

MANAGEMENT OF "ANTERIOR SEGMENT" DISEASES AND DISORDERS WITH SPECIALTY CONTACT LENSES

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FINANCIAL DISCLOSURE SLIDE

- CONTAMAC ADVISORY BOARD – ONE DAY, RELATIONSHIP HAS ENDED
- NO OTHER DISCLOSURES TO REPORT

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COURSE OBJECTIVES

- DISCUSS PROSTHETIC SOFT CONTACT LENS PATIENT CASES
- DISCUSS UNIQUE SPECIALTY GAS PERMEABLE LENS CASES
- DISCUSS IRREGULAR CORNEA CASES AND MANAGEMENT
- DISCUSS PIGGYBACK DESIGN
- DISCUSS SCLERAL LENS PATIENT CASES
- DISCUSS UNUSUAL PRESENTATIONS IN ALL CASES AND TIPS FOR SUCCESS

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ALBINISM OPTIONS

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OCULOCUTANEOUS AND OCULAR ALBINISM

- | | |
|---|-------------------------|
| • STRUCTURAL FINDINGS: | • FUNCTIONAL SYMPTOMS: |
| • FOVEAL HYPOPLASIA | • REDUCED VISUAL ACUITY |
| • IRIS HYPOPIGMENTATION AND TRANSILLUMINATION | • NYSTAGMUS |
| • FUNDUS HYPOPIGMENTATION | • PHOTOPHOBIA |
| | • STRABISMUS |

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ALBINISM

- CONTACT LENS OPTIONS
 - IRIS OCCLUSION/PROSTHETIC LENSES
 - TINTED/FILTER LENSES
 - GAS PERMEABLE LENSES
 - VISUALLY CORRECTIVE LENSES
 - SOFT, GP, HYBRID OR SCLERAL

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ALBINISM

• CONTACT LENS OPTIONS

- IRIS OCCLUSION/PROSTHETIC LENSES
 - COMPLETELY CONCEAL THE IRIS, CLEAR PUPIL
 - CAN START WITH DECORATIVE OR COSMETIC VERSION
 - SPECIALTY PROSTHETIC VERSION MOST LIKELY
- TINTED/FILTER LENSES
 - NEUTRAL GREY OR DARK BROWN FILTER
 - START WITH DECORATIVE OR COSMETIC
 - SPECIALTY PROSTHETIC VERSION MOST LIKELY



Photo credit: Clinical Manual of CL
 A. Prosthetic SCL (no dark underprint)
 B. Prosthetic SCL (dark underprint)
 C/D. Cosmetic frequent replaced tinted CL

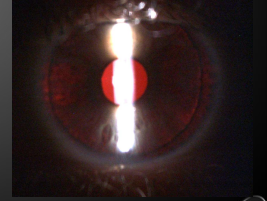


Photo credit: ABB optical group

OCULAR ALBINISM – CASE 1A

• 28 YEAR MALE

- FIRST EXAMINED BY ME AT AGE OF 15
- OCULAR ALBINISM, NYSTAGMUS AND FOVEAL HYPOPLASIA
- HE WANTED TO DRIVE AND LIVE AN INDEPENDENT LIFE
- MANIFEST REFRACTION
 - OD: +2.75 -5.50 X 014 20/60+
 - OS: +2.75 -5.50 X 176 20/40+
- CONTACT LENS CORRECTION:
 - SOFT EXTENDED PARAMETER TORIC LENS; MONTHLY REPLACEMENT
 - OD: +2.00 -5.25 X 020 20/60
 - OS: +2.50 -5.75 X 180 20/60

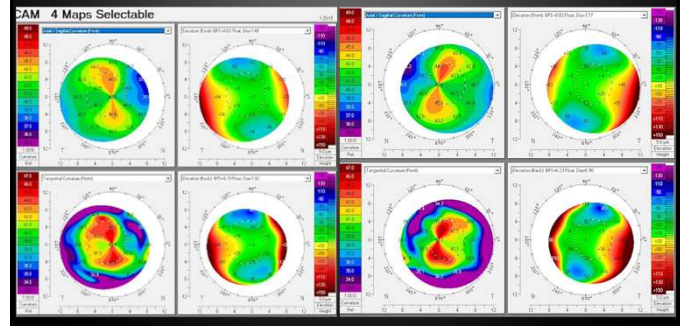


OCULAR ALBINISM – CASE 1B

• 18-YEAR FEMALE

- FIRST TIME EXAMINED 14 YEARS OLD
- "INTERESTED IN SPECIALTY CONTACT LENS FIT TO IMPROVE VISION"
- OCULOCUTANEOUS ALBINISM, FOVEAL HYPOPLASIA AND LIGHT SENSITIVITY, NYSTAGMUS
- CORNEAL GP LENSES MAY HELP DAMPEN NYSTAGMUS
- OD: +3.00 -5.50 X 015 20/70+
 - 40.40@12/45.20@102
- OS: +4.25 -5.00 X 160 20/70+
 - 40.30@171/45.60@81

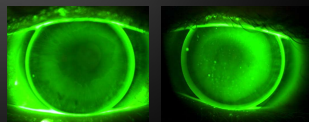
OCULAR ALBINISM – CASE 1B



OCULAR ALBINISM – CASE 1B

• FIT INTO BITORIC GAS PERMEABLE LENSES

- HOW TO FIT/ORDER: RECOMMEND EMPIRICAL
- SEND PATIENT HVID, MANIFEST REFRACTION, TOMOGRAPHY/TOPOGRAPHY/KERATOMETRY VALUES TO THE LAB
- HYPEROPIC LENSES: SELECT A MODERATE DK MATERIAL
- ADD PLASMA OR HYDRAPEG COATING
- ADAPTION IS A PROCESS/CONCERN
 - 8.40/7.68 +3.00/-1.50
 - 8.37/7.56 +5.00/+0.75
- 10.0 DIAMETER OD, OS; DK MATERIAL OF 100

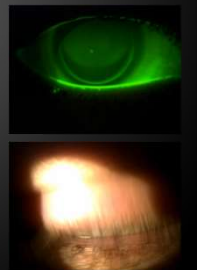


OCULAR ALBINISM – CASE 1B

• BITORIC NONADAPT

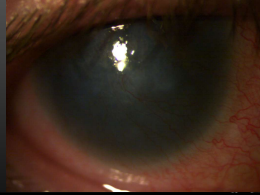
- REFIT HER INTO A HYBRID LENS
- SEND PATIENT HVID, MANIFEST REFRACTION, TOMOGRAPHY/TOPOGRAPHY/KERATOMETRY VALUES TO THE LAB

- OD: 7.84/14.5/+0.50 20/70+
- OS: 7.78/14.5/+0.75 20/70-



CASE 1C

- 46 YEAR OLD MALE – REFERRED FOR SPECIALTY CONTACT LENS FITTING AFTER OCULAR LENS REMOVAL OS
- CONGENITAL OPTIC ATROPHY, CONGENITAL NYSTAGMUS, ANIRIDIA, APHAKIA OS, LIMBAL STEM CELL DEFICIENCY, LOW VISION PATIENT
 - CF @ 3FT OD AND 20/300 OS
 - OD: +6.25 20/400
 - OS: +15.50 -4.00 X 120 20/300
- COULD NOT COMPLETE A TOMOGRAPHY
- CL OPTIONS:
 - CORNEAL IRREGULARITY
 - GAS PERMEABLE MATERIAL



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CASE 1C

- 46 YEAR OLD MALE – REFERRED FOR SPECIALTY CONTACT LENS FITTING AFTER OCULAR LENS REMOVAL OS
- SCLERAL LENS FITTING
 - DIAMETER: BASED ON HVID
 - BASE CURVE: I HAD NO TOPOGRAPHICAL INFORMATION – SELECT A MID-40S LENS
 - EVALUATE AND MAKE ADJUSTMENT
- 15.8 DIAMETER, 7.67 BASE CURVE LENS, POWER OF -3.00
- EVALUATION: CENTRAL CLEARANCE 100 MICRONS, LENS DECENTERED INFERIORLY WITH SUPERIOR CORNEAL TOUCH, EDGE LIFT SUPERIORLY, MARKS AT 180
 - OR: +10.00 -4.00 X 180 20/125

