Specialty Contact Lens Workshop

Melissa Barnett, OD FAAO FSLS BCLA
University of California, Davis
930 Blue Ridge Road
Davis, California 95616 USA
530.752.2346 Office
drbarnett@ucdavis.edu

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Shalu Pal, OD, FAAO, FSLS, FBCLA, FIAOMC
The Yorkville Eye Institute
Dr. Shalu Pal & Associates
80 Bloor Street West, Suite 408
Toronto Ontario, M5S 2V1 Canada
416-924-9210 Office, 416-845-4085 Cell
ShaluPal@hotmail.com

&

Ashley Wallace Tucker, OD, FAAO, FSLS
Bellaire Family Eye Care
The Contact Lens Institute of Houston
5001 Bissonnet Ste 107
Bellaire, TX 77401
832-205-3570 Office, 832-205-3570 Cell
Tucker@bfeye.com

2 hour
Category: Contact Lenses
OD Education

Course Description:
This two hour presentation is an interactive, workshop format where principles of specialty contact lenses are discussed. A didactic portion is followed by hands-on practice with scleral profilometry and scleral, ortho-K and hybrid lenses.

Course Learning Objectives:

1. Understand scleral lens indications
2. Learn how to fit scleral lenses
3. Learn how to fit ortho-K lenses
4. Understand the various hybrid contact lenses available
5. Learn different methods of applying and removing hybrid contact lenses
6. Obtain knowledge on how to use scleral profilometry for fitting success

Course Outline:

I. Scleral Lens Terminology, Designs and Indications
- A. Lens diameter
- 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 corneas
    - i. Refractive error
    - ii. Astigmatism
    - iii. Presbyopia
  - b. Irregular corneas
    - 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

II. Scleral Lens Fitting Principles
- A. The basic steps Fitting
  - a. Completely bridge over the cornea and limbus
    - i. 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. 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
  - b. Provide an adequate "landing" on the sclera
    - i. Scleral landing
      1. Scleral impingement
         a. Arcuate edge staining on the 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

III. Hands-On Training
- A. Cleaning and disinfection of scleral lenses
- B. Selection of base curve/vault
- C. Application 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. Application solutions
   b. Disinfection solutions
      i. Hydrogen peroxide solutions
      ii. Scleral lens compatible RGP cleaning solutions
   c. Additional cleaners

IV. A variety of approaches to scleral lens fitting
   i. Anterior segment OCT
   ii. Slit lamp biomicroscopy with and without sodium fluorescein

V. Orthokeratology Introduction
   a. History
   b. Modern Design
      i. Reverse Geometry Design
         1. Flatter Back Optic Zone Diameter versus first peripheral curve
      ii. Gas Permeable Materials
      iii. Topography Design
         1. Empirical Design

2. Corneal Changes
   a. Epithelial Changes First
      i. Intracellular Fluid
   b. Most likely long term epithelial and stromal remodeling
   c. Importance of Pachymetry
3. Fluorescein Patterns
   a. 50 microns discerned by the eye of slit lamp
   b. Central Base Curve and Alignment Zone
   c. Reverse Curve
4. Choosing Candidates for Myopic Orthokeratology
      i. Topography Basics
         1. Axial
         2. Tangential
         3. Eccentricity Values
         4. Elevation Map
      ii. Refractive Error
         1. Approved up to -6.00
         2. Off Label Designs for higher myopia
5. Troubleshooting Topography

VI. Hybrid contact lenses

a. Anatomy
b. Indications
c. Fitting process
    1. Empirical vs diagnostic
d. Evaluation
e. Hybrid contact lens application
    2. Plunger
    3. Finger tripod
f. Hybrid contact lens removal
g. Plunger not recommended
h. Pinching soft skirt

Scleral Shape

1. Introduction on ocular surface profile
2. The importance of data
    a. To understand the scleral shape
    b. Obtain measurements
    c. Custom made scleral lenses based on ocular shape
3. Lens customization
    a. Using Eaglet Eye Surface Profiler (ESP)
    b. Using Corneo Scleral Profile (CSP) report module with the Pentacam® (Oculus Optikgeräte)
    c. Using sMap3D corneo-scleral topographer (Visionary Optics)
    d. Using an impression-based technique