FITTING THE TROUBLED CORNEA

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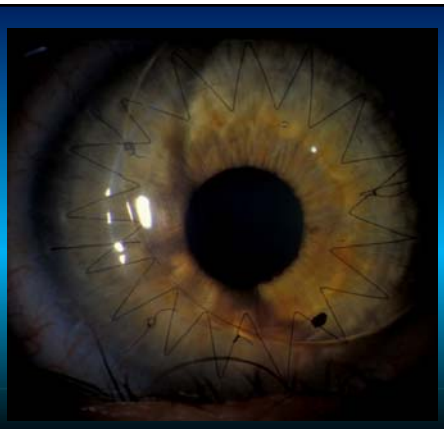
DISCLOSURE

- Consultant:
  - Alcon
  - Allergan
  - NovaBay
  - Valeant
- President EyePrint Prosthetics



GENERAL FITTING PRINCIPLES

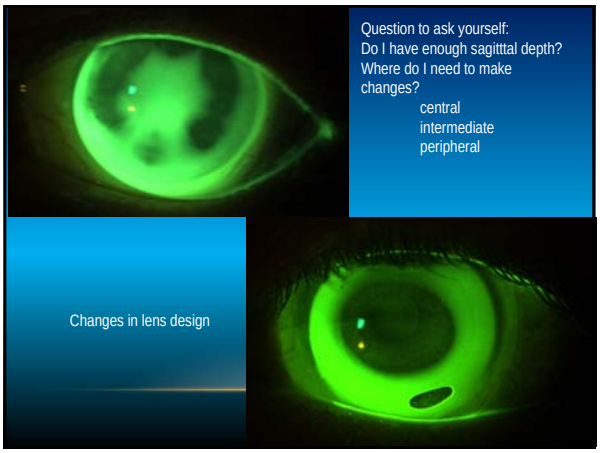
- Avoid mechanical pressure on the cornea
- Spread bearing area to periphery
- Avoid Limbal irritation and inflammation
- Avoid endothelial cell stress by removing oxygen barrier to endothelium
  - Long term wear of any low Dk lens contributes to polymegathism and pleomorphism.

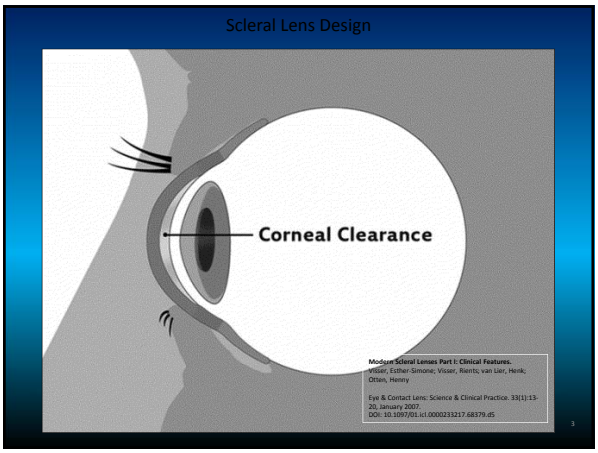
INITIAL LENS SELECTION

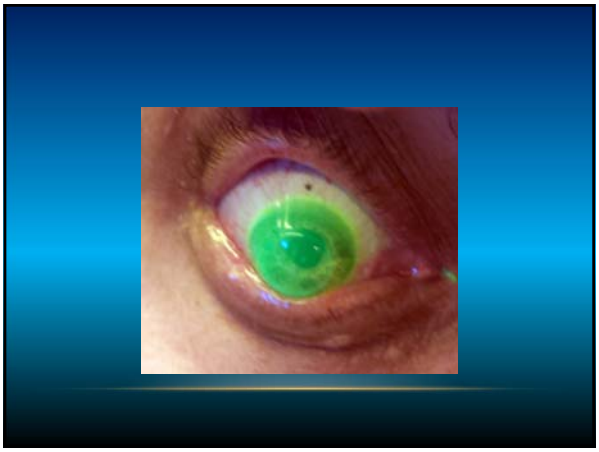
- Typically your choice of a lens design is based upon
  - Unique characteristics of a specific design and the disease you are working with
    - Keratoconus
    - Post penetrating keratoplasty
    - Post refractive
    - Ocular Surface disease
    - Endothelial Cell health

TODAY'S OPTIONS

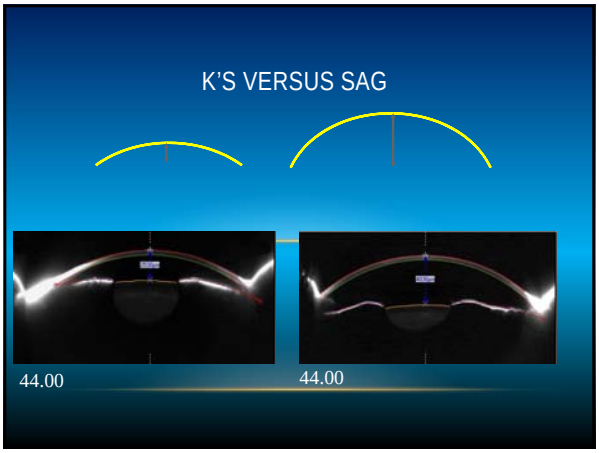
- Gas Permeable Lenses
- Soft Lenses
- Hybrid Lenses
- Scleral Lenses

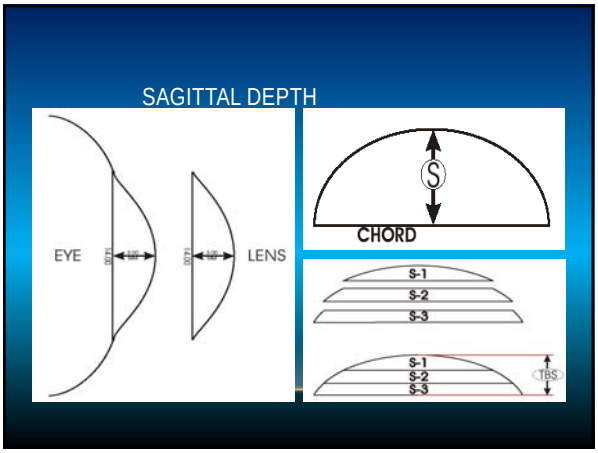

Question to ask yourself:
Do I have enough sagitttal depth?
Where do I need to make changes?
central
intermediate
peripheral
Changes in lens design


Scleral Lens Design
Corneal Clearance
Modern Scleral Lenses Part I: Clinical Features.
Visser, Esther Simone; Visser, Rients; van Lier, Henk; Otten, Henny
Eye & Contact Lens: Science & Clinical Practice. 33(1):13-20, January 2007.
DOI: 10.1097/01.icl.0000233217.68379.d5



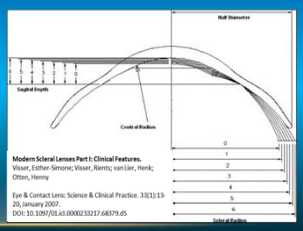

Central Vault in Dry Eye Patients Successfully Wearing Scleral Lens.
Sonsino, Jeffrey; Mathe, Dora
Optometry & Vision Science. 90(9):e248-e251, September 2013.
DOI: 10.1097/OPX.0000000000000013


K'S VERSUS SAG
44.00
44.00


SAGITTAL DEPTH
EYE
LENS
S
CHORD
S-1
S-2
S-3
S-1
S-2
S-3
TBS

SAGITTAL DEPTH

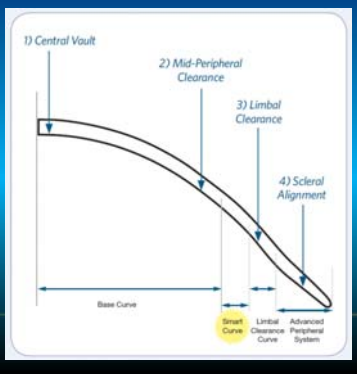
- Sag depth = {R-sqrt(R^2-(1-SF)xC^2)}/(1-SF)
- R= apical curve radius (Base curve)
- SF= shape factor (Peripheral curves)
- C=visible iris diamter/2 (Lens diameter)



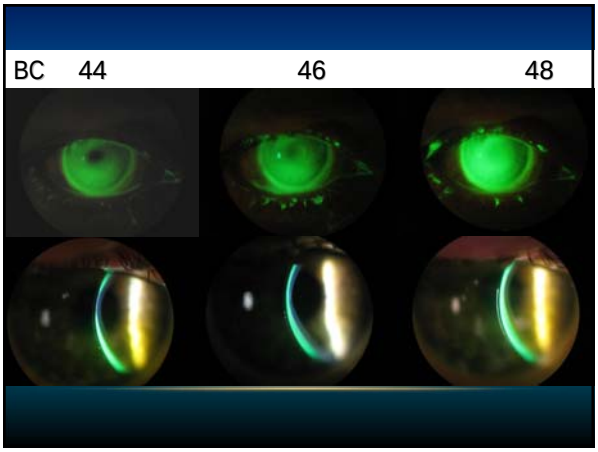
CHANGING SAGITTAL DEPTH

- Increase
  - Steepen base curve
  - Steepen/ lengthen peripheral curves
    - Intermediate
    - Limbal
    - Peripheral
  - Increase diameter of lens or optic zone
- Decrease
  - Flatten base curve
  - Flatten/ shorten peripheral curves
    - Intermediate
    - Limbal
    - Peripheral
  - Decrease diameter of lens or optic zone

