

Optometric Management of Keratoconus

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Normal



Keratoconus



Kera = cornea
Konos = cone

Early Stages

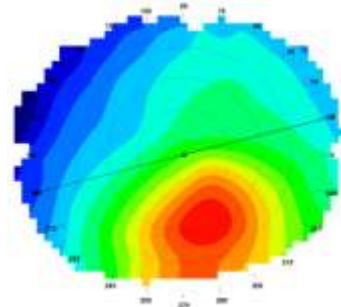
Spectacles

- Well tolerated
- Work in big steps
- Have patient adjust cyl axis

Soft Contact lenses

- Good initial comfort
- Soft torics – variable vision
- Kerasoft

Both have limited correction



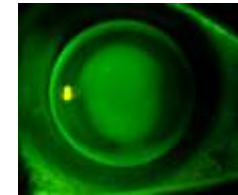
Nothing

Specs/SCL until BCVA inadequate, RGP CL when specs inadequate

Keratoconus



KC with RGP Contact Lens

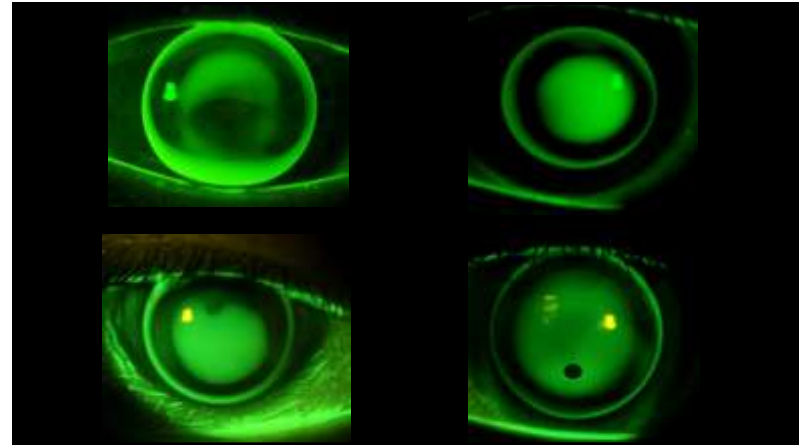
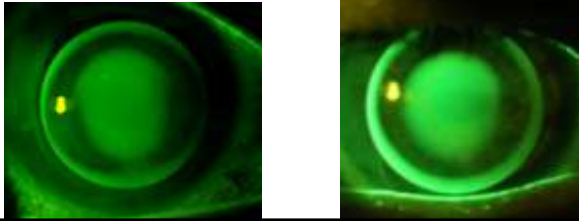


For vision only:

- **Do not push** cone into shape
- **Does not** slow progression
- **Not** a cure for KCN

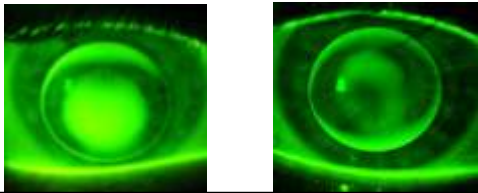
Corneal RGP Contact Lenses

- Apical clearance, 3pt touch
- CLEK study: apical insult → progression, scarring & ↓ vision
 - FDAFL (first definite apical clearance lens)
- **Does not** push cone into shape



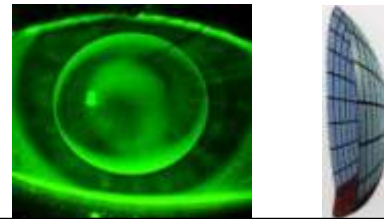
Low Riding Lenses

- Most common form of KCN – low sagging cones
- Lens centres over steepest part of cornea
- Low cones → inferior lift off, drops down
- Decreased vision, ghosting, haloes
- Always centre lens when assessing

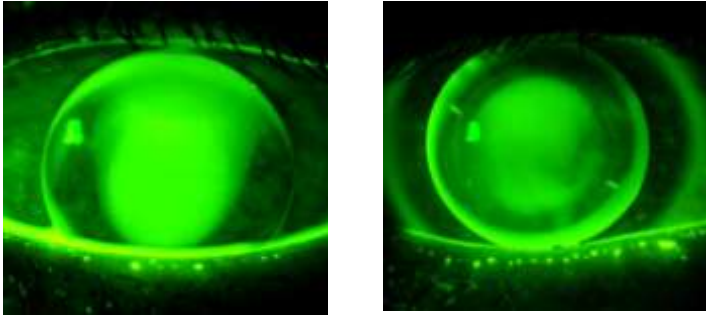


Tucks (asymmetrical quadrants)

