

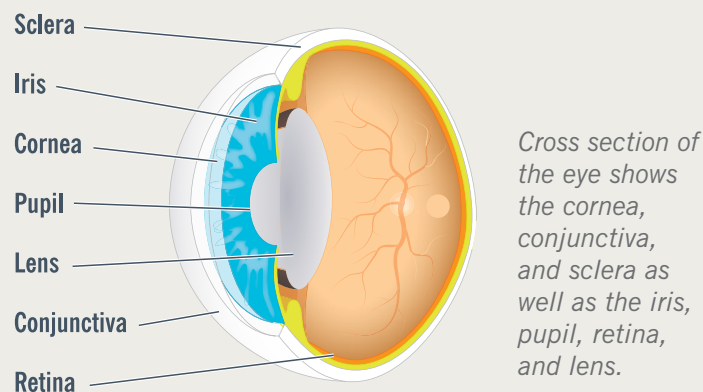
## Anatomy and Function of the Human Eye

Just as the skin protects the human body, the ocular surface protects the human eye. The ocular surface is made up of the cornea, the conjunctiva, the tear film, and the glands that produce tears, oils, and mucus in the tear film.

**SCLERA:** The sclera is the white outer wall of the eye. It is made of collagen fibers that are arranged for strength rather than transmission of light.

**CORNEA:** The cornea is the front center portion of the outer wall of the eye. It is made of collagen fibers that are arranged in such a way so that the cornea is clear. The cornea bends light as it enters the eye so that the light is focused on the retina. The cornea has a protective surface layer called the epithelium.

**CONJUNCTIVA:** The conjunctiva is a transparent mucous membrane that covers the sclera up to the edge of the cornea.



## The Ocular Surface in Healthy Eyes

Eyes with a healthy ocular surface can wear contact lenses comfortably on the cornea, which is one of the most sensitive parts of the human body. The healthy eye continuously produces tears, mucus, and oils that prevent damage to the conjunctiva and cornea from the environment. This same tear film allows the healthy eye with a normal ocular surface to tolerate a contact lens that touches the cornea.

## The Ocular Surface in Unhealthy Eyes

There are many conditions and diseases that can affect the function of the ocular surface. For example, reduced tear production results in poor lubrication of the cornea and eyelid, leading to the discomfort and blurred vision of dry eye syndrome:



### IRREGULAR OR DISTORTED CORNEA

- Keratoconus
- Pellucid marginal degeneration
- Keratoglobus
- Terrien's marginal degeneration
- Salzmann's nodular degeneration
- Corneal dystrophy



### OCULAR SURFACE DISEASE

- Dry eye syndrome
- Ocular graft-versus-host disease (GVHD)
- Sjögren's syndrome
- Stevens-Johnson syndrome
- Chemical or thermal burns
- Nerve damage
- Herpes simplex



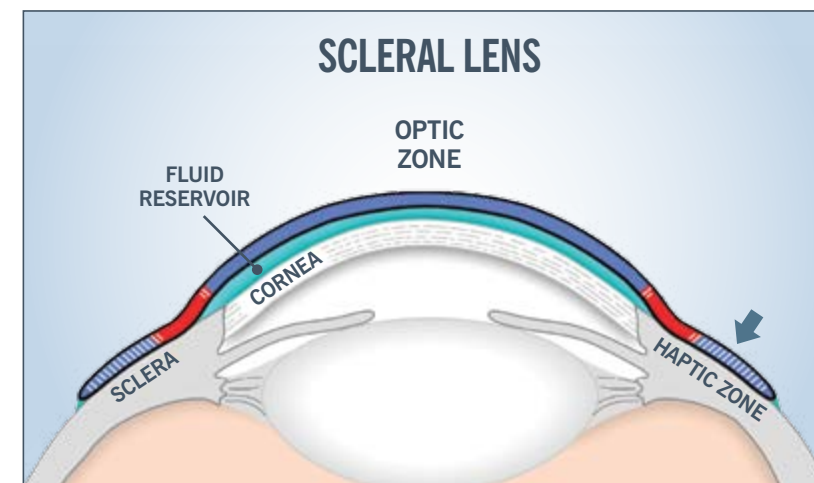
### AFTER EYE SURGERY

- Cornea transplant
- LASIK
- Photorefractive keratectomy (PRK)
- Radial keratotomy (RK)
- For injury
- For scarring

These conditions can create an inadequate environment for the support of corneal contact lenses. But there is an alternative.

## How Scleral Lenses Interact with the Ocular Surface

Scleral lenses are large-diameter lenses designed to vault the cornea and rest on the conjunctival tissue sitting on top of the sclera. The space between the back surface of the lens and the cornea acts as a fluid reservoir. Scleral lenses can range in size from approximately 14.5mm up to 24.0mm.



**Due to their size, scleral lenses consist of at least two zones:**

**The optic zone vaults over the cornea**

**The haptic zone rests on the conjunctiva overlying the sclera**

*This image shows how a scleral lens rests on the surface of an eye with an irregular cornea. The gray arrow points to the haptic zone where the scleral lens actually touches the eye.*

The conjunctiva and sclera are less sensitive than the cornea. Scleral lenses are generally more comfortable than corneal lenses because of the larger diameter that allows them to rest on the conjunctival tissue overlying the sclera as opposed to resting on the sensitive cornea.

The fluid reservoir in a scleral lens helps create an ideal moisture chamber, providing a healthy environment for the eye.

## The Benefits of Scleral Lenses

Because of its rigid gas-permeable material, large diameter, and fluid reservoir, a scleral lens supports and restores a healthy ocular surface. Scleral lenses reduce evaporation and drying and can protect against a challenging environment or eyelid abnormalities. A scleral lens eliminates blurry vision caused by an irregular cornea and can be used to correct nearsightedness, farsightedness, and astigmatism.

By providing a healthy environment for the ocular surface, a scleral lens offers improvement in both comfort and vision for people with irregular or distorted corneas, ocular surface disease, or problems after eye surgery.



For more information, please contact your primary eye care provider or visit [www.bostonsight.org](http://www.bostonsight.org)