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CASE 1C

- 15.8 DIAMETER, 7.67 BASE CURVE LENS, POWER OF -3.00
- EVALUATION: CENTRAL CLEARANCE 100 MICRONS, LENS DECENTERED INFERIORLY WITH SUPERIOR CORNEAL TOUCH, EDGE LIFT SUPERIORLY, MARKS AT 180
 - OR: +10.00 -4.00 X 180 20/125
- HOW TO IMPROVE FIT WITH ORDER:
 - INCREASE CENTRAL CLEARANCE BY 300 MICRONS
 - STEEPEN VERTICAL PERIPHERAL EDGE BY 60 MICRONS (~2 STEPS STEEP)
 - STEEPEN FLAT PERIPHERAL EDGE BY 30 MICRONS (~1 STEPS STEEP)
 - ADD OR
 - HIGH DK MATERIAL

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SCLERAL LENS INFERIOR DECENTRATION

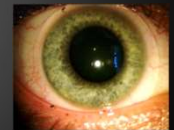
MOST COMMON CHALLENGE

LIKELY CAUSES:

- TOO MUCH CORNEAL OR LIMBAL CLEARANCE
- VERTICAL EDGE LIFT
- GRAVITY

SOLUTIONS:

- EXCESSIVE CORNEAL/LIMBAL CLEARANCE
 - FLATTEN THE BASE CURVE
 - REDUCE REVERSE CURVE
- VERTICAL EDGE LIFT
 - STEEPEN VERTICAL LENS PERIPHERAL HAPTIC TO IMPROVE CENTRATION



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CASE 1C

- 15.8 DIAMETER, 7.67 BASE CURVE LENS, POWER +8.25 -4.00 X 180 20/125 WITH SHADOWING
 - MARKINGS AT 158, LENS DECENTRATION, PERIPHERAL ALIGNMENT AT 3/9 O'CLOCK, SLIGHTLY FLAT AT 6/12
 - OR: +1.25 -1.75 X 090 20/125
- HOW TO IMPROVE FIT WITH ORDER:
 - STEEPEN VERTICAL PERIPHERAL EDGE BY 90 MICRONS (~3 STEPS STEEP)
 - ADD OR
- NEW LENS: 15.8 DIAMETER, 7.67 BASE CURVE LENS, POWER +8.25 -3.00 X 168 20/125
- "BEST VISION HE HAS EVER EXPERIENCED"

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CASE 1C

- 15.8 DIAMETER, 7.67 BASE CURVE LENS, POWER +8.25 -3.00 X 168 20/125
- MY EVALUATION: EDGE ALIGNMENT, EXCESSIVE CENTRAL LENS CLEARANCE, RE-EVALUATE AT FOLLOW-UP TO DETERMINE IF CENTRAL CLEARANCE NEEDS TO BE ADJUSTED.



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PROSTHETIC LENSES

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CASE 2: FUNGUS IS BETTER WHEN SERVED ON PIZZA

- 55 YEAR OLD FEMALE PATIENT
- LEFT EYE
- PKP FROM A PENETRATING FUNGAL ULCER
 - APHAKIA
 - ANIRIDIA
 - DEVELOPED AN ESOTROPIA



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CASE 2: FUNGUS IS BETTER WHEN SERVED ON PIZZA

- PATIENT GOALS:
 - VISION
 - COSMETIC
- CORRECTIVE OPTIONS
 - PROSTHETIC LENS WITH OVER SPECS
 - APHAKIA AND IRREGULAR CORNEA COMPLICATES THIS OPTIONS
 - PROSTHETIC LENS WITH SPECIALTY GP LENS



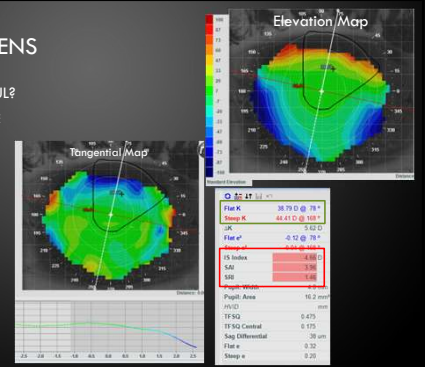
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STEP 1: FIT THE GP LENS

- WILL A GP LENS BE SUCCESSFUL?
 - LOOK AT ELEVATION DIFFERENCE

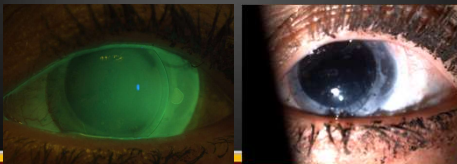
- FIT AN INTRALIMBAL
 - ★ START WITH MEDIAN K ★
 - 8.44 (40.00D)/11.2MM
 - DK 100 GP MATERIAL
 - FOR HIGH OXYGEN
 - +17.87 POWER
 - 20/40+



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CASE 2: FUNGUS IS BETTER WHEN SERVED ON PIZZA

- STEP 2: CONFIRM FIT OF GP LENS WITH UNDERLYING SOFT LENS FOR PIGGYBACK
- CLEAR LENS THAT IS THE SAME BASE CURVE/DIAMETER OF PLANNED PROSTHETIC LENS



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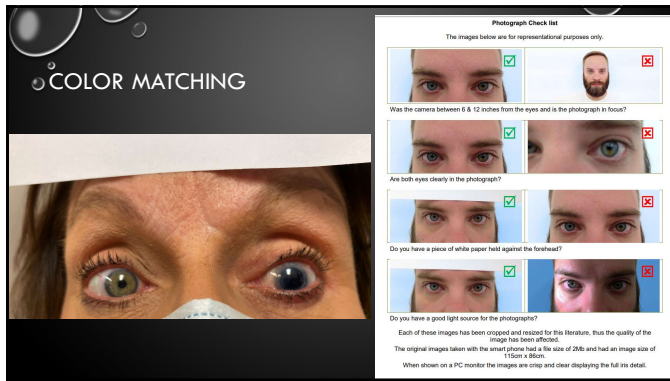
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CASE 2: FUNGUS IS BETTER WHEN SERVED ON PIZZA

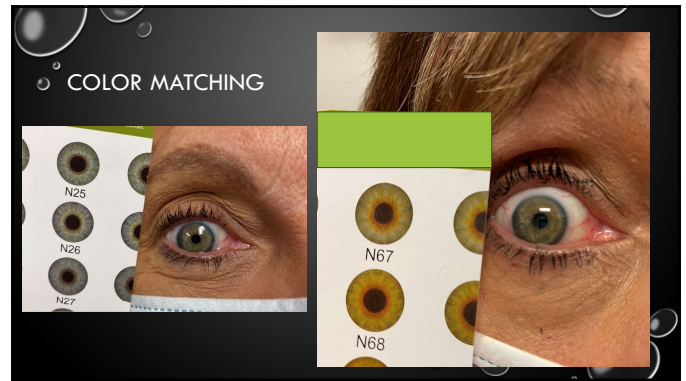
STEP 3: SOFT LENS SELECTION AND COLOR MATCHING



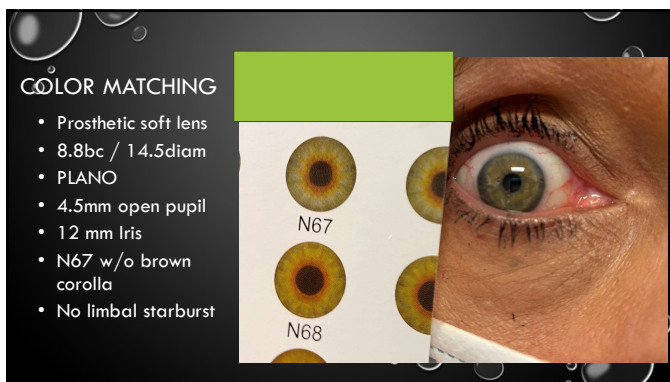
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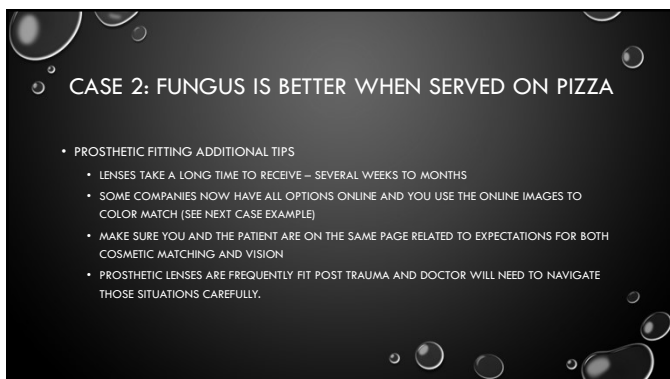
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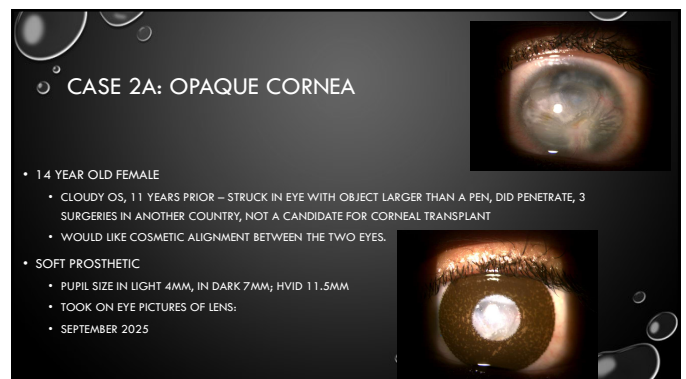
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CASE 2A: OPAQUE CORNEA

