

Laser Refractive Surgery Update

Dr Ben LaHood

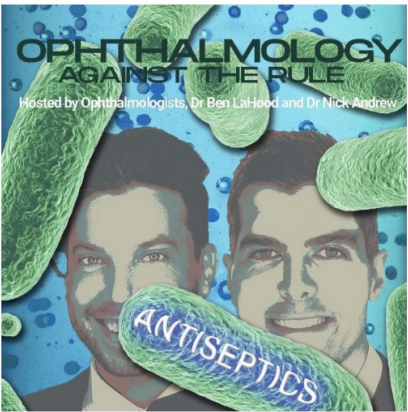
MBChB (dist.) PGDipOph (dist.) PhD FRANZCO
Ophthalmologist, Refractive Cataract and Laser Surgeon
Adelaide, Australia



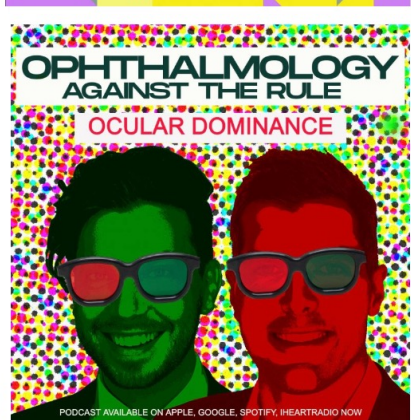
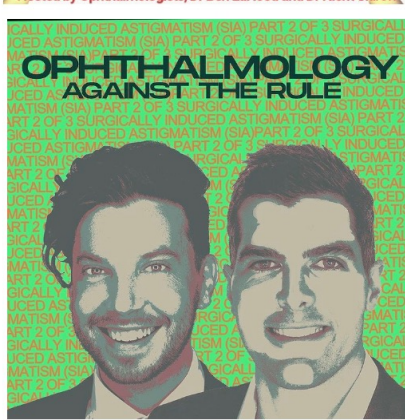
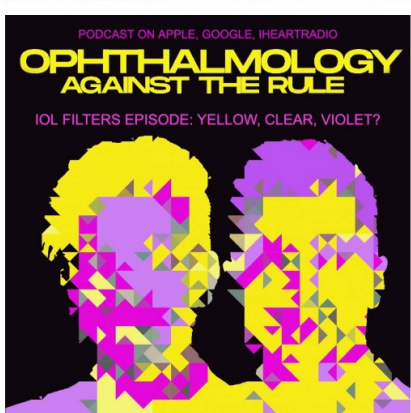
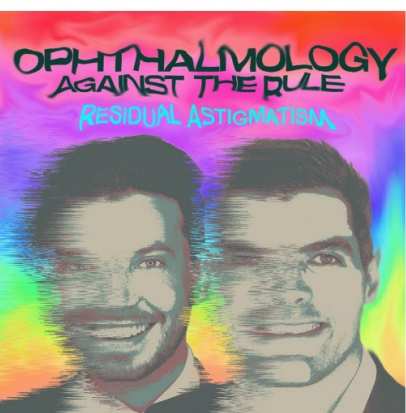
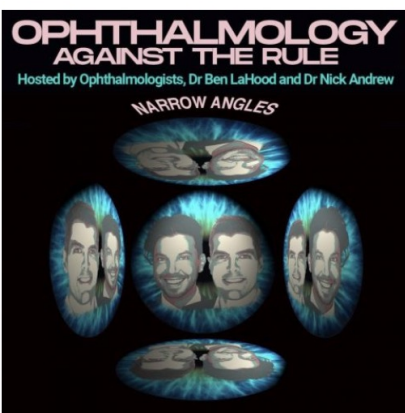
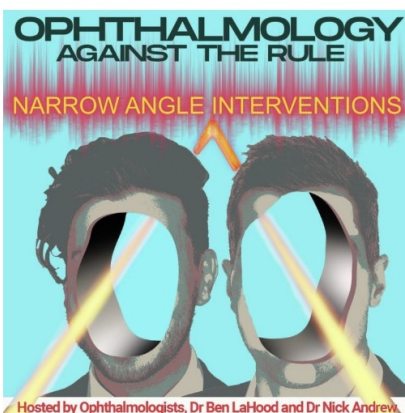
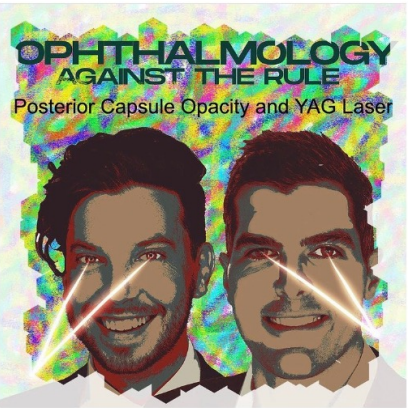
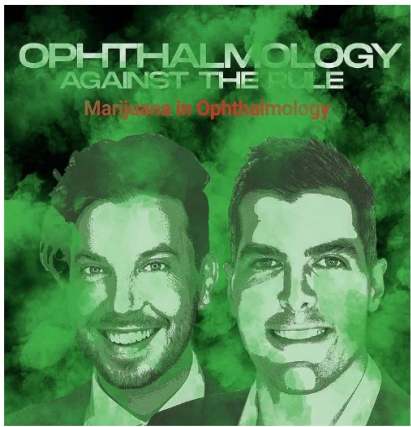
My Background