- Inferior lift off (stand off) → decentration, instability, ejection, discomfort, poor, variable vision
- Can 'tuck', steepen one or more quadrants
- At least 0.3mm tuck

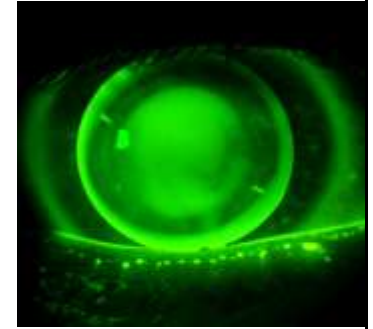


Toric Periphery



Toric Periphery

- Useful when peripheral cornea toric
- Toric BOZR used for regular cyl corneas
- Toric not used for KCN – high irreg cyl
- Order with at least 0.3mm toricity



Corneal RGP Downfalls



The Premise:

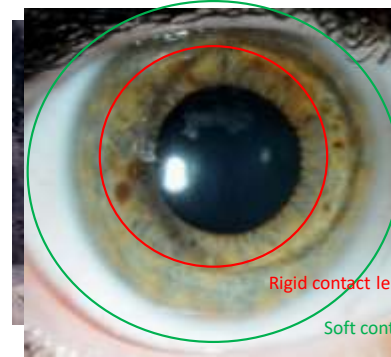
A hard plastic disc designed to rest on and slide over the distorted surface of the most sensitive and fragile tissue of the human body is logical.

- Dr Perry Rosenthal

Improving Comfort

- PiggyBacking
- Hybrids
- Corneo-scleral/Semi-scleral
- Mini-scleral / Sclerals

Piggy backing



Rigid contact lens

Soft contact lens

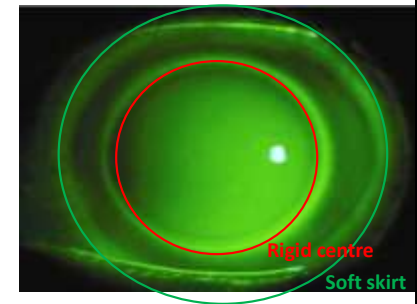
- Soft lens beneath rigid
- 'Shield'
- Helpful for sensitive ocular surface
- Dusty environments
- **Not** useful for true RGP intolerance

Hybrids



Hybrid Contact lenses

- Rigid center
 - optimal visual acuity
- Soft skirt
 - Stability, comfort, centration, not prone to FBs



Rigid centre

Soft skirt

Hybrid Contact Lenses

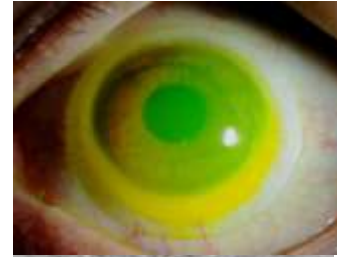
Pros

- Comfort
- Stability
- Centration
- Reduced corneal insult?
- Fast adaptation
- Part time
- Lenses rarely broken/lost
- Postpone/prevent surgery

Cons

- Handling
- Increased cost
- Limited parameters
- Fixed optic size

Mini-Scleral / Scleral lenses



- Larger diameter
- Entire lens rests on sclera
- 'Mini-scleral:' up to 6mm > HVID
- 'Large scleral:' Diam > 6mm > HVID
- 'Vault' the cornea
- Sealed lens system
- Post lens 'resevoir'

van der Worp E. A Guide to Scleral Lens Fitting, Version 2.0. Forest Grove, OR: Pacific University; 2015.
Available from: <http://commons.pacificu.edu/mono/10/>.

Scleral Lenses

Pros

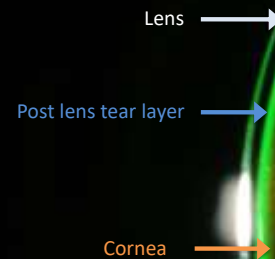
- Comfort
- Stability
- Centration
- Reduced corneal insult
- Fast adaptation
- Part time
- Ocular surface protection
- Lenses rarely broken/lost
- Postpone/prevent surgery

