

What is the Cornea ?

The cornea is the front part of the eye. Think of it as the crystal on the front of your watch.

The cornea, as thick as two business cards, must be transparent to enable clear vision.

The cornea has five layers, front to back, Epithelium, Bowman's layer, Stroma, Descemet's membrane, and Endothelium.

What are Corneal Dystrophies?

With corneal dystrophies, one or more of these layers malfunction, causing a loss of transparency and possibly visual distortion and pain from their induced physiological abnormalities.

The cure for several of these diseases is a corneal transplant, using a human donor through an eye bank or, as an extreme measure, an artificial cornea.

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Corneal Dystrophies

These are potentially blinding diseases which may affect the transparent front part of the eyes. Dystrophies are genetic and bilateral, affecting both eyes. They cause physiological abnormalities that often result in visual distortion.

THE CORNEAL DYSTROPHY FOUNDATION

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Types of Corneal Dystrophies

Experts count more than 20 corneal dystrophies. They are categorized as Anterior, Posterior, and Stromal.

Most are inherited, progress gradually, affect both eyes, occur in otherwise healthy people, and are not caused by outside factors such as diet.

Here are four of the most common corneal dystrophies and the part of the cornea where the trouble begins:

- **Keratoconus:** the middle of the cornea thins and gradually bulges outward. Cured by corneal transplant
- **Map-Dot-Fingerprint Dystrophy:** the membrane that separates the epithelium from the Stroma develops abnormally.
- **Fuchs' Dystrophy:** the cells in the Endothelium fail. Cured by Corneal Transplant.
- **Lattice Dystrophy:** originates in the Stroma. Cured by corneal transplant.

Symptoms of Corneal Dystrophies

- Is your eyesight 'fuzzy' in the morning, clearing later in the day?
- When you first open your eyes in the morning, do you ever experience a sharp, stabbing or other type of pain?
- Do your eyes feel gritty, sandy or scratchy in the morning?
- Does it seem as if your glasses were sometimes smeared with Vaseline?
- Do you experience major problems with glare from the sun, headlights or other bright lights?
- If someone is between you and a bright light or the sun, are you unable to identify their features?
- Do you have trouble with contrast vision that causes difficulties walking and/or driving at dusk or in the dark, e.g., tripping on steps or curbs because you thought they were just shadows?
- Do you have a history of family vision problems, specifically older relatives?

Corneal Transplants

Corneal transplant surgery has the highest success rate of any type of transplant surgery, 95% or better. The first successful corneal transplant in the United States was done by Dr. Ramon Castroviejo in 1941.

Types of Corneal Transplants
Penetrating Keratoplasty (PK), is the traditional full thickness transplant that was the only option for over half a century until the advent of the **EK**. In the PK procedure, all five layers of the cornea are removed and replaced by donor tissue, requiring many

PK (cont'd)

stitches and a long healing time of 6 months to a year or possibly longer before vision stabilizes. Varying amounts of astigmatism are often introduced because of the induced stress placed on the graft by the stitching method. Double and higher multiple imaging is often reported by the patient.

A PK reduces the structural integrity of the eye. Sutures are a potential path for infections. The incision heals very slowly. Blunt force trauma to the head may cause the wound to rupture since the structural integrity of the eye is compromised.

Endothelial Keratoplasty (EK) is the latest procedure, in use since 2000. This surgery replaces only the diseased endothelial cell layer, using no stitches in the cornea to cause less astigmatism, resulting in faster healing, and a stronger cornea and eye. Versions of these posterior transplants are called DLEK, DSEK, DMEK, and DSAEK.

EK is the surgery of choice for endothelial corneal dystrophies that is endorsed by The American Academy of Ophthalmology, The Cornea Society and the Eye Bank Association of America

Femtosecond Laser

Recently, use of the Femtosecond Laser in PK surgery offers promise of a stronger bond at the wound and much more precise donor button fit. The instrument is only in **experimental** use. We know of no completed medical study on this instrument.