CONTROL PARAMETERS



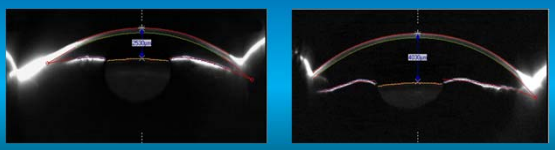
Alden Optical



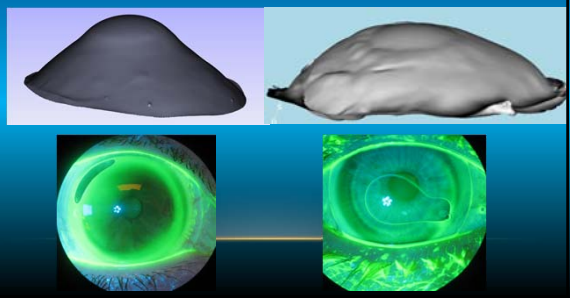
FACTORS WHICH AFFECT SAGITTAL DEPTH

- Corneal Diameter
- Corneal Geometry
- Limbal Geometry
- Scleral Geometry

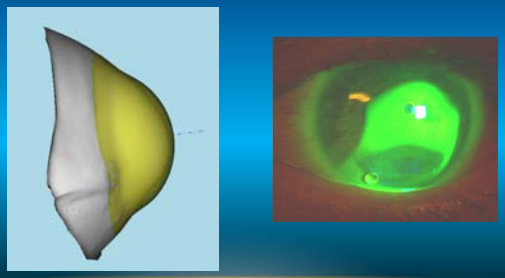
CORNEAL DIAMETER



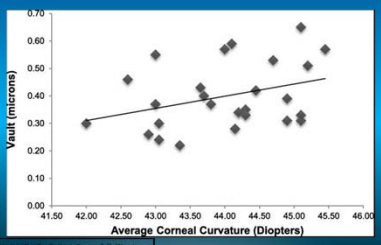
CORNEAL GEOMETRY

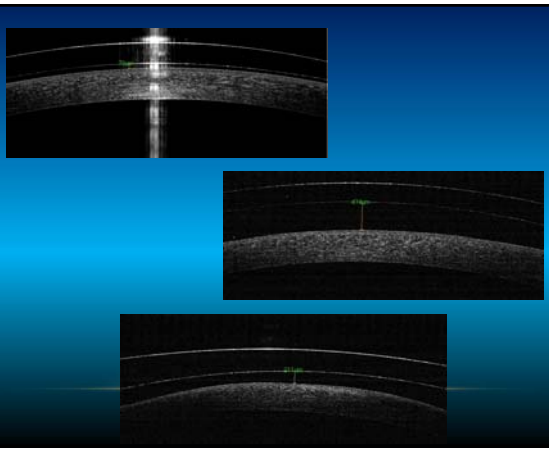


FOCAL GEOMETRIC CHANGES

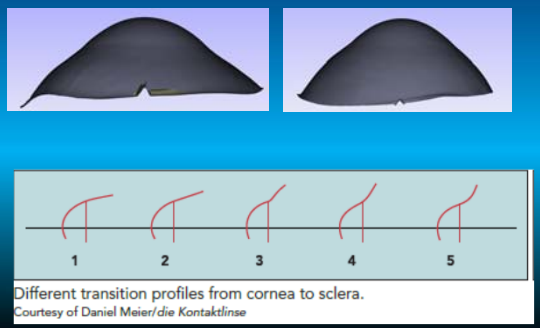


DOES BASE CURVE AFFECT VAULT?



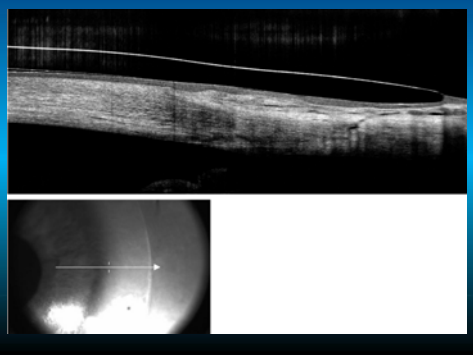


LIMBAL GEOMETRY

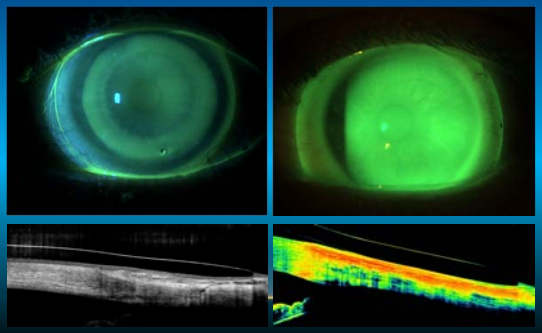


Different transition profiles from cornea to sclera.
Courtesy of Daniel Meier/*die Kontaktlinse*

LIMBAL LENS DESIGN

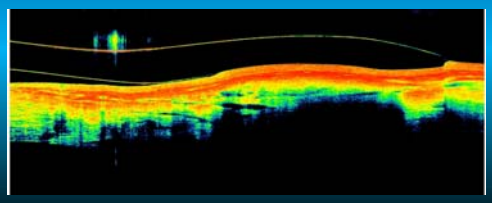


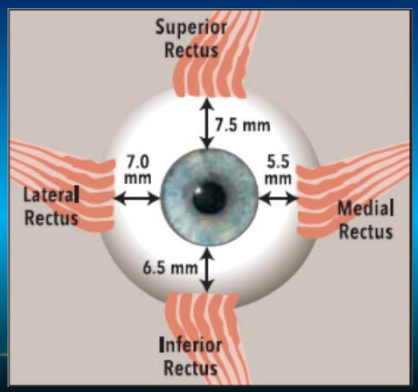
LIMBAL CLEARANCE



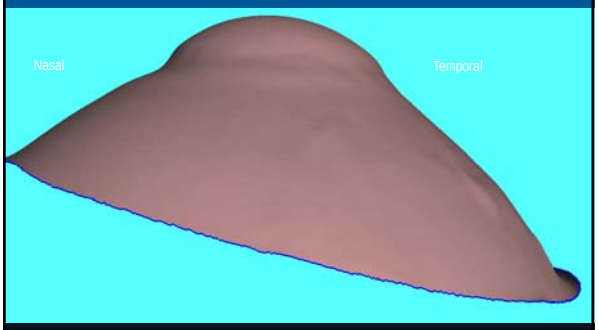
PERIPHERAL LENS DESIGN

- Periphery
- Edge

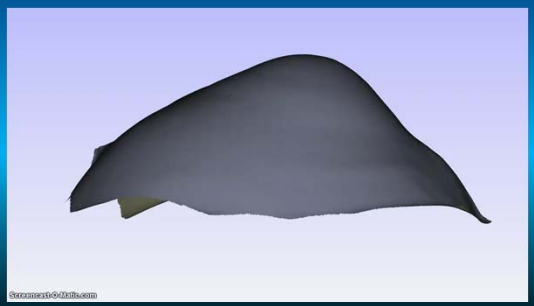




OCULAR GEOMETRY NASAL VS TEMPORAL

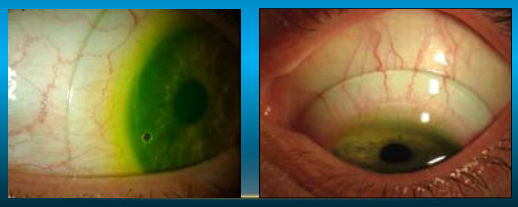


OCULAR GEOMETRY SCLERAL TORICITY

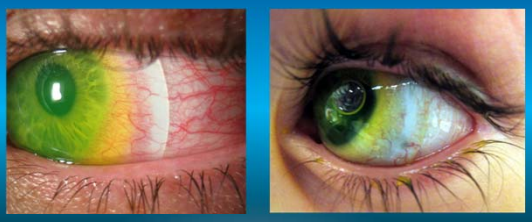


EDGE

- Good alignment

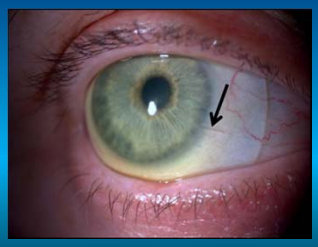


IMPINGEMENT



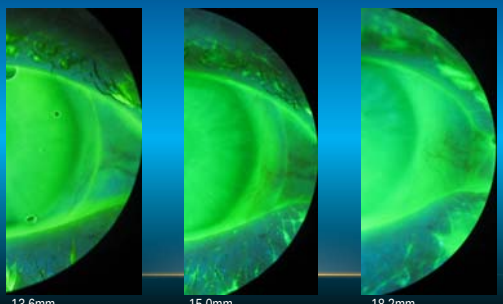
LIFT OFF

BITANGENTIAL DESIGN

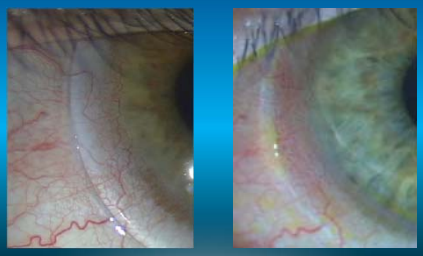


Medical Applications and Outcomes of Bitangential Scleral Lenses.

