

# National Optometric Association 2024

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# **Rigid Gas Permeable lens options for my patients**

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**NOA - 2024**

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**Disclosures**

**NONE**

# Making the Case

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- ▶ **Do you correct to 20/15 or 20/20?**
  - ▶ **Either way is great, but:**
    - ▶ **Look back at 20/15- prosperous year**
    - ▶ **Look back at 20/20 –Disastrous year**
    - ▶ **That should tell you something!**

# Making the Case

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- ▶ **Rx Example for patient A**
  - ▶ **Manifest Rx:-1.75 -0.25 X 180**
- ▶ **Do you write this amount of cyl?**
  - ▶ **Why?**
  - ▶ **Maybe you want absolute Best VA for your patient?**

# Making the Case

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- ▶ **Rx Example for patient B**
  - ▶ **Manifest Rx: -1.75 -0.50 X 180**
    - ▶ **What is your soft CL Rx?**  
**-2.00 DS?**

**What happened to the cyl?**

**OK – say SCL Rx is -1.75 -0.75 X 180**

**Is VA 20/15 and stable even if 20/20?**

# Making the Case

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- ▶ **Rx Example for patient C**
  - ▶ **Manifest Rx:-1.75 -4.75 X 180**

**What is your soft CL Rx?**

◆ **Now you talk about XR lenses**

**Forever to get to patient**

**Do you celebrate 20/30 VA here?**

◆ **OH! Please do not lose your lenses**

**– 2 months wait**

# Goals for RGP fitting

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- ▶ **Good vision**
- ▶ **Good comfort**
- ▶ **Good corneal physiology**



# Why RGP Lenses?

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- ▶ **Better vision with RGPs**
  - ▶ **Pts with irregular astigmatism**
  - ▶ **Pts with low astigmatism which is corrected with the tear lacrimal lens**
- ▶ **Some ocular conditions are best fit with RGPs**
  - ▶ **Keratoconus, traumatized corneas, post-grafts**

# Why RGP Lenses?

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- ▶ **RGP lens can be easier to apply and remove because they are smaller in diameter**
  - ▶ **Better for Pts with narrow aperatures**
- ▶ **RGPs provide good corneal physiology**

# Methods of RGP Fitting

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- ▶ **Empirical**

- ▶ Fit based on refractive error and corneal curvature
- ▶ No trial lens fit

- ▶ **Diagnostic**

- ▶ Fit based on evaluation with trial lenses

# Empirical Fitting

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- ▶ **The most common way of ordering GP lenses in the U.S.**

# Empirical Fitting

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## Advantages:

- ▶ **First lens put on the eye is a better experience than with a trial lens**
  - ▶ **Good vision**
  - ▶ **Fit is usually pretty close to accurate**
- ▶ **Useful if you do not have a trial lens set**
  - ▶ **Good for GP Torics**
- ▶ **Empirical fitting works well with some experience**

# Empirical Fitting

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- ▶ **Disadvantages:**
  - ▶ **Valuable information is not taken into account**
    - ▶ **Lid/lens interaction**
    - ▶ **Movement characteristics of the lens**
  - ▶ **First lens ordered is used as a “trial”**
    - ▶ **One less lens to use in the warranty**
- ▶ **Empirical fitting method may not be best for bifocals or irregular corneas**

# Diagnostic Fitting

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- ▶ **Advantages:**
  - ▶ **Best way to truly evaluate how the GP lens will perform on the eye**
  - ▶ **Can adjust parameters before ordering a lens**
  - ▶ **First lens ordered will be more accurate**
  - ▶ **Show your knowledge to your patients**
  - ▶ **Patients understand time and skill involved**

# Diagnostic Fitting

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- ▶ **Disadvantages:**
  - ▶ **Patient spends more time in the office**
  - ▶ **First lens (trial) patient tries is not perfect**
    - ▶ **Blurry vision**
    - ▶ **Uncomfortable fit**



# Basic Fitting Steps

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1. Choose a philosophy- **empirical or trial lens**
2. Choose a material
3. Choose a design – **lid attach. Or interpalpebral**
4. Choose a diameter
5. Choose a curvature
6. Choose a lens power
7. Evaluate the lens
8. Modify the lens as needed

# Step 1: Philosophy

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- ▶ **Lid Attachment vs. Interpalpebral Fit**
  - ▶ **Based on:**
    - ▶ **Lid Contour**
    - ▶ **Lid Tension**
    - ▶ **Corneal topography**

# Lid Attachment

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- ▶ **Works well with the following patients:**
  - ▶ **Lid position rests low covering part of the superior limbus**
  - ▶ **Normal lid tension**
  - ▶ **With-the-rule astigmatism**

# Lid Attachment

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# Interpalpebral Fit

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- ▶ **Works well with the following patients:**
  - ▶ **Lid position is at or above the superior limbus**
  - ▶ **Excessively loose or tight lids**
  - ▶ **Against-the-rule astigmatism**