- 14 YEAR OLD FEMALE: DECEMBER 2025!
- LENS HAS GOOD CENTRATION AND MINIMAL MOVEMENT. THE COLOR IS GRANITE, WHICH IS INCORRECT. A NEW LENS WITH SAME COLOR DIAMETER AND BLACK PUPIL SIZE WILL BE ORDERED WITH A DIFFERENT BROWN COLOR FOR IMPROVED MATCHING;
- U2+58V+ LRE+56X+56V+SVB60+55V



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Images from the company website for best color matching

U2+58V+LRE+56X+56V+SVB60+55V

U2+57V+SBV58+56V+55V+LRE56

U2+56V+SBV55+4.0B P MED BROWN



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CASE 2A: OPAQUE CORNEA

- FEBRUARY 2026: LENS DISPENSE
- HYDROGEN PEROXIDE CLEANER; DAILY WEAR
- YEARLY REPLACEMENT LENS MODALITY



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CORNEAL SCARRING



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CORNEAL SCARRING

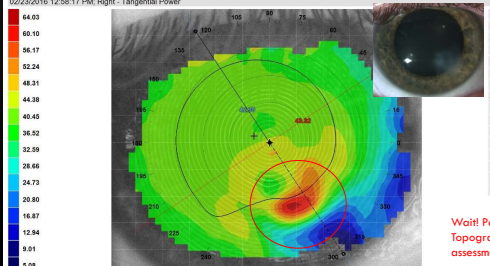
- MAY BE ELEVATED OR DEPRESSED
- WILL LIKELY RESULT IN IRREGULAR ASTIGMATISM
- CAN FIT WITH
 - SOFT LENS IF NOT IRREGULARITY ON CORNEA
 - GP LENS FOR IRREGULAR CORNEA
- IF FITTING A SCLERAL: MINIMIZE CLEARANCE OVER THE SCAR



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CASE 3A

42.35 flat K value



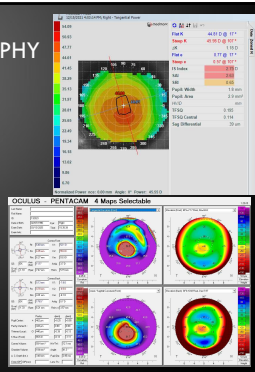
Flat K	42.35 D @ 121°
Steep K	43.32 D @ 34°
AK	0.97 D
Flat e ¹	0.37 @ 124°
Steep e ¹	0.55 @ 34°
IS Index	0.71 D
BAI	6.99
SRI	1.52
Pupil: Width	6.0 mm
Pupil: Area	28.5 mm ²
HVID	mm
TFSQ	Central
Sag Differential	um
Flat e	0.63
Steep e	0.76

Wait! Pause! Time to discuss Topography/Tomography assessment

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CORNEAL TOPOGRAPHY & TOMOGRAPHY

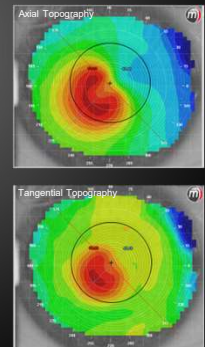
- BASELINE DATA
- MONITORING OF PROGRESSION OR CHANGE
- **TOPOGRAPHY:** 2D MAP OF THE ANTERIOR SURFACE OF THE CORNEA
- **TOMOGRAPHY:** 3D VIEW OF THE ENTIRE SURFACE
 - ANTERIOR
 - POSTERIOR
 - THICKNESS



CORNEAL TOPOGRAPHY

• IMPORTANT MAPS

- **AXIAL /SAGITTAL**
 - ASSUMES THE CENTER OF THE RADIUS OF CURVATURE IS ALWAYS ON THE CENTRAL AXIS
 - SMOOTHS OUT THE PERIPHERY, BEST OPTICAL CHARACTERISTICS OF THE CORNEA
- **TANGENTIAL**
 - MAKES NO ASSUMPTIONS
 - LOOKS AT A PART OF THE CORNEA AND MEASURES THE RADIUS AS A TANGENT FROM THAT POINT
 - MORE DETAILED REPRESENTATION OF THE CORNEA
 - ESPECIALLY IN THE PERIPHERY

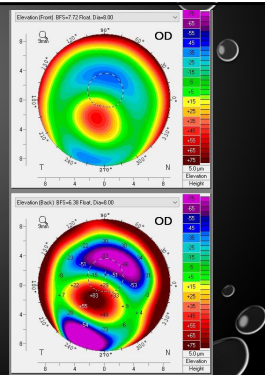
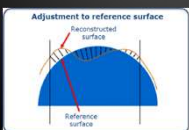


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CORNEAL TOPOGRAPHY

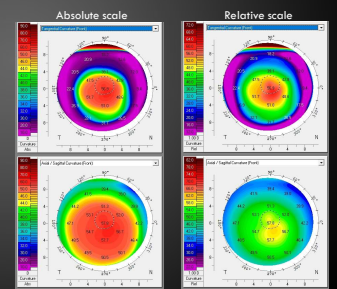
- **ELEVATION MAP**
 - CORNEA COMPARED TO A BEST FIT SPHERE
 - RED – HIGHER THAN THE SPHERE REFERENCE
 - BLUE – LOWER THAN THE SPHERE REFERENCE



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CORNEAL TOPOGRAPHY

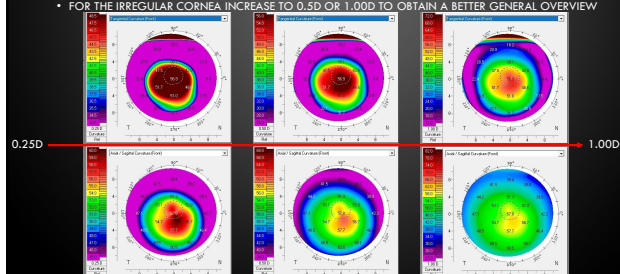
- **ABSOLUTE SCALE**
 - REPRESENTATION OF ALL CURVES AVAILABLE IN NORMAL CORNEAS
 - COLORS ARE EVENLY DISTRIBUTED OVER THAT RANGE
- **RELATIVE SCALE**
 - REPRESENTS CURVES THAT ARE AVAILABLE FOR THAT PARTICULAR CORNEA
 - COLORS AVAILABLE REPRESENT A MUCH SMALLER RANGE OF CURVES
 - MORE DETAIL THAN ABSOLUTE
 - CANNOT COMPARE ONE CORNEA TO ANOTHER CORNEA OR ONE CORNEA OVER TIME AS SCALE MAY VARY



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CORNEAL TOPOGRAPHY

- A COUPLE NOTES ABOUT SCALE
 - STEPS REPRESENTING DIFFERENT COLORS ARE TYPICALLY SET AT 0.25D
 - FOR THE IRREGULAR CORNEA INCREASE TO 0.5D OR 1.00D TO OBTAIN A BETTER GENERAL OVERVIEW



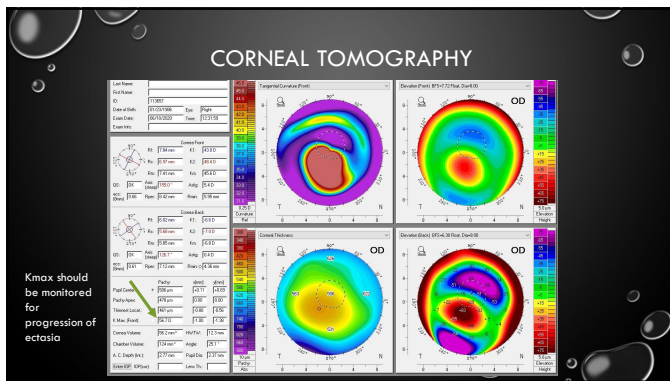
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CORNEAL TOPOGRAPHY

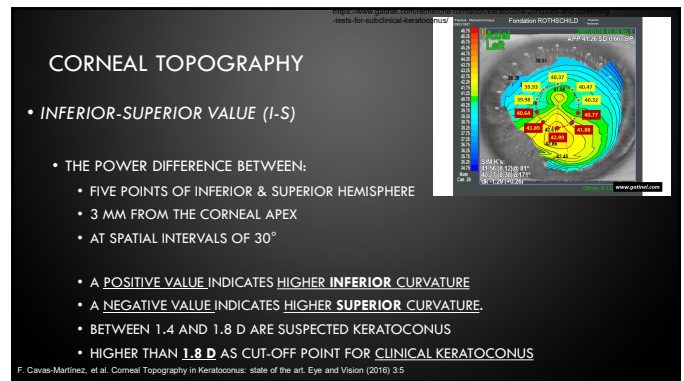
- A NORMAL CORNEA TYPICALLY HAS A DIOPTRIC RANGE OF 10 DIOPTERS OR LESS
- AN ABNORMAL CORNEA TYPICALLY WILL HAVE GREATER DIOPTRIC RANGE.