- From Dunedin, New Zealand
- Fellowship training in refractive cataract and laser surgery
- PhD on posterior corneal astigmatism
- Practice
 - Ashford Advanced Eye Care
 - Topographically guided transepithelial PRK
 - Cataract and Lens replacement surgeries
 - Adelaide Eye and Laser Centre / Park View Day Surgery
 - SMILE
 - LASIK
 - ICL
 - Cataract and Lens replacement surgeries
- Education
 - Run courses ESCRS, ASCRS
 - Teach RANZCO Cataract and Refractive Final Exam Course
 - Podcasts





Ophthalmology Against The Rule Podcast





The Second Look Podcast



Monthly Email Newsletter

Create Collaboration
Case Discussions
Questions and Answers
Updates on publications/presentations
CPD Events

To sign up: ben@drbenlahood.com



REGISTER YOUR INTEREST
FOR MY
NEXT EVENT



QUESTIONS
FROM THIS MONTH

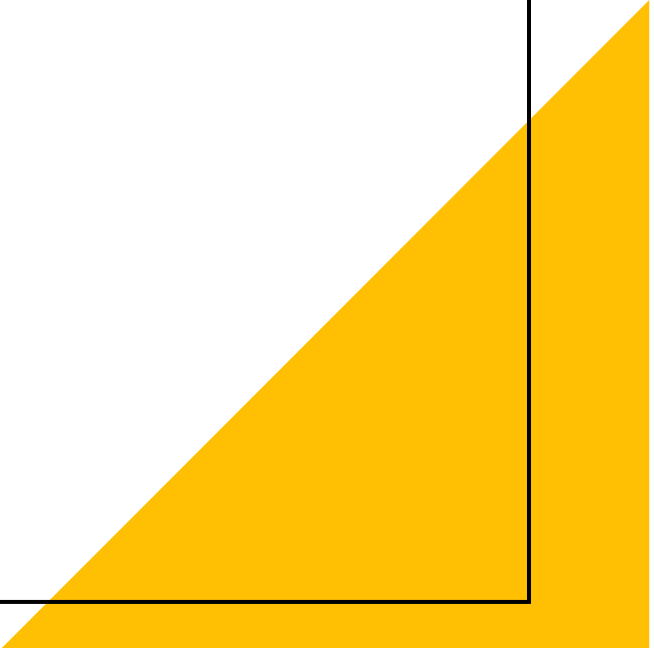
Update Goals for Today

- SMILE
 - Hyperopia
 - Astigmatism limits
- LASIK
 - Improved patient experience
- PRK
 - Topographically guided treatments
 - Transepithelial ablation
- Optom role
 - Pre-op and Post-op
- When things don't go to plan

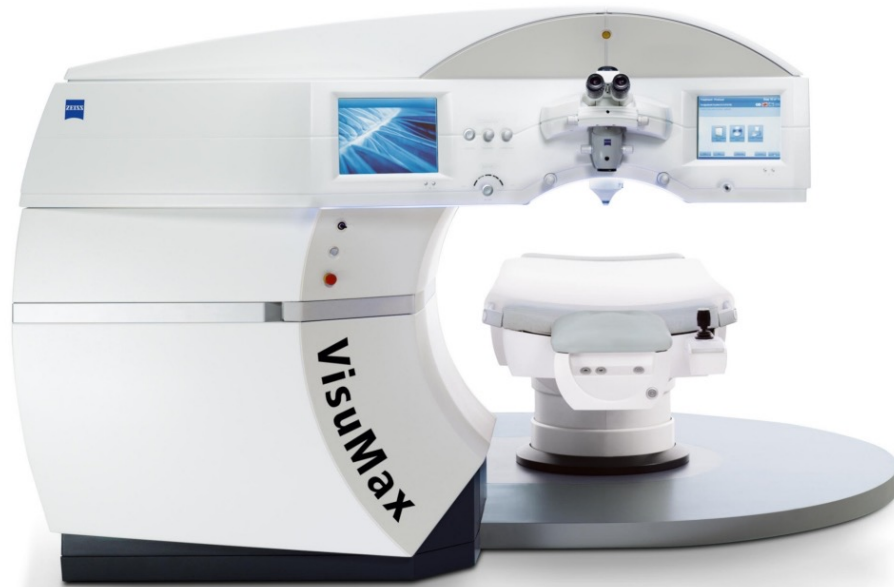
SMILE

- New Laser
- Visumax 800
 - Faster
 - Less risk of suction loss
 - Better patient experience
 - More accurate astigmatism treatment
 - Ability to treat hyperopia

SMILE Concerns

- Limited refractive range (personal limits)
 - Myopia greater than -1D
 - Astigmatism less than 1D
 - No hyperopia
 - Long laser duration
 - Suction loss more likely as duration lengthens
 - May need to abandon procedure
 - Can cause anxiety for patient
 - Can feel claustrophobic
 - Dissection can be difficult
 - No guidance for centration or cyclotorsion
- 
- A large yellow triangle is positioned in the bottom right corner of the slide, pointing towards the top right.

