


On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE letter for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.



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Financial Disclosure – Justin Schweitzer, OD, FAAO

• Aerle – C/L	• Sun – C/L
• Alcon – C/L	• Equinox - I
• Allergan – C/L	• Radars – C
• Bausch + Lomb – C/L	• J&J – C/L
• Ocular Therapeutix - C	• Glaukos – C/L
• EyePoint – C	• Horizon – C
• Sight Sciences – C/L	• Quidel – C
• Dompig – C	• MedPrint – C
• Zeiss – C/L	• LEC – C/L
• Vitus – C	• Avellino – C
• Science Based Health – C	• Novartis – C
• Kala – C	• Iveric bio – C
• RVL – C	• Occuphire – C

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Current Trends in Keratoconus Management

Justin Schweitzer, OD, FAAO
 Vance Thompson Vision, Sioux Falls, South Dakota
 Optometric Externship Director
 Associate Residency Director

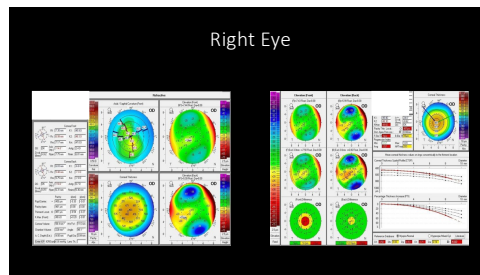
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Case

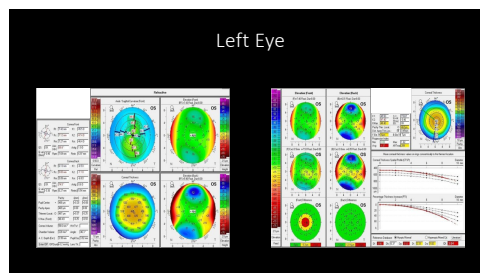
"I have noticed a steady decline in my vision and glasses don't seem to fix it. I am also noticing some fluctuation in my vision"

- 29-year-old female w/reduced vision
- Refraction: OD: -0.75 -2.25 x 34 20/15
OS: -1.75 -0.75 x 15 20/15
- Ocular Allergies w/ eye-rubbing
- SLEx: Remarkable for conjunctival injection, otherwise unremarkable.

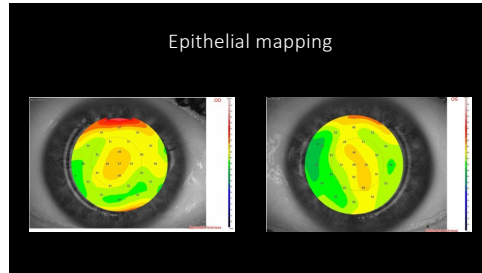
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Keratoconus

- Keratoconus is a bilateral, asymmetric, progressive corneal ectasia resulting in irregular astigmatism and loss of visual function, with onset in teenage years¹
- Affects 1 in 2000 people (US)
 - More recent 1:375 (Netherlands)
- Alternative Treatment options include:
 - Rigid or Specialty Contact Lens
 - Intra-corneal ring segments
 - Corneal Transplant
- Eye Bank Association of America noted >6,900 transplants/year in patients with keratoconus (16% total penetrating keratoplasty in U.S.)²

¹Quinn & Gorman J. Keratoconus: Age of onset and natural history. Optom Vis Sci 2002;79:147-153.
²Eye Bank Association of America Statistical Report, 2010

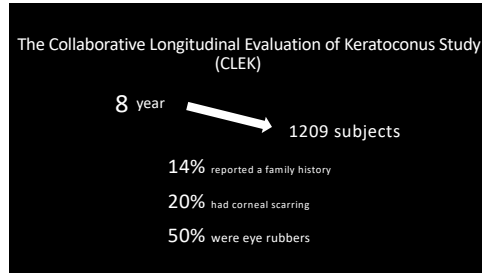
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23 years