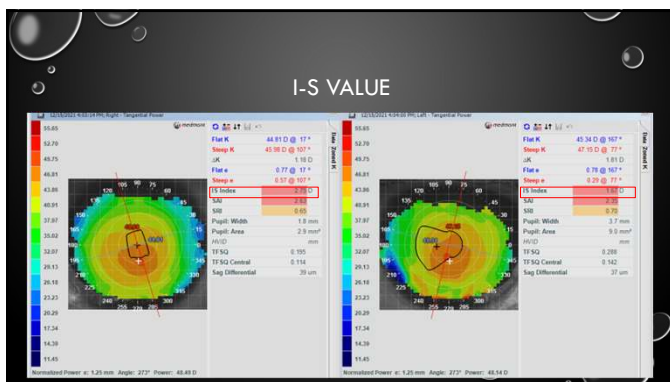
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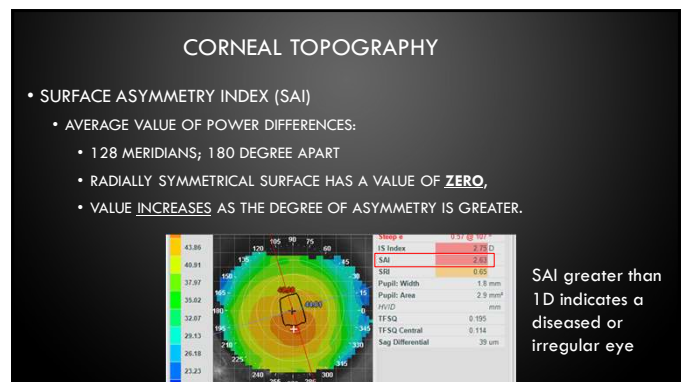
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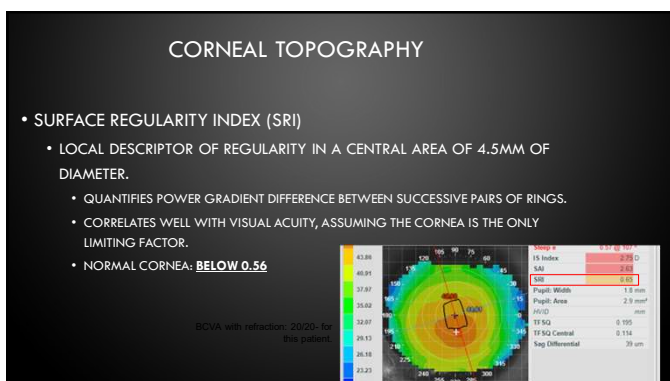
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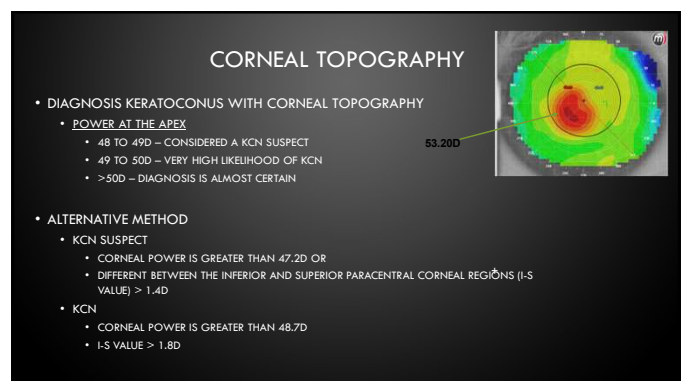
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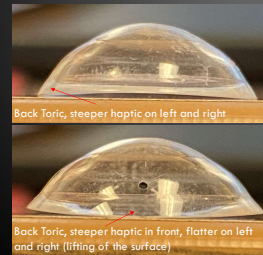
BACK SURFACE TORIC LENS DESIGN

- ALLOWS FOR LENS ALIGNMENT WITH SCLERA
- WILL HAVE TWO BC RADII VALUES, 90 DEGREES APART



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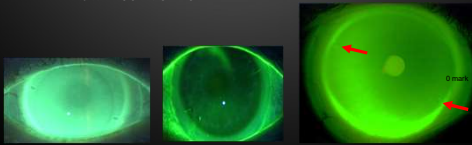
BACK SURFACE TORIC LENS DESIGN



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BACK SURFACE TORIC LENS DESIGN

- TORIC BACK SURFACE
 - ALLOWS FOR MORE EQUAL PRESSURE DISTRIBUTION
 - CAN HELP CENTER AN INFERIORLY DECENTERED LENS
 - FLAT AND STEEP MERIDIAN
 - CAN ADJUST EITHER INDEPENDENTLY
 - FLAT MERIDIAN IS TYPICALLY MARKED
 - LENS WILL LOCK INTO PLACE



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SCLERAL LENS FITTING USING THE ANATOMY AND SHAPE

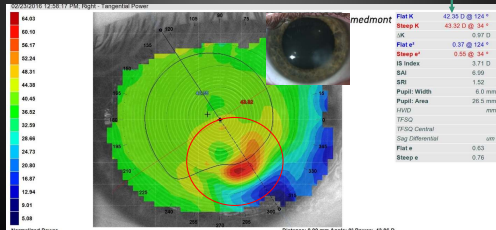
- **PROLATE CORNEA WITH TORIC SCLERA**
 - TRADITIONAL GEOMETRY; PROLATE LENS WITH TORIC PERIPHERY
- **OBLATE CORNEA WITH TORIC SCLERA**
 - REVERSE GEOMETRY/OBLATE LENS WITH TORIC PERIPHERY
- **HIGHLY TORIC CORNEA WITH TORIC SCLERA**
 - TRADITIONAL GEOMETRY/PROLATE LENS WITH TORIC PERIPHERY
 - WATCH FOR LENS DECENTRATION AND IRREGULAR CORNEAL CLEARANCE



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CASE 3A: CORNEAL SCARRING 42.35 Flat K value

- DISCUSSION OPTIONS: PATIENT SELECTS A SCLERAL LENS



- 8.4 (40D) BASE CURVE; 16 MM DIAMETER; 3400 SAG

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CASE 3A: CORNEAL SCARRING

- 8.4 (40D) BASE CURVE; 16 MM DIAMETER; 3400 SAG; 36-42
- WHAT DID THE CHART SAY?
 - AVERAGE CLEARANCE 210 MICRONS, ABOUT 180 MICRONS OVER CORNEAL SCAR
 - ROTATED 30 DEGREES FROM 3 O'CLOCK, EXCESSIVE MOVEMENT
- WHAT DID I ORDER?
 - LENS WITH A STEEPER EDGE DESIGN AND ADDED OVER-REFRACTION

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CASE 3A: CORNEAL SCARRING

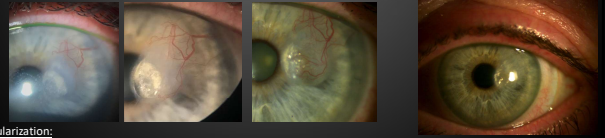
- 8.4 (40D) BASE CURVE; 16 MM DIAMETER; 3400 SAG; 40-46
- LENS DISPENSE:
 - CENTRAL CLEARANCE 272 MICRONS, ROTATED ABOUT 20 DEGREES FROM 3 O'CLOCK (TEMPORAL), SLIGHT EDGE LIFT TEMPORAL, GOOD LIMBAL CLEARANCE
 - PATIENT NOTES SOME MID-DAY FOGGING, GOOD COMFORT, NO REDNESS.
- RE-ORDER:
 - STEEPER PERIPHERY (60 MICRONS)
 - FINAL LENS



