

# CORNEAL CONDITIONS

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What are the symptoms of corneal conditions?

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## Corneal Conditions

The cornea is the clear, protective outer layer of the eye. Along with the sclera (white of the eye), the cornea serves as a barrier against dirt, germs, and other particles that can harm the eye's delicate components. The cornea is also capable of filtering out some amounts of the sun's ultraviolet light.

The cornea also plays a key role in vision. As light enters the eye, it is refracted, or bent, by the outside shape of the cornea. The curvature of this outer layer helps determine how well your eye can focus on objects close up and far away. If the cornea becomes damaged through disease, infection, or injury, the resulting scars or discoloration can interfere with vision by blocking or distorting light as it enters the eye.

There are three main layers of the cornea:

- **Epithelium:** The most superficial layer of the cornea, the epithelium stops outside matter from entering the eye. This layer also absorbs oxygen and nutrients from tears.
- **Stroma:** The stroma is the thickest layer of the cornea and is found behind the epithelium. It is made up mostly of water and proteins that give it an elastic but solid form.
- **Endothelium:** The endothelium is a single layer of cells located between the stroma and the aqueous humor, the clear fluid found in the front and rear chambers of the eye. The endothelium works as a pump, expelling excess water as it is absorbed into the stroma. Without this specialized function, the stroma could become waterlogged and hazy and opaque in appearance, also reducing vision.

The term "corneal disease" refers to a variety of conditions that affect mainly the cornea. These include infections, degenerations, and many other disorders that may arise mostly as a result of heredity.

### What are the symptoms of corneal conditions?

With its ability for quick repair, the cornea usually heals after most injury or disease. However, when there is deep injury to the cornea, the

healing process may be prolonged, possibly resulting in a variety of symptoms, including:

- Pain
- Blurred vision
- Tearing
- Redness
- Extreme sensitivity to light
- Corneal scarring

If you experience any of these symptoms, seek care from an eye doctor. They may indicate a more serious problem or require special treatment.

### What conditions can damage the cornea?

#### Keratitis

This is an inflammation of the cornea that sometimes occurs with infection after bacteria or fungi enter the cornea. These microorganisms can enter the eye after deep injury, causing infection, inflammation, and ulceration of the cornea. Though uncommon, this type of infection can also arise after injury from wearing contact lenses.

Symptoms of keratitis include:

- Severe pain
- Reduced visual clarity
- Corneal discharge

Treatment usually includes antibiotic or antifungal eye drops.

#### Ocular Herpes (Herpes Of The Eye)

This is a viral infection of the eye that may reoccur. The main cause of ocular herpes is the herpes simplex virus I (HSV I). This is the same virus that causes cold sores, but ocular herpes can also result from the sexually transmitted herpes simplex II virus (HSV II) that causes genital herpes.

Ocular herpes produces sores on the surface of the cornea; over time, the inflammation can spread deeper into the cornea and eye.

There is no cure for ocular herpes, but it can often be controlled with the use of antiviral drugs.

#### Herpes Zoster (Shingles)

Shingles is a recurrence of the chicken pox virus in people who have already had the disease. After the bout of chicken pox, this virus usually remains inactive within the nerves of the body. It can later travel down these nerves, infecting specific parts of the body, like the eye. Herpes

zoster can cause blisters or lesions on the cornea, fever, and pain from nerve fibers. Corneal lesions usually heal by themselves, but antiviral treatment may shorten the course of disease. Some patients develop chronic inflammation of the cornea after shingles requiring use of long-term eye drops, or less commonly, corneal surgery.

Shingles can occur in anyone exposed to the chicken pox virus, but there is an increased risk in older adults (especially those over age 65) and people with a weakened immune system.

See your doctor if you have any symptoms of shingles.

## Corneal Dystrophies

There are more than 20 corneal dystrophies, diseases that cause structural problems with the cornea. Some of the most common are:

### **Keratoconus**

Keratoconus is a progressive disease in which the cornea thins and changes shape. Keratoconus changes the curvature of the cornea, creating either mild or severe distortion, called astigmatism, and usually nearsightedness. Keratoconus may also cause swelling and scarring of the cornea and vision loss.