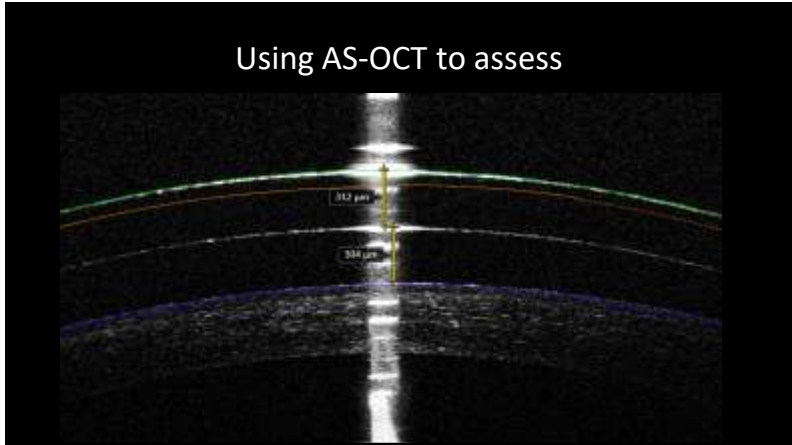
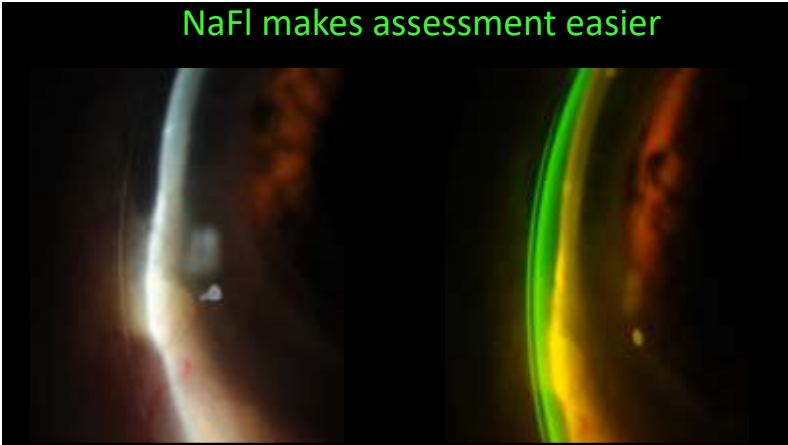
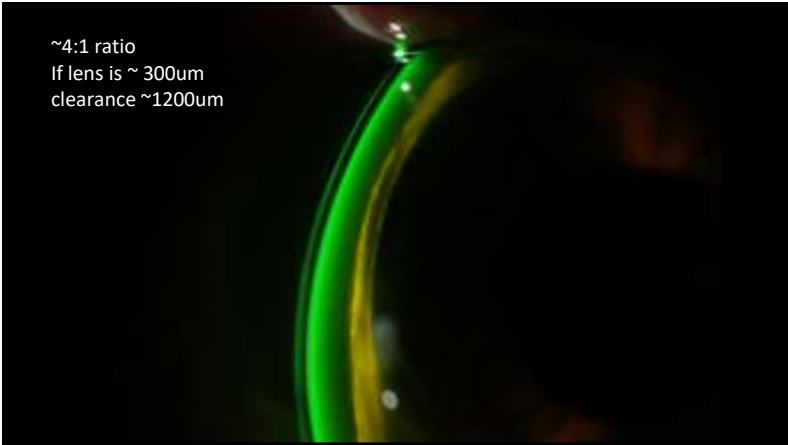
Cons

- Handling
- Increased cost
- Hypoxia
- Post-tear lens debris



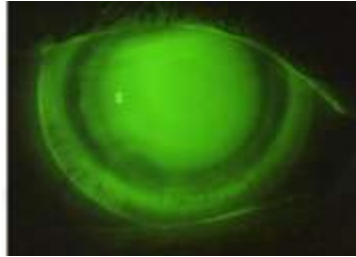
Approx 1:1 ratio between the dark (lens) and green (tear film) bands





Corneo-scleral/Semi-scleral

- Rests partly on sclera, partly on cornea
- Larger cf corneal RGPs
- Smaller cf mini-scleral/scleral
- Improved comfort, centration, stability, less foreign particles
- Tear exchange
- E.g. RoseK2XL, Limbal lift



When to Refer

- For cross-linking when progression
- When all CL options exhausted
- Surgery **not** a cure
- Surgery does **not** mean good unaided or spectacle acuity
- Many still require RGPs post surgery
- Kerarings often make CL fitting **more** difficult
- Grafts – compromised tissue
- Grafts do not last forever



Resources

- <https://www.roseklens.com/practitioners/rose-k2-video-fitting-guides/>
- <https://sclerallens.org/>
- van der Worp E. A Guide to Scleral Lens Fitting, Version 2.0. <https://commons.pacificu.edu/work/sc/1c04131a-7e30-4ccb-9ce5-6bee90360f3d>
- <https://synergeves.com/professional/>
- Randy Kojima topography videos – YouTube

Thank You

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