The Basics of Soft Toric Lens Fitting

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Introduction

- Astigmatism – What is it?
- Who needs can wear toric lenses
- Soft toric lens design
- Fitting - Preparation
- Determining Power
- Axis
- Diagnostics – Assessment
- Custom
- Problem Solving

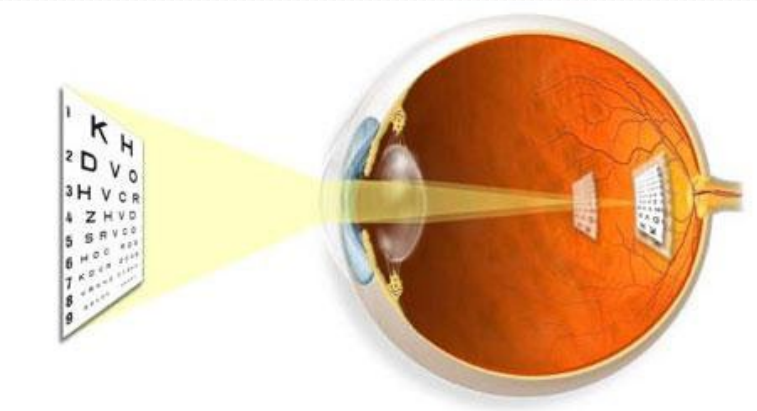
Continual Changes in Technology

- Before this course is even published, technology will change
- These are to be considered guidelines only
- Any reference to specific products can change
- Check vendors for up-to-date materials

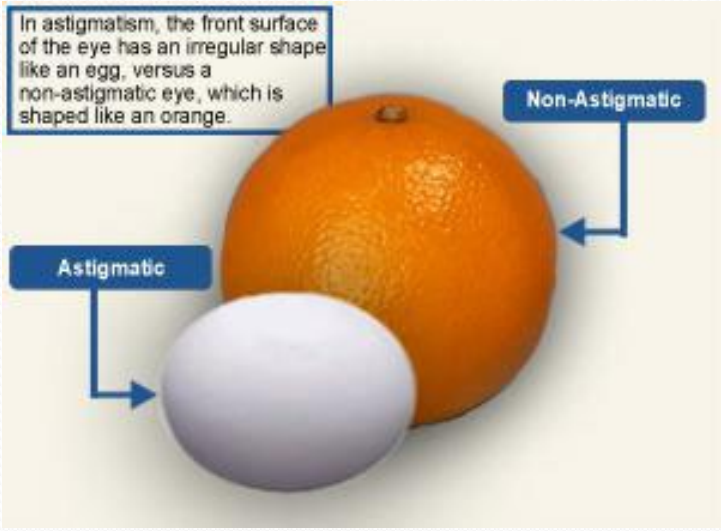
According to Contact Lens Spectrum Annual Report

- New fits for soft toric lens fittings were down in 2020
- New fits of soft toric lenses were 23% of new fits versus 26% in 2019

Astigmatism – What is It?



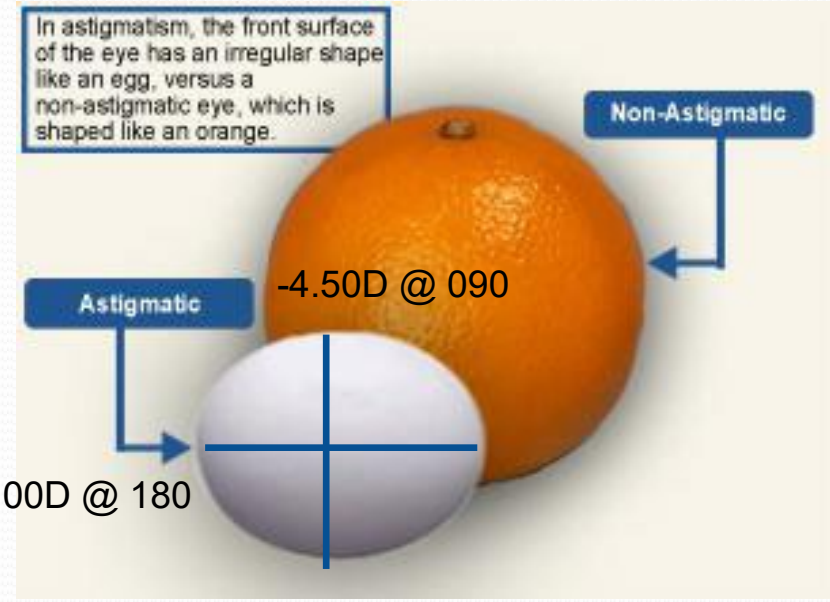
Original	Compromise
aio	aio
Horizontal Focus	**Vertical Focus**
aio	aio