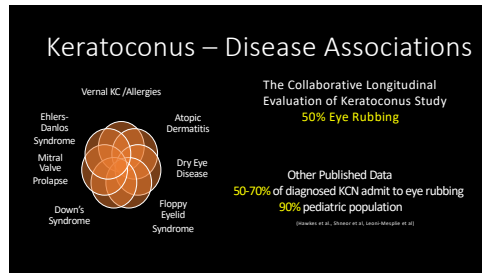
83%

Archives of Ophthalmology
2011 Jun; 129(6): 691-697
Epub 2011 Feb

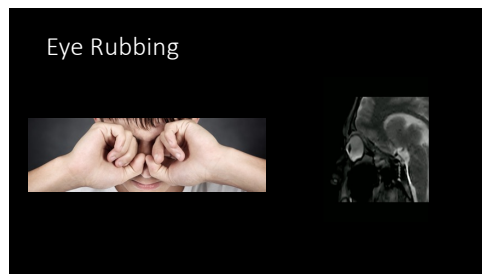
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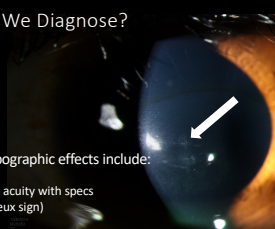
How Do We Diagnose?

SLE findings include:

- Central corneal thinning,
- Fleischer's ring,
- Corneal scarring
- Vertical striae (Vogt's lines).

• Common refractive or topographic effects include:

- Irregular astigmatism and
- poor best-corrected visual acuity with specs
- "Oil droplet" reflex (Charleux sign)

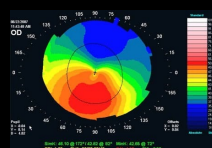


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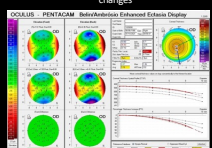
How Do We Diagnose?

Topography/Tomography

Topography
Keratoconus cornea




Tomography
Keratoconus cornea
Irregular/thin pachymetry, posterior float changes



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Genetic Testing for at Risk Patients

- Non-invasive cheek swab test
- Examines over 1,000 variants across 75 genes for keratoconus
- 0 to 100 green-yellow-red scale based on research done by Avellino and study populations



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Early Diagnosis is Important

- Prospective study 104 patients
- Progressive KCN Age 14-50
- 53% were eye rubbers
- Mean time to CXL 85 days +/- 69 days

TABLE 2 Morphological Changes Between Groups*					
Measurement	Patients < 20 Years (n = 23)	Patients 20-50 Years (n = 45)	Patients > 50 Years (n = 44)	P	
Age (yr)	16.04 ± 3.23	23.22 ± 7.59	52.90 ± 5.58	<.001	
Meaning (mm)	46.85 ± 20.66	76.52 ± 30.77	102.91 ± 34.98	.05	
Choroid (μ)	1.38 ± 1.27	0.66 ± 0.68	0.41 ± 1.24	.003	
↓ Choroid (μ)	0.55 ± 1.51	0.05 ± 0.84	-0.23 ± 1.86	.30	
↓ Choroid (μ)	0.26 ± 0.65	0.22 ± 0.78	0.08 ± 0.84	.21	
↓ PCV (μm)	-0.02 ± 1.02	2.28 ± 20.32	-0.85 ± 21.12	.63	

*P-values are unadjusted. †Statistical significance between groups was assessed by using a 2-tailed t-test. ‡P-values are Bonferroni corrected.

Footnote: Y. Yamaguchi, E. Arita, T. Ueda, N. Iwano, K. Yamaguchi, & M. Kikuchi. (2015). Progression of Keratoconus in Patients With Axial Central Cornea-Locking in Progressive Corneal Ectasia. *Journal of Refractive Surgery*, 31(7), 177-180.