# Step 2: Material

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Material decision based on:

- ▶ **Refractive error**
  - ▶ **Plus lenses need high Dk, because it is a thicker lens**
  - ▶ **Minus lenses can vary; moderate Dk is good.**

# Step 2: Material

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**Material decision based on:**

- ▶ **Design of Lens**
  - ▶ **Tight fit needs high Dk; Loose fit can vary**
- ▶ **Extended wear**
  - ▶ **High Dk**
- ▶ **More durable lens**
  - ▶ **Low Dk**

# Material

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## Suggested starting points:

- ▶ **Low Dk**
  - ▶ **Dk of about 30**
  - ▶ **Paragon Thin or Boston ES**
  - ▶ **Good for thin lens designs**



# Material

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- ▶ **Moderate Dk**
  - ▶ **Dk of about 60**
  - ▶ **Paragon HDS or Boston EO**
  - ▶ **Normal lens thickness**
  - ▶ **Good for daily wear myopes**

# Material

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- ▶ **High Dk**
  - ▶ **Dk of about 100**
  - ▶ **Paragon HDS 100 or Boston XO**
  - ▶ **Good for extended/all-day wear and hyperopes**
  
- ▶ **Increased Dk better for higher power, thicker designs, and compromised corneas**

# Step 3: Design

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- ▶ Sphere?
- ▶ Bäck toric?
- ▶ Aspheric?

# Step 4: Diameter

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- ▶ **Range of RGP lens diameters (LD): 8 to 11mm**
- ▶ **Decision based on:**
  - ▶ **Lid position**
    - ▶ **Normal lids – try lid attachment**
    - ▶ **High upper lids – interpalpebral fit**
    - ▶ **Low upper lids – smaller diameter for lid attachment or interpalpebral fit**

# Step 4: Diameter

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- ▶ **Range of RGP lens diameters (LD): 8 to 11mm**
- ▶ **Decision based on:**
  - ▶ **Fitting philosophy**
    - ▶ **Lid attachment – needs larger lens; 9.6 mm or greater**
    - ▶ **Interpalpebral fit – needs smaller lens; 9.2 mm or smaller**

# Diameter

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- ▶ **Decision based on:**
  - ▶ **Corneal diameter**
    - ▶ **Larger corneas = larger diameter**
      - ▶ **12 mm cornea – 9.6 mm or greater**
      - ▶ **10 mm cornea – 8.8 mm or smaller**

# Diameter

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- ▶ **Decision based on:**
  - ▶ **Corneal curvature**
    - ▶ **Flatter cornea – needs larger diameter**
    - ▶ **Steeper cornea – needs smaller diameter**

# Diameter

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- ▶ **Optic Zone Diameter (OZD)**
- ▶ **Based on pupil size in dim illumination:**
  - ▶ **Range: 7.4-8.4 mm (1.2-1.6 mm smaller than LD)**
  - ▶ **Larger pupils require larger optic zones**
  - ▶ **Usually start 1.4 mm less than LD**



# Step 5: Curvature

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- ▶ **Guide for first lens choice**

<b>K Cyl</b>	<b>Base Curve</b>
0.00 – 0.50	0.50 – 0.75 FTK
0.75 – 1.25	0.25 – 0.50 FTK
1.50	On K
1.75 – 2.00	0.25 STK
2.25 -2.75	0.50 STK
3.00 – 3.50	0.75 STK

- ▶ **Curves steeper with more toricity for better stability**

# Step 6: Lens Power

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- ▶ May not be the same as the patient's refractive error due to the tear layer effects
- ▶ Combines with the lacrimal lens to provide total refractive correction
- ▶ Determine with diagnostic lens and over-refraction
- ▶ Checked empirically using keratometry, subjective refraction, and vertex distance
- ▶ RGP's can be made in any power in 0.12D steps

# Step 7: Evaluate the Lens

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- ▶ It is important to wait at least 5 minutes after application of the first lens to allow tearing to subside
  - ▶ Excessive tearing can alter your evaluation
- ▶ This can be reduced by using a topical anesthetic
- ▶ While the patient is adapting to the lens, it is helpful to have them look downward and instruct them to blink normally

# White Light Assessment

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- ▶ Evaluation with lids in normal position:
  - ▶ The lens should remain in the limbal area when the lids move
- ▶ Evaluation while holding lids apart:
  - ▶ The lens should drop slowly after being pushed to the top of the cornea
  - ▶ A flat-fitting lens drops quickly and often in a curved path since it pivots around the corneal apex
  - ▶ A steep-fitting lens falls slower and often remains positioned at the corneal apex
- ▶ Evaluation post-blink:
  - ▶ Movement should be 1.5-2 mm, smooth, vertical, and of medium speed