Astigmatism and How it Looks

sphere / cylinder x axis

-3.00 / -1.50 x 180



Who Has Astigmatism

- Approximately 50% of patients have significant astigmatism
- More than one-third of CL patients need astigmatic correction
- Only about 23% of soft lenses fitted are torics in US
- Disproportionately high % of CL drop-outs are astigmats 51%: ≥0.75DC both eyes or ≥1.50DC one eye (Young, Veys, Pritchard, Coleman 2002)

Incidence of Astigmatism

> 0.25D	76.5%
> 0.50D	61.5%
> 0.75D	45.4%
> 1.00D	34.8%
>1.25D	24.8%
>1.50D	19.2%
>1.75D	15.8%
>2.25D	10.0%
>3.00D	3.4%

- As the amount of astigmatism increases, the percentages of patients affected decreases
- Over 75% of all patients have some astigmatism
- Over 45% have over 0.75D

Who to Fit With Toric Soft Lenses

- Old rule was 1.00D or more of astigmatism
- Now it would be 0.75D or more of astigmatism
  - Remember that spherical equivalents have image focus straddle the retina
- Sphere power - 1/4 of sphere power usually acceptable
- e.g. -5.00/-1.25 x 5 -2.00/-1.25 x 5
- •WTR vs. ATR vs. Oblique astigmatism

Spherical Equivalent

- -2.00 – 1.00 x 180

Spherical Equivalent

- -2.00 – 1.00 x 180

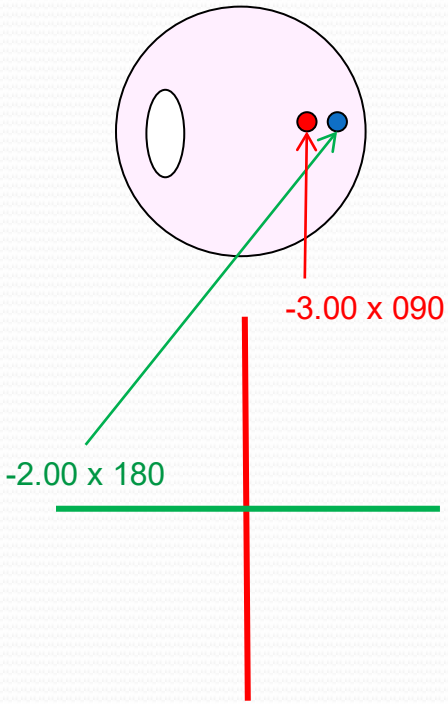
- ½ of the cylinder power
  - Added to the sphere power

Spherical Equivalent

- -2.00 – 1.00 x 180
- ½ of the cylinder power
  - Added to the sphere power
- Becomes the spherical equivalent
- -2.50 sph

