



DOHENY  
EYE INSTITUTE

# Prosthetic Replacement of the Ocular Surface Ecosystem | PROSE

Information for Patients and Doctors



BOSTON FOUNDATION *for* SIGHT

## Treatment Description

PROSE (prosthetic replacement of the ocular surface ecosystem) is a pioneering treatment model developed by Boston Foundation for Sight (BFS) to restore vision, support healing, reduce symptoms and improve quality of life for patients suffering with complex corneal disease. PROSE uses FDA-approved custom designed and fabricated prosthetic devices to replace or support impaired ocular surface system functions that protect and enable vision.



## Benefits

- Reestablishes a healthy and stable ocular surface environment that supports healing and reduces symptoms
- Improves vision by masking surface corneal irregularities and transmitting a sharp image to the back of the eye
- Prevents damage by protecting and shielding the cornea and conjunctiva against the environment and eyelids



For many of the thousands of patients suffering with complex corneal disease, PROSE can be the ideal, and sometimes only, treatment capable of restoring vision and dramatically reducing eye pain and light sensitivity.

## Indications

### Ocular Surface Disease

#### Dry Eye Syndrome

Chronic ocular graft versus host disease (GVHD)  
Sjögren's syndrome  
History of LASIK or other refractive surgery

#### Limbal Stem Cell Deficiency

Stevens-Johnson syndrome (SJS)/  
toxic epidermal necrolysis syndrome (TENS)  
Aniridia  
Cicatricial conjunctivitis/ocular cicatricial  
pemphigoid  
Chemical/thermal injury

#### Epidermal Ocular Disorders

Goldenhar syndrome  
Ectodermal dysplasia  
Atopy  
Epidermolysis bullosa

#### Neurotrophic Keratitis

Herpes zoster (shingles)  
Herpes simplex (ocular herpes)  
Familial dysautonomia  
Moebius syndrome  
Trigeminal nerve dysfunction  
Post-surgical

#### Corneal Exposure/Lagophthalmos

Anatomic  
Paralytic

- Acoustic neuroma

### Corneal Ectasia/ Irregular Astigmatism

#### Corneal Degenerations and Dystrophies

Keratoconus  
Keratoglobus  
Pellucid marginal degeneration  
Terrien's marginal degeneration  
Salzmann's nodular degeneration  
Meesmann's corneal dystrophy

#### Post Operative Astigmatism

Cornea transplant (penetrating  
keratoplasty or PK, PKP)  
Radial keratotomy (RK)  
Phototherapeutic keratectomy (PTK)  
Photorefractive keratectomy (PRK)  
Epikeratophakia  
LASIK  
Open globe injury

#### Corneal Scarring

After trauma  
After infection



## Devices Used in PROSE

The prosthetic devices created during PROSE are transparent domes, about the size of a nickel, made of gas-permeable plastic that allows oxygen to reach the ocular surface. Devices fit under the eyelids and rest on the sclera (the relatively insensitive white tissue) of the eye, vaulting the damaged cornea and creating a new smooth optical surface that protects the eye from the environment and blink trauma. The devices are filled with sterile saline at the time of insertion, creating a reservoir of fluid that continuously bathes the ocular surface with oxygenated artificial tears.



### PROSE Creates:

- A new transparent, smooth optical surface over the irregular, damaged or diseased cornea
- An expanded artificial tear reservoir that provides constant lubrication while maintaining necessary oxygen supply

Prosthetic devices have three important zones performing different functions:

**Optic Zone** – replaces the optical power of a healthy cornea in combination with the fluid reservoir

**Transitional Zone** – assures sufficient vault over any cornea shape, independent of base curve

**Haptic Zone** – maximizes ocular surface system function by precisely aligning the shape of the haptic bearing with the shape of the patient's eye

The mathematical description of contours using spline functions that are integral to the Design to Fit (DTF)<sup>™</sup> CAD/CAM system allow devices to be created of almost infinitely variable shapes with smooth transitions between zones.

## Treatment Process



PROSE interdisciplinary treatment teams include a cornea specialist ophthalmologist and an optometrist who has completed an intensive nine - week PROSE Clinical Fellowship at Boston Foundation for Sight. PROSE treatment teams work with each patient, his/her support system and other medical providers to form a collaborative care network in which all members work to understand each patient's specific needs and reach treatment goals together.



