My Best Fitting Tips for Solving Scleral Lens Fitting Problems

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Attended New England College of Optometry where she earned her Doctor of Optometry and Master of Vision Science degrees. She went on to complete a Residency in Cornea & Contact Lenses at Pacific University. In the fall of 2014, Dr. Walker joined the faculty at UHCO as a Visiting Assistant Professor, working as an attending clinician as well as on various research initiatives.

The Scleral Lens

Indications for SL wear

- Irregular Astigmatism
  - Keratoconus
  - Pellucid Marginal Degeneration
  - Post-LASIK Ectasia
  - Post-Radial Keratotomy
  - Post-Penetrating Keratoplasty
  - Post-Infectious irregularities
  - Herpetic
  - Post-Scarring / Surgical
  - Penetrating injury scars
  - Suture irregularities

Indications for SL wear

- Ocular surface disease:
  - Graft versus Host disease
  - Sjogren
  - Sarcoidosis
  - Rheumatoid Arthritis
  - Ocular surface exposure (post-surgical)
  - Neurotrophic Keratopathy
  - Neuropathic Ocular Pain
  - Limbal Stem Cell Deficiency
  - Cicatricial Pemphigoid
  - Familial Dysautonomia
  - Ocular Allergies
  - Stevens’ Johnsons syndrome
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Indications for SL wear
- Normal cornea:
  - High refractive error
  - High astigmatism
  - Amblyopia/strabismus
  - Presbyopia
  - High performance (sports vision)

The Scleral Lens
Not without complications...

Conjunctival Bearing & Impression
Midday Fogging
Epithelial Bogging
Limbal Chemosis & Neovascularization

Scleral Lens Exam Sequence
- Visit 1: Baseline testing
- Visit 2: Dispense
- Follow-up: 1 week, 1 month, 6 months (year 1)
- 6mo - 1 year f/u on all pts

Baseline Exam
- Step 1: Evaluate disease state
  - Scarring
  - Neovascularization
  - Fibrosis

Diagnostic Fitting

Baseline Exam
- Step 1: Evaluate disease state
  - Staining: Cornea & Conjunctiva
  - Eyelid health
  - Other: glaucoma? cataracts?

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Scleral Topography

- OCT
  - Optional for SAG measurements when fitting
  - Nice for monitoring hot spots of corneal ectasia (ie. Kc apex, proud grafts)
  - Corneal edema with SL

Slit Lamp Evaluation of Lenses

- White light
- Optic section
- 45 degree angle

Do we need NaFl?

Ectasia tear reservoir patterns
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Ectasia tear reservoir patterns

Ideal Clearance:
- 100-200µm over highest corneal area
- Expect ~150µm settling effect
- 250-300µm at dispense

Image courtesy of Patrick Caroline

Easy and Common Complications
- Application bubble
- Lens non-wetting

Questions?

Easy and Common Complications
- Use of Progent cleaner
- Lens deposits

Excessive Apical Clearance
- Problems:
  - Blurry vision & visual distortion
  - Lens discomfort
  - Midday fogging (debris accumulation)
  - Increased swelling

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**Complex Corneal Touch**
- **Touch**: Too much clearance
- **What to do?**

**Corneal Staining**
- **Causes:**
  - Lens touch (focal)
  - Toxicity (diffuse)
  - Disease state (remember to compare to baseline!)
- **Management:**
  - Determine cause
  - Manage lens fit
  - Change application solution

**The Tear Film Reservoir**
- **Function of Tear Film:**
  - Lubrication
  - Smooth refraction
  - Microbial protection...
  - Corneal nourishment and O₂ delivery

**Epithelial Bogging**
- **Cause unknown**
- **Occurs commonly**
- **Potential etiologies:**
  - Loss of glycocalyx
  - Epithelial edema
  - Osmotic imbalance
  - Lack of epi sloughing
- **Management:**
  - Monitor
  - Differentiates from staining
  - Can change application solution