Spherical Equivalent

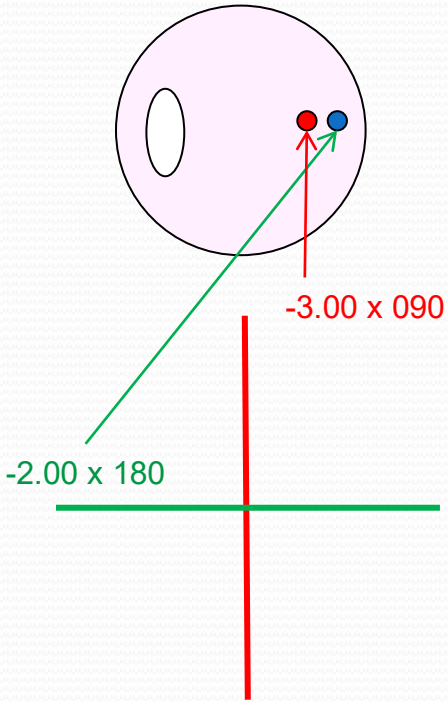
-2.00 – 1.00 x 180



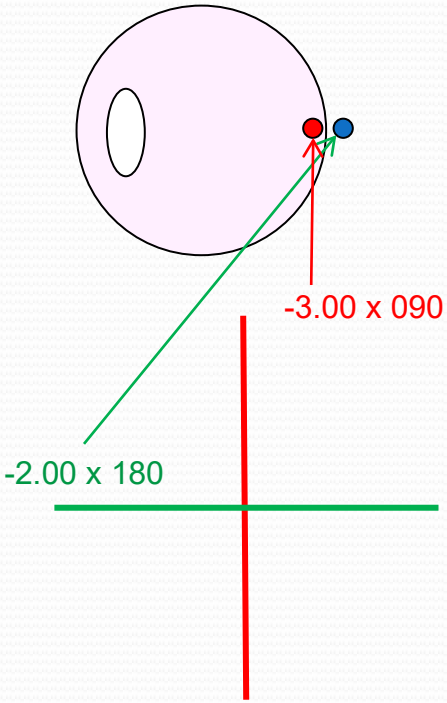
Spherical Equivalent

- -2.50 sph

-2.00 – 1.00 x 180



-2.00 – 1.00 x 180

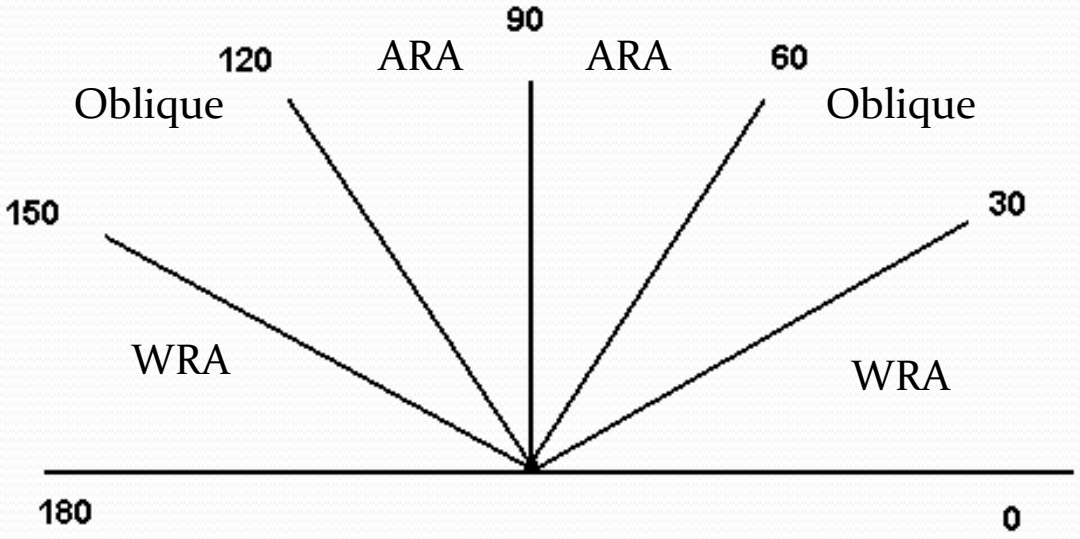


No Astigmatism

Against the Rule Astigmatism

With the Rule Astigmatism

Corneal Astigmatism



Indications for Soft Toric Lenses (vs. Rigid Lenses)

- Patients with normal to loose lids
- Patients with average to large palpebral fissures
- Patients with lower lid margin at the lower limbus
- WRA and ARA
  - 180 and 90 degree axis
- Patients with a difference in corneal & refractive astigmatism
- Patients who experience rigid lens intolerance
- Existing spherical soft lens wearers with moderate amounts of astigmatism who would like better VA
- Sports or part-time use

Patients Who May Pose a Challenge for Soft Toric Lenses

Remember, this doesn't make it impossible

- Patients who are sensitive to slight fluctuations in vision
- Successful rigid lens wearer (patient's assessment)
- Patients with excessively steep corneas
- Patients with narrow palpebral fissures
- Patients with exophthalmic eyes
- Patients with poor tear quantity or tear quality
- Little spherical power related to cylinder power
  - Cylinder > sphere power e.g. -0.50 / -1.75 x 180
- Oblique astigmatism
  - Possibly
- Tight lids
  - Possibly

Methods of Stabilization

- Prism Ballast
  - Modified Prism Ballast
- Prism Ballast With Truncation
- Peri-Ballast
- Dynamic Stabilization
  - Double Slab-Off

Prism Ballast

- Adds Thickness and weight to the lower portion of the lens
- Misconception is lens is held in place by gravity
- Major factor is interaction with upper lid with thinnest portion of lens
  - Watermelon Seed Principle - is that if a watermelon seed is squeezed between thumb and forefinger, it will spin around and orient with its thinnest portion between the fingers and the thickest portion pointing outward.