# Colbalt Blue Filter Assessment

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- ▶ Instill sodium fluorescein after RGP lens application.
  - ▶ Note amount of fluorescein:
    - ▶ Too much can obscure real fluorescein pattern
    - ▶ Too little will look like “alignment” even if not
- ▶ Set-up the biomicroscope:
  - ▶ Low magnification (10x)
  - ▶ Diffuse beam width
  - ▶ High illumination
- ▶ A Wratten #12 yellow filter will enhance the view of the fluorescein pattern by eliminating unwanted wavelengths

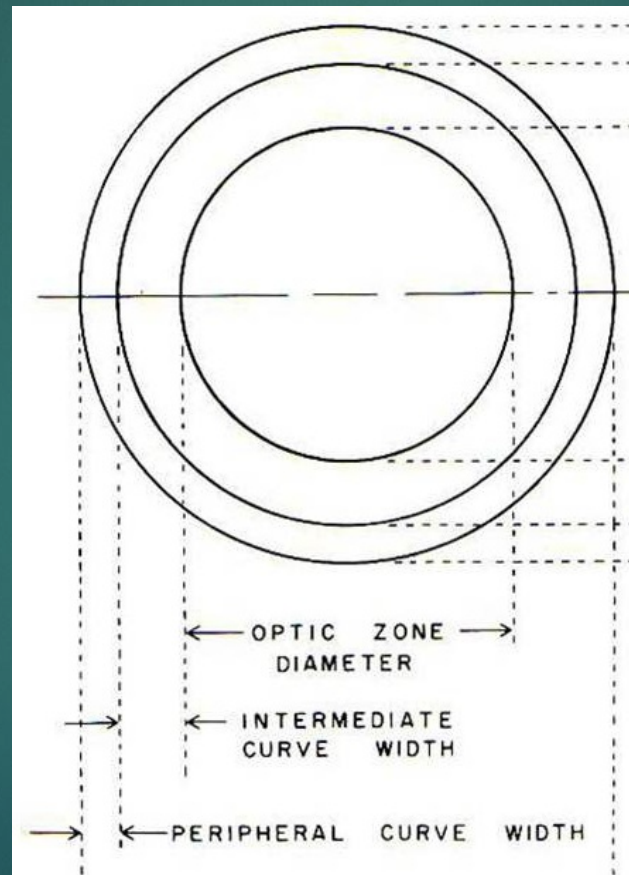
# Lens Areas

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- ▶ Apical zone:
  - ▶ Area within the optic zone of the lens
  - ▶ Central 7 to 8 mm
- ▶ Mid-peripheral zone:
  - ▶ Area under the intermediate curves
  - ▶ Important in positioning and stabilizing the lens
- ▶ Peripheral zone:
  - ▶ Peripheral clearance is important for proper tear flow under the contact lens

# Lens Areas

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# Apical Zone

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- ▶ **Apical alignment: IDEAL fit**
  - ▶ The lens evenly contours the cornea
  - ▶ Even, light green spread of fluorescein centrally
- **Apical bearing/touch: Indicates FLAT fit**
  - ▶ Direct contact of the lens against the cornea
  - ▶ Appears as dark area in fluorescein due to corneal touch
  - ▶ Surrounding areas show increasing green/fluorescein clearance
- **Apical clearance: Indicates STEEP fit**
  - ▶ Bright green/fluorescein pooling centrally
  - ▶ Surrounding areas are dark showing corneal touch



# Mid-Peripheral Zone

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- ▶ Mid-peripheral alignment:
  - ▶ Even, light green pattern across entire intermediate curves
- ▶ Mid-peripheral touch:
  - ▶ Dark area across intermediate curves
  - ▶ Usually accompanies an apical clearance pattern
  - ▶ Steeper lens than corneal curvature
- ▶ Mid-peripheral clearance:
  - ▶ Bright green pattern across intermediate curves
  - ▶ Usually accompanies an apical touch pattern
  - ▶ Flatter lens than corneal curvature

# Peripheral Zone

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- ▶ Peripheral contact lens clearance is important for proper tear exchange
- ▶ Clearance classification: Low, Medium, High
- ▶ Too little clearance:
  - ▶ Inadequate tear flow
  - ▶ Possible lens adherence
- ▶ Excessive clearance:
  - ▶ Discomfort
  - ▶ Bubbles
  - ▶ Corneal staining