SMILE Updates #1 New Laser



Original Visumax Laser



New Visumax 800 Laser
Park View Day Surgery (where I work)
LVSA (Graham Fraenkel)

SMILE Updates #3 Any colour you want!



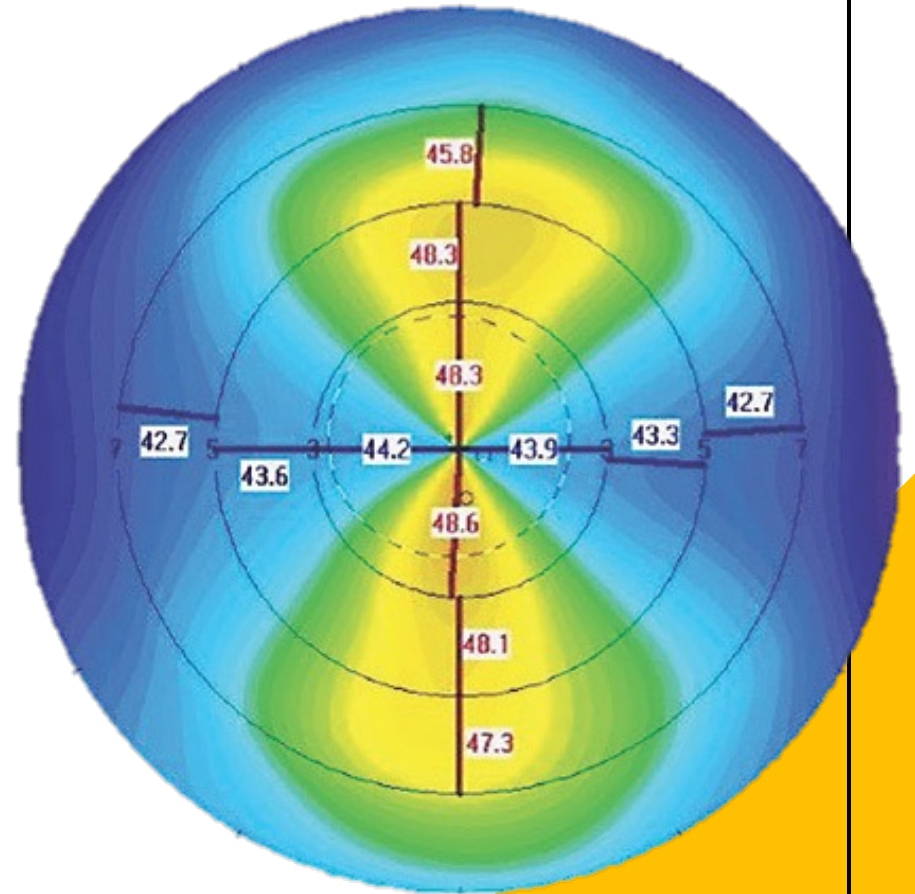
SMILE Updates #4 Centration

- Original Visumax
 - Centration manual
 - Depends where you dock the eye
 - Visual axis not always on pupil centre
 - Decentration
 - Aberrations
 - Night vision issues
- New Visumax 800
 - Computer assisted guidance
 - Positioning of treatment after docking