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KCN: Old Mantra

Diagnose → Monitor → Spec. CL → PKP/DALK

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KCN: New Mantra

Diagnose **Early** → Stop Progression → Rehabilitate VA

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Global Consensus on Keratoconus

Global Delphi Panel:
 "Anyone with progressive ectasia should undergo CXL, no matter what age or level of vision"

Global Consensus on Keratoconus and Ectatic Diseases
 Peter J. Coleman, MD, PhD, FRCOphth, FRCS (Ed) (University of Glasgow, 2014);
 Richard W. Knight, MD, FRCOphth, FRCS (Ed) (University of Glasgow, 2014);
 Priscilla K. Khoo, MD, FRCS (Ed) (University of Glasgow, 2014);
 Alan Graham, MD, FRCS (Ed) (University of Glasgow, 2014)

Cornea • Volume 34, Number 4, April 2015

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Cross-linking Procedure Summary

1. Remove epithelium

2. Soak cornea (riboflavin 5% phosphate in 20% dextrose ophthalmic solution) for 30 minutes

4. Once flare is observed, measure corneal thickness. If corneal thickness is less than 400 μ m, instill 3 drops of riboflavin 5% phosphate in ophthalmic solution until the corneal thickness increases to at least 400 μ m.

5. Irradiate for 30 minutes. Continue applying riboflavin 5% phosphate in 20% dextrose ophthalmic solution during irradiation.

3. Check for flare

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The Procedure

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Post-operative course:
What's normal?

Day 1-5:

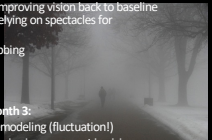
- Discomfort as epithelium heals
 - (BCL in place)
- Sensitivity to light
- Tearing
- A reduction and fluctuation in vision

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Post-operative course:
What's normal?

Day 5-30:

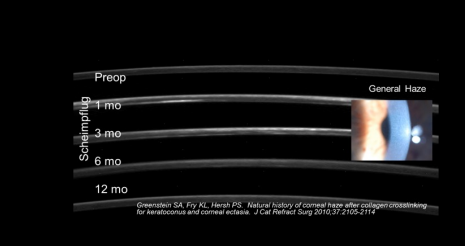
- Comfortable, sensitivity decreasing
- Hazy but improving vision back to baseline
- Typically relying on spectacles for correction
- No eye rubbing



Day 30 to month 3:

- Corneal remodeling (fluctuation!)
- +/- Progressive improvement in vision
- Ability to wear previous CL correction
- @ 3 months, consider refit for contact lens

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Preop

Scheimpflug

1 mo

3 mo

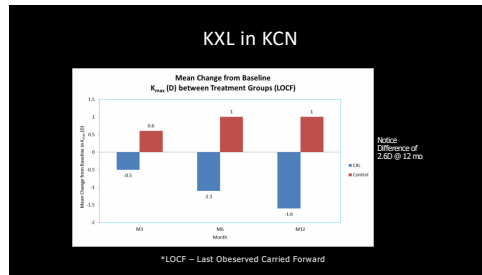
6 mo

12 mo

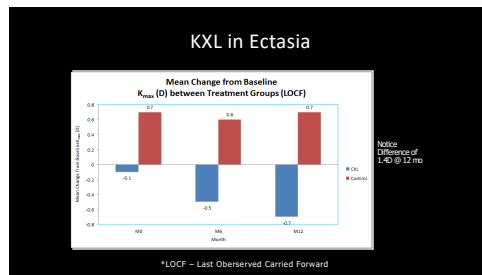
General Haze

Greenstein SA, Fry KL, Jamba PC. Medical history of cornea after corneal crosslinking for keratoconus and corneal ectasia. J Clin Refract Surg 2010;17:2105-2114