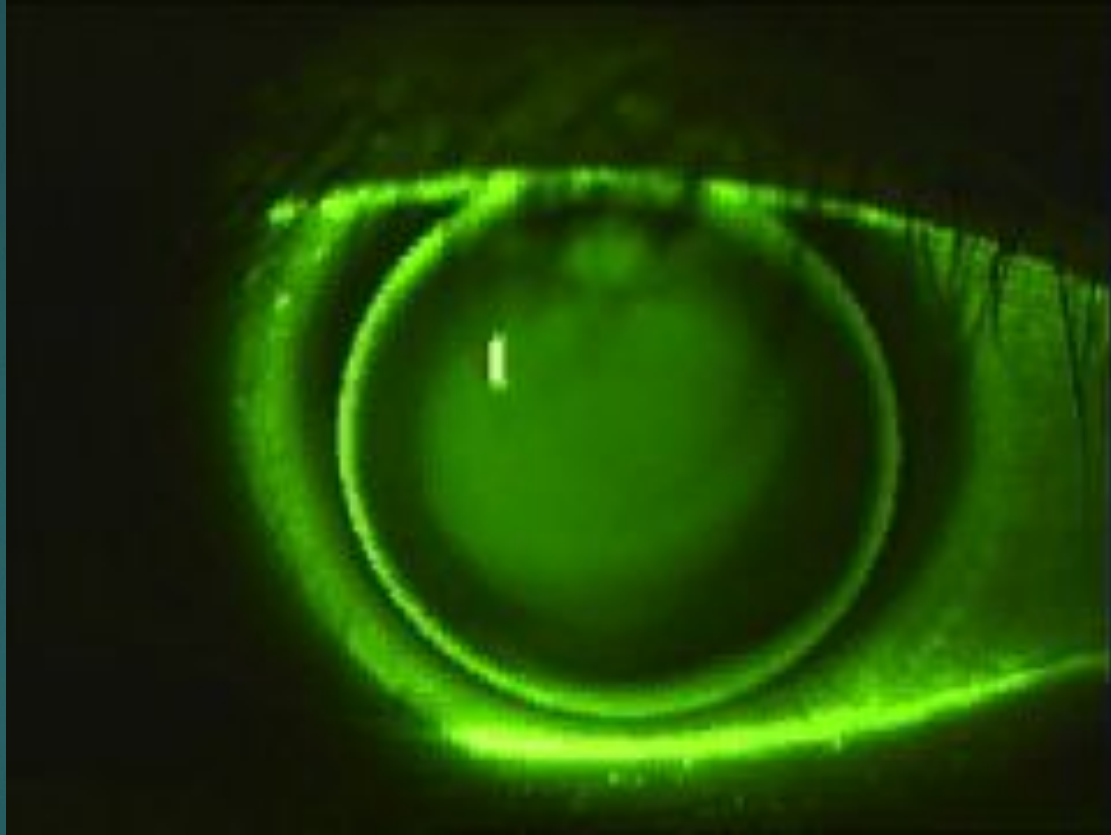
# Steep Fit

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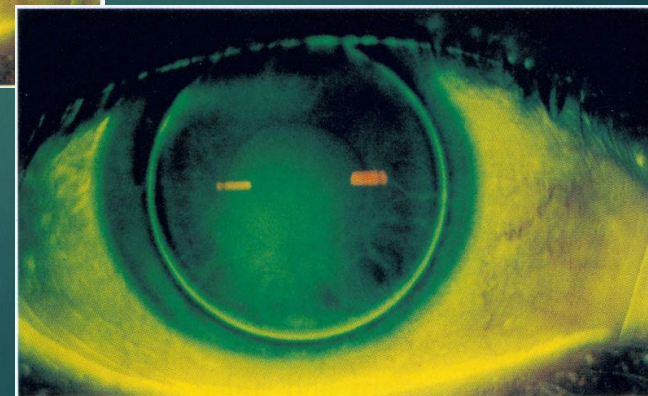
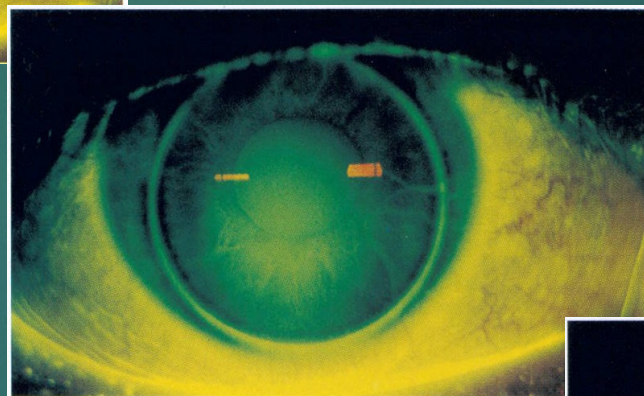
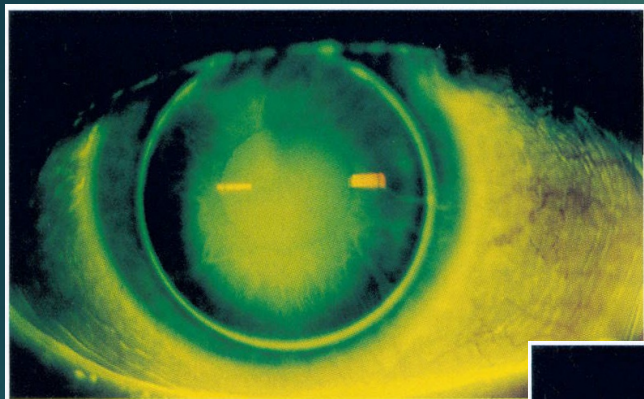
# Steep Fit

