

Brief Guide to Contact Lens Troubleshooting

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The graphic features a central illustration of a contact lens case with a lens inside, surrounded by water splashes and floating contact lenses. The text is positioned on the left side of the graphic.

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How to apply and remove a lens?

- Soft Lenses
- Rigid Gas Permeable (RGP)
- Sclerals

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The Essentials

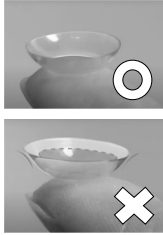
1. Always wash hands with soap
2. Dry hands thoroughly with a lint free towel



The image shows a pair of hands being washed with soap in a white sink. The water is running from a faucet, and the hands are covered in white soap suds.

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How to apply a soft lens?



Good eyelid control is KEY!

<https://www.youtube.com/watch?v=6rKjH1MwEAg>

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How to remove a soft lens?



1. Control eyelids, gaze opposite to site of removal

2. Firmly decenter lens towards site of removal

3. Pinch lens off from the sclera

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How to apply a RGP lens?



1. Fill lens with solution to minimize insertion bubbles

2. Control the upper and lower eyelids

3. Insert on cornea, then have patient look down or close their eyes

<https://www.youtube.com/watch?v=4H#isofMww>

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How to remove a RGP lens? Method 1



- 1. Lift and press the upper eyelid tightly against the globe beyond the edge of the lens. This will form a tight seal to prevent the lens from getting under the eyelid
- 2. Lower and press the lower eyelid tightly against the globe. Push both eyelids towards the edge of the lens
- 3. The lens should lift off the cornea

<https://www.youtube.com/watch?v=4IHisoMww>

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How to remove a RGP lens? Method 2



- 1. Look straight ahead and open the eyes widely, place fingers at the temporal canthus and drag the lids temporally so the lids are tight against the globe
- 2. Maintain the lids tightly against the globe and have the patient blink
- 3. The lens should lift off the cornea when the patient blinks

<https://www.youtube.com/watch?v=4IHisoMww>

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How to apply a scleral lens?



- 1. Mount scleral lens on an applicator. Fill up the scleral lens with preservative free saline solution until the solution looks like a "dome"
- 2. Firmly control both upper and lower lids and have the patient look in the hole of the applicator as they bring it close to their eye. Have them keep both eyes open
- 3. Press the stem of the applicator to easily release the lens onto the eye. Vision may be blurry and the lens may feel uncomfortable if there is an air bubble trapped under the lens

<https://www.youtube.com/watch?v=5uKYwHlQUU>

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How to remove a scleral lens?



1. Moisten a small plunger with saline
2. Put the plunger on the lower 1/3 of the scleral lens. **NEVER** on the center of the scleral lens as it can pull too hard on the eye.
3. Gently pull the plunger up and out to break suction and remove the lens from the eye

<https://www.youtube.com/watch?v=SUkYKwHIQQU>

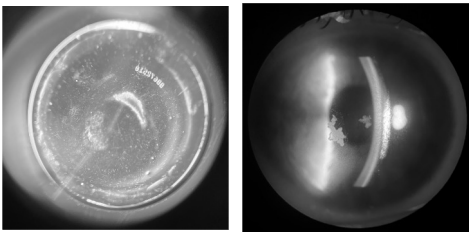
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Common Challenges with Lenses

1. Lens surface
2. Optics
3. Lens Discomfort
4. Irregular Eyes

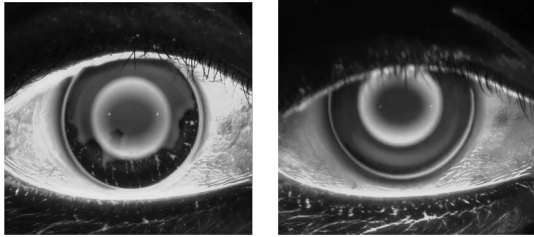
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Lens Surface: Scratches and Deposits

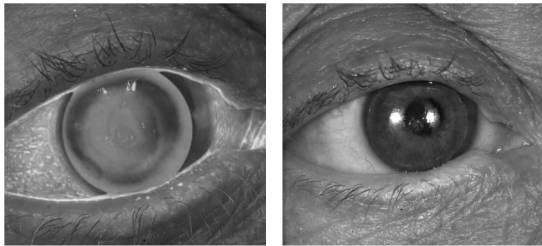


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Poor Lens Surface Wetting



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Solution (no pun intended)