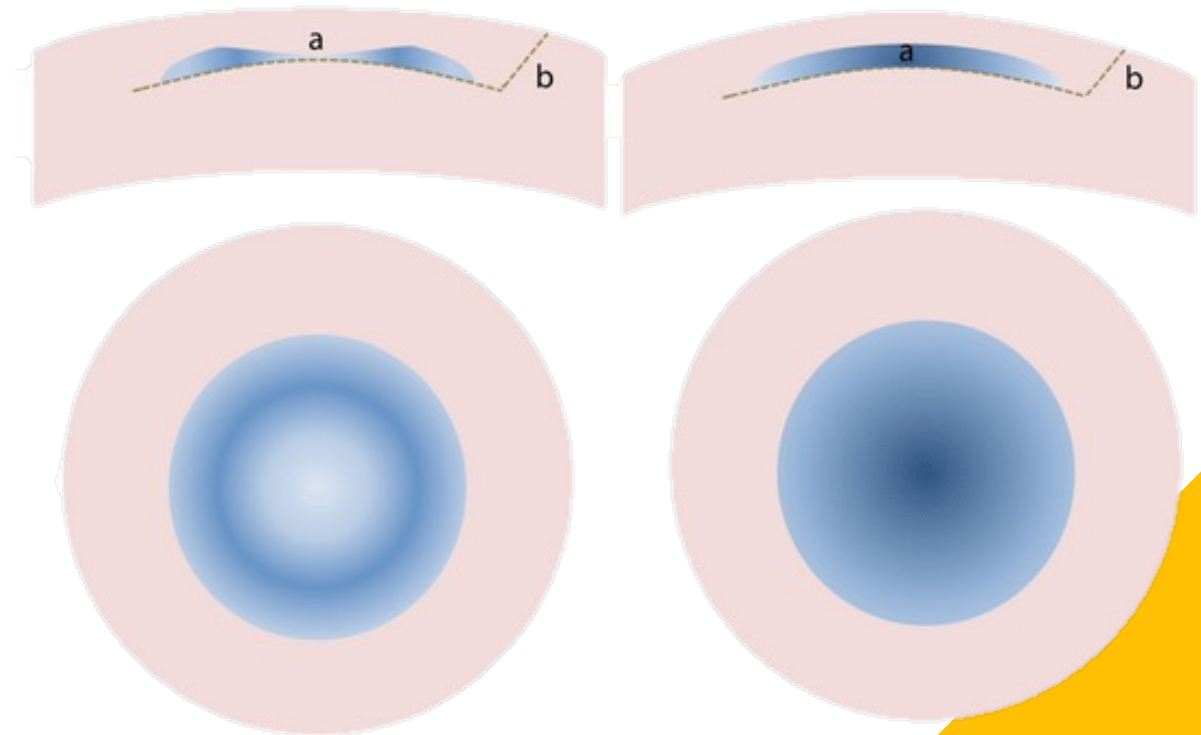
SMILE Updates #5 Astigmatism

- Original Visumax
 - No automatic adjustment for cyclotorsion
 - Most eyes rotate from sitting to lying down
 - Mark eyes manually
 - Limit to low astigmatism (1D or less)
- New Visumax 800
 - Cyclotorsion control automated
 - Astigmatism range similar to LASIK (up to 5D)



SMILE Updates #6 Hyperopia

- Original Visumax
 - Myopia only
- New Visumax 800
 - Hyperopic treatments in 2023




Overall SMILE Update

Previously

- Myopia only
- Low astigmatism
- Longer procedure
- Dissection sometimes difficult

Visumax 800

- Myopia and Hyperopia
 - Any astigmatism
 - Short procedure
 - Dissection easier
 - Better patient experience
 - Less stressful
- 
- A large yellow triangle is positioned in the bottom right corner of the slide, pointing towards the top right.

Meme break



@drbenlahood



LASIK Updates

- New Visumax 800 Laser
 - Faster
 - Smoother
- New Wavelight Excimer Laser

LASIK Limits

- Myopia
 - -0.50D to -12D
- Astigmatism
 - -0.25D to 5.0D
- Hyperopia
 - Up to +6.0D

LASIK Limits

- What limits treatment powers
 - Corneal thickness
 - Ectasia risk
 - Vision quality
 - Higher treatments need smaller optical zones
 - Smaller optical zones vs larger pupils
 - Night time glare and halos risk

LASIK Update

- Faster flap creation
 - More comfortable for patients
 - Lower risk of suction loss
- Smoother flap creation
 - Easier to open
 - Probably faster recovery
- Still a great technique
 - If LASIK came after SMILE?

Meme break



@drbenlahood



PRK Update

- Transepithelial Ablation
- Topographically guided treatments
- Central corneal regularization
- Improved comfort

PRK Methods

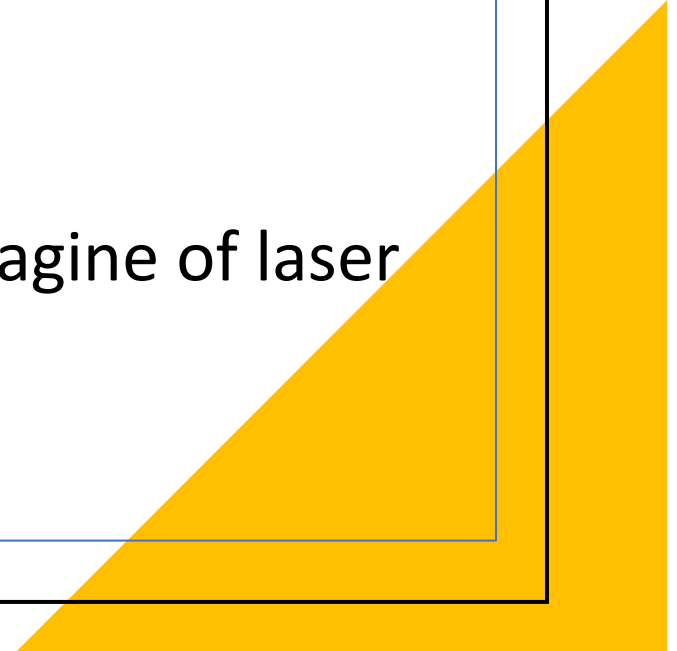
Epithelial debridement

- Remove epithelium manually
 - Ragged edges
- Can be stubborn to remove



Transepithelial

- Laser through epithelium
 - Literally laser sharp edge
- No touch at all
- Fast process
- What people imagine of laser