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# Steep Fit

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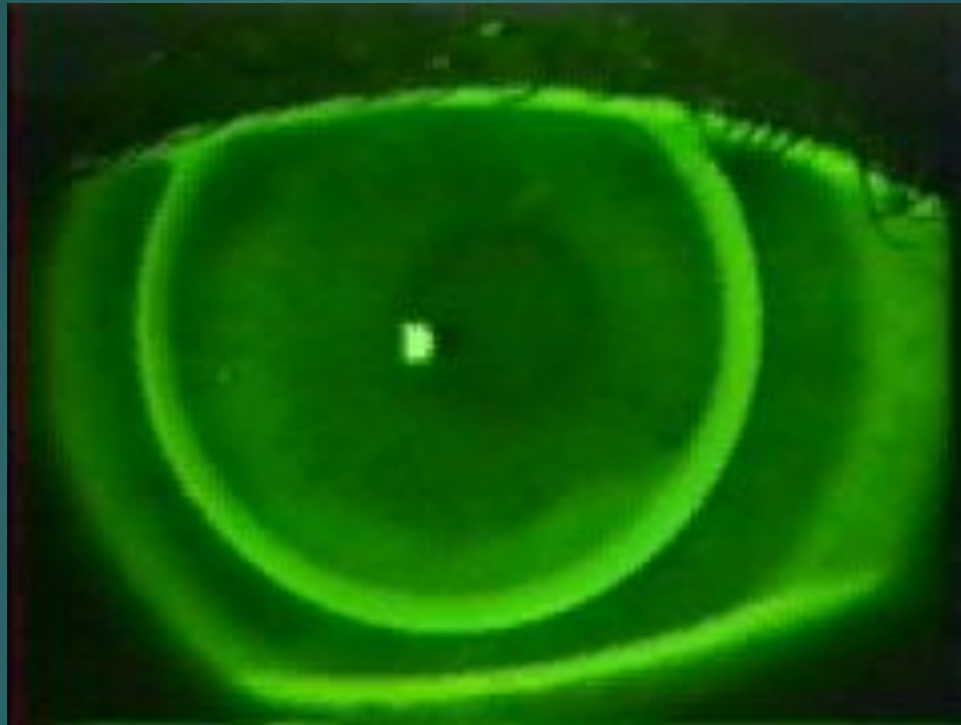