- Cleaning regimen
- Preservatives, lotions, make up
- How old are the lenses?
- In office cleaning and polishing

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Cleaning vs. Disinfection

According to the CDC:

- **Cleaning:** removal of deposits, debris, and some germs from the surface of the contact lens
- **Disinfection:** killing of germs present on the contact lens, some of which can cause serious eye infections

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Tap Water and CLs do NOT mix

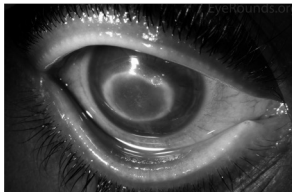
According to the CDC:

- About 85% of Acanthamoeba keratitis (AK) cases occur in contact lens wearers
- Increased risk with:
 - "Topping off CL cases"
 - History of corneal trauma
 - Swimming, showering, tap water on lenses
 - Poor lens hygiene, using wrong solution



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Acanthamoeba Keratitis



- Previously was ok to use tap water for rinsing CLs, but recommendations have changed!
- VERY important to educate patients AK can lead to blindness!

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Things to consider

- Type of lens: soft vs gas permeable
- Sensitivity to preservatives
- Level of complexity of cleaning regimen
- Wetting agents
- Lens coatings

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Soft Lens Solutions

- Multipurpose
- Hydrogen peroxide system



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Gas Permeable Lens Solutions

- Multistep systems: Boston Advance
- One step systems: Boston Simplex, Unique pH
- Hydrogen peroxide



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Hydrogen Peroxide



- Compatible with soft lens and gas permeable materials
- Minimum 6 hrs of soaking
- Patients often forget to rub lenses before disinfecting
- Red cap ≠ directly on eye

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For stubborn deposits

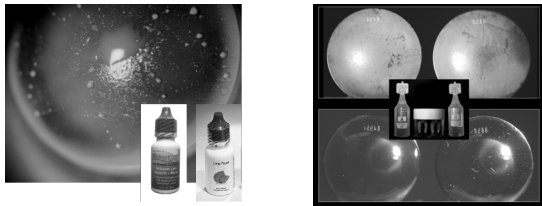
- Isopropyl lens cleaners
- Progent



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For stubborn deposits

- Isopropyl lens cleaners
- Progent



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Hydra-PEG

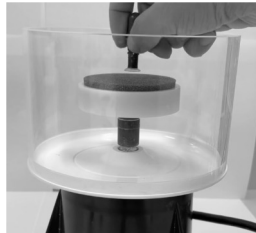
- Helps lenses wet better and resist deposits
- Compatible with hydrogen peroxide systems
- NOT compatible with isopropyl systems and harsh lens cleaners (Miraflo, Progent, etc)
- Can be restored with Tangible Boost



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In-Office Cleaning and Polishing

- Manual cleaning in office
- Polishing
 - Not as common anymore



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Optics: Case #1

- RT 83 yo M presents for new scleral lens s/p cataract surgery OS
- Stable KCN OU, h/o cataract surgery OD, PKP OU
- Habitual lenses:

OD: Scleral Lens/4800/8.04/-6.50/16.5/-3
LLZ/-3 SLZ/+6 TH/Clear

OS: Scleral Lens/4600/8.04/-
8.00/16.5/STD periphery/Blue



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Exam findings

- Entering VAs: OD 20/30- (PH NI) , OS 20/200 +1 (PH 20/40)
- Pupils: ERRL, (-)APD OU
- Lids/lashes: 1+ MGD, tr bleph OU
- Corneas: clear center, PKP, (-)edema/PEE OU
- Lens: clear PCIOL (undilated)

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Over Refraction OS

ORx +10.50 over habitual scleral lenses, BCVA 20/20 OU

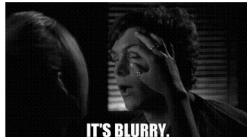
- Habitual:
OS: Scleral Lens/4600/8.04/-8.00/16.5/Optimum Extra/Clear
- New order:
OS: Scleral Lens/4600/8.04/+2.50/16.5/Optimum Extra/Blue
RTC in 2 weeks for CL check or sooner prn

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Before the 2 week f/up

Pt reports newest OS lens was blurred and could not see ANYTHING!

Reports good comfort and fit with lens. Denies other changes in vision or eye health history since last visit.