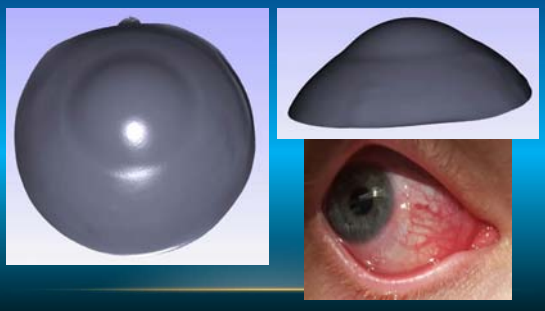
LANDING ZONE



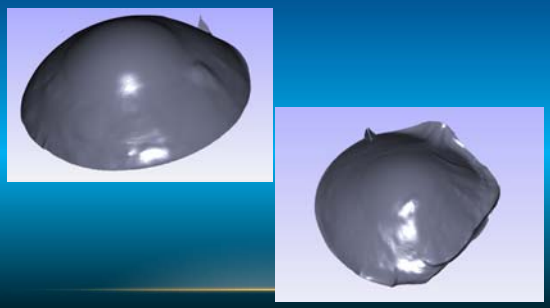
COMPRESSION FACTORS



COMPRESSION FACTORS



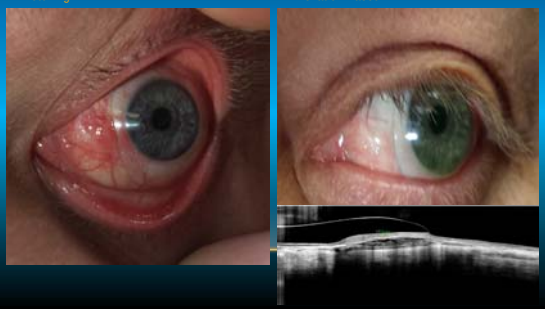
UNEXPECTED GEOMETRY



ADVANCED PERIPHERIES

Notching

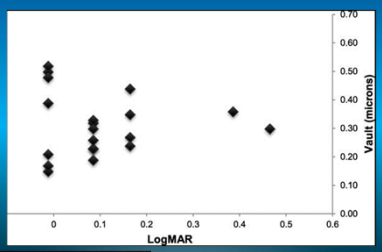
Elevation Based



WHAT DETERMINE THE RIGHT AMOUNT OF SAGITTAL DEPTH?

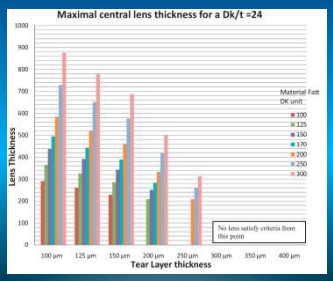
- Vision?
- Oxygen?
- Physiological Response?
- Disease State?

DOES SAGITTAL DEPTH AFFECT VISION?



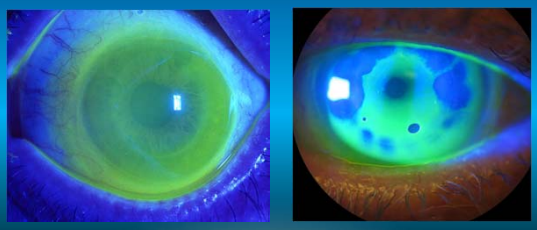
Central Vault in Dry Eye Patients Successfully Wearing Scleral Lens

OXYGEN TRANSMISSION LENS AND TEARS

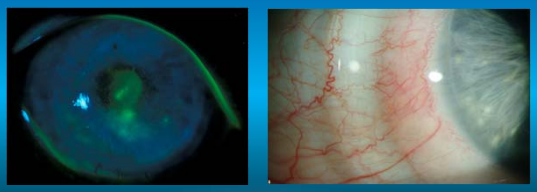


Contact Lens and Anterior Eye
Volume 35, Issue 6, December 2012, Pages 266–271
Predicting estimates of oxygen transmissibility for scleral lenses
Langis Michaud, Eef van der Worp, Daniel Brazeau, Richard Warde, Claude J. Giasson

DISEASE STATE

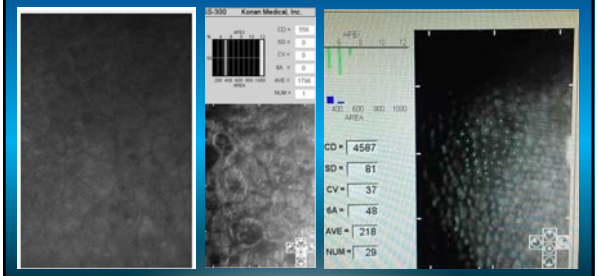


PHYSIOLOGICAL RESPONSE



CORNEAL EDEMA

ENDOTHELIUM



COMPRESSION ON AN INFLAMMED EYE

SO HOW DO YOU DESIGN A LENS?

THE FIRST QUESTION YOU MUST ASK YOURSELF…

What Diameter am I going to use?

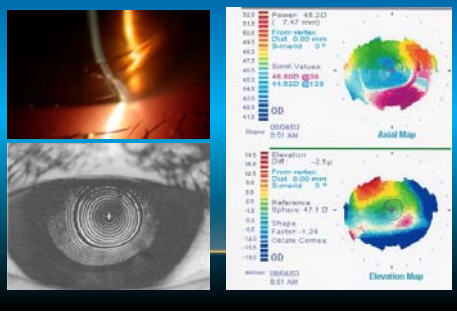
Thursday, October 06, 2016 49

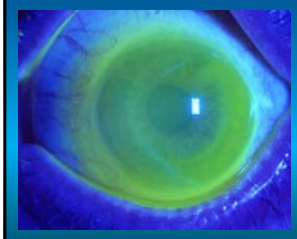
NOMENCLATURE

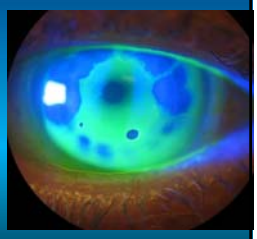
Terminology

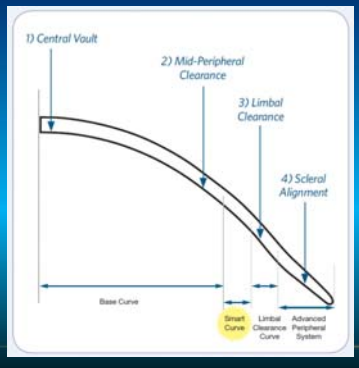
	Alternative Names	Diameter	Bearing	Tear Reservoir
Corneal		8.0 to 12.5 mm	All lens bearing on the cornea	No tear reservoir
Corneo-scleral	Corneal-Limbal Semi-scleral Limbal	12.5 to 15.0 mm	Lenses share bearing on the cornea and the sclera	Limited tear reservoir capacity
(Full) Scleral	Haptic	15.0 to 25.0 mm	All lens bearing is on the sclera	
		Mini-scleral 15.0 to 18.0 mm		Somewhat limited tear reservoir capacity
		Large-scleral 18.0 to 25.0 mm		Almost unlimited tear reservoir capacity

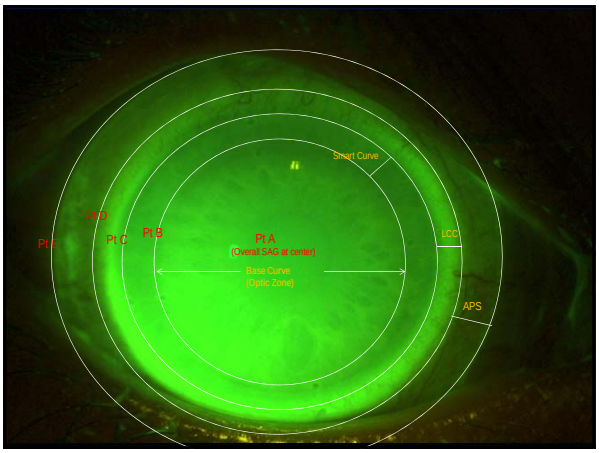
TOPOGRAPHY VS ELEVATION



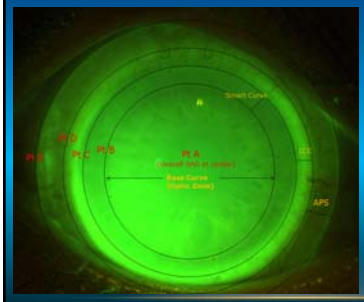








MOVING THE FIT POINTS

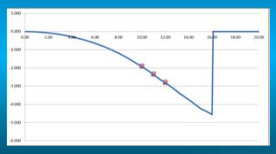


- Point A is moved up or down by changing the overall SAG
- Point B is moved up or down by changing the Base Curve
- Point C is moved up or down by requesting more or less limbal clearance by microns
- Point D is where lens lands on sclera, and so represents the reference point for moving the other fit points
- Point E is moved up or down in 30 micron APS steps

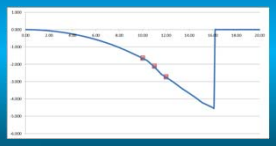
Each fit point can be moved individually, or in conjunction with one another.