Prism Ballast With Truncation

- Uses the Prism Ballast with a segment of plastic removed from the inferior portion of the toric lens
- Because of discomfort and dehydration of straight edge, this method is rarely used today

Peri-Ballast

- Optic zone is free of prism
- Weight and thickness is confined to carrier
  - May eliminate vertical image displacement caused by prism in the optical zone used by prism ballast design

Dynamic Stabilization
Double Slab-Off

- Lenses are thicker through the mid-section and thinner inferiorly and superiorly
  - The top and bottom have been thinned through slabing off the thickness
  - Thin zones tuck underneath the lids
  - Uses the watermelon seed principle of stabilization
  - The thinner inferior zone is usually more comfortable
  - No OZ prism is used
  - Good for patients with tight lids

Factors Affecting Stabilization

- Watermelon Seed Principle
- Forces acting on a Soft Toric Lenses
  - Static upper lid force
  - Dynamic lid force
  - Gravity
  - Static lower lid force

Patient Factors Influencing Toric Soft Lens Fit

Palpebral Aperture – Size/Shape

Lower Central Lid Angle

Inner-Canthal Angle

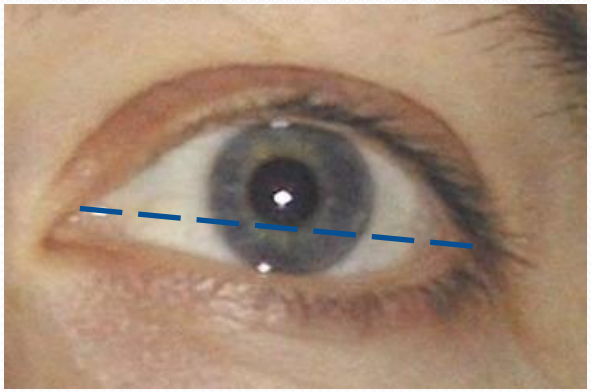
Upper Central Lid Angle

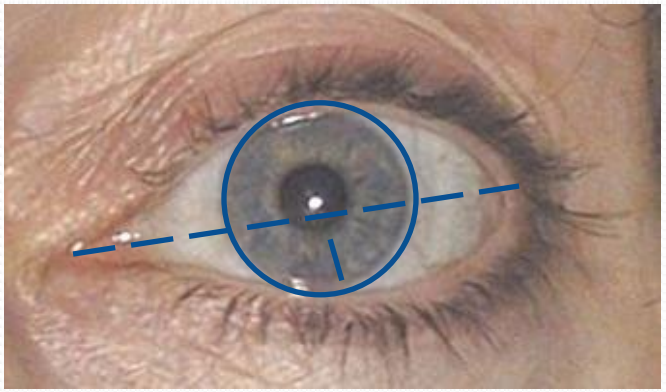
Orientation Factors Influencing Toric Soft Lens Fit

- Orientation stability
- Re-Orientation speed
- Orientation Inferior-Temporal

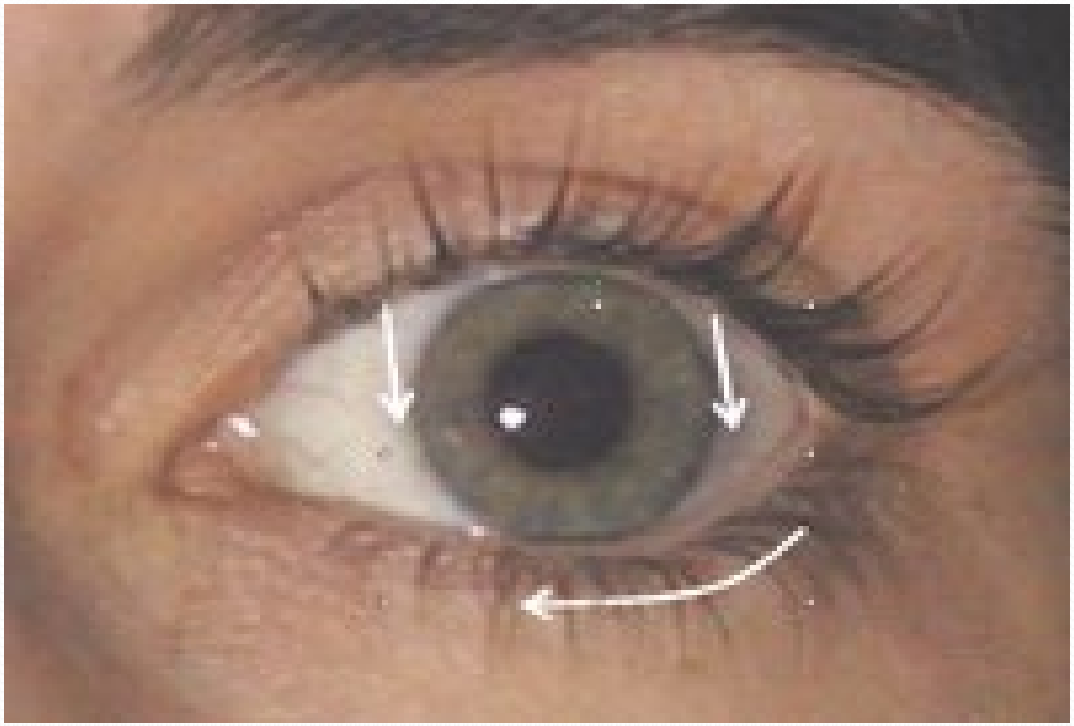
Inner-canthal angle vs. orientation

- Rotation will be affected based on patient anatomical factors





Conflicting actions of the upper and lower lids during the blink



Soft Toric Fitting Basics

Following are a few basic guidelines for a successful soft toric fit:

- The majority of soft toric candidates do well with median base curve values
  - (8.3mm to 8.7mm).
- With-the-rule (WTR) and against-the-rule (ATR) astigmats tend to have more success than do oblique astigmats.
- Choose the replacement plan that best suits the patient.
  - Options range from daily disposable to traditional conventional plans.
- Choose material options based on patient needs and ocular health.