Causes of keratoconus include:

- Genetics (a person can inherit a tendency to get the condition from a parent)
- Eye trauma (for example, from rubbing your eyes or long-term use of hard contacts)
- Eye diseases, such as retinitis pigmentosa, retinopathy of prematurity, and vernal keratoconjunctivitis
- Other diseases, like Down syndrome, osteogenesis imperfecta, Addison's disease, Leber's congenital amaurosis, and Ehlers-Danlos Syndrome

At first, the condition is correctable with glasses or soft contact lenses. But, as the disease progresses, you may need to wear rigid gas permeable contact lenses.

A corneal transplantation may also be necessary. During this procedure, the damaged cornea is replaced with a donated cornea. This operation is successful in about 9 out of 10 people with advanced keratoconus. Even after a transplant, you most likely will need glasses or contact lenses to see clearly.

Corneal cross-linking is a newer treatment for keratoconus which uses a special type of ultraviolet light to stabilize the cornea and slow the progression of disease. Your doctor may recommend an evaluation for this treatment if you are a candidate for this therapy.

### **Map-Dot-Fingerprint dystrophy**

Map-dot-fingerprint dystrophy is a corneal condition which causes abnormal folds and reduplications of the epithelium, the outermost layer of the cornea. The effects of these changes are patterns in the cornea that resemble maps, dots, and small fingerprints.

Map-dot-fingerprint dystrophy usually affects adults between the ages of 40 and 70, or children as a result of heredity. It is usually painless and causes no vision loss. In some cases, however, epithelial erosions may occur. Epithelial erosions are spontaneous corneal abrasions that occur, exposing the nerves lining the cornea and causing severe pain. The cornea's normal curvature may be altered, causing astigmatism and

nearsightedness.

As the cornea is altered, vision may be blurry and accompanied by:

- Moderate to severe pain
- Increased sensitivity to light
- Excessive tearing
- A feeling that something is in your eye

Most patients with this condition require no treatment. If erosions are occurring, they may be managed with topical lubricating ointments, special contact lenses, or a minor surgical procedure to debride the abnormal surface tissue.

### **Fuch's dystrophy**

Fuch's dystrophy is a gradual deterioration of the innermost layer of the cornea, the corneal endothelium. As these cells weaken over time, the cornea may swell causing blurred vision. In the advanced stages of this condition, haze and small blisters on the corneal surface may appear, causing pain and irritation.

A slowly progressing disease, the earliest signs of Fuch's dystrophy may be visible in patients in their 30's and 40's. However, the disease doesn't normally affect vision until about 20 years later. It is more common in women than men.

Some patients with Fuch's dystrophy experience blurred vision in the morning that gradually clears up during the day. As the disease worsens, swelling becomes more consistent and vision may be blurry at all times.

Treatment includes:

- Observation for the early stages of the condition
- Ointments and eye drops for mildly symptomatic patients
- Corneal transplant surgery when the vision is significantly impaired or chronic pain is present

### **Lattice dystrophy**

Lattice dystrophy is characterized by the presence of abnormal protein fibers throughout the stroma. Although this condition can occur at any age, early changes can be seen in childhood.

Lattice dystrophy gets its name from the clear overlapping lines of proteins in the stroma. This can make the cornea cloudy and reduce vision. In some people, these proteins may cause epithelial erosion.

Treatment of lattice dystrophy includes:

- Eye drops and ointment for symptomatic irritation
- Corneal transplant for severe vision loss or chronic pain

Although the early results of corneal transplantation are typically very good, lattice dystrophy may reappear in transplant patients requiring long-

term treatment.

### How is corneal disease diagnosed?

Corneal disease can only be diagnosed after a thorough examination by an ophthalmologist.

### Can corneal disease be prevented?

The risk of infectious corneal disease caused by bacteria and viruses can be reduced by protecting the eye from injury and limiting physical contact with people who have contagious forms of conjunctivitis. Avoid sharing eye makeup, contact solution, lens cases, and eye drops with people who are infected. Wash your hands thoroughly with soap and warm water for at least 15 seconds after contact with an infected person.

Although corneal disease resulting from hereditary factors, like dystrophies, cannot be prevented, vision can often be preserved through early detection and treatment.

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