CHANGES IS RADIUS AND WIDTH

Standard Geometry



Reverse Geometry



WHERE TO BEGIN??

- Start with corneal diameter and general eye shape
- If cornea is prolate in shape (steeper centrally) use the prolate design
- If cornea is oblate in shape (flatter centrally) use oblate design

CENTRAL VAULT

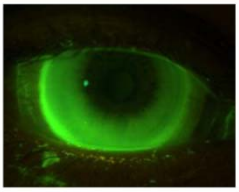


Figure 1. Unacceptable central touch

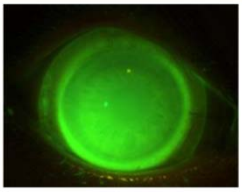


Figure 2. Central Clearance

Alden optical

CENTRAL VAULT

Once central clearance is observed, use SLE cross section view to determine the amount of clearance, as below:

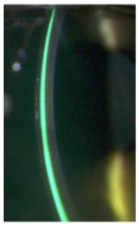


Figure 3. 4.600 SAG lens with roughly 200 microns of vault

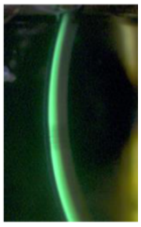


Figure 4. 4.900 SAG lens with roughly 500 microns of vault

If you want somewhere in between, just specify the sag you want

LIMBAL CLEARANCE

2) **Limbal Clearance**: The lens should also exhibit clearance beyond the limbus. If a lens does not demonstrate full limbal clearance, either move to a larger diameter or ask for an increased limbal clearance as a custom parameter when ordering.

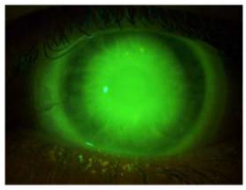


Figure 5. Unacceptable limbal bearing

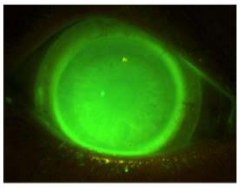


Figure 6. Clearance the extends beyond limbus with larger diameter lens

Alden optical

HOW DOES THIS AFFECT POWER?

- By adding a reverse curve
  - Flatter base curve = less minus
  - A 60.00 cornea could have a 45.00 BC
  - Therefore a -20.00 eye could wear a -5.00 lens
  - This affects lens thickness and oxygen transmission
- Conversely, you may not want a flatter BC on a high hyperope.

COMPRESSION

Thursday, October 06, 2016

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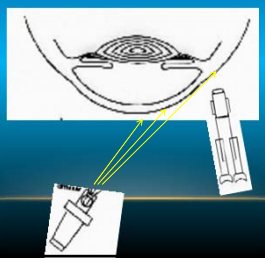
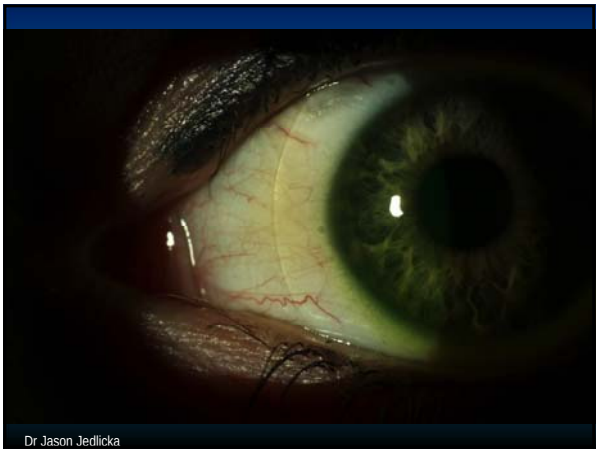
SHADOWING OF THE LENS EDGE

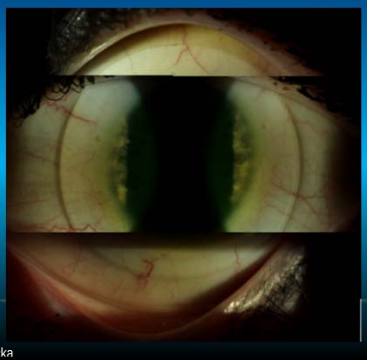
- Easy way to assess the edges for excessive lift
- Position slit beam across lens and view the far lens edge





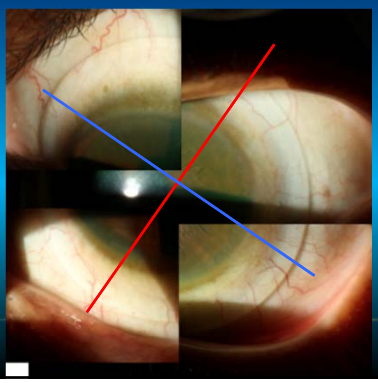
Dr Jason Jedlicka

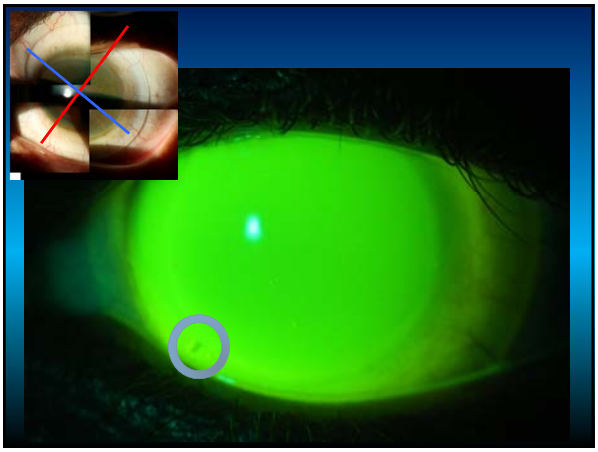
SHADOW AT 3/9 O'CLOCK



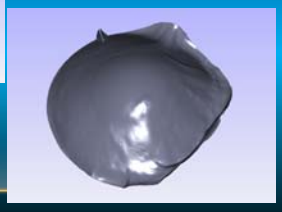
Dr Jason Jedlicka

SHADOWING OF LENS EDGE - OBLIQUE



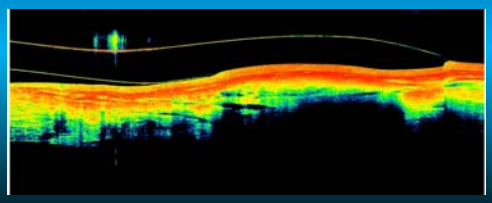


UNEXPECTED GEOMETRY



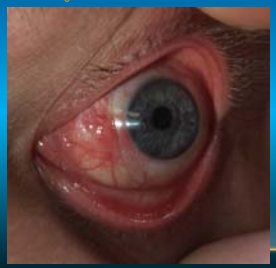
PERIPHERAL LENS DESIGN

- Do you need a custom periphery?

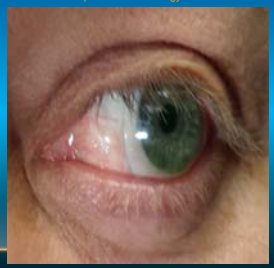


ADVANCED PERIPHERIES

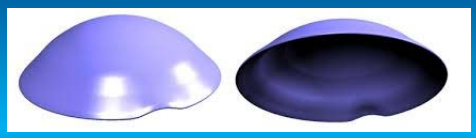
Notching



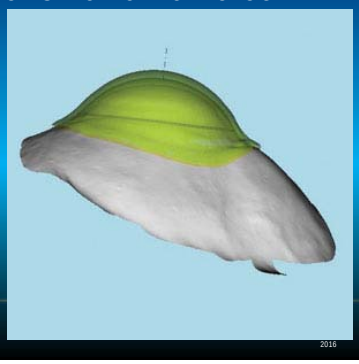
Elevation Specific Technology



MICRO VAULT



ELEVATION SPECIFIC TECHNOLOGY



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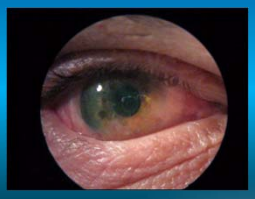


THE PENETRATING KERATOPLASTY

SPECIFIC INDICATIONS

- Keratoconus
- Aphakic corneal edema
- Psuedophakic corneal edema
- Failed graft
- Fuch's corneal dystrophy
- Herpes Simplex Keratopathy
- Inflammation
- Trauma
- Stromal dystrophies

PKP OBJECTIVES

1. Establish a clear central cornea/Visual axis
2. Minimize refractive error
3. Provide tectonic support
4. Alleviate pain
5. Eliminate infection

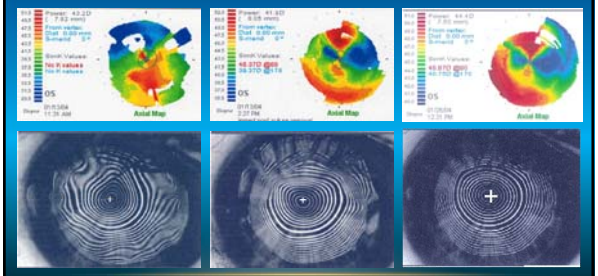
ASTIGMATISM:
OPERATIVE FACTORS TO CONSIDER

1) Donor cornea
2) Recipient corneal disease
3) External compression factors
4) Trephination (host/ donor)
5) Tissue mal-apposition
6) IOP
7) Suturing