Soft Toric Fitting Basics

Following are a few basic guidelines for a successful soft toric fit:

- Perform a *careful* refraction, which will save time during the fitting process.
- Compensate for vertex ± 4.00 in each meridian
- Use diagnostic sets to choose initial lenses or order diagnostic lenses empirically.
- Adjust for rotation using the LARS method.
- Begin with a spherical over-refraction, but don't settle for "20/happy."— if necessary, move to a spherocylindrical over-refraction.
- Educate the patient and set expectations properly.
  - Explain the tremendous benefit in vision that you are providing with the use of toric lenses.

How To Fit Soft Toric Lenses
Simple Method

- Do accurate refraction
- Insert lens nearest to refraction (vertex- corrected) - with goal of dispensing
- Allow 5-10 minutes settling – Full equilibration would be 20-30 minutes.
- Assess for fit and orientation
- If necessary change lens to allow for rotation
- Repeat steps 2-5

Selecting Lens Power and Axis

- Round power to nearest 0.25D
- Err on the side of lower power in both sphere and cylinder
  - Every cylinder power isn't available from every manufacturer
- Select axis closest to refraction
  - Example
    - Rx is -2.50 -1.25 x 002
    - Select lens -2.50 -1.25 x 180
  - Every axis isn't available form every manufacturer

Diagnostically Fitting Toric Soft Contact Lenses

- Diagnostic lens
- Transpose to minus cylinder
- Vertex each meridian as needed
- Place lens on patient

Evaluating the Fit

- Allow lens to equilibrate for 20-30 minutes
  - Allowing ample time gives better evaluation results and fewer re-dos later
- Check for visual acuity and stability

Loose – Flat Lens Symptoms

- Flat lenses will :
  - Rotate off-axis with the blink
  - Lag more than 0.5mm after the blink or in upgaze
  - Fail to maintain stable orientation between blinks

- Patients complain of:
  - Discomfort
  - Irritation
  - Foreign body sensation
  - Post-blink blur followed with slow clearing

Tight – Steep Lens Symptoms

- Tight lenses will:
  - Lock onto the cornea
  - Fail to rotate into place
  - Movement may be minimal or non-existent
    - Lens may appear to move but if you look carefully, you will notice the lens drags the conjunctiva down rather than moving freely
    - Tight lenses may impede blood flow to the limbus and cause blanching of the conjunctival vessels inside the lens edge
    - Removal of lens will oftentimes reveal scleral indentation
      - Imprint of the lens edge.

Tight – Steep Lens Symptoms

- Patients complain of:
  - Discomfort
  - Irritation
  - Foreign body sensation
  - Dryness sensation
  - Air bubbles beneath the lens
  - Post-blink clarity followed with slow blurring