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JUST WHEN YOU THOUGHT A CORNEAL SCAR WAS BAD ENOUGH

- CORNEAL SCARRING – 2ND TO PREVIOUS VIRAL INFECTION
- WEARS A SCLERAL LENS, HAVE PROGRESSIVE NEOVASCULARIZATION – USING A STERIOD



Neovascularization:
 -If neovascularization progresses – refer for Yellow Laser Treatment
 Can use Argon laser or 577-nm yellow dye laser
 Laser photocoagulation facilitates obliteration of corneal efferent vessels

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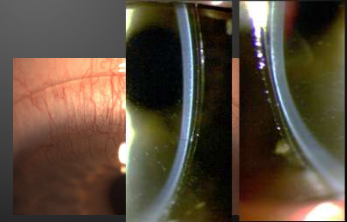
NEOVASCULARIZATION

- INCREASING OXYGEN TRANSMISSIBILITY
 - 1. HIGH DK MATERIAL (DK > 125)
 - OPTIMUM EXTREME
 - OPTIMUM INFINITE, MENICON Z, ACUTY 200
 - 2. MINIMAL TEAR CLEARANCE BEHIND THE LENS (<200)
 - MOST IMPORTANT COMPONENT
 - 3. REDUCED CENTER THICKNESS OF THE LENS (<.250)
 - THIS LENS IS CONSIDERABLY THICKER COMPARED TO CORNEAL GP, NEED TO KEEP THAT IN MIND EVEN WITH HIGHEST DK MATERIAL

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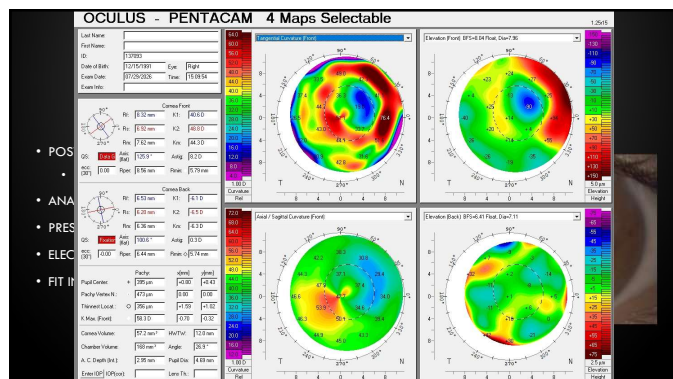
NEOVASCULARIZATION

- TEAR FILM IS THE MOST IMPORTANT FACTOR
 - MINIMIZE THE TEAR RESERVOIR THICKNESS
 - RECOMMEND 200 MICRONS OR LESS
- LENS THICKNESS
 - VARIATIONS DID NOT CHANGE THE CORNEAL EDEMA TO A SIGNIFICANT AMOUNT



-Fisher D, Collins MJ, Vincent SJ. Scleral Lens Thickness and Corneal Edema Under Closed Eye Conditions. Eye Contact Lens. 2022 May;34(5):194-199.
 -Fisher D, Collins MJ, Vincent SJ. Fluid Reservoir Thickness and Corneal Edema during Open-eye Scleral Lens Wear. Optom Vis Sci. 2020 Sep;97(9):683-689

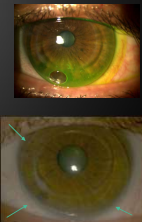
64



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CASE 3B: CORNEAL SCARRING

- LARGE DIAMETER DESIGN/INTRALIMBAL
 - CENTER BETTER THAN SMALL DIAMETER LENSES
 - DISTRIBUTES LENS PRESSURE ACROSS GREATER AREA OF CORNEA
 - MORE COMFORTABLE THAN SMALL DIAMETER LENSES
- LARGE OPTIC ZONE
 - MORE FORGIVING IF LENS DOES DECENTER
- CONCERNS ABOUT MID-PERIPHERAL BUBBLES WITH THE STEEPER BASE CURVES
- INITIAL LENS SELECTION: MEDIAN OR AVERAGE K



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CASE 3B: CORNEAL SCARRING

- FIT IN AN INTRALIMBAL DESIGN
 - MEDIAN K VALUE: 11.2 DIAMETER, 7.67 BASE CURVE LENS, SPECIALTY DESIGN
 - +1.75 OR 20/25-
 - ORDER LENS WITH NO PARAMETER ADJUSTMENT, ONLY A POWER CHANGE



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DON'T BE AFRAID TO TOSS THE SCLERAL

FITTING FOR KERATOCONUS IS NOT ALL ABOUT THE BIG LENSES AND IT SHOULD HAVE NEVER BECOME THAT.....

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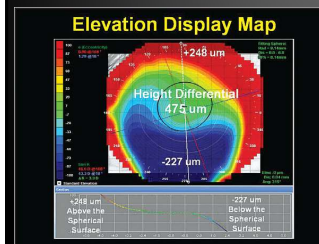
CASE 4: DON'T BE AFRAID TO TOSS THE SCLERAL

- 66 YEAR FEMALE
 - KERATOCONUS OU
 - SCLERAL LENS OD AND CORNEAL GP LENS OS
 - SCLERAL LENS: LARGE DIAMETER AND AN EVEN LARGER NOTCH
 - CONCERNS:
 - CONJUNCTIVAL PROLAPSE
 - LARGE NOTCH
 - DIAMETER OF SCLERAL LENS
 - PATIENT UNSURE WHY SHE WEARS A SCLERAL LENS IN ONE EYE



69

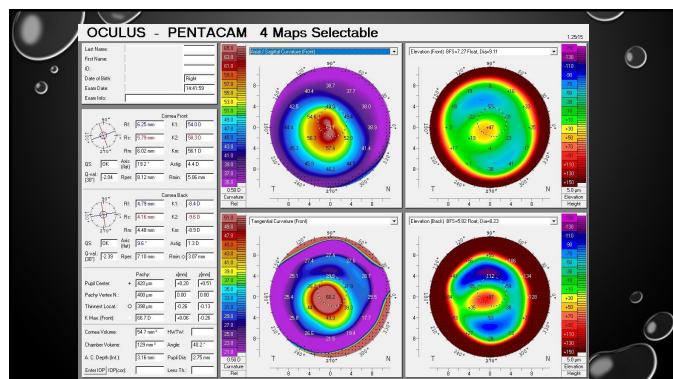
CASE 4: DON'T BE AFRAID TO TOSS THE SCLERAL



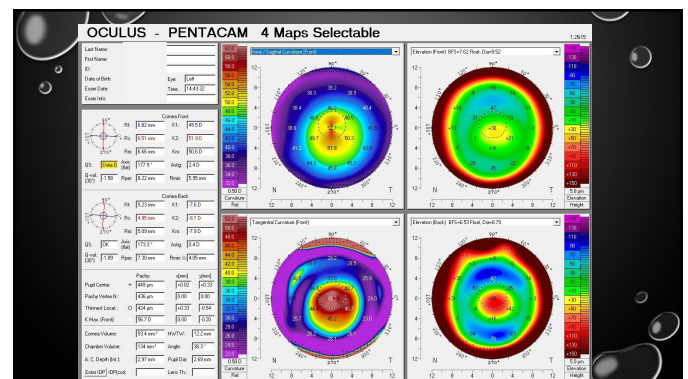
If a patient has less than 350 um differential between the highest and lowest points along the greatest meridian of change – there is a 88.2% chance of the patient being successful with a corneal GP lens.

350 um elevation difference is the guideline when determining between a corneal GP and a scleral lens in HEALTHY cornea.