ASTIGMATISM: POST- OP MANAGEMENT

- Intraoperative prevention
- Corneal topography
- Suture adjustment and/or removal
- Corneal Relaxing Incisions (CRIs or LRIs)
- Compression sutures
- Laser refractive surgery (ie. LASIK, PARK)
- Wedge resection
- Wound revision

SELECTIVE SUTURE REMOVAL



Pre-removal | Immed post-removal | 2 week post-removal

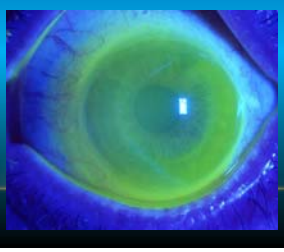
CONTACT LENSES AND THE PKP

CONTACT LENS DESIGN

- Corneal Gas Permeable
  - Front toric
  - Back toric
  - Bitoric
  - Spherical
  - Diameter modification
  - Optic zone modification
  - Rotationally assymetric
  - Reverse geometry

CONTACT LENS DESIGN

- Scleral lenses
  - Total corneal vault



SOFT LENSES

- Choose:
  - Material: high Dk
    - Corneal hypoxia
    - Neovascularization
  - OAD: 2mm > HVID
  - BC: 0.5mm > flat K

SOFT LENSES

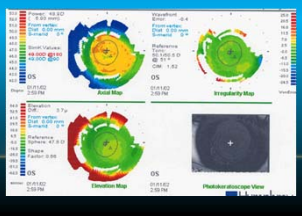
- Astigmatism
  - Avoid tight fit or thick lenses
  - May be difficult to get stability
- Piggyback with hyper Dk lenses
- Avoid extended wear
  - Risk of chronic edema, infection, neovascularization

INDENTIFYING CORNEAL GRAFTS TOPOGRAPHICALLY

- The perfect graft
- The plateau graft
- The proud graft
- The tilted graft
- The high cylinder graft

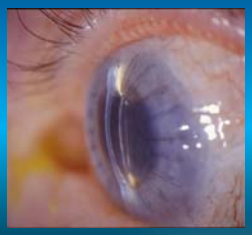
THE PERFECT GRAFT

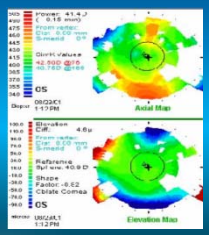
- These are not the eyes that will be sent to you to be fit
- Every surgeon has different definition of "perfect"
  - Usually VA 20/40 or better
  - Some consider success to be spherical equivalent within 2 D of emmetropia



THE PLATEAU GRAFT

THE PLATEAU GRAFT





THE PLATEAU GRAFT

- Tight stitches
- Low IOP
  - Vitrectomy at the time of surgery
  - Filter
- Button < 0.5mm larger than host
- Same size graft with KCN patients to get flattening (reduce myopia)

THE PLATEAU GRAFT

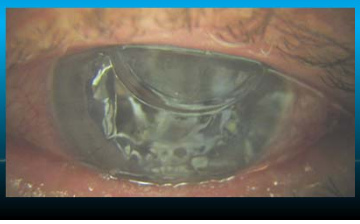
- Surgical correction
  - Need to keep chamber formed
  - Resuture
  - Remove running suture

THE PLATEAU GRAFT

- Contact Lens Correction
  - Standard design RGP would vault and trap excess tears and bubbles beneath the lens
  - Fit very small (within the graft)
  - Fit very large (reverse geometry)

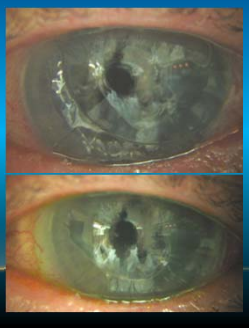
THE PLATEAU GRAFT

- Small/ flat lenses will ride high



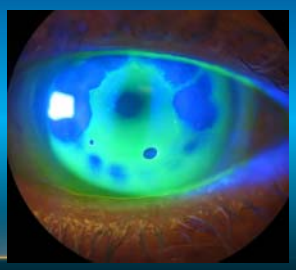
THE PLATEAU GRAFT

- Central Bubble



THE PLATEAU GRAFT

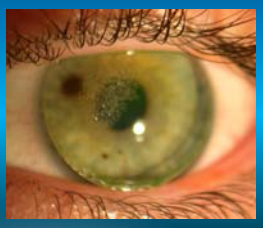
- Good Plateau fit may need extreme curves
- Graft host junction may be site for lens adherence



30.00BC with 8D reverse curve

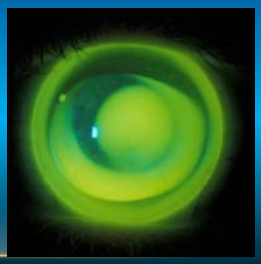
THE PLATEAU GRAFT

- Edge lift off



THE PLATEAU GRAFT

- Large OAD
- Oblate design with large optic zone
  - vault running suture
- Fit PC's separately

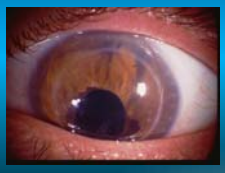


THE PLATEAU GRAFT

THE PROUD GRAFT

THE PROUD GRAFT

- The graft is evenly elevated above the host



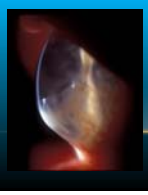
THE PROUD GRAFT

- Small recipient bed or large donor button
- Tending to create pseudo-cone

THE PROUD GRAFT

- Surgical Correction
  - Resuture
  - Repeat PKP
  - PRK for aniosmetropia
    - Cannot cut flap
  - Epikeratophakia

THE PROUD GRAFT



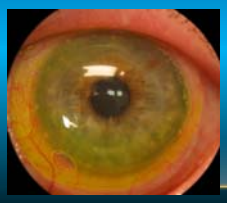
- Difficult to fit periphery because of broad area of central elevation
- Need reverse curve to bring align periphery with host
  - Steeper
  - Longer

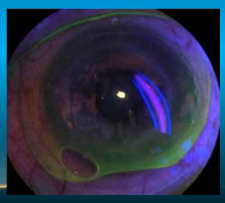
THE PROUD GRAFT

- Treat like a cone, but may need large optic zone (instead of making OZ smaller)

THE PROUD GRAFT

- Without enough sag, usually get inferior lift off





THE PROUD GRAFT

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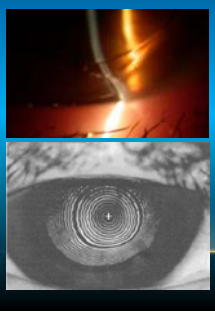
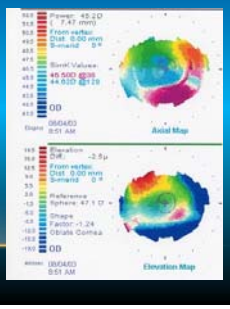
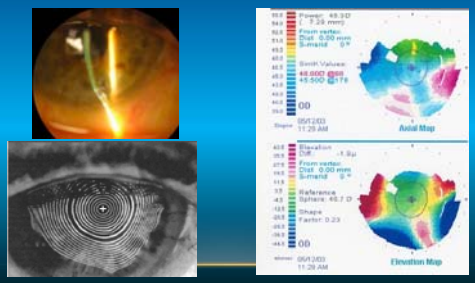
THE TILTED GRAFT

THE TILTED GRAFT





THE TILTED GRAFT



THE TILTED GRAFT

- Usually seen in KCN/ PMD
  - Tough to remove entire cone
- Trephine dependent
  - Use vacuum trephine to avoid undercutting
- Wound dehiscence
- Tissue mal-apposition
- Improper suture placement
- Unequal suture tension

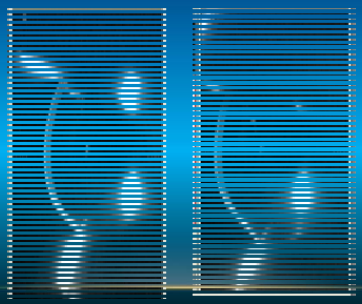
THE TILTED GRAFT

- Surgical Methods to Correct
  - Pulling sutures
  - Placing sutures
  - Wedge resection
  - Wound revision

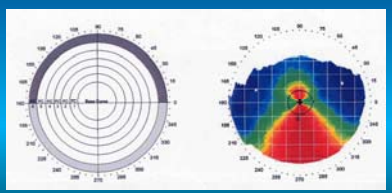
GRAFT TILT

- Large lenses
  - Beware old grafts with poor endo function
- Small lenses
- Keratoconus designs
- Increasing or decreasing optic zone
- Assymetrical lenses

THE TILTED GRAFT



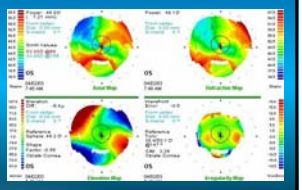
ASSYMETRICAL LENSES



DIL Flat/ Steep Lens
Lens Dynamics

THE TILTED GRAFT

Large diameter lenses

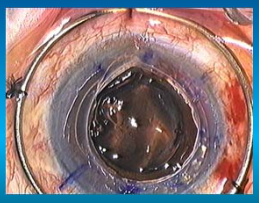


Macro A 45.00

HIGH CYLINDER GRAFT

HIGH CYLINDER GRAFT

- Causes
  - Elliptical opening
    - External compression
  - Cardinal suture placement/ tension

