

Prosthetic Replacement of the Ocular Surface Ecosystem

Prosthetic Replacement of the Ocular Surface Ecosystem (PROSE) is a therapeutic strategy that was pioneered by BostonSight® using custom designed FDA approved scleral contact lenses to restore the ocular surface environment in patients suffering from corneal disease. PROSE therapy is designed to reduce symptoms of ocular discomfort, enhance vision by neutralizing corneal surface irregularities (e.g. irregular astigmatism), and prevent further damage to the cornea. Patients in whom PROSE may be indicated include those suffering from ocular surface disease (e.g. ocular GVHD, Sjögren's syndrome, keratitis sicca), limbal stem cell disease (e.g. ocular cicatricial pemphigoid therapy, Steven's Johnson syndrome), neurotrophic keratitis, ocular surface exposure (e.g. lagophthalmos), corneal degeneration (e.g. keratoconus, pellucid marginal degeneration), corneal dystrophies, and post-surgical induced irregular astigmatism (e.g. radial keratotomy, penetrating keratoplasty, pterygium).

The contact lens clinic at UofL subscribes to similar principles as BostonSight® PROSE therapy using custom made scleral contact lenses. Scleral contact lenses are large diameter rigid gas permeable lenses (RGP) designed to vault the surface of the cornea and rest on the sclera, which is unlike all other contact lenses.

Scleral contact lenses incorporate a lens tear reservoir to interface with the cornea and ocular surface. The scleral lens tear reservoir neutralizes all corneal surface irregularity to maximize vision, as well as provide constant lubrication to the ocular surface, preventing desiccation and breakdown of the corneal epithelium. The high-level of oxygen diffusion and transmissibility of scleral contact lenses coupled with daily renewal of the lens tear reservoir with non-buffered, non-preserved saline solution, promotes a healthy ocular surface ecosystem that otherwise may be absent in patients with complex corneal disease.

Unfortunately, not all patients with complex corneal disease are candidates for PROSE therapy. For example, patients who do not have ample dexterity to insert and remove scleral contact lenses on their own are not ideal, as scleral contact lenses need to be removed daily to prevent buildup up of metabolic waste in the tear reservoir, and neglecting to do so can be highly detrimental to the cornea. Patients with small interpalpebral fissures are not ideal given the large diameter of scleral contact lenses that require a normal to large interpalpebral fissure for safe insertion and removal.

Prior to referring a patient for PROSE therapy, referring physicians should inform the patient that several visits

will be required in order to properly fit and design customized scleral contact lenses, as well as assess lens adaptation and corneal health. Physicians should also inform the patient that most insurance carriers **do not** cover the cost of the fitting, materials (scleral contacts lenses) and associated supplies.

Image: Anterior segment photo (OD) of a 50 year-old white male suffering from ocular GVHD treated with PROSE-type therapy. Prior to PROSE-type therapy the patient's BCVA ODcc:20/50, OSccl:20/50 with no alleviation of severe dry eye and ocular discomfort with aggressive ocular lubrication and insertion of punctual plugs. With PROSE-type therapy the patient's ocular symptoms were alleviated, visual acuity improved to ODscl:20/20, OS scl:20/20, and the cornea and peri-limbal region appeared healthy relative to the unprotected surrounding conjunctiva.



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