Topographically Guided PRK

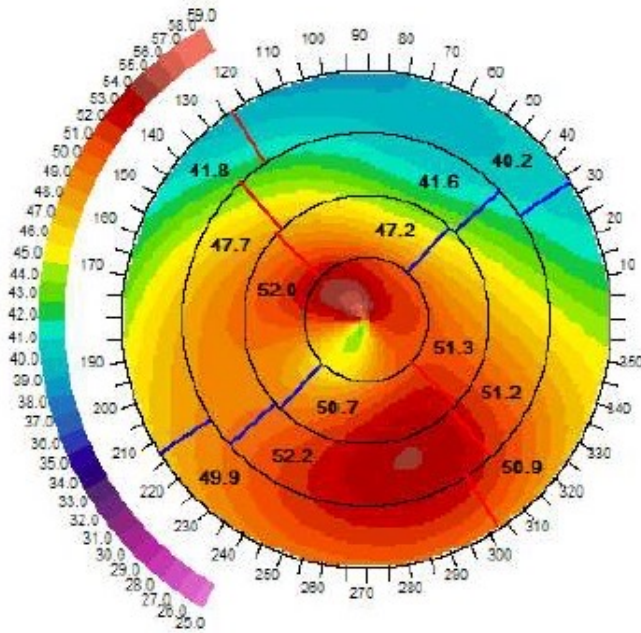
- Wavefront guided
 - Wavefront measured for eye and treatment based on this
 - Impacted by opacities
- Wavefront optimized
 - Hard to know whether to treat a particular aberration
 - Coma vs astigmatism
- Topographically guided
 - Improving shape regardless of aberrations etc.
 - Make the cornea a more regular shape

Topographically Guided Examples

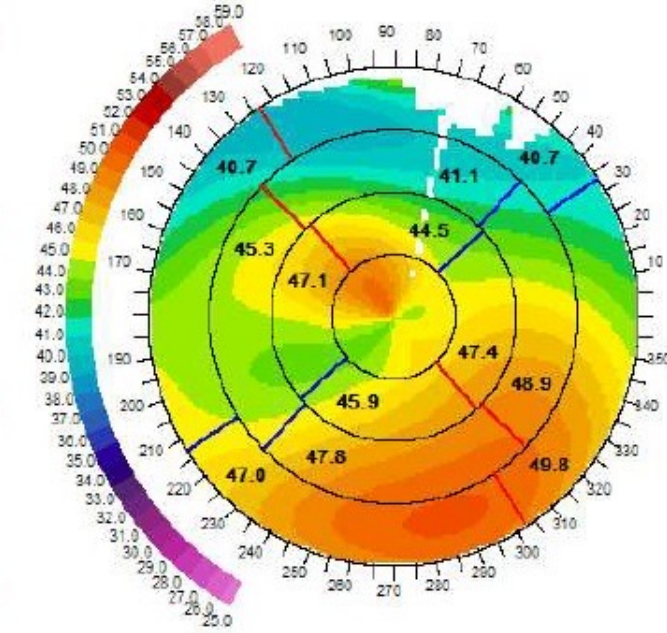
- Irregular scars can be smoothed
- Standard refractive treatments can be further optimised
- Keratoconus improved