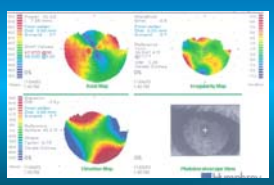


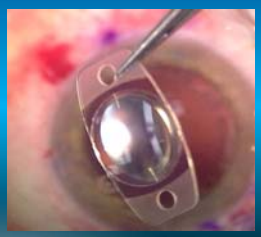
HIGH CYLINDER GRAFT

- Surgical Correction
  - Selective suture removal
  - Resuture
  - Corneal relaxing incision
    - With or with out compression sutures
  - Refractive procedures
  - Wedge resection
  - Repeat PKP
  - Refractive implant

HIGH CYLINDER GRAFT

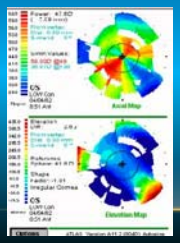
- Toric IOL





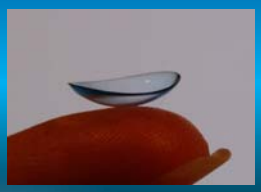
HIGH CYLINDER GRAFT

- 5 –6 D cylinder common

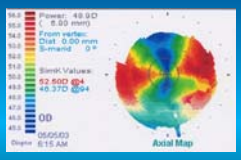


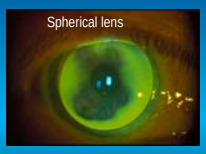
HIGH CYLINDER GRAFT

- Contact Lens Options
  - Spherical lenses
  - Bitoric/ Back toric
  - Large diameter lenses



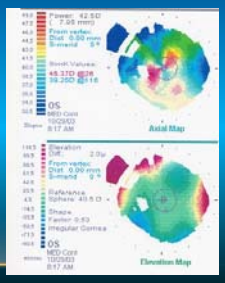
HIGH CYLINDER GRAFT





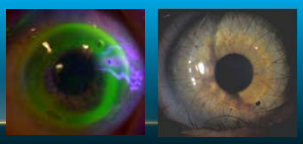
INSIDE CYLINDER

- Periphery fairly spherical
- Spherical lens works well
- May be a proud cornea

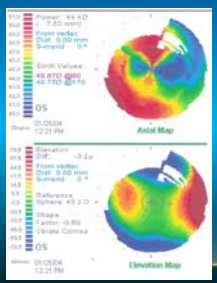


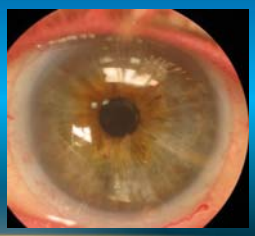
OUTSIDE CYLINDER

- Lens will ride over highest/ steepest area
- May be a plateau cornea



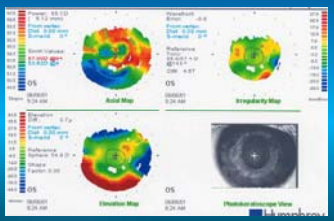
PLATEAU WITH CYLINDER





FALSE CYLINDER

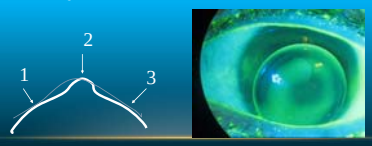
- Tilted graft
- Proud graft
- Irregular astigmatism
- Remove sutures



KERATOCONUS

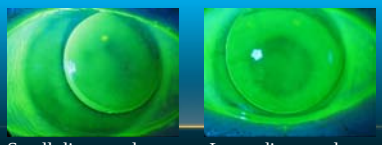
FITTING PHILOSOPHIES

- Three Point Touch
  - Apical bearing with mid-peripheral touch
  - Apical bearing 2-3mm wide
  - Advantage: vision may be better with flatter lenses
  - Disadvantage: Pressure on the apex may lead to erosions or scarring



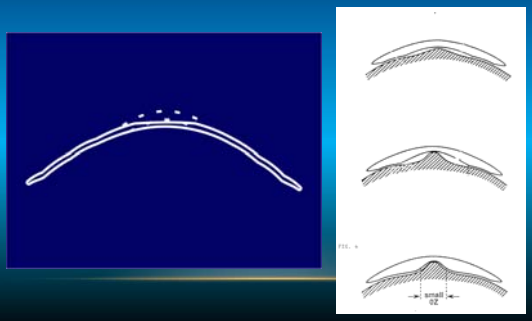
FITTING PHILOSOPHIES

- Large diameter/ flat lenses
  - Forced centration or pupil coverage
  - Good for large or inferior cones
  - Generally lid attached
  - Advantages: Good comfort, large optic zone, stays in eye when small lenses will not.
  - Disadvantages: apical bearing, lower lid interaction



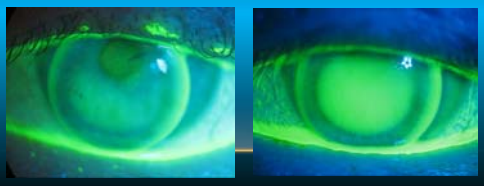
Small diameter lens Large diameter lens

TRADITIONAL KC DESIGNS



FITTING PHILOSOPHIES

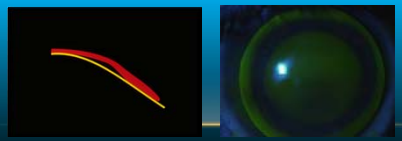
- FDACL (First Definite Apical Clearance Lens- CLEK Study)
  - The flattest lens that vaults the apex of the cone
  - Start with initial lens equal to or steeper that average K and adjust BC until apical clearance is achieved.



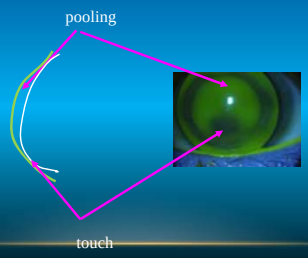
Rose K 7.00 8.3 STD PC Rose K 6.60 8.3 STD PC

FITTING PHILOSOPHIES

- Reverse geometry
  - Steeper secondary curve position lens centrally and allows the base curve to vault, rather than touch, the cone.
  - Advantages: large optic zone, good centration
  - Disadvantage: lower lid interactions

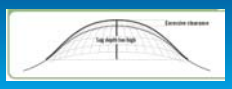


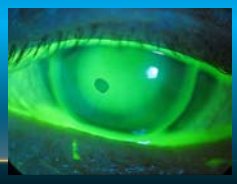
REVERSE GEOMETRY DESIGN



TOO MUCH SAGITTAL DEPTH

- Central bubbles under the lens
- Lens rides low





NOT ENOUGH SAGITTAL DEPTH

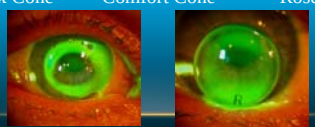
- Lens decenters
- Touch over cone
- Bubbles at edge of lens

WHAT SHOULD YOU CONSIDER IN LENS DESIGN?

- Ease of fitting
  - trial sets
  - Simple fitting guide
- Minimal fitting time
- High first fit success
- Minimal corneal insult
- Increased patient comfort
- Repeatable replacements

MANY DESIGN OPTIONS

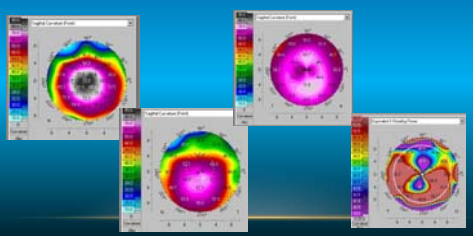
Apex Cone | Comfort Cone | Rose K



Jupiter Cone | Soper Cone

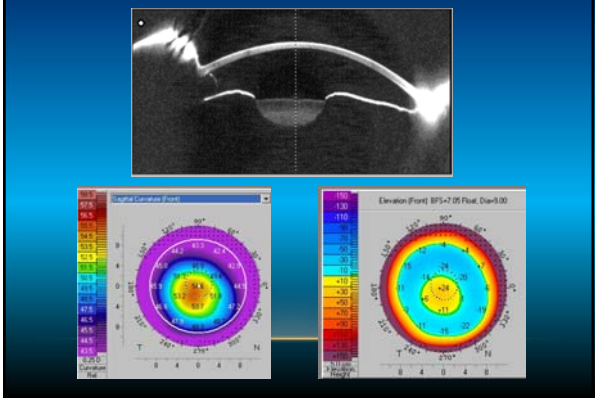
WHY DO YOU NEED MORE THAN ONE LENS DESIGN?

- Many types of cones!!!



