

## Scleral Lens Workshop

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### Course Description

This two hour presentation is an interactive, workshop format where basic principles of large diameter, rigid, scleral lenses are discussed. A didactic portion is followed by hands-on practice with insertion, removal, and fitting of scleral lenses. Instructors who are members of the Scleral Lens Education Society will provide hands on fitting experience using scleral lenses from several different lens companies.

### Course Learning Objectives

Provide participants with hands on knowledge and training of scleral lens fitting and management of a wide range of medical conditions. Practitioners will learn fitting guidelines and problem-solving tips with tips from the experts. Practitioners will learn how to use various instrumentation for scleral success. Even practitioners who have never fit a scleral lens should feel comfortable starting a scleral lens practice after the workshop.

### Outline

- I. History of Scleral Lenses
  - A. Blown glass lenses
  - B. Molded plastic lenses
  - C. Modern gas permeable lenses
  
- II. Scleral Lens Terminology, Design and Indications
  - A. Size classifications
    - a. Mini scleral lenses: up to 6mm larger than patient's HVID
    - b. Large scleral lenses: greater than 6mm larger than patient's HVID
  - B. Lens designs and parameters
    - a. Scleral lens geometry
      - i. Optical zone
      - ii. Transition zone
      - iii. Landing zone
    - b. Importance of scleral lens sagittal depth
      - i. Base curve radius vs overall diameter
  - C. Scleral lens indications
    - a. Regular cornea patients
      - i. Refractive error
      - ii. Astigmatism
      - iii. Presbyopia
    - b. Irregular cornea patients
      - i. Primary and secondary corneal ectasias
        1. Advanced (notably decentered) keratoconus

- 2. Keratoglobus
    - 3. Pellucid marginal degeneration
  - ii. Post-surgical/refractive
    - 1. Post-LASIK
    - 2. Post-PRK
    - 3. Post-RK
    - 4. Post Penetrating keratoplasty
      - a. Endothelial cell count
      - b. Scleral lens wearing time
  - iii. Corneal transplants
  - iv. Trauma
  - v. Corneal scars
  - vi. Corneal degenerations or dystrophies
    - 1. Salzmann's nodular degeneration
    - 2. Terrien's marginal degeneration
  - vii. Epithelial defects
- c. Ocular surface disease
  - i. Graft versus host disease
  - ii. Sjögren's syndrome
  - iii. Stevens Johnson syndrome
  - iv. Neurotrophic keratopathy

### III. Scleral Lens Fitting Principles

#### A. The basic steps Fitting

- a. Completely bridge over the cornea and limbus
  - i. Photographs illustrating corneal clearance
    - 1. Excessive corneal clearance
    - 2. Adequate corneal clearance
      - a. Around 200um to minimize corneal hypoxia
    - 3. Corneal touch
  - ii. Tips to achieve adequate corneal clearance
    - 1. Compare to scleral lens center thickness
    - 2. Account for scleral lens settling
    - 3. Ideal to assess fit after 30 minutes of in office wear
    - 4. Lens settling
  - iii. Photographs illustrating limbal clearance
    - 1. Excessive limbal clearance
      - a. Limbal microcystic edema
    - 2. Adequate limbal clearance
      - a. Around 60um to minimize corneal hypoxia
      - b. Difficult to assess when less than 40um thick
    - 3. Limbal touch
      - a. Compression ring or limbal staining
  - iv. Tips to achieve adequate limbal clearance
- b. Provide an adequate "landing" on the sclera
  - i. Photographs illustrating scleral landing
    - 1. Scleral impingement
      - a. Arcuate edge staining on conjunctiva

- 2. Haptic compression
  - a. Blanching of conjunctival blood vessels
  - b. Rebound injection post scleral lens removal
- 3. Edge lift
  - a. May cause late forming bubbles
  - b. May increase rate of chamber debris
- 4. Adequate haptic alignment
  - ii. Tips to achieve adequate haptic alignment
    - 1. Heel vs toe effect
    - 2. Toric haptics, especially if scleral lens OAD is greater than 15.0mm
    - 3. Account for scleral lens settling
    - 4. New scleral mapping technologies
- c. Ensure adequate tear flow under the lens
  - i. Tear exchange limited to 0.2% per minute
  - ii. Takes more than eight hours to replenish the bowl under a scleral lens
  - iii. Tear exchange may be hindered by excessive or inadequate corneal clearance
- B. Fitting pitfalls – do not do this

IV. Case histories – Several photographic histories will be presented and will be selected from a large collection of cases including keratoconus, post penetrating keratoplasty, corneal scarring, trauma, severe dry eye, graft vs host disease, etc.

#### V. Hands-On Training

- A. Cleaning and disinfection of scleral lenses
- B. Selection of base curve/vault
- C. Insertion with plunger vs finger techniques
  - a. Demonstrate patient positioning
  - b. Suction vs non-suction
  - c. Exposure to various scleral lens insertion tools that may benefit patients
- D. Assessing scleral lens fit in free space, slit lamp and anterior segment OCT
  - a. Bubble formation
  - b. Vault and fluorescein evaluation
  - c. Assessing peripheral fit (landing)
  - d. Assessing tear flow
- E. Removal technique
  - a. Plunger
    - i. Importance of slightly decentered plunger placement
  - b. Hands/finger
- F. Solutions
  - a. Insertion solutions
    - i. Non-preserved 0.9% sodium chloride solution vials
    - ii. Non-preserved saline solution
    - iii. Preservative free artificial tears
    - iv. When to use more viscous artificial tears with preservative free saline

- b. Disinfection solutions
  - i. Hydrogen peroxide solutions
  - ii. Scleral lens compatible RGP cleaning solutions
- c. Additional cleaners

VI. A variety of approaches to scleral lens fitting

- i. Anterior segment OCT
- ii. Slit lamp biomicroscopy with and without sodium fluorescein

VII. Live Demonstrations. Some volunteer patients (attendees) will be fit by one of the presenters. Patients will have brief case histories and be wearing scleral lenses for evaluation by the participants.