being more football shaped rather than basketball shaped. LRI's are incisions that are placed on the far peripheral aspect of the cornea (the limbus) resulting in a cornea that is more round. The astigmatism is thus reduced and uncorrected vision is improved.

The procedure can be completed in a few seconds after numbing the eye with anesthetic drops. There is usually little if any post-operative discomfort. The procedure is extraordinarily safe and is not associated with glare or starburst, as often occurs with true corneal incisions (RK and AK). Furthermore, the cornea is usually stable within a week, indicating that visual fluctuations have typically resolved by that time interval.

Limbal relaxing incisions have gained widespread acceptance amongst cataract surgeons where it is often combined with the cataract operation to reduce pre-existing astigmatism. This results in better post-operative vision without glasses. The procedure can also be used in individuals whose primary refractive error is astigmatism

Keratoconus (ker-ah-to-ko'-nus) means to have a 'coned-shaped cornea'. It is a relatively common and non-inflammatory progressive disorder whereby the normally round cornea becomes thin and irregularly conically shaped. The abnormal shape of the cornea prevents the light from correctly focusing on the retina. Called irregular astigmatism, it results in blurred vision and visual distortions.

Nearly 10 per cent of new cases of keratoconus show some level of genetic transmission from a family member. Its definitive cause is unknown, although there are several theories that exist. Some eyecare practitioners believe that keratoconus relates to other conditions such as atopic diseases, for example, endocrine disorders or Down's syndrome. Others believe that it results from frequent rubbing of the eye, as a relatively high percentage of patients with the disease indicated a history of forcefully rubbing their eyes. The cornea usually begins to change shape during puberty or early twenties and gradually develops thereafter, although there may be periods of no growth. It is rare that the cornea distorts rapidly and causes a sudden change in vision. Either one or both eyes are affected.