PROSE Clinical Fellows use Boston Foundation for Sight's proprietary DTF CAD/CAM system to directly control the design and assure that each prosthetic device precisely fits the patient's unique eye shape and maximizes ocular surface system function. Devices are manufactured at BFS' state-of-the-art lab using Precitech ultra-precision diamond Nanoform computerized numerical command (CNC) lathes, typically used to manufacture high-tech parts for the aerospace industry.



### Steps in the Treatment Process

- Referral from primary eye care provider, medical doctor or cornea specialist
- Initial medical review by our doctors
- Determination of insurance coverage and potential eligibility for financial assistance (2-6 weeks)
- PROSE treatment (4 - 12 day-long visits)
- Periodic follow-up visits as required
- Annual evaluation by the PROSE provider

Patients continue to be followed by their primary eye care provider throughout treatment, and ongoing care is coordinated with primary providers and the PROSE treatment team.

### Call Us Today for a Consultation!

Call us today to learn more or set up a consultation. We are available to answer all of your questions. Please call today! (323) 442-6337



## About Doheny Eye Center PROSE Clinic

Doheny Eye Center in Los Angeles is part of the larger Doheny Eye Institute, a top-ranked research, education, and patient care group of non-profit organizations working together to further the conservation, improvement and restoration of human eyesight. They accomplish this through the discovery of new knowledge, innovative eye care, and the education of the leaders of ophthalmology and vision science. Founded in 1947, the Doheny Eye Institute is currently ranked in the top 10 Ophthalmology hospitals in the United States by US News and World Report. Doheny is affiliated with the Keck School of Medicine at the University of Southern California.

Our PROSE clinic opened in 2009 under the direction of corneal specialists, John Irvine, MD, Samuel Yiu, MD, PhD, and PROSE Clinical Fellow, Gloria Chiu, OD. Dr. Chiu and our PROSE staff would be happy to assist you with any questions you may have regarding candidacy, billing, insurance or scheduling.

### Contact Information

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## About Boston Foundation for Sight

Boston Foundation for Sight (BFS) is an internationally renowned nonprofit eye health care organization specializing in complex corneal disease research, education, treatment and patient care. Their 13,000 square foot facility in Needham, MA, includes a state-of-the-art manufacturing lab, a medical institute staffed with seven doctors and a dozen technicians/trainers, a Clinical Research Center and a new Patient and Community Support Center.

Please visit their website for more information: [www.bostonsight.org](http://www.bostonsight.org) or call 781-726-7337.

[PROSE Guide for Patients and Doctors](#)      [www.doheny.org](http://www.doheny.org)      (323) 442-6337



## Research Highlights

*PROSE treatment “significantly improved visual acuity and visual functioning in patients with corneal ectasia, irregular astigmatism and ocular surface disease....”*

- American Journal of Ophthalmology 2010; 149: 54-61

*Fit of prosthetic devices “could be attained in all candidate eyes (n = 89) with corneal ectasia. 93.1% of eyes achieved visual acuity of 20/40 or better.” PROSE treatment “yielded significant increase in visual function... with high tolerance (wearing failure 8%) at 6 months.”*

- Poster Presentation, World Cornea Congress VI, April 2010

## PROSE Clinic Network

In addition to the Doheny Eye Center at the University of Southern California and Boston Foundation for Sight, there are eleven top-ranked specialty eye care institutes located in academic medical centers in the U.S. and clinics abroad that offer PROSE treatment. Each PROSE clinic is independently operated by PROSE partners who manage scheduling and insurance and provide ongoing care.

Illinois Eye and Ear Infirmary, University of Illinois College of Medicine, Chicago

Kellogg Eye Center, University of Michigan, Ann Arbor

North Shore - Long Island Jewish Health System, Great Neck, NY

Weill Cornell Eye Associates, Weill Cornell Medical College, New York City

Alkek Eye Center, Baylor College of Medicine, Houston, TX

Brooke Army Medical Center, San Antonio, TX

LV Prasad Eye Institute, Hyderabad, India

Sankara Nethralaya, Chennai, India

The Eye Super Specialities (TESS), Mumbai, India

Noor Eye Hospital, Tehran, Iran

Nagoya Eye Clinic, Nagoya, Japan