IMPROVING



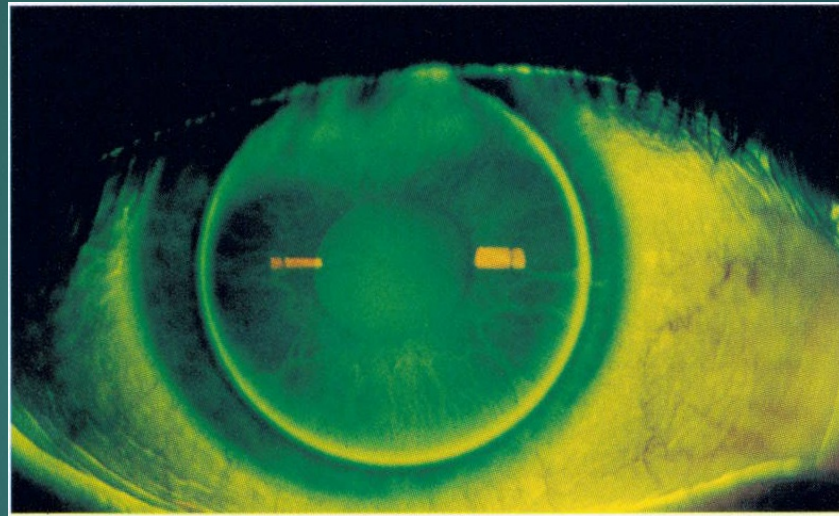
# Alignment Fit

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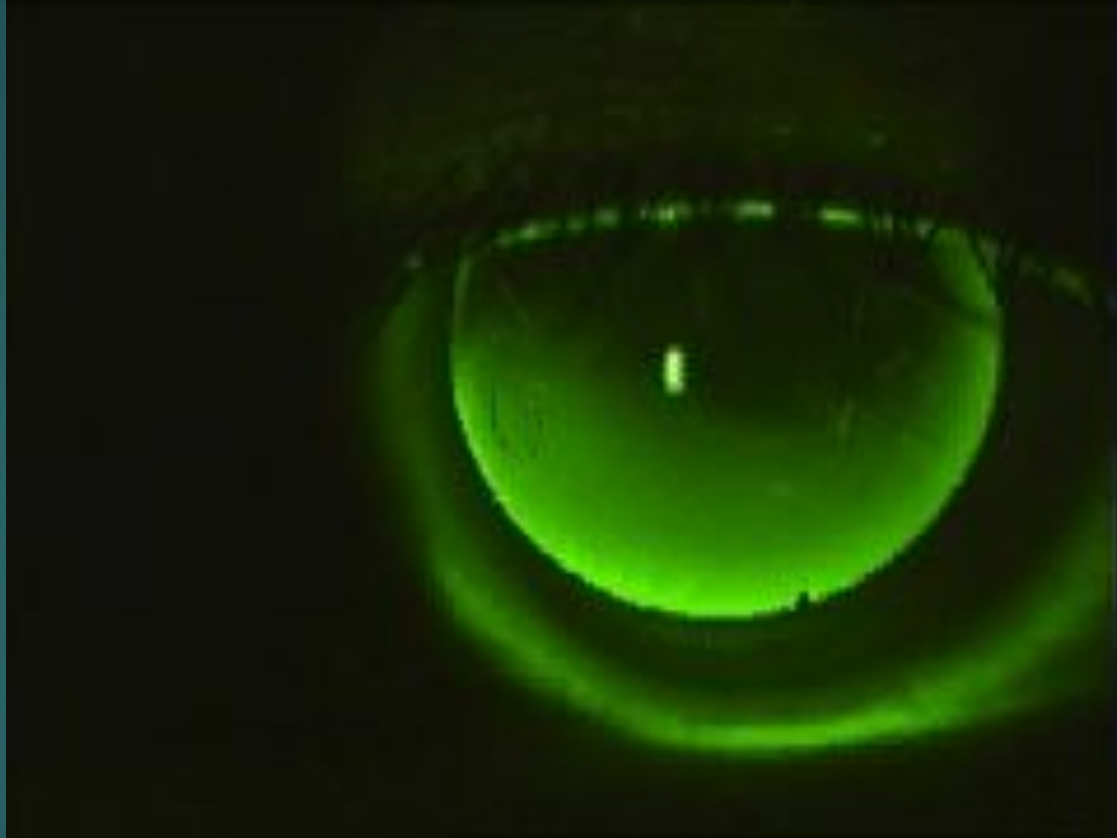
# Alignment Fit

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# Flat Fit

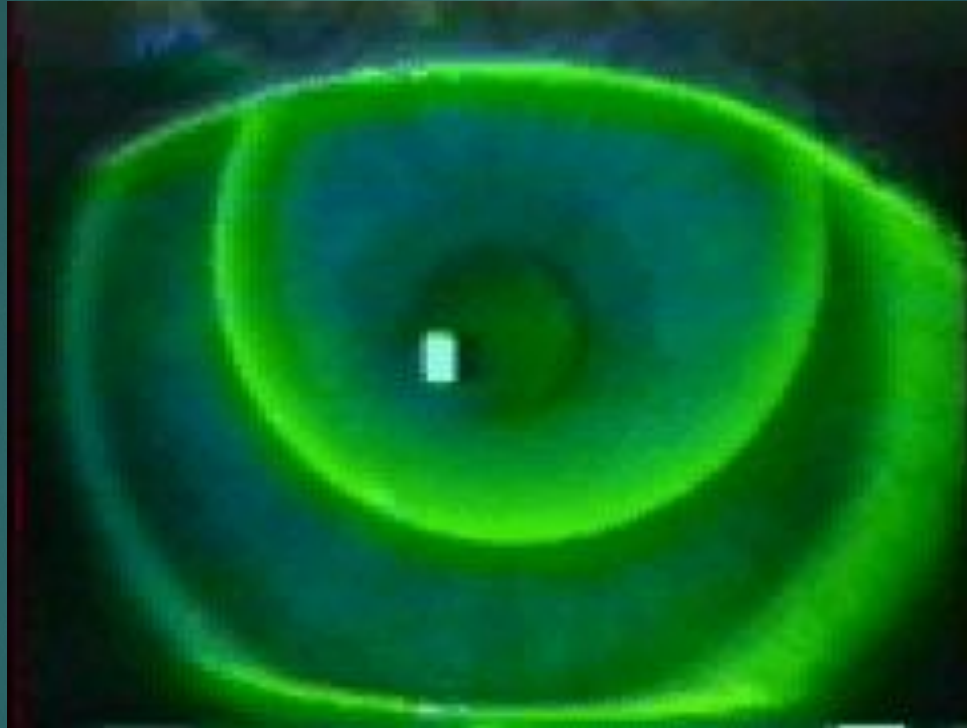
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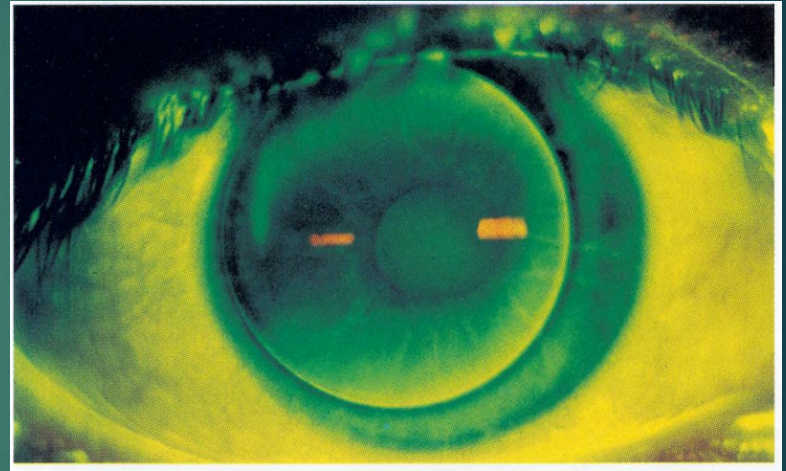
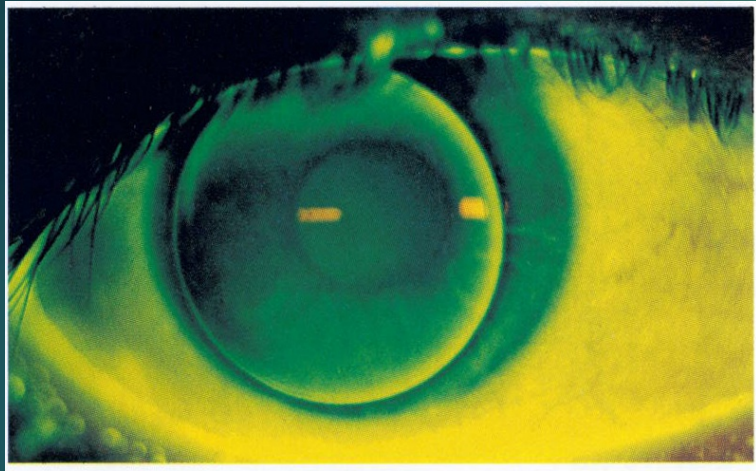
# Flat Fit