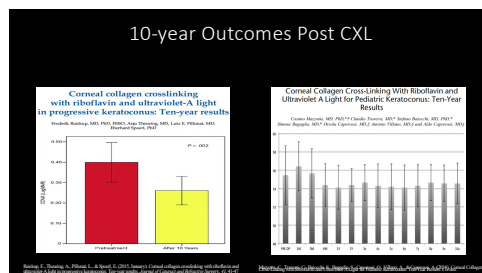
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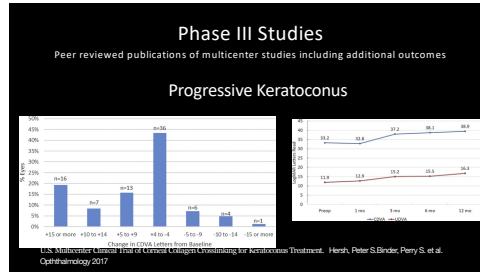
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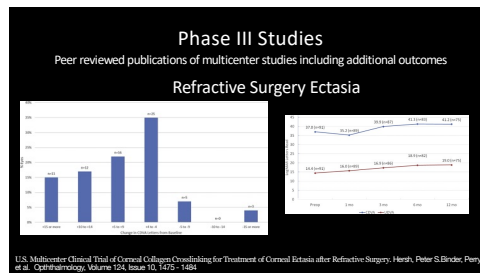
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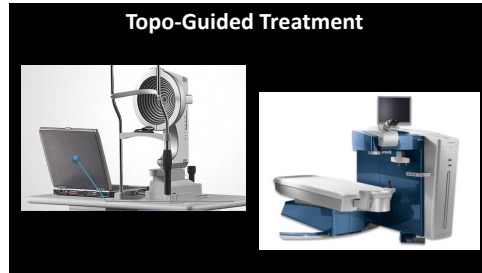
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Intacs vs CTAK + CXL

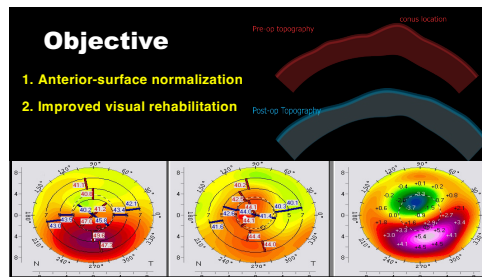
<p>Advantages</p> <ul style="list-style-type: none"> - Less Invasive - Reversible - Recovery time 	<p>Disadvantages</p> <ul style="list-style-type: none"> - Variable Response - Can Erode
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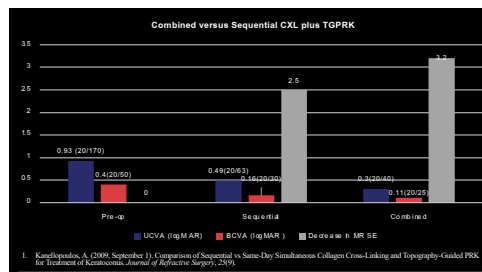
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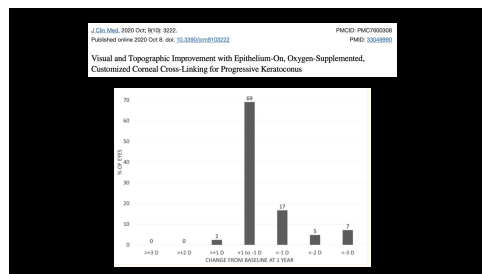
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Epi On vs Off Experience

Question	Response	Percentage
1. How often do you experience eye irritation when wearing your contact lenses?	Never	100%
2. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
3. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
4. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
5. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
6. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
7. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
8. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
9. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
10. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
11. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
12. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
13. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
14. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
15. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
16. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
17. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
18. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
19. How often do you experience eye irritation when wearing your contact lenses?	Always	100%
20. How often do you experience eye irritation when wearing your contact lenses?	Always	100%

<https://twoplhalnologist.com/uses/enterprising-ophthalmology/epi-on-or-epi-off/>

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