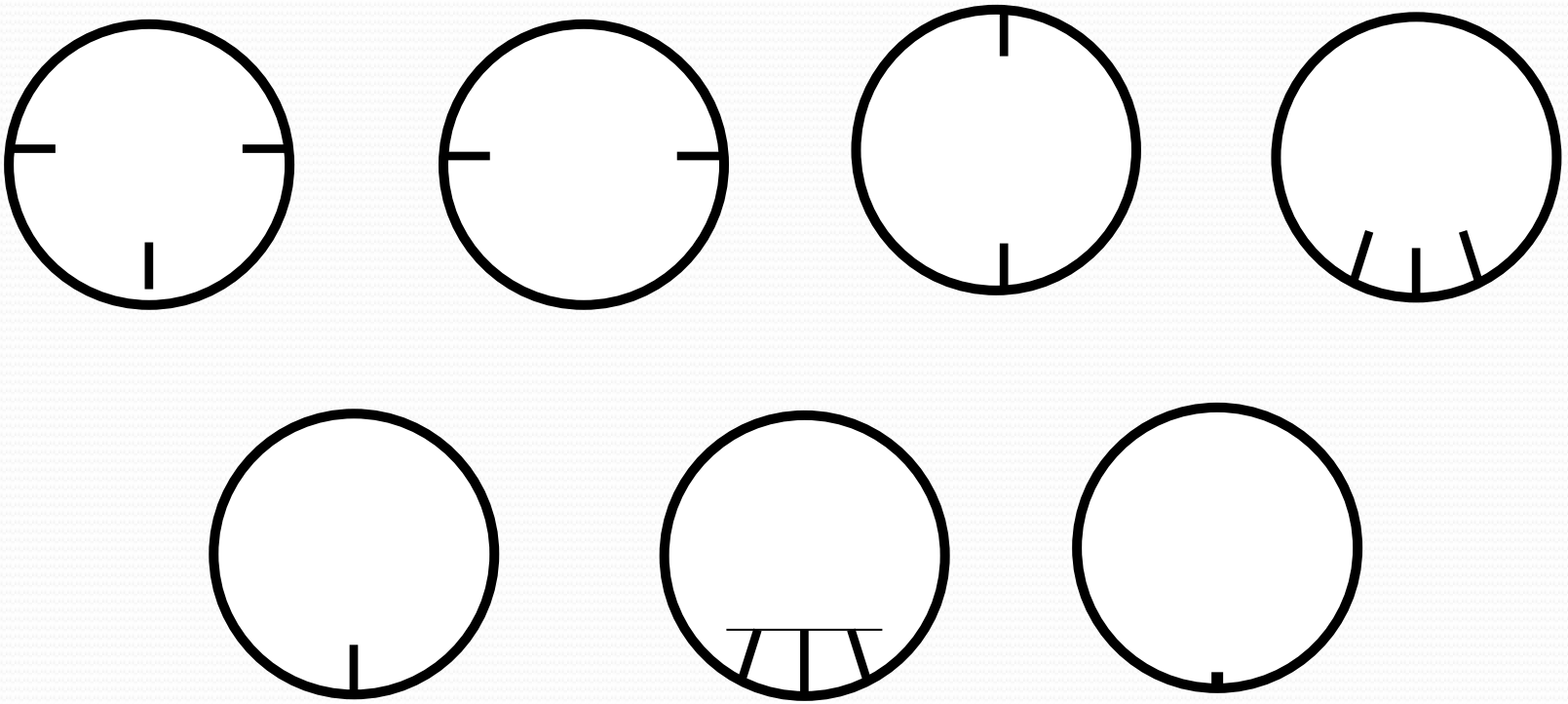
Evaluating Orientation

- Slit lamp evaluation
- Spheroclindrical over-refraction

Evaluating Orientation

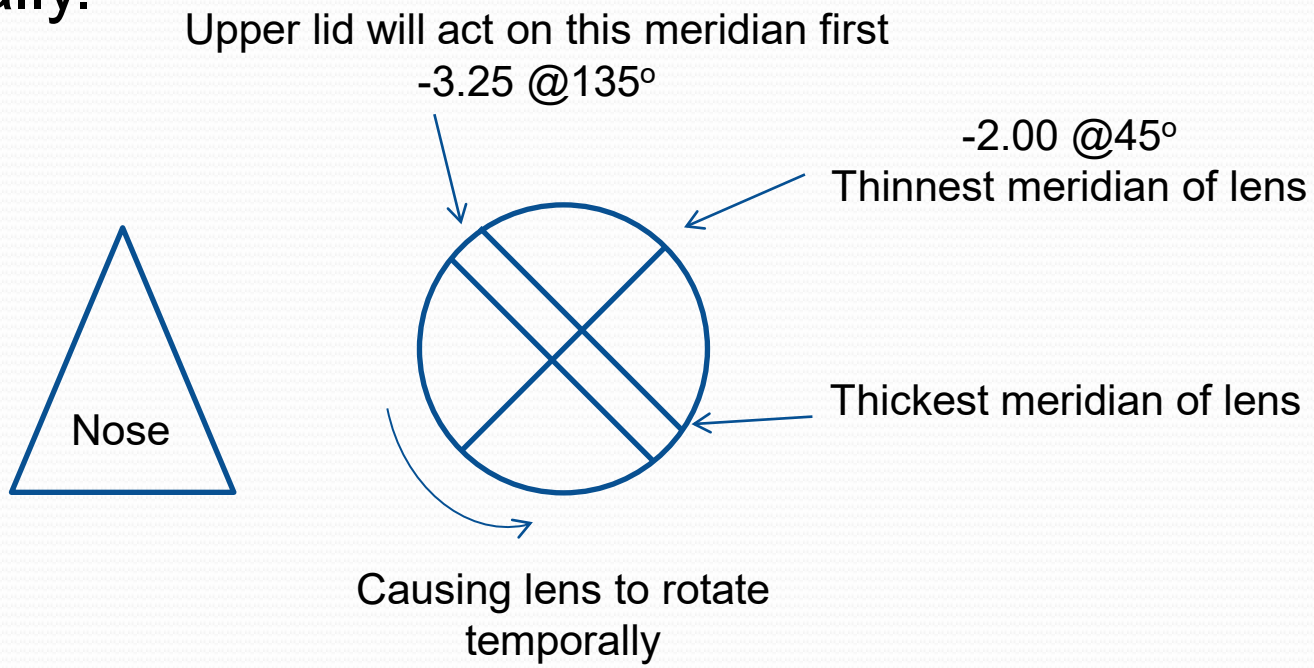
- Slit lamp evaluation
- 3-point touch
- Flat/Tight/Good fit
- Axis orientation
  - Refine axis FIRST