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# Flat Fit

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# Toricity Pattern

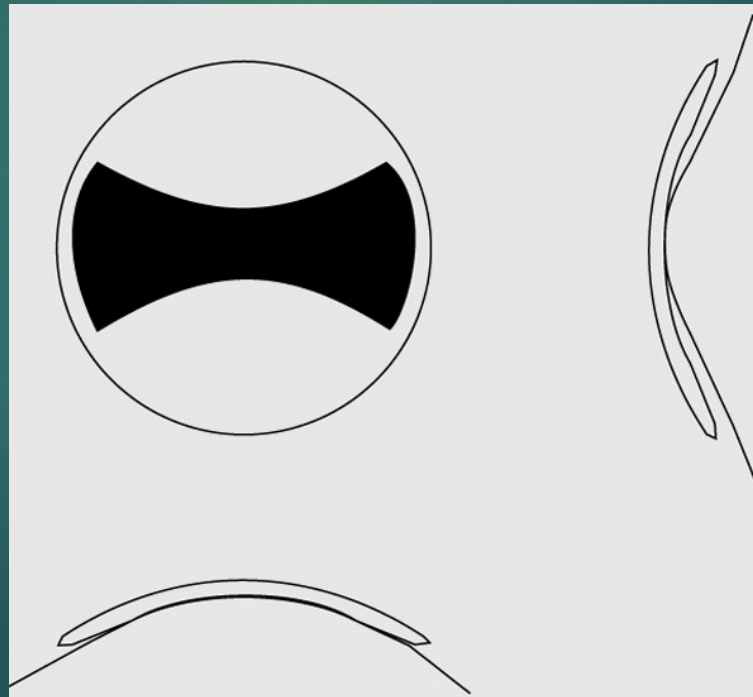
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- ▶ Corneal astigmatism:
  - ▶ Astigmatism  $> 1$  D will show a dumbbell-shaped fluorescein pattern
  - ▶ The steeper meridian shows clearance that gradually increases towards the edge of the lens

# Toricity Pattern

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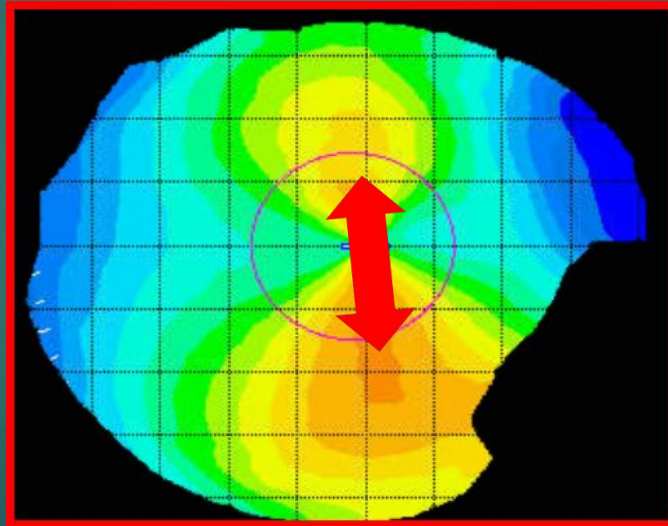
- ▶ With-the-rule astigmatism:
  - ▶ Horizontal band of corneal alignment/touch
  - ▶ Clearance superiorly and inferiorly