**Epithelial Toxicity**
- **Does not occur in most patients.**
- **Cause:**
  - (1) Preservative Toxicity
  - (2) Tear Stagnation (metabolic waste buildup)
- **Management:**
  - (1) Education patient, change application solution
  - (2) Increase tear exchange
  - Increase diameter
  - Toric periphery
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Application Solutions
- Several FDA approved saline solutions
- One approved saline with metabolites (Ca, K, Mg)
- Preservative Free artificial tears
- Autologous serum drops
- Mixed “cocktail”: Tears/serum + saline

Corneal Health during 3 Month SL Wear

Changes in symptoms of MDF with Novel SL solution

Results:
- Significant improvement in subjective symptoms
- No change in MDF
- No change in ocular surface health

Conclusion:
Safe to use and may improve subjective satisfaction with SL

What about corneal edema?

Measuring Hypoxia

Expect 20-40um swelling
>50um: need to make some changes

Consequences of Hypoxia

Epithelial changes
- decreased metabolic rate
- morphologic changes
- microcysts
- Bullous keratopathy
- changes in junctional integrity
- decreased corneal sensation
- pannus formation.

Consequences of Hypoxia

Stromal changes
- Edema
- Acidosis
- Neovascularization
- Changes in corneal shape
- Can lead to corneal thinning

Image courtesy of Dr. Karen Carrasquillo

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Consequences of Hypoxia

- Endothelial changes
  - Bleb formation
  - Polymegethism
  - Changes in endothelial cell density
  - Possible changes in endothelial function.

Photo courtesy of Dr. Langis Michaud

High Risk Patients

- Transplant patients
- Compromised endothelium
- Difficult lens, less than 200 cells/mm²
- Post-BK

+72um central
+136um inferior

Management of Edema with SL

- Diffusion through lens and tears
  - Lens thickness (SAM/FAP)
  - Lens Dk (lost ROI after 1007)
  - Tear reservoir thickness (Fisher 2020)
  - Application solution?

Dhallu et al 2020
Increase Dk 100 to 200
CT: 350; FR: 325

Management of Edema with SL

- Does increasing tear exchange help?
  - Maybe, not tested experimentally
  - Lens diameter
  - Lens haptic toricity
  - Channels

Pre-channels
Post-channels

Image courtesy of Dr. Karen Carrasquillo

Midday Fogging (MDF)

Questions?

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**Current Thinking on MDF**
- Sequestered lipids, cells (white blood cells), make-up, mixture of all these components (variable)
- Can mostly be managed by lens fit and hygiene
- No apparent increase in inflammation
- Visual frustrating!
  - Necessitates removal and refreshing of solution 2-5+ times per day
  - Most often affects people with ocular surface disease (ie. MGD)

**Reducing MDF**
- Reduce apical clearance
- Lipophilic PFAT
- Manage patient-specific hygiene

**Reducing MDF**
- **Personal hygiene therapies**
  - Eyelid health
  - Treatment of allergies/dry eye
  - Eyewash
  - Waiting to apply lenses in AM

**The Transition (Limbal) Zone**
Fitting Goal: Alignment without bearing

**Evaluating the Limbus**
NaFl most helpful at limbus (and edge)

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Evaluating the Limbus

- NaFl pattern over the limbus
- Will be affected by lens decentration
- Evaluate all gazes for limbal touch

Conjunctival Prolapse

Landing Zone

- Tight / Steep
- Loose / Flat
- Just Right

Using OCT to evaluate SLZ

Fitting Goal: Smooth and even landing

The Landing Zone

Using NaFl for Landing Zone Evaluation

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Using NaFl for Landing Zone Evaluation

Impression Rings

Are they always bad?
Can we eliminate them?

Conjunctival Roadblocks
Minor: toric haptic zone

Customized lens designs

Toric markers will mark the flat or the steep meridian.
Check with your consultant!

Customized lens designs

What About IOP?

Without custom edge
With custom edge

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Aqueous Humor Outflow

- Conventional Outflow
- Unconventional Outflow

Measuring IOP in SL wear

- Goldmann
- Tono-Pen
- Portable NCT
- Pneumotonometry
- OCT

OCT and IOP

- Bruch’s Membrane Opening (BMO): termination of Bruch’s membrane at the optic nerve head
- Minimum Rim Width (MRW): shortest distance from the BMO to the inner limiting lamina (also termed BMO-MRW)
- Two studies, variable results

Thinning of the MRW indicates increase IOP

Evaluating the ONH in scleral lens wear?