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Over Refraction OS (again)

- Good comfort and adequate fit with habitual scleral lens OS
- ORx **+2.00** over newest scleral lenses, BCVA 20/20
- Habitual:
OS: Scleral lens/4600/8.04/**-8.00**/16.5/Optimum Extra/Blue
- New order:
OS: Scleral lens/4600/8.04/**+4.50**/16.5/Optimum Extra/Blue

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How to Vertex?

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Other optics to consider




- Transposing between (+) and (-) cyl
- Verifying lens parameters
- Checking for lens flexure
- Following the lens fitting guide and understanding the lens design

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Verify Lens Parameters

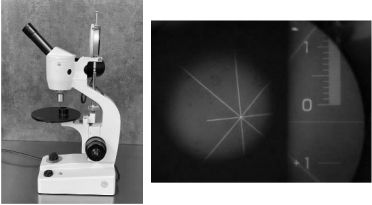
- Power
- Base Curve
- Diameter



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Verify Lens Parameters

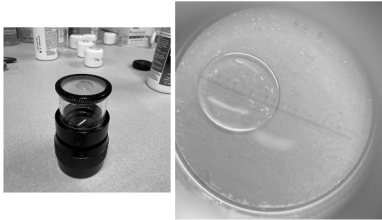
- Power
- Base Curve
- Diameter



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Verify Lens Parameters

- Power
- Base Curve
- Diameter



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Lens Discomfort

- Leading reason for soft CL wear drop out (51%)
 - Dryness (41%)
- Level of complexity of cleaning regimen
- Poor lens fit

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Lens Discomfort: Case #2

PR 77 yo M presents for follow up because newest OS scleral lens is uncomfortable on the inferior temporal edge

Relevant ocular history:

1. Keratoconus, stable, bilateral
2. Irregular astigmatism of both eyes
3. Corneal scar OD

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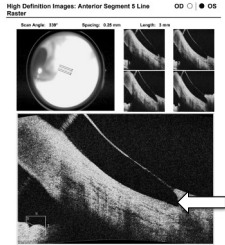
Lens Discomfort: Case #2

- Good comfort, vision, and fit with habitual OD scleral lens. BCVA 20/20- OD with no ORx
- OS some discomfort, but good vision. BCVA OS: 20/25+2 with no ORx
- Reports good compliance with Clear Care and contact lens hygiene

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Lens Discomfort: Case #2

- Pt symptomatic for discomfort on inferior temporal edge of left scleral lens, no blanching or EL on slit lamp examination
- Anterior segment OCT shows scleral lens landing excessive on inferior temporal sclera,



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Lens Discomfort: Case #2

Continue habitual lenses for now.

Order and MTP:

OS: Scleral Lens/4400/8.04/+8.50/16.5/LLZ +4/SLZ -2/Optimum Infinite/HydraPEG

- Flattened scleral landing zone (SLZ) by 2 steps
- Consider ordering lens in smaller diameter if changes do not provide relief

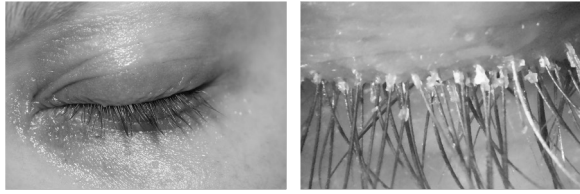
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Dryness

- Some things we can control, some we can't
- Switch to daily disposable or try different materials (water gradient)
 - Preservatives in lens care regimen
- Scleral lenses
- Include ATs (PFATs for over the CL use)
- Refer to dry eye service

