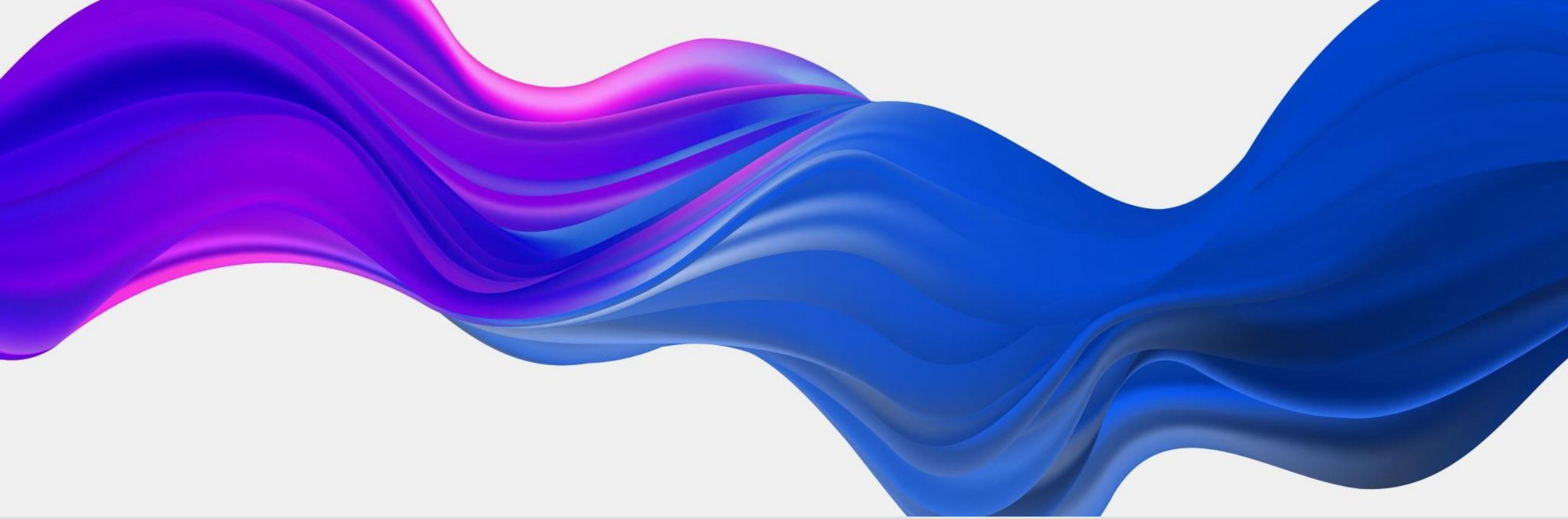
SightLine's 23rd Annual CE Program

Pittsburgh Marriott North

Sunday February 25, 2024



Co-Management of the Refractive Surgery Patient

Charlene Maloney, OD

Refractive Surgery

Corneal:

PRK – FDA Approved 1995

LASIK – FDA Approved 1998

Intraocular

ICL – FDA Approved 2005 (Toric in 2018), EVO 2022

RLE

IMPORTANCE OF TALKING ABOUT LVC

LASIK Eye Surgery Market 2024 Showing Upcoming Growth in Decades by 2032

Research Reports World [RRW]

Research Reports World [RRW]

Published Feb 9, 2024

Our Latest Report on the global "**LASIK Eye Surgery Market**" 2024 shows a steady and strong upward trend in recent years, and this trend is anticipated to remain favorable through 2032. Our report provides a comprehensive examination of the industry, covering aspects such as market size, prominent players, regional assessment, and the trends in growth. It covers different types **(Wavefront Optimized, Wavefront-Guided, Topography Guided, All Laser)**, applications **(Hospitals, Eye Care Clinics, LASIK Centers, Others)**, Region **(North America, Europe, Asia-Pacific, South America, The Middle East and Africa)**, and Market Leaders **(Bausch Health, Carl Zeiss, Johnson & Johnson (Abbott Medical Optics), Novartis (Alcon Laboratories), AMO Manufacturing, Nidek, LaserSight Technologies)**. Anticipated annual growth in the LASIK Eye Surgery market from 2024 to 2032 is projected to be remarkable, with a magnificent Compound Annual Growth Rate (CAGR).