70



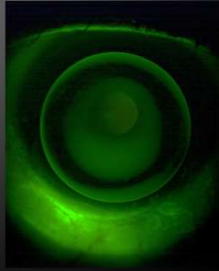
71



72

LEFT EYE – CURRENT LENS

- 20/20-
- SPECIALTY DESIGN CORNEAL LENS
- 6.9 (48.87D) BASE CURVE 49.5/51.9
- 8.7 DIAMETER
- SLIGHTLY STEEP /ALIGNED FIT WITH SOME EXCESS INFERIOR EDGE LIFT
- DID NOT MAKE ANY PARAMETER CHANGES TO THIS LENS

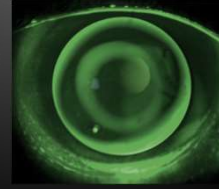
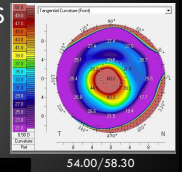


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RIGHT EYE – FITTING PROCESS

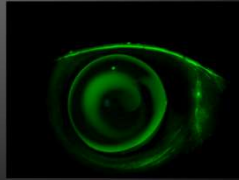
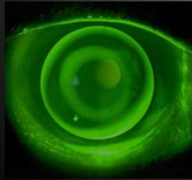
- SELECT A LENS WITH SIMILAR OR SAME DIAMETER
 - 8.7
- SMALL DIAMETER FITTING, SELECT INITIAL BASE CURVE SIMILAR TO PREVIOUS SMALL LENS BASE CURVE
 - 6.7 (50.37D)
- CORRECTABLE TO 20/20



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RIGHT EYE – FITTING PROCESS

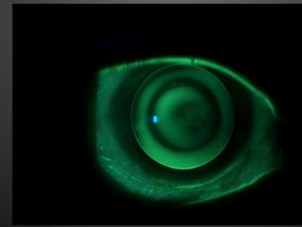


Re-order:
6.6 base curve (~ 0.5D steeper)
8.7 diameter
1 step steep inferior

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CASE 4: DON'T BE AFRAID TO TOSS THE SCLERAL



Finalized
6.6 base curve
8.7 diameter
1 step steep inferior
20/20

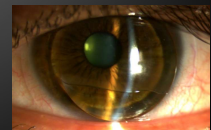
76

AM I GOING TO GET THOSE HALOS WITH THESE LENSES

CASE 5: AM I GOING TO GET THOSE HALOS WITH THESE LENSES

- 51 YO MALE; KCN DIAGNOSIS 1987 OU;
PKP OS 1989 (PRESENTED IN 2019)
- PRESCRIBED A SCLERAL CL OU, BUT DEVELOPED EDEMA
OS – REFERRED FOR A CORNEAL GP FIT OS

	OD	OS
BCVA (CLs)	20/25	20/40-
Conj	WNL	WNL
Cornea	Subtle apical thinning	s/p PKP, clear graft, no NaFl staining, no apacities, no MCE. 1+ NV @ 3 and 10; outside graft/host junction
Lens	Clear	Clear
Post Seg	unremarkable	unremarkable



Presenting cGP OS (Synergeyes II 7.6/9.6 ~8.000S) with piggyback CL; significant inferior edge lift

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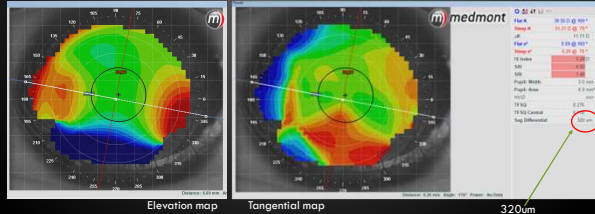
OS Specular microscopy: ~1008 – frank polymegathism

77

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CASE 5: AM I GOING TO GET THOSE HALOS WITH THESE LENSES

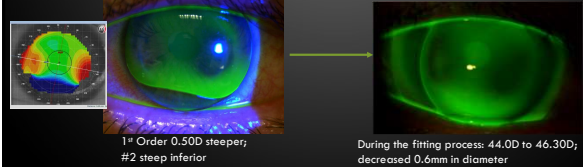
- 51 YO MALE; KCN DIAGNOSIS 1987 OU; PKP OS 1989



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CASE 5: AM I GOING TO GET THOSE HALOS WITH THESE LENSES

Ks: 39.50/51.21
Trial lens: 7.67 (44D) / 11.2 diam



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CASE 5: AM I GOING TO GET THOSE HALOS WITH THESE LENSES

- FINALIZED:
- SPECIALTY GP INTRALIMAL
- 7.29 / 10.6 / -10.25
- 20/20
- 4 STEPS STEEP INF, STANDARD EDGE LIFT
- PIGGYBACK WITH NIGHT AND DAY - 0.50 / 8.4



81

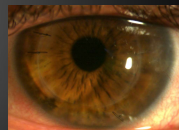
CASE 5: AM I GOING TO GET THOSE HALOS WITH THESE LENSES

- FAST FORWARD TO 2025
- PATIENT HAS CATARACT SURGERY
- PATIENT SEES A COLLEAGUE
- NEW LENS DISPENSE IS ON MY CLINIC SCHEDULE
- IT IS A SCLERAL LENS DISPENSE.....
- WHAT ARE THE FIRST WORDS OUT OF THE PATIENT'S MOUTH WHEN I ENTER THE ROOM....
- AM I GOING TO GET THOSE HALOS WITH THESE LENSES....

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CASE 5: AM I GOING TO GET THOSE HALOS WITH THESE LENSES

- YES, YOU ARE PROBABLY GOING TO GET THOSE HALOS
- COMPLICATIONS:
 - NEW SCLERAL LENS ORDERED ARRIVED WITH A CENTER THICKNESS OF 550 MICRONS
- PATIENT STILL INTERESTED IN TRYING A SCLERAL
 - REFIT - NEW SCLERAL LENS ARRIVED WITH CENTER THICKNESS OF .280, OPTIMUM INFINITE MATERIAL AND ~200 MICRONS CENTRAL CLEARANCE



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CASE 5: AM I GOING TO GET THOSE HALOS WITH THESE LENSES

- MAXIMIZING OXYGEN WITH SCLERAL LENSES
- MINIMAL CENTER THICKNESS (<0.250)
 - VARIATIONS DID NOT CHANGE THE CORNEAL EDEMA A SIGNIFICANT AMOUNT
- HIGHEST DK MATERIAL (MENICON Z, OPTIMUM INFINITE, ACUTY 200)
- MINIMAL CENTRAL CLEARANCE (<200 MICRONS)
 - TEAR FILM MOST IMPORTANT FACTOR

*Fisher D, Collins MJ, Vincent SJ. Scleral Lens Thickness and Corneal Edema Under Closed Eye Conditions. *Exp Contact Lens*. 2022 May 1;48(5):194-198.
*Fisher D, Collins MJ, Vincent SJ. Fluid Reservoir Thickness and Corneal Edema during Open-eye Scleral Lens Wear. *Optom Vis Sci*. 2020 Sep;97(9):683-689.

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CASE 5: AM I GOING TO GET THOSE HALOS WITH THESE LENSES

• NEXT DAY, AFTER 2 HOURS OF SCLERAL LENS WEAR...DOC I AM GETTING THE HALOS!

Parameter	Value
Number of Cells (N/M)	11
Cell Density (C/D)	840
Average Area (A/M)	1190
Standard Deviation (SD)	239
Coefficient of Variation (CV)	24
Max Area (MAX)	3107
Min Area (MIN)	353
Intracanal Cells (H/E)	73
Corneal Thickness (CT)	572

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KERATOCONUS - LOST LENSES

WHEN YOU NEED SOME SPECTACLES TO COMPLEMENT YOUR CONTACT LENSES

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CASE 6: KERATOCONIC - LOST LENSES

- KCN OU, 81 YO FEMALE
- CURRENTLY WEARS GP LENSES OU WITH BIFOCAL GLASSES.

81 year old female complains of difficulty seeing well (lost os contact lens) in OS CL lost for spring of 2015. Contact is reported as currently wears gas perm lenses with bifocals over them. Relief is experienced from wearing old contact lens to replace lost lens os. Patient described the following signs and symptoms: blurred vision, squinting. Additional Notes: Tried scleral lenses (but did not like size). Hydrogen peroxide cleaner

BAT Low M

Visual Acuity Method

SC Dist	OU	RH	SC Near	OU
OD				
OS				
CC Dist <td>OU</td> <td>RH</td> <td>CC Near <td>OU</td> </td>	OU	RH	CC Near <td>OU</td>	OU
OD 20/80-2	20/70-2		20/40-4	20/25-2
OS 20/70-1	20/70-2		20/83-3	20/25-2

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CASE 6: KERATOCONIC - LOST LENSES

Intralimbal OU, OD current, OS old lens

OD OS

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CASE 6: KERATOCONIC - LOST LENSES

- FITTING OD:
 - OD GOOD FIT; BASE CURVE IS A 6.85 AND DIAMETER IS 11.2
 - INTRALIMBAL DESIGN- SAME DIAMETER; LIKELY TO HAVE A SIMILAR FIT WITH THE SAME BASE CURVE
 - FIT: 6.89 BC/11.2 DIAMETER/-8.00 DIAGNOSTIC POWER