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Blepharitis



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Meibomian Gland Dysfunction

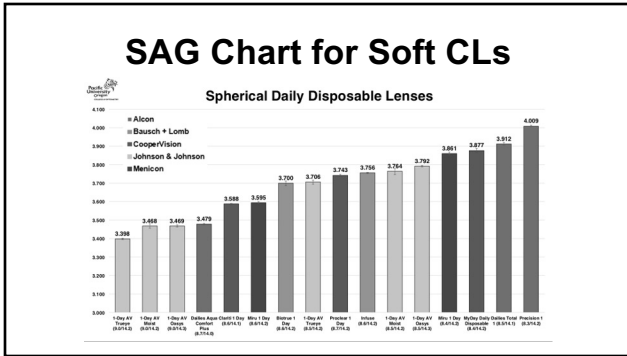


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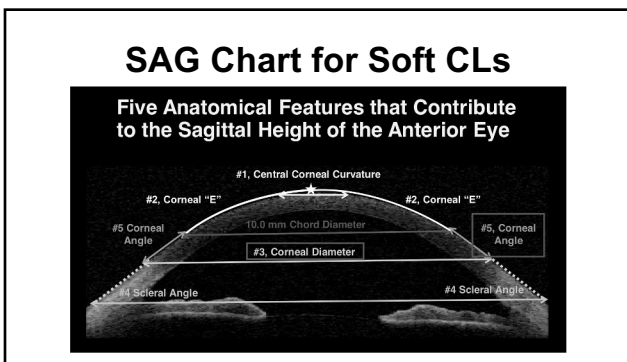
Chronic Allergic Conjunctivitis



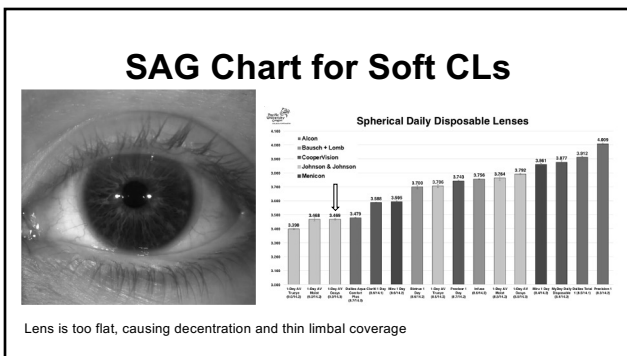
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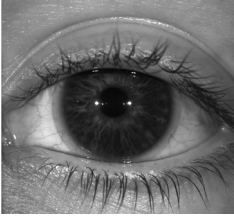


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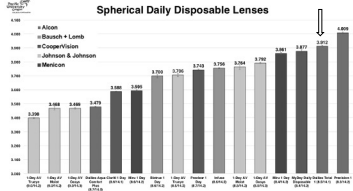


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SAG Chart for Soft CLs



Spherical Daily Disposable Lenses


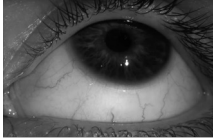
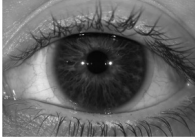



Brand	SAG Value
Alcon	0.0300
Bausch + Lomb	0.0388
CooperVision	0.0400
Johnson & Johnson	0.0443
Menicon	0.0488
Alcon	0.0500
Bausch + Lomb	0.0550
CooperVision	0.0600
Johnson & Johnson	0.0650
Menicon	0.0700
Alcon	0.0750
Bausch + Lomb	0.0800
CooperVision	0.0850
Johnson & Johnson	0.0900
Menicon	0.0950
Alcon	0.1000

Lens has improved centration and movement (~443um steeper)

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SAG Chart for Soft CLs

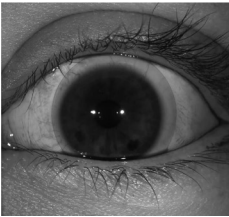





Acuvue Oasys 1 day
9.0 BC
Sag 3.469
(top, flatter)

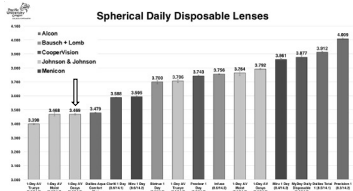
Dailies Total 1
8.5 BC
Sag 3.912
(bottom, steeper)

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SAG Chart for Soft CLs



Spherical Daily Disposable Lenses



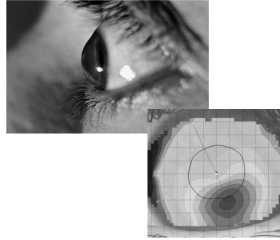
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Bausch + Lomb	0.0550
CooperVision	0.0600
Johnson & Johnson	0.0650
Menicon	0.0700
Alcon	0.0750
Bausch + Lomb	0.0800
CooperVision	0.0850
Johnson & Johnson	0.0900
Menicon	0.0950
Alcon	0.1000

Lens is too flat, causing decentration and insufficient limbal coverage in certain gazes

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Examples of Irregular Eyes

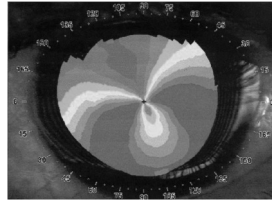
- Keratoconus
 - Steeper center to inferior cornea
 - Irregular astigmatism
 - Good success with soft lenses (early-intermediate stages), GP lenses, and scleral lenses