Topographically Guided Examples

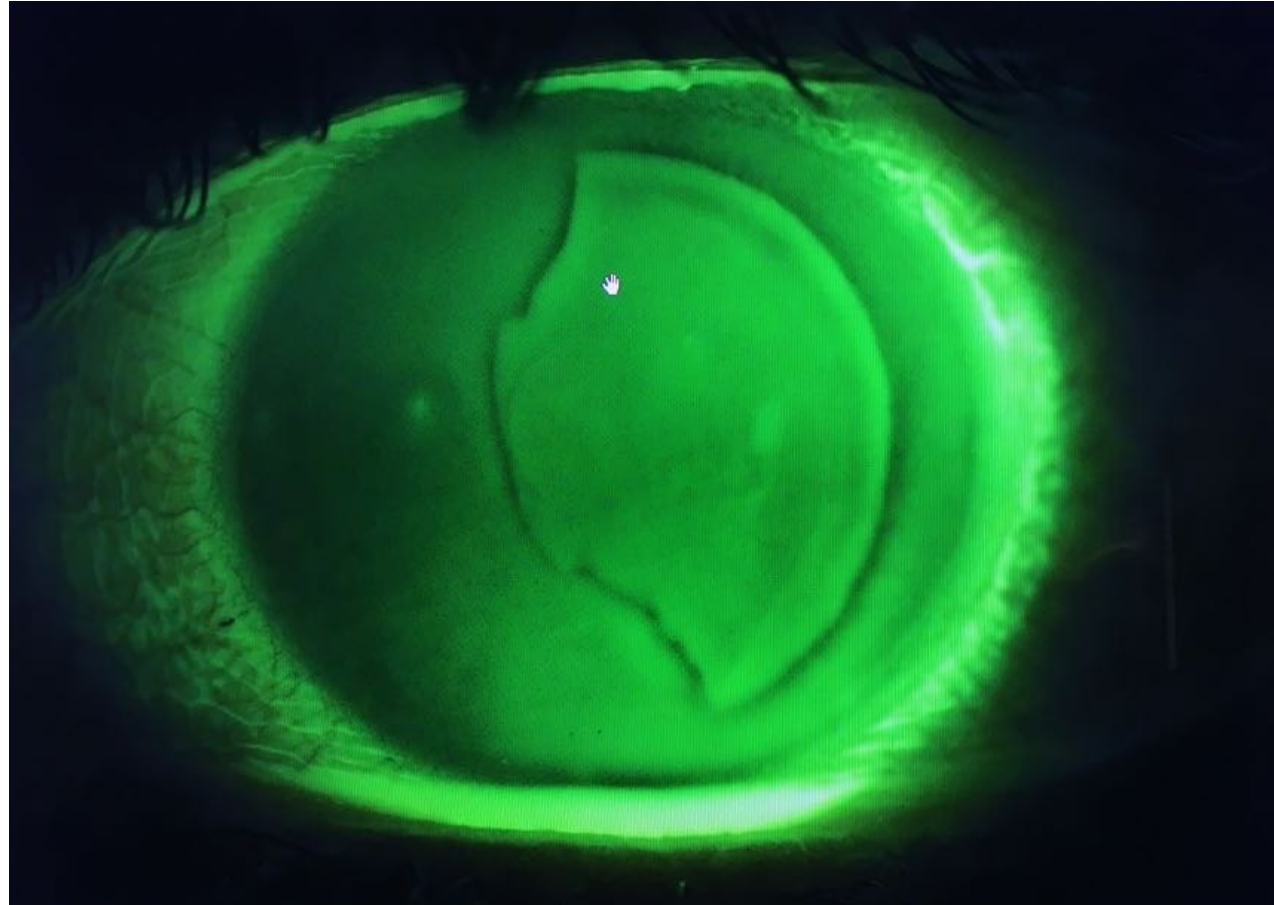


UDVA 6/150
BCVA 6/9.5 (-8.0 -5.5 x 60)



UDVA 6/9.5
BCVA 6/7.5 (+1.00 -2.5 x 60)

Topographically Guided Examples



Topographically Guided Regularisation

Best candidates

- Mild longterm stable irregular astigmatism
- Central elevations/bowtie
- Older patient (30+) or crosslinked
- Thick cornea

Not Candidates

- Thin corneas
- Significant scarring
- Very steep corneas ($>58D$)
- Ocular viral infection within past 6 months
- Pregnant or breastfeeding
- Unstable

Improving Comfort of PRK

- PRK has an uncomfortable recovery period
- Great method for some eyes
- Evidence that Systane Hydration improved post-cataract comfort
- Randomised Double Blinded Trial
 - Dr Jeremiah Lim
 - Flinders Optometry School
 - Patient Reported Outcomes and Corneal Staining
 - Systane Hydration vs Refresh Plus

Improving Comfort of PRK

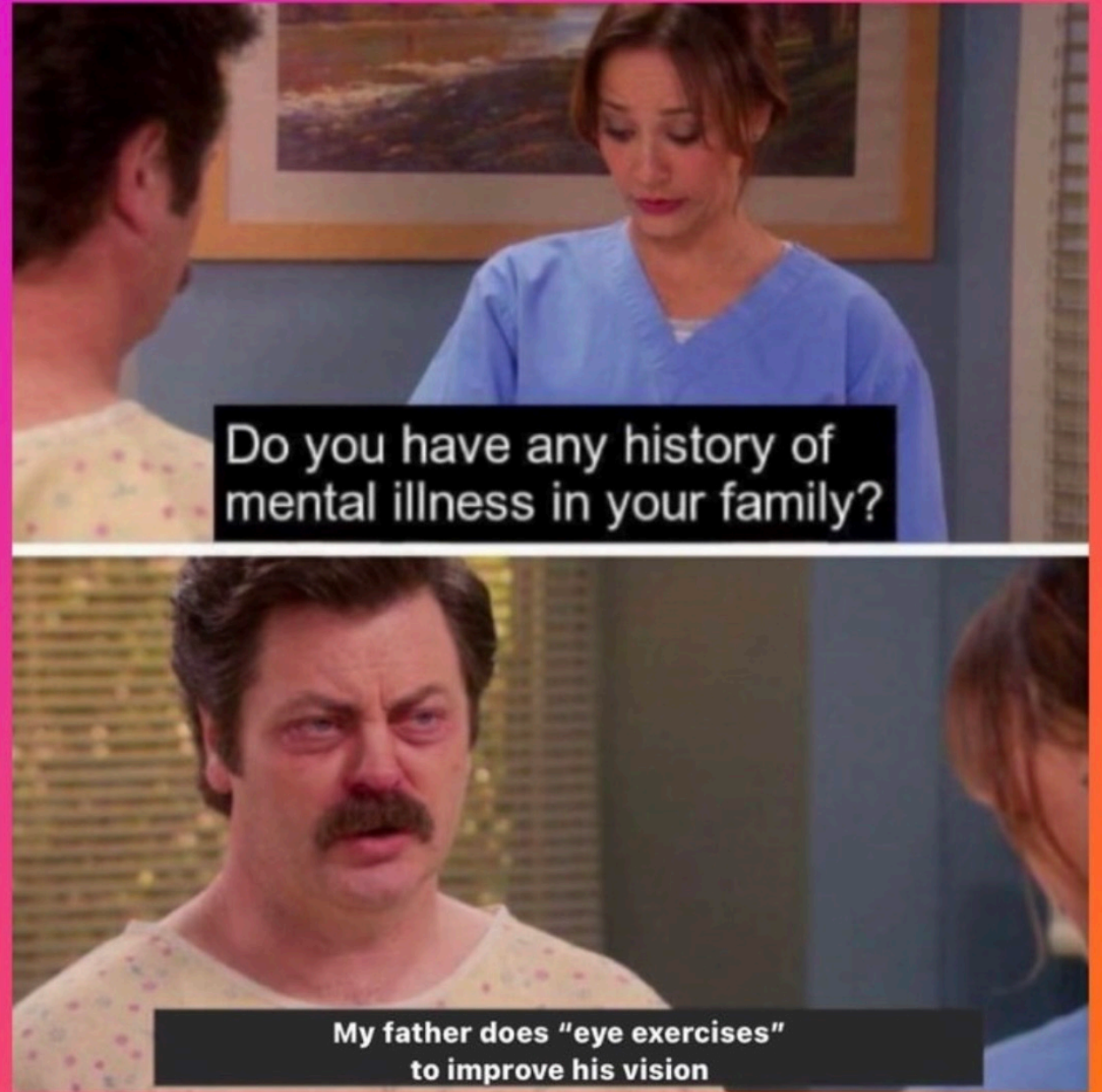
- Randomised Double Blinded Trial
 - Systane Hydration UD
 - Less corneal staining at day 4
 - Trend towards smaller defect size at day 4
 - Trend towards being more comfortable at day 4