Edge Lift inferiorly
Slightly steep overall fit

Order with #2 steepening; inferior quadrant

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QUICK TIP

- QUADRANT SPECIFIC EDGE MODIFICATION FOR A CORNEAL SPECIALTY GP LENS
- AS YOU INCREASE THE AMOUNT OF THE EDGE STEEPENING IT INCREASES IN STEEPNESS AND WIDTH

1 step steep 2 steps steep 3 steps steep

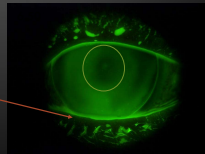
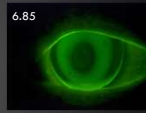
90

CASE 6: KERATOCONIC - LOST LENSES

• FITTING OS:

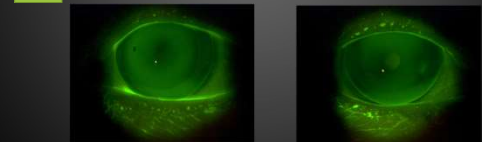
- OS TOO FLAT (6.85 BC); INTRALIMBAL DESIGN
- FIT: 6.5 BC/11.2 DIAMETER/-11.00 DIAGNOSTIC POWER
 - APICAL TOUCH AND INFERIOR EDGE LIFT

- ORDER $\frac{3}{4}$ D STEEPER WITH #1 STEEPENING INFERIOR QUADRANT



CASE 6: KERATOCONIC - LOST LENSES

Pre Diagnostic And Prescribed										Fit Type (Eye R/L)			
Item	Type	BC1	BC2	BC3	DIA	Sphere	Cyl	Axis	Add	Add Desc	Seg	Color	DNA



Management Plan: wear new lenses with BF specs for best visual outcome

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NO SCLERAL LENSES FOR YOU

SERIOUSLY, I CAN NOT SAY THIS ENOUGH – YOU ARE ALLOWED TO FIT OTHER LENSES BESIDES SCLERAL LENSES....

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YOU DON'T ALWAYS NEED A SPECIALTY LENS

- STANDARD OR SPHERICAL GP LENSES CAN BE USED FOR PATIENTS WITH IRREGULAR CORNEAS
- MOST SUCCESSFUL WHEN THERE IS A CENTRAL, SMALL CONE AND MINIMAL ELEVATION DIFFERENCE ON ANTERIOR SURFACE OF THE CORNEA
- RECEIVED A PHONE CALL FROM A NEW PATIENT ASKING IF I WOULD BE WILLING TO FIT HIM INTO A GAS PERMEABLE LENS, NOT A SCLERAL LENS
- CURRENT DOCTOR SAID HE COULD ONLY WEAR A SCLERAL AND IF HE WANTED TO TRY SOMETHING DIFFERENT, HE SHOULD MAKE AN APPOINTMENT WITH ME.

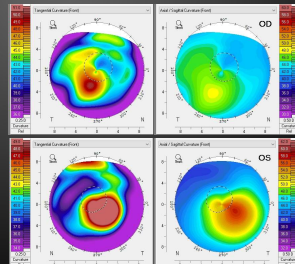
93

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CASE 7: NO SCLERAL LENSES FOR YOU

KCN OU,
PREVIOUS GP WEARER,
CURRENTLY WEARS SPECS
CC OF DOUBLE VISION
IN ONE EYE.

K Values
OD: 44.00/45.3
OS: 48.2/51.8
MR
-1.25 -1.75 x 050 20/25+
-0.25 -1.75 x 090 20/25-



CASE 7: NO SCLERAL LENSES FOR YOU

Steep K OD: 45.3D; Lens BC 45.50

Median K OS -49.5; Lens BC 46.75 (7.22)

Pre Diagnostic And Prescribed										Fit Type (Eye R/L)			
Item	Type	BC1	BC2	BC3	DIA	Sphere	Cyl	Axis	Add	Add Desc	Seg	Color	DNA

Lens BC 48.00 (7.03)

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WORKING FROM THE INSIDE TO THE OUTSIDE

FITTING THAT HIGHLY ASTIGMATIC CORNEA

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ASTIGMATIC OPTIONS

- HIGH ASTIGMATISM CAN BE MANAGED WITH MULTIPLE LENS OPTIONS
 - SOFT TORIC
 - HIGHER ASTIGMATISM AMOUNTS WILL BE LARGER IN DIAMETER, HAVE MORE PRECISE AXIS OPTIONS AND HIGHER CYLINDER OPTIONS
 - HYBRID
 - CORRECTS UP TO 6D OF CYLINDER
 - GAS PERMEABLE
 - SPHERICAL FOR 2.00D OF CORNEAL CYLINDER OR LESS
 - BITORIC FOR 2.50D OF CORNEAL CYLINDER OR MORE
 - SCLERAL LENS

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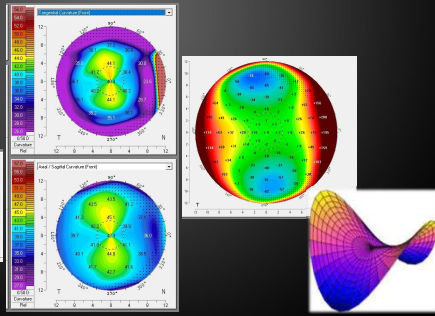
98

CASE 8: WORKING FROM THE INSIDE TO THE OUTSIDE

Inferior Decentration is common with scleral lenses....
A Less Common Cause:
Significant With the Rule Corneal Cylinder

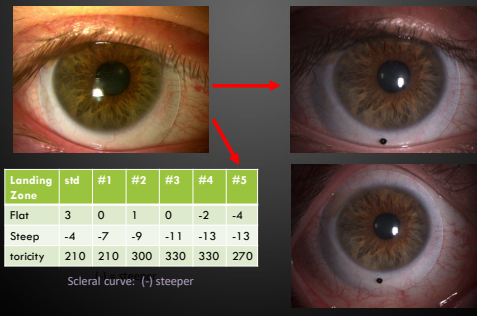
Cornea Plot			
Rf:	8.44 mm	K1:	40.00
Rc:	7.45 mm	K2:	40.30
Rm:	7.94 mm	Km:	42.50
Axis (Rf):	7.2°	Axis (Km):	5.30
Radius (Rf):	8.16 mm	Radius (Km):	7.26 mm

MR:
+2.25-6.50x006 20/20
-3.00-0.25x013 20/20



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CASE 8: WORKING FROM THE INSIDE TO THE OUTSIDE



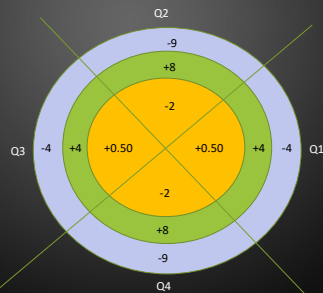
100

CASE 8: WORKING FROM THE INSIDE TO THE OUTSIDE

Scleral (-) steeper
Limbal (+) less clearance
Cornea (-) less clearance



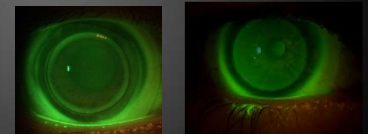
Scleral
Toricity: 150



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CASE 8A: ASTIGMATISM

- 24 YO FEMALE (NEW PATIENT)
 - PRESENTS WEARING SOFT TORIC CL AND COMPLAINTS OF REDNESS AND IRRITATION.
 - MR: OD: PL -4.75 X 010
OS: -1.25 -4.25 X 005
 - FIT INTO HYBRID LENS
 - RX'D CLEAR CARE
 - IMPROVED END OF DAY COMFORT AND VISION



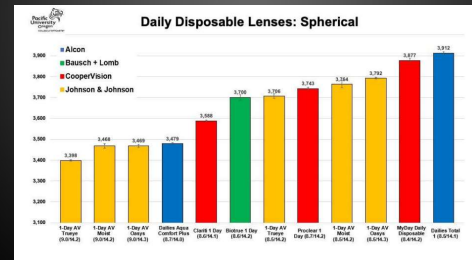
102

QUICK COMMENTS ON PIGGYBACKING

- HIGH DK LENS MATERIAL
 - THINK SILICONE HYDROGEL
 - MONTHLY OR DAILY DISPOSABLE
- ONE CARE SYSTEM
 - CLEAR CARE
- FIT GP LENS FIRST, THEN ADD SOFT LENS
- DON'T PLAN ON SOFT LENS HELPING MUCH WITH VISION
 - SOFT LENS ONLY PROVIDES ~20% OF ITS POWER
 - USE A LOW MINUS OR LOW PLUS POWER (+/- 0.50)
- ONLY USE WHEN PATIENT HAS AN ISSUE WITH LENS COMFORT

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QUICK COMMENTS ON PIGGYBACKING



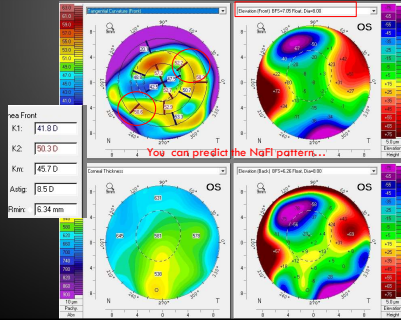
Pacific_SCL_Sagittal_Depth_Story_Charts.pdf

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CASE 10: WHY WEAR ONE LENS IN AN EYE WHEN YOU CAN WEAR TWO?