Axis Alignment Markings
Scribe Marks

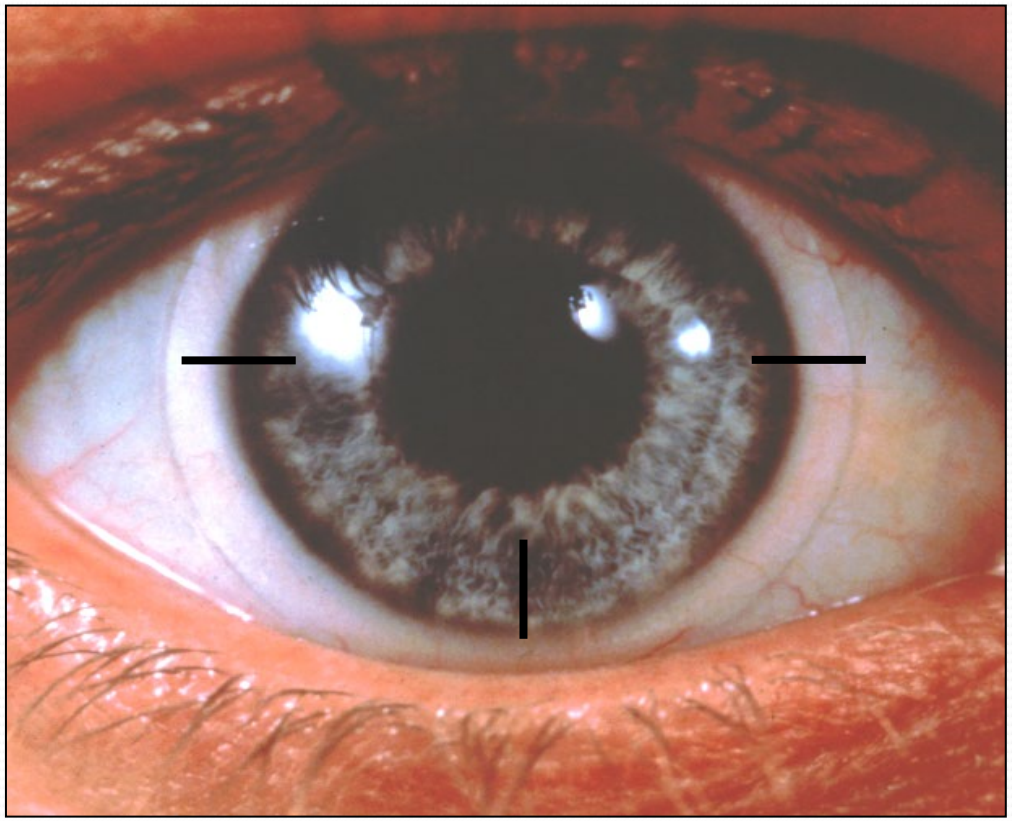


Left Eye

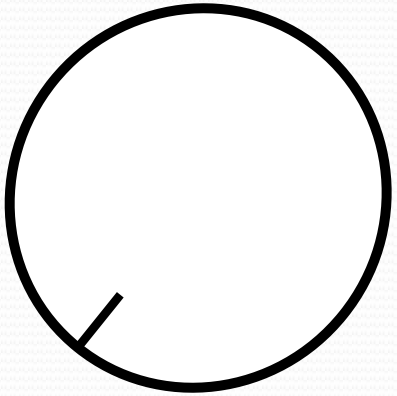
- Toric lens BVP -2.00 -1.25 x 045
- Effect of lid action on lens rotation
- The upper lid will initially act on the thicker (135°) meridian, thereby causing the lens to rotate temporally.