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Examples of Irregular Eyes

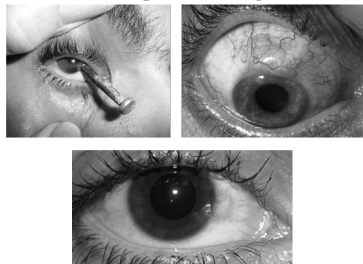
- Pellucid Marginal Degeneration
 - Steep inferior cornea
 - "Crab-claw" or "kissing dove" pattern
 - Irregular astigmatism
 - Good success with scleral lenses



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Examples of Irregular Eyes

- Ocular trauma
- Pinguecula and pterygium
- Blebs



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Irregular Fit: Case #3

- MN 30 year old Caucasian male was referred for CL fitting
- Ocular history:
 - Keratoconus OU
 - s/p PKP OS
 - Pseudophakia OS
 - Secondary glaucoma OS following PKP
 - His uncontrolled intraocular pressures (IOPs) following the PKP resulted in tube shunt placement and then trabeculectomy OS
- BCVA of 20/20 OD with his habitual soft lens and 20/40-2 OS uncorrected.
- Manifest refraction was OD -9.50 -2.25 x060 with BCVA 20/20 and +3.75 -4.25 x030 OS BCVA 20/30+2

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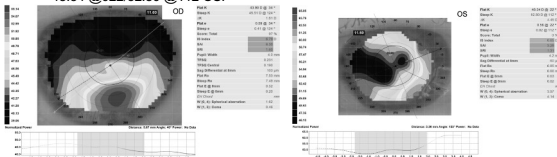
Irregular Fit: Case #3

	OD	OS
Lids	Normal	Normal
Conjunctiva	White and quiet	White and quiet, patent filtering bleb inferior nasal
Cornea	Inferior thinning and inferior corneal neovascularization	PKP with clear center, 2+ pigmented guttata and no signs of graft rejection, edema, corneal neovascularization, or keratic precipitates
Anterior chamber	Deep and quiet	Deep and quiet, tube shunt 2:00
Lens	Clear natural lens	PCIOL

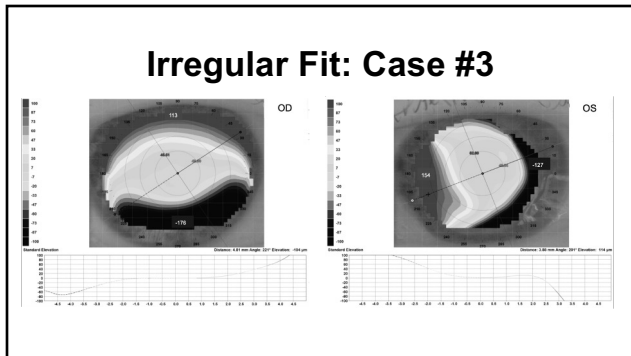
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Irregular Fit: Case #3

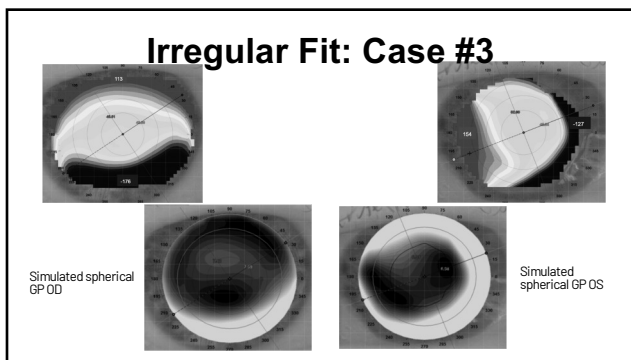
- Patient had good and comfortable vision with his habitual soft contact lens OD:
 - CooperVision/Biofinity Toric XR/8.7 BC/-8.50 -1.75 x060/14.5 diameter (Dk 138).
- His simulated Ks with corneal topography were 43.90 @034/45.51 @124 OD and 48.34 @022/52.80 @112 OS.