Meme break



@drbenlahood



Optometrist Role in Laser Surgery

- Pre-op Assessment
- Pre-op Discussion
- Post-op Management

Optometrist Role in Pre-op Assessment

- Deciding if stable
 - Prescription stability for two years optimal
 - Change within 0.5D usual limit
 - Not a safety concern but satisfaction

Optometrist Role in Pre-op Assessment

- Optimising ocular surface
 - Minimise contact lens wear
 - Treat any blepharitis/MGD aggressively
 - Out of soft contact lenses 48 hours
 - RGP much longer
 - Month would be great
 - Some need even longer

Optometrist Role in Pre-op Discussion

- Talking about risk
 - Few key points
 - Nothing catastrophic on the day
 - Ectasia risk extremely low for normal eyes
 - Enhancement risk about 2%

Optometrist Role in Pre-op Discussion

- Talking about expectations
 - Vision quality in contact lenses is hard to beat
 - Night time vision/halos
 - More common with high prescriptions
 - Dryness is usual in first month

Optometrist Role in Pre-op Discussion

- Considering Technique Options
 - Dry eye
 - PRK reasonable
 - SMILE advantage over LASIK
 - Astigmatism
 - LASIK
 - Squeamish
 - PRK

Optometrist Role in Post-Op Management

- Patients seen to a month post-op routine
- Annual check recommended
- Dry eye symptoms
 - Hot lid massages are safe after a month
 - Lubricants safe
- Residual refractive error
 - Enhancement is free
 - Happiness with vision most important factor

When Things Don't Go To Plan

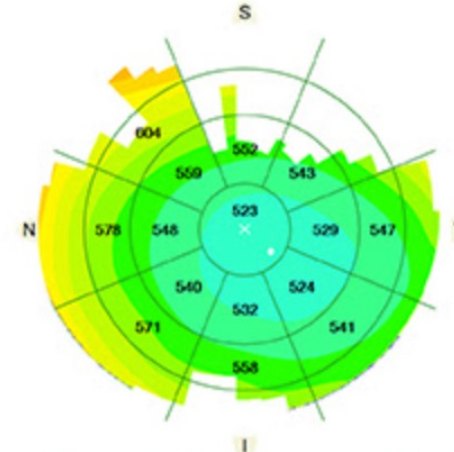


When Things Don't Go To Plan

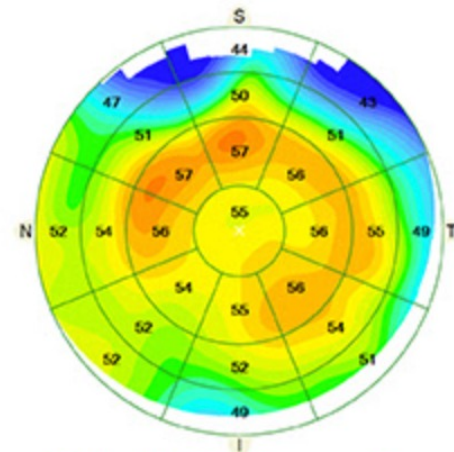
- PRK
 - Haze
 - Visible for up to a year
 - Not usually visibly significant
 - May consider topical steroid boost

When Things Don't Go To Plan

- PRK
 - Regression
 - Most common for hyperopic treatments
 - Commonly epithelial hypertrophy