NIPPLE CONE

- Small, paracentral cone
- Usually < 5 mm diameter
- Very steeply curved

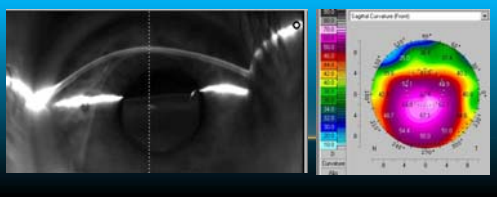


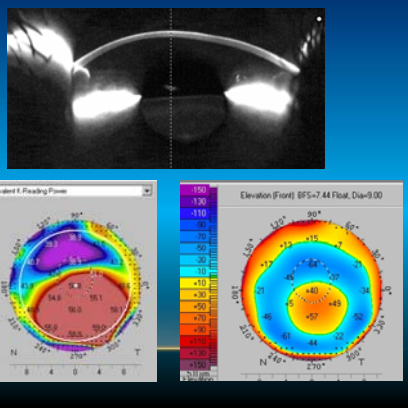
SMALL CENTRAL CONES

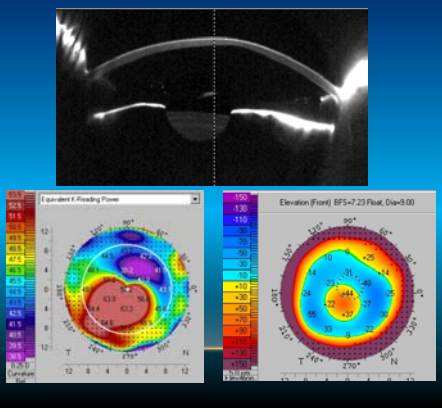
- Traditional cone designs work well
- Many options

OVAL CONE

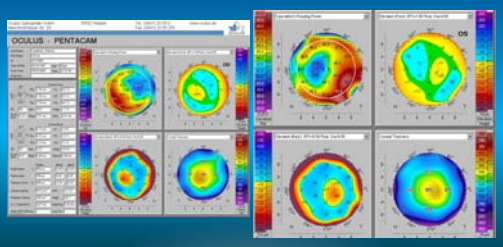
- Displaced apical center
- Inferior quadrant
- Cone diameter > 5-6 mm



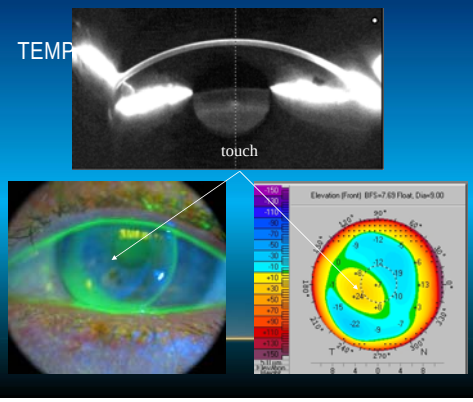




TEMPORAL CONE

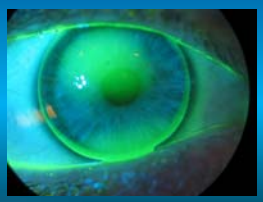


TEMP



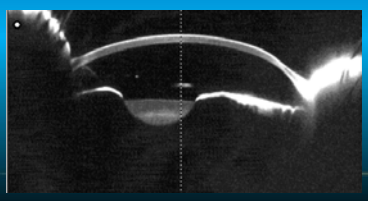
OVAL OR DISPLACED CONES

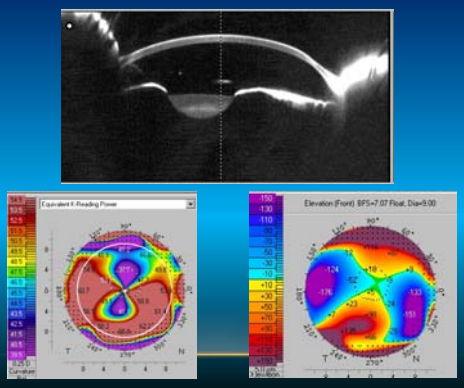
- Large diameter
  - Larger optic zones
- Reverse Geometry



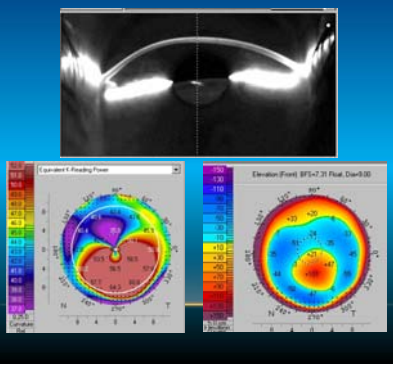
PELLUCID MARGINAL DEGENERATION

- "Kissing doves"
- Thinning 1-2mm from limbus

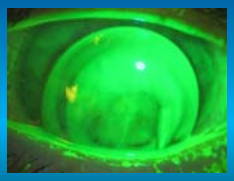


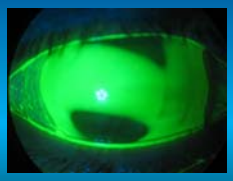


PSUEDO- PMD



PMD





-Reverse Geo lens

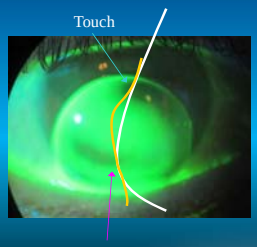
-

-Smaller lenses will ride low

-Often with inferior lift off

Scleral lens

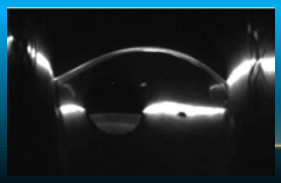
PMD

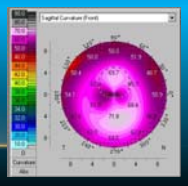


Traditional KC designs don't fit

GLOBUS CONE

- Largest
- Involves 75 - 90% of the cornea





FITTING A LENS

- Total Diameter
- Base Curve
- Peripheral Curves
- Power

DIAMETER

- Optimum:
  - Hang off top lid
  - Be well clear of lower limbus
  - Locate centrally

Central keratoconus – small diameter lens good fit

Animation courtesy of Lens Dynamics

FOR SMALL CENTRAL CONES

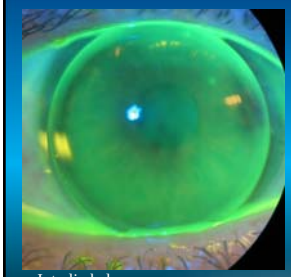
- Standard cone designs work well
- The steeper the cone the smaller the optic zone
  - Generally smaller lenses
  - However, diameter does not have to dictate optic zone.

Inferior keratoconus – small diameter lens fits poorly

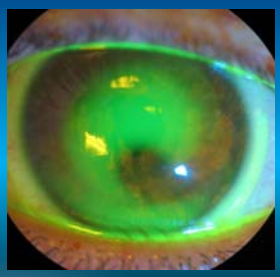
Animation courtesy of Lens Dynamics

Inferior keratoconus – large diameter lenses force centration

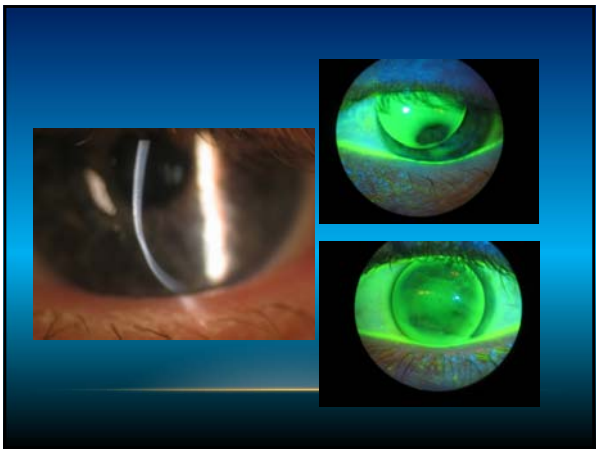
Animation courtesy of Lens Dynamics



Intralimbal



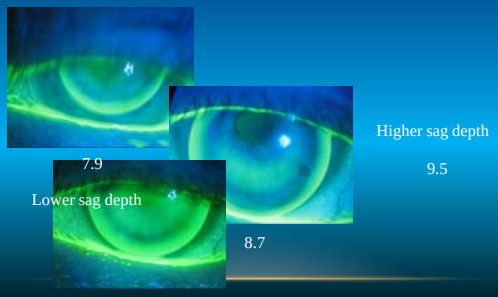
MiniScleral



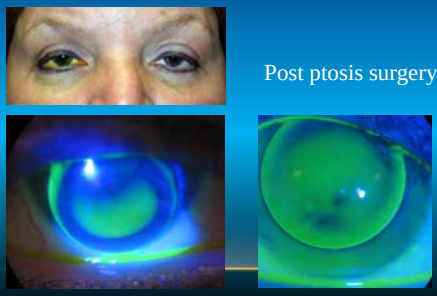
BEST OPTIONS FOR INFERIOR CONES

- Small and Flat (low sag)
  - Will ride high
  - May have inferior lift off
- Large Diameter
  - Forced centration
  - Covers pupil better, less flare
  - Peripheral geometry of concern
  - More lower lid interaction
- Reverse Geometry

CHANGING DIAMETER

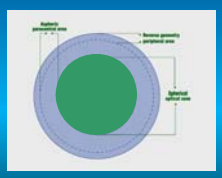


LID LOCATION



FITTING A LENS

- Total Diameter
- Base Curve
- Peripheral Curves
- Power

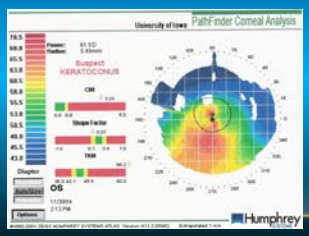


CHOOSING A BASE CURVE

- 3-4 mm Rule
- Yellow Rule
- Reference Sphere
- .2mm Flatter than Average K
- Fit steep K