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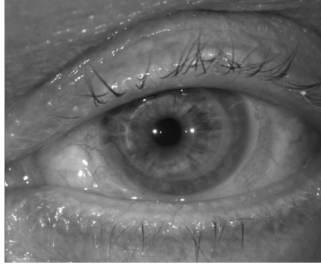
Irregular Fit: Case #3

- Manifest refraction was OD -9.50 -2.25 x060 with BCVA 20/20 and +3.75 -4.25 x030 OS BCVA 20/30+2
- Options for this fit included:
 - Scleral lens (impression, notched/micro vault)
 - Toric GP lens
 - Soft custom lens
- The newest lens was ordered based on refraction, central K readings and VID: Art Optical/Intelliwave Pro Toric/8.0/+3.75 -4.00 x 030/15.0/Definitive (Dk 60)

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Irregular Fit: Case #3

- Soft custom lens
- OS: Art Optical/Intelliwave Pro Toric/8.0/+3.75 -4.00 x 030/15.0/Definitive (Dk 60)
- Good candidate for soft lens (BCVA 20/30+2)



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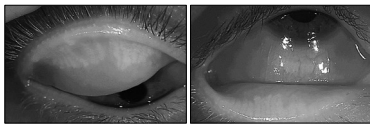
Dry eyes: Case #4

- PV is a 33-year-old male with a history of radiation therapy for leukemia
- History of mixed aqueous deficient and evaporative dry eye and exposure keratopathy due to nocturnal lagophthalmos
- Previously underwent extensive dry eye treatments but found no relief
- Co-management with the corneal specialist led to a diagnosis of GVHD

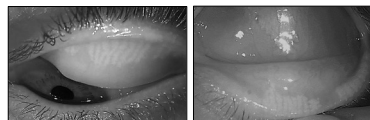
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Dry eyes: Case #4

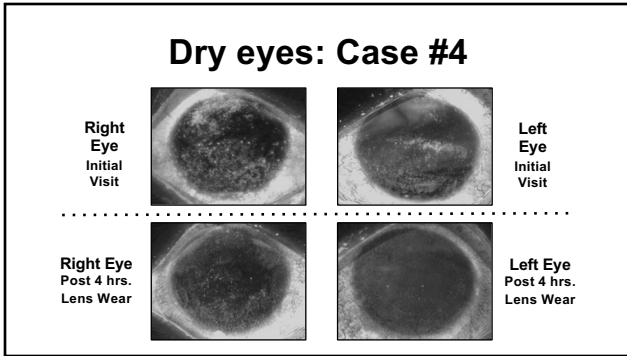
Meibography Right Eye



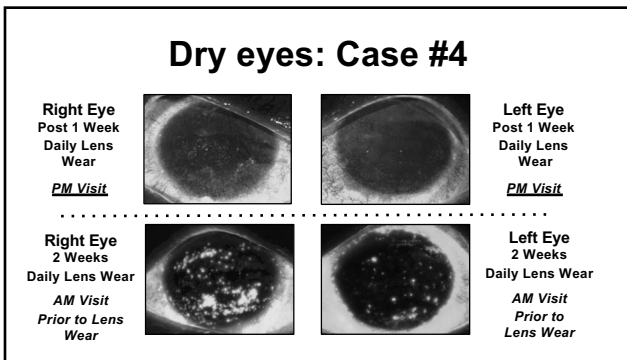
Meibography Left Eye



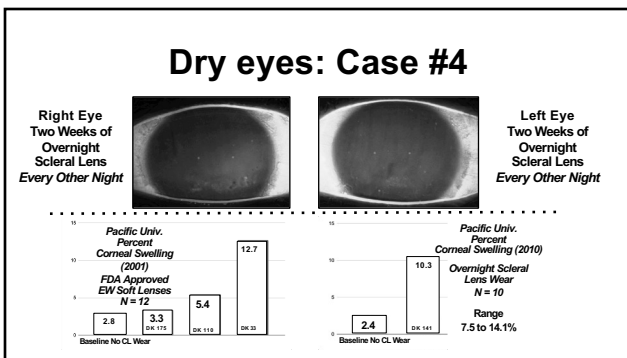
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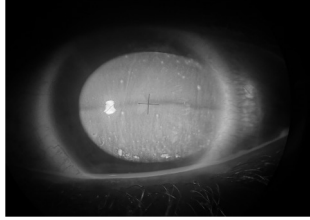


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Dry Eye: Case #4



Doing well with only day time scleral lens wear and using moisture chamber goggles at night



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Resources

- Gas Permeable Lens Institute (GPLI)
 - <https://gpli.info/>
- Scleral Lens Education Society (SLES)
 - <https://sclerallens.org/>



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Thank you!

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