# Toricity Pattern

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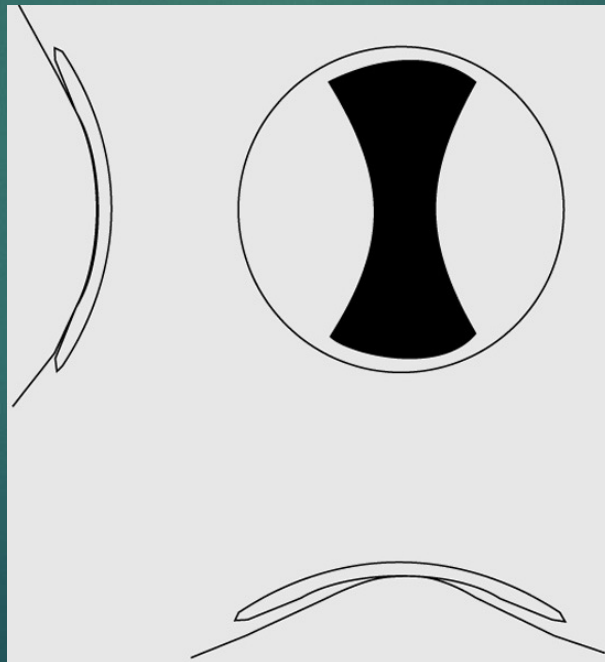
- ▶ WTR
  - ▶ Lens will move more up and down



# Toricity Pattern

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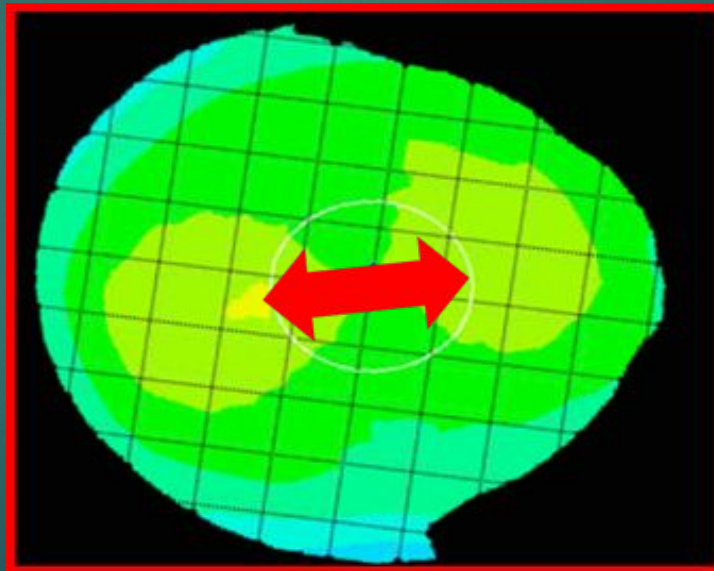
- ▶ Against-the-rule astigmatism:
  - ▶ Vertical band of corneal alignment/touch
  - ▶ Clearance nasally and temporally



# Toricity Pattern

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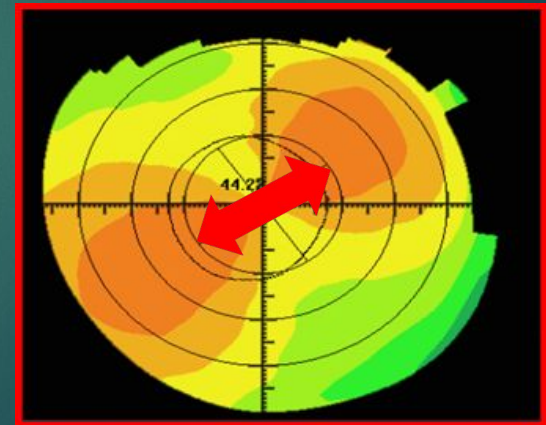
- ▶ ATR
  - ▶ Lens will move more left and right



# Toricity Pattern

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- ▶ Oblique astigmatism:
  - ▶ Band of corneal alignment/touch along flatter meridian
  - ▶ Lens will move more along the steeper meridian





# Step 8: Modify the Lens

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- ▶ When a rigid lens is not fitting satisfactorily, parameter changes must be made
- ▶ Simplest changes should be made first
- ▶ The base curve (BC) is usually the first change to be made when a lens is not fitting properly

# Modify the Lens

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Modifications no longer as common because of

- ▶ Short turnaround time for lenses
- ▶ Lenses no longer as expensive as they used to be

# Summary

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- ▶ Key points for successful RGP fitting:
  - ▶ Initial evaluation
  - ▶ Be comfortable with your method of fitting
  - ▶ Carefully evaluate the fit and performance of the lens on the eye

# QUESTIONS

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All Resources in ONE place

<https://gpli.info/>