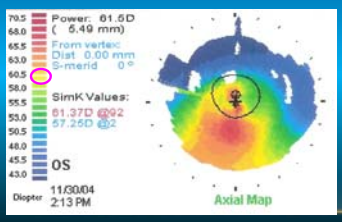
3-4 MM RULE

- Temporal Quad



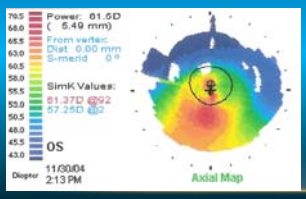
50.50D or 6.68mm

YELLOW RULE



59.00D or 5.72mm

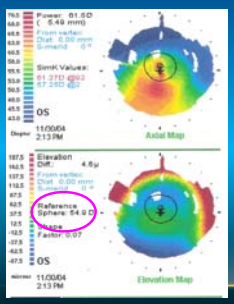
.2MM FLATTER THAN AVERAGE K



Average K = 59.31
Or 5.7mm

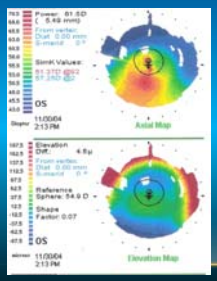
57.00D or 5.9mm

REFERENCE SPHERE/ BFS



55.00D or 6.10mm

FIT STEEP K



Steep K = 61.37D

WHAT WORKS?

- Depends on type of cone
- Depends of type of lens
- Use the fitting set recommendation

- Remind patient that you are putting the first lens on the eye to get yourself orientated.
  - The patient won't be able to see and the lens will likely be uncomfortable.

BASE CURVE SHOULD BE EVALUATED WITH THE LENS RIDING OVER THE CONE

FLAT LENSES (LOW SAG) RIDE HIGH, STEEP LENSES (HIGH SAG) RIDE LOW

6.25mm BC

5.7mm BC

EVALUATING THE BASE CURVE

7.4mm

Lower sagittal depth

Greater sagittal depth

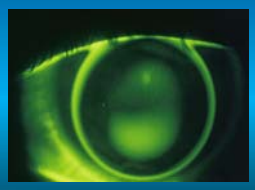
7.00mm

6.6mm

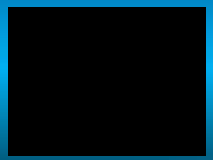
POOLING AT BASE OF CONE

High Sag

- Flatten Base Curve
- Decrease Diameter or Optic Zone
- Flattening the peripheral curves



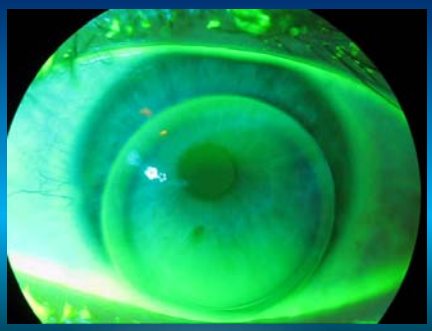
BUBBLES UNDER THE LENS



- High Sag
  - Flattening the base
  - Flattening the peripheral curves
  - Decreasing the diameter or OZ

BUBBLES UNDER THE LENS

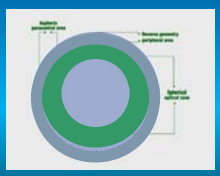
- Low sag
  - steepen base curve
  - Steepen PC
  - Increase OZ or diameter



Increased OZ
Steeper PC's

FITTING A LENS

- Total Diameter
- Base Curve
- Peripheral Curves
- Power



PERIPHERAL CURVES

Flat PC's

Standard PC's

Increased sagittal depth

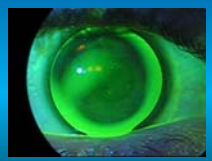
Steep PC's

Lower sagittal depth

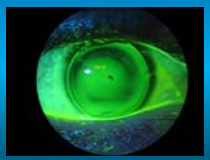
EDGE LIFT

- Most important factor for a comfortable fit.
- Ideal Edge Lift = fluorescein band width of 0.6 mm to 0.8 mm wide

DON'T TRY TO ADJUST PERIPHERAL CURVES BY CHANGING THE BASE CURVE



I Kone
50.00
9.6



I Kone
53.00
9.6

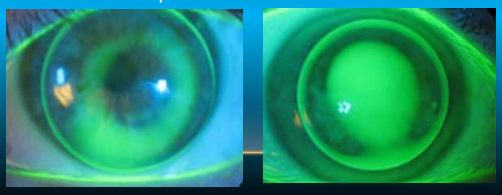
PERIPHERAL CURVE ADJUSTMENT

Naturalens
8.0
10.3
STD PC's

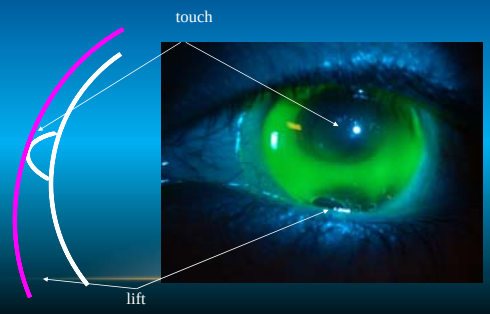
Naturalens
8.0
10.3
Flat PC's

ADHERENCE

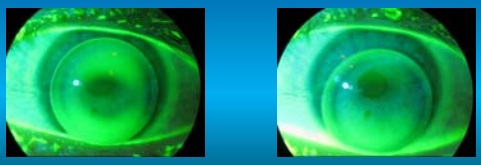
- Make peripheral curves flatter and wider
- Flatten BC
- Reduce the optic zone



INFERIOR LIFT OFF



INFERIOR LIFT OFF

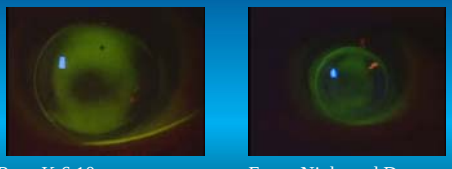


Increased OZ
Steeper PC's

Rotationally Assymetric Lenses

Zone 2 has a different radius than Zone 1
Zones 3 and 4 are transition zones for 1&2

PIGGY BACK



Rose K 6.10

Focus Night and Day
Rose K 6.10

LENS LOCATION

- Riding High
  - Reduce diameter
  - Steepen base curve
  - Reduce edge lift
- Low Riding
  - Increase diameter
  - Flatten base curve
  - Increase edge lift

FITTING A LENS

- Total Diameter
- Base Curve
- Peripheral Curves
- Power

POWER

- Over scope
- Refine in +/- 0.50 & +/- 0.25 steps
- Final lens power = trial lens + over refraction
- vertex > 4.0 D over Rx

PEARLS

- Finish refraction with lights on.
- Reassure patient if VA is not optimum at initial fitting.(tearing)
- VA often improves over first few weeks wear.
- Educate patient about VA expectations. (night driving)

- A lens which slides or is tipped or tilted on the cornea can induce significant amounts of unwanted cylinder
- A tilted lens can cause distorted and fluctuating vision
- The steeper secondary curve such as a reverse geometry lens, can help prevent lens tilt by centering the lens horizontally and vertically.

CORRECTION OF RESIDUAL ASTIGMATISM

- Over Spectacles
- Front Surface Toric
- Peripheral Toric
- Large Diameter
- Reverse Geometry

OVER SPECTACLES

- A/R coat
- Photochromic
- Prescription sunglasses

FRONT SURFACE TORIC

- Increase diameter 0.3 mm
- Incorporate prism ballast
- Truncation if required

SUMMARY

- Determine location of cone
  - Elevation maps helpful
  - Lens will center over "high" area
- Choose design and diameter of lens based on cone type.
  - Large lens force centration
  - Small lenses for central cones

SUMMARY

- Patients with PMD require large diameter, or even scleral, GP lenses.

SUMMARY

- Select base curve based on the fitting algorithm of your choice
- Place lens on eye and determine sagittal depth
  - Flat lenses ride high
  - Steep lenses ride low
- Only evaluate overall sagittal depth with the lens centered on the cone

SAGITTAL DEPTH

- Decrease
  - Decrease diameter or optic zone
  - Flatten BC
  - Widen/ flatten PC's
- Increase
  - Increase diameter or Optic Zone
  - Steepen BC
  - Narrow/ steep PC's

SUMMARY

- Diameter/ OZ
  - Optimize centration
  - Minimize lid interaction
  - Increase diameter: increase sag
  - Decrease diameter: decrease sag

SUMMARY

- Base Curve
  - Greatest effect on sagittal depth
  - BC changes do not adjust peripheral curves
  - Gracing touch over cone

SUMMARY

- Peripheral curves and edge lift
  - Effects comfort
  - Determine the appropriate PC's after the diameter and base curve have been selected
  - Alter diameter and base curve before doing quadrant specific designs

MOST IMPORTANTLY

- Don't make too many changes all at once
  - Large fitting sets are helpful
  - Practice altering once parameter at a time to learn how each change impacts the overall fit
  - Remember, these are general principles and each lens will have its own specific nuances.

THANK YOU