Over-Refraction

- Be careful not to over-minus
  - Max plus to max VA & duochrome test
- Sphero - cylinder
  - ~30% will need toric power
  - First lens: only Rx toric power if >0.75D
  - Stabilized with prism ballast (spherical haptic) or toric haptic zone

Tip: If Rx'ing toric power, put on a toric haptic trial lens

Managing the Disease State

- Keratoconus
  - Inflammation, atopy, eye rubbing
- Post-transplant
  - Transplant rejection, endothelial loss
- Ocular Surface Disease
  - Risk of infection

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Post CXL SL Considerations

- Recommend 6-8 weeks post-procedure (or more)
- Monitor and document haze (usually present)
- Patients still on steroids?
  - Can they still wear a SL?

Initial Follow-Up Exam: 1-3 weeks

1) Evaluation of lenses on eye
   - SCOR
   - Fit evaluation (OCT, imaging optional)
2) Removal of lenses
   - Cornea: check IOP, edema, staining, scarring
   - Conjunctiva: monitor impression rings, hyperemia, staining
3) F/U on patient education

Concluding remarks

- Scleral lenses have revolutionized specialty contact lens management.
- Like all specialty lens management, it is a balancing act of risks and benefits.
- Important to understand the positive impact...while being aware of potential limitations.
- Use cautious optimism when fitting SL patients!

ABB Delivers Greater Value

- Consultation efficiency
- Order Consolidation
- Shipping efficiencies
- Accounting efficiencies
- Business Review
- Education

Scleral lenses have revolutionized specialty lens management. Like all specialty lens management, it is a balancing act of risks and benefits. Important to understand the positive impact...while being aware of potential limitations. Use cautious optimism when fitting SL patients!

Specialty Vision Products

The largest portfolio and educational resource for specialty lenses in the industry.
- Scleral
- Ortho K
- Irregular Cornea
- Bifocal/Multifocal
- Spherical
- Hybrids
- Custom Soft

Prime Warranty Program

NEW

Prime Warranty Program

Prime Warranty Program

Scleral Lenses

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Educational Opportunities

Virtual Learning Topics Available
- Specialty Lens Products Catalog
- Scleral Lens Specific Education
- Getting Started with Scleral or Specialty Lenses
- Scleral Lens Product Specific Education
- Basic Scleral Education
- Basic Scleral Lens Troubleshooting
- Product Specific Troubleshooting
- Basic Scleral Staff Education - Can be provided in a series for your staff separately
- Educating Patients with Care and Handling Sclerals
- Increasing Patient and Pratical Success
- Instrumentation for Scleral Lens Fitting
- Dry Eye Education

Scleral Starter Kits

Ships with new scleral lens orders

The starter kits contain:
- 2 - 5ml, 6 vial boxes of Vibrant Vue Sterile saline
- 1 - 3.4 oz Tangible Clean MPS solution
- 1 - lg DMV inserter
- 1 - sm DMV remover
- 1 - contact lens case
- Convenient on-the-go pouch

New Product

- Featuring
- Tangible- Boost
  - Monthly treatment to restore Tangible Hydra-PEG coating

New Dry Eye Product

- Featuring
- Regener-Eyes®
  - the first and only sterile biological eye drop

Made-to-Order Soft Custom Lenses

- Have patients outside of the available parameter ranges for standard soft lenses?
- Need an alternative for Hydra-Soft Lenses?
- Need Custom Made Soft Therapeutic Lenses?

Fastest Turnaround Times!
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ABB Verify

ABB Verify, powered by Affinity Analytics, is a tool that helps drive patients to return to your practice and maximize their current vision care benefits. By reaching out to your patients via email and text message, it brings back not only patients who have exam and material benefits but also those who had an exam and still have unused material benefits.

Questions?

2021 Webinar Series

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