OS fitting:
Intralimbal design
Initial Lens Selection:

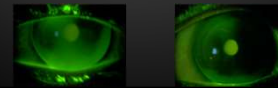
Base curve: ~45D to
46 D
Diameter: 11.2mm



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CASE 10: WHY WEAR ONE LENS IN AN EYE WHEN YOU CAN WEAR TWO?

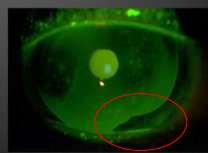
- 46.00D BC/11.2 DIAMETER
 - HORIZONTAL BOW-TIE PATTERN OF TOUCH, EXCESSIVE INFERIOR EDGE LIFT (EDGE RESTING ON INFERIOR LID MARGIN)
- 48.00D BC/11.2 DIAMETER
 - BOW-TIE PATTERN LIGHT TOUCH PARACENTRALLY, APICAL CLEARANCE WITHOUT BUBBLE; SMALL INFERIOR BUBBLES, TOUCH ALONG INFERIOR LID MARGIN, SUFFICIENT MOVEMENT WITH BLINK – PATIENT REPORTS GOOD COMFORT.



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CASE 10: WHY WEAR ONE LENS IN AN EYE WHEN YOU CAN WEAR TWO?

- INITIAL ORDER OS:
 - INTRALIMBAL 48.00D (7.03) BC/ 11.2 DIAMETER / -9.50
 - #1 STEEP SUPERIOR CURVATURE 20/20



Final Lens Order: 48.00D (7.03) bc/ 11.2 diameter / -9.50 #3 inferior steepening
Clear Care solution, build up wear time

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GO BIG OR GO HOME

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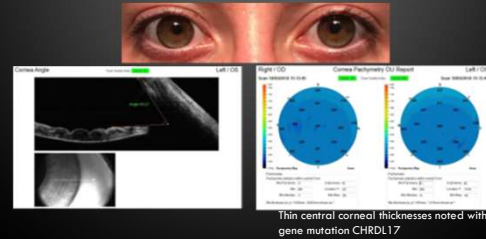
CASE 11: GO BIG OR GO HOME

- 22 YO M – PRESENTS TO CLINIC FOR A CL FITTING.
- HAS ATTEMPTED TO WEAR PREVIOUSLY, BUT WOULD SEE "EDGES OF A CIRCULAR OBJECT IN VISION" AND CL HAD TENDENCY TO "POP OFF"
- WAS TOLD, NO CL WOULD "WORK WELL" WITH HIS EYE
- OCULAR HX: **MONITORED AT BIRTH FOR SOME OCULAR CONDITION, BUT LATER TOLD HE WAS "OK"**
- EXAM FINDINGS: HVID 14.5MM OD/OS
- OD: 43.00@006/45.00@096 -5.00-3.00X011 20/25 PHNI
- OS: 45.75@177/45.25@087 -4.75-3.25X165 20/25 PHNI

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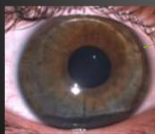
CASE 11: GO BIG OR GO HOME

Simple megalocornea presents without additional ocular and systemic abnormalities.



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CASE 11: GO BIG OR GO HOME



Inadequate limbal coverage with standard SiHy lens

8.40/8.50 mm BC, 16.0 mm OAD Art Optical Intellwave toric
CL Made in Definitive SiHy material
• OD lens: -4.75-2.75x011 20/25
• OS lens: -4.50-3.00x165 20/25 20/20 OU



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SOMEONE DIM THE LIGHTS!

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CASE 12 : SOMEONE DIM THE LIGHTS!

- 56 YO FEMALE – COMPLAINS OF LIGHT SENSITIVITY IN LEFT EYE
- 9 MONTHS IN DURATION, ALL DAY, SEVERE WITH A HEADACHE
- H/O HYSTERECTOMY 10 MONTHS PRIOR, FOLLOWED BY OVERDOSE OF MEDICATION FROM URGENT CARE
- ONLY HEADACHE RELIEF IS FROM STEROIDS

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CASE 12: SOMEONE DIM THE LIGHTS!



- PHOTSENSITIVITY WORSE WITH INDOOR LIGHT AND DRIVING AT NIGHT, BETTER WHEN OUTSIDE
- FREQUENTLY SHUTS HER LEFT EYE WHEN TALKING TO PEOPLE, WEARS HAT AND SUNGLASSES MOST OF THE TIME

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CASE 12: SOMEONE DIM THE LIGHTS!

- SHORTER WAVELENGTHS ARE KNOWN TO TRIGGER MIGRAINES
 - LIKE BLUE LIGHT
 - SOURCES OF BLUE LIGHT INCLUDE SUNLIGHT, CELL PHONES, COMPUTER MONITORS, TABLET SCREENS, FLAT SCREEN LED TELEVISIONS, LED LIGHTS, AND COMPACT FLUORESCENT LIGHT BULBS
- USING PSYCHOPHYSICAL ASSESSMENTS IN PATIENTS WITH NORMAL EYESIGHT:
 - **Green light** EXACERBATES MIGRAINE HEADACHE SIGNIFICANTLY LESS THAN WHITE, BLUE, AMBER OR RED LIGHTS.
- WHY?
 - **GREEN** ACTIVATES CONE-DRIVEN RETINAL PATHWAYS TO A LESSER EXTENT THAN WHITE, BLUE AND RED (ERG/VEP)
 - SUGGEST THAT PATIENTS' EXPERIENCE WITH COLOR AND MIGRAINE PHOTOPHOBIA COULD ORIGINATE IN CONE-DRIVEN RETINAL PATHWAYS

Rodrigo Naseda, Carolyn A. Bernstein, Migraine photophobia originating in cone-driven retinal pathways, Brain, Volume 139, Issue 7, July 2016, Pages 1971–1986, <https://doi.org/10.1093/brain/aww119>




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CASE 12: SOMEONE DIM THE LIGHTS!

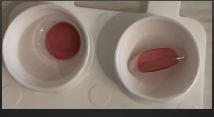
- LAVENDER-TINTED LENSES CAN REDUCE PHOTOPHOBIA AND HEADACHES BY FILTERING OUT SHORTER, WAVELENGTHS OF LIGHT → LIKE BLUE LIGHT
- **ROSE/PINK/LAVENDER**
 - FILTERS OUT BLUE LIGHT, PARTICULARLY HELPFUL FOR FLUORESCENT LIGHTING AND DAILY SCREEN USE
- **AMBER OR BROWN**
 - FILTERING BLUE LIGHT AND REDUCING GLARE
- **GREY-GREEN**
 - USED FOR OUTDOOR LIGHT SENSITIVITY, "DIMMING EFFECT"

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CASE 12: SOMEONE DIM THE LIGHTS!

- FIT THE PATIENT: BIOMED LAVENDER SOFT CONTACT LENS
- BASE CURVE 8.3 DIAMETER 14.0
- IRIS DIAMETER 11.5MM

Size Parameters	Tint Parameters
Info / Pupil Dimensions	Info / Pupil Tints
• EDGE - Edge to Edge	• Lavender
• 11.5 mm with clear 4.5 pupil	• Migraine 55
• 12.0 mm	• Blue Blocker
• 11.5 mm	• Cobalt
• 10.5 mm	• Teal
• 9.0 mm	• Red
• 7.0 mm	
• 5.0 mm	
• 4.0 mm	

Very Blue Soft Contact Lenses
Lavender



Migraine photophobia relief
Migraine photophobia relief
Photophobia relief by lavender and cobalt lenses

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THANK YOU!

- QUESTIONS?
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