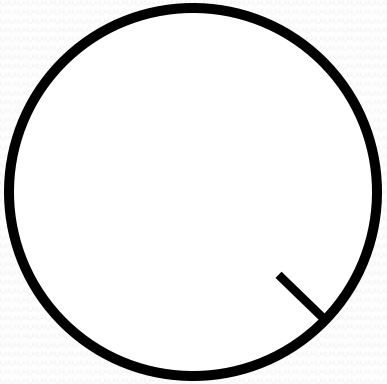
Toric Soft Contact Lenses



LARS (CAAS)

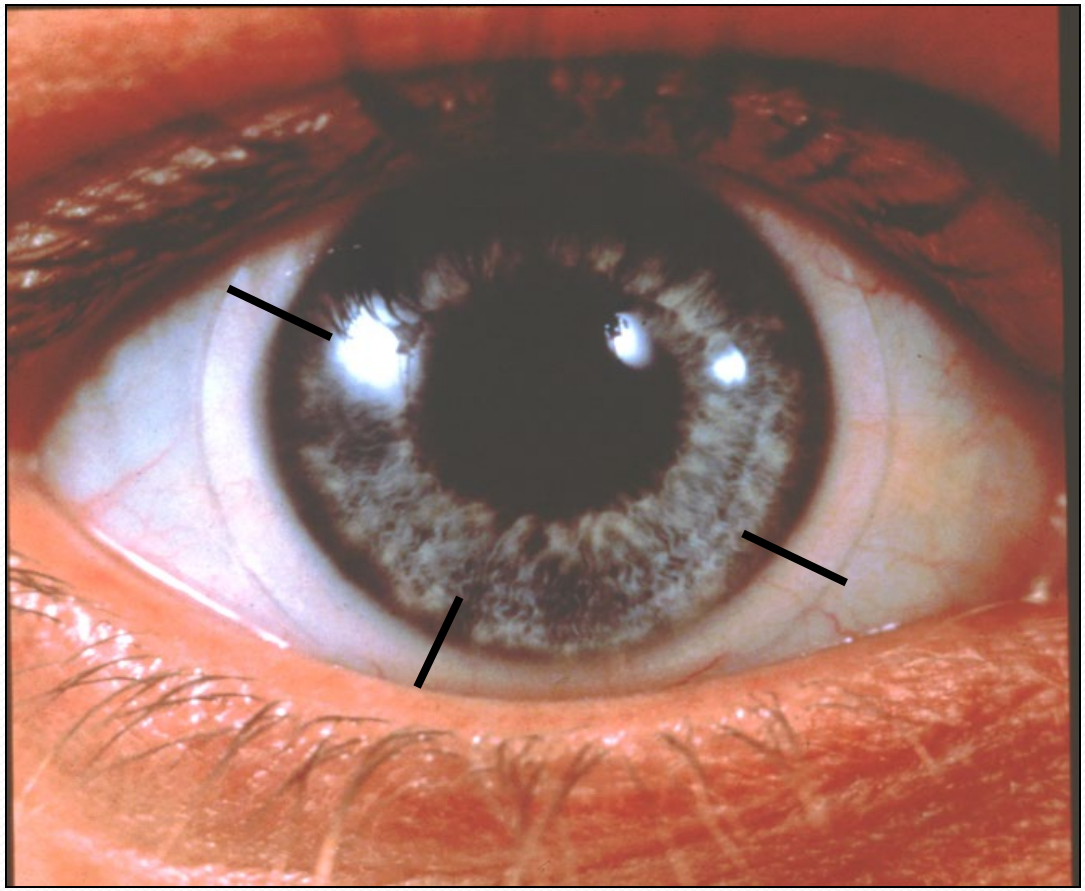


Left Add
Clockwise Add



Right Subtract
Anti-clockwise Subtract

Toric Soft Contact Lenses



Evaluating Orientation

- Visual Acuity
- Spheroclindrical over-refraction

- Patient is wearing:
  - -2.00 – 1.00 x 180^{o}
- Over-refraction shows:
  - -100 – 1.00 x 180^{o}
- Since the axis is the same simply combine the sphere and cylinder components giving the following:
  - -3.00 – 2.00 x 180^{o} – Remember to compensate for vertex

Evaluating Orientation

- Visual Acuity
- Spheroclindrical over-refraction

- Patient is wearing:
  - -3.00 – 1.50 x 180^{o}
- Over-refraction shows:
  - -150 – 1.50 x 20^{o}
- Since the axis are not same simply, a hand held computer can be used to arrive at the new lens power. In this case, the computer calculates the new power to be::
  - -4.50 – 2.00 x 005^{o} – Remember to compensate for vertex

Pearls

- Lenses always tighten as they are worn
- They never loosen
- If the diagnostic is close to looking tight, it will GET tighter

Conclusion

- Take your time
- Use diagnostic lenses
- Wait
- Evaluate fit/VA/patient comfort
- Over-refract
- Order lenses
- Don’t eliminate custom torics

Conclusion/Questions/Answers
Thank You