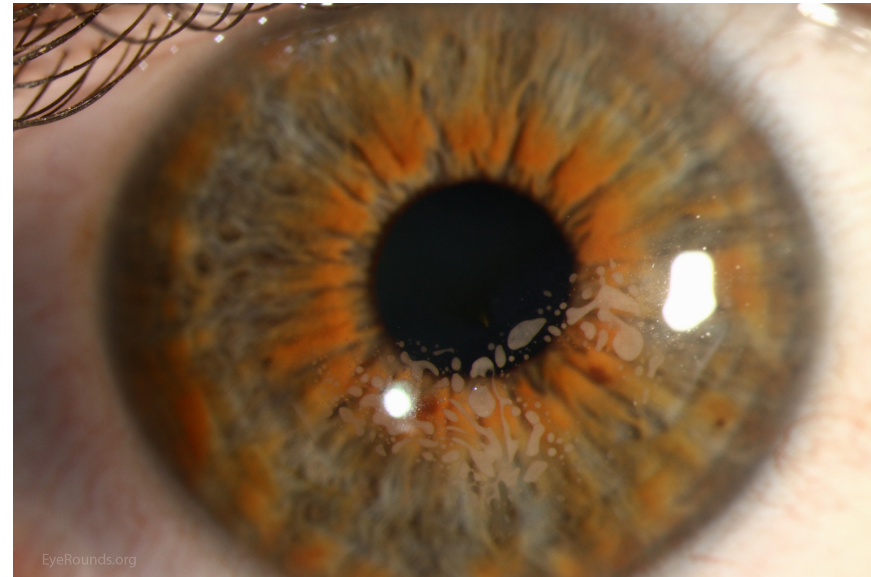
Corneal Pachymetry Map



Epithelial Thickness Map

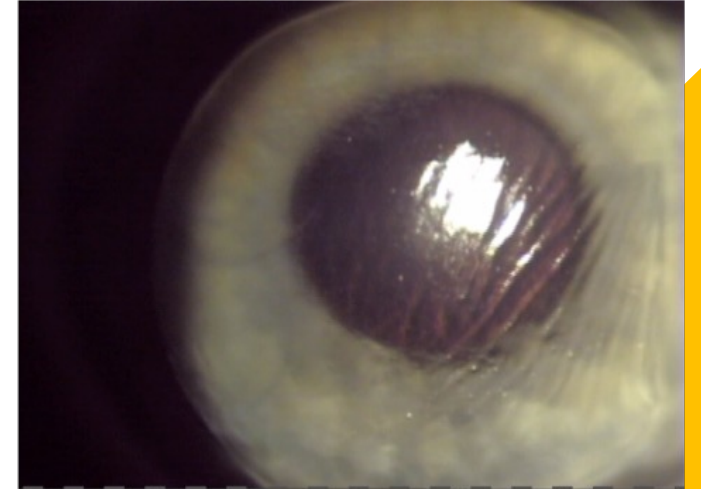
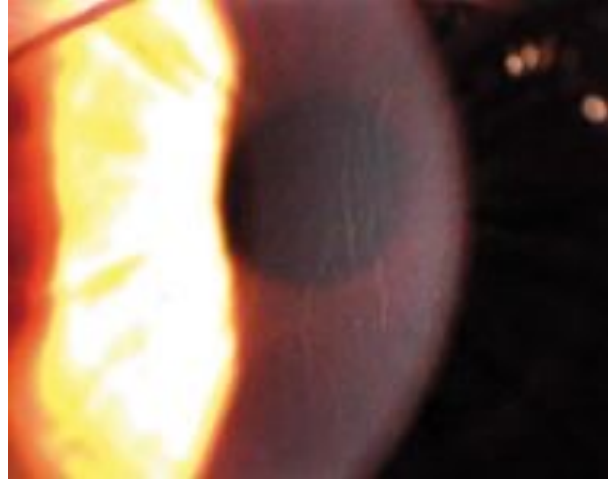
When Things Don't Go To Plan

- LASIK
 - Opacity beneath flap
 - Most likely epithelial ingrowth
 - Best to treat as though infection and refer urgently



When Things Don't Go To Plan

- LASIK
 - Microstriae
 - If vision good, can leave alone
 - If early and significant, refer for flap relift



When Things Don't Go To Plan

- SMILE
 - Glare or halos
 - Could be decentred treatment
 - This will require tomography
 - Potentially PRK regularisation
 - Could be remodelling after lenticule removed
 - This just needs time

When Things Don't Go To Plan

- ECTASIA
 - Any drop in BCVA after any laser
 - Scissor reflex
 - Referral
 - Crosslinking

When Things Don't Go To Plan

- Residual Refractive Error
 - PRK
 - Repeat PRK but traditional rather than trans-epi
 - LASIK
 - Flap lift if within 1-2 years
 - Otherwise PRK
 - SMILE
 - PRK
 - Thin flap LASIK
 - Overall
 - Give at least three months to give stable refraction

One Last Meme



@drbenlahood

How I feel as a refractive surgeon at a retinal meeting





Discussion Time

Thank You Questions?



ben@drbenlahood.com



[@drbenlahood](https://www.instagram.com/drbenlahood)



www.drbenlahood.com