YOU DECIDE YOUR ROLE

Refer and let the surgeon and staff make the decision

Discuss options with the patient and make broad recommendations

Take the time to discuss the options and make specific recommendations

Call us any time

WE WANT TO GIVE YOU THE TOOLS

OPTOMETRY'S ROLE

- OFFER LVC AS A PRIMARY TREATMENT OPTION ALONG W/ CL'S AND GLASSES WHEN APPROPRIATE (EVEN IF YOU DON'T WISH TO CO-MANAGE)
- PATIENT RETENTION - *LOSING A PATIENT IS MORE LIKELY TO HAPPEN TO THE DOCTOR WHO CHOSE NOT TO BE A PART OF THE PROCESS*
- PATIENT PERCEPTION – PATIENTS GAIN CONFIDENCE IN THEIR PRIMARY EYE CARE PROVIDER BY COMANAGING THEIR SURGICAL PROCEDURE WHEN ABLE TO DO SO
- ASSIST IN PATIENT SELECTION (AGE, REFRACTIVE ERROR, OCULAR HEALTH)

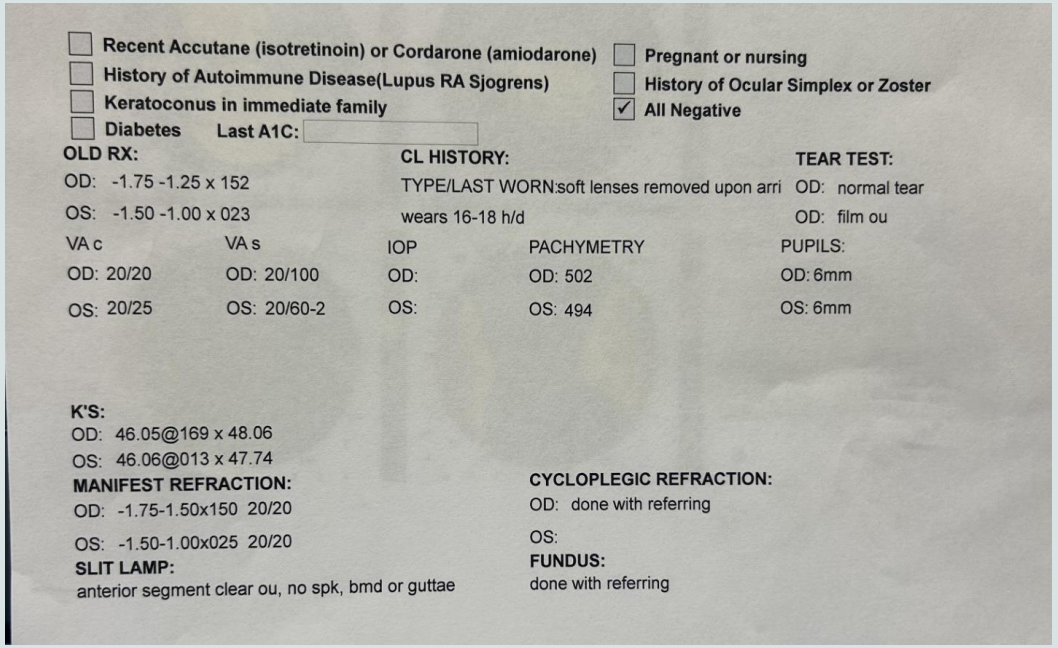
Corneal Refractive Surgery – What We Will Discuss

- HOW DO WE DETERMINE CANDIDACY? LASIK V PRK
- HOW DO WE PREPARE PATIENTS FOR THEIR REFRACTIVE PROCEDURE?
- WHAT IS THE APPROPRIATE FOLLOW-UP CARE AND EXPECTATIONS?
- WHAT ARE INTRA-OCULAR ALTERNATIVES WHEN THE PATIENT IS NOT THE BEST CORNEAL REFRACTIVE PATIENT?

ALLEGRETTO WAVE

- **Approved for the elimination or reduction of hyperopia (farsightedness) of up to + 6.00 D of sphere and up to 5.00 D of astigmatism at the spectacle plane and –12.00 with up to 6 D of astigmatism who are 18 years of age or older, and who have documented evidence that their refraction did not change by more than 0.5 Diopter during the year before the preoperative examination.**
- **DOES NOT ALWAYS MEAN WE SHOULD…*

Refractive Evaluations



☐ Recent Accutane (isotretinoin) or Cordarone (amiodarone)
☐ History of Autoimmune Disease(Lupus RA Sjogrens)
☐ Keratoconus in immediate family
☐ Diabetes Last A1C:
☐ Pregnant or nursing
☐ History of Ocular Simplex or Zoster
☑ All Negative

OLD RX:
OD: -1.75 -1.25 x 152
OS: -1.50 -1.00 x 023

CL HISTORY:
TYPE/LAST WORN:soft lenses removed upon arri
wears 16-18 h/d

TEAR TEST:
OD: normal tear
OD: film ou

VA c	VA s	IOP	PACHYMETRY	PUPILS:
OD: 20/20	OD: 20/100	OD:	OD: 502	OD: 6mm
OS: 20/25	OS: 20/60-2	OS:	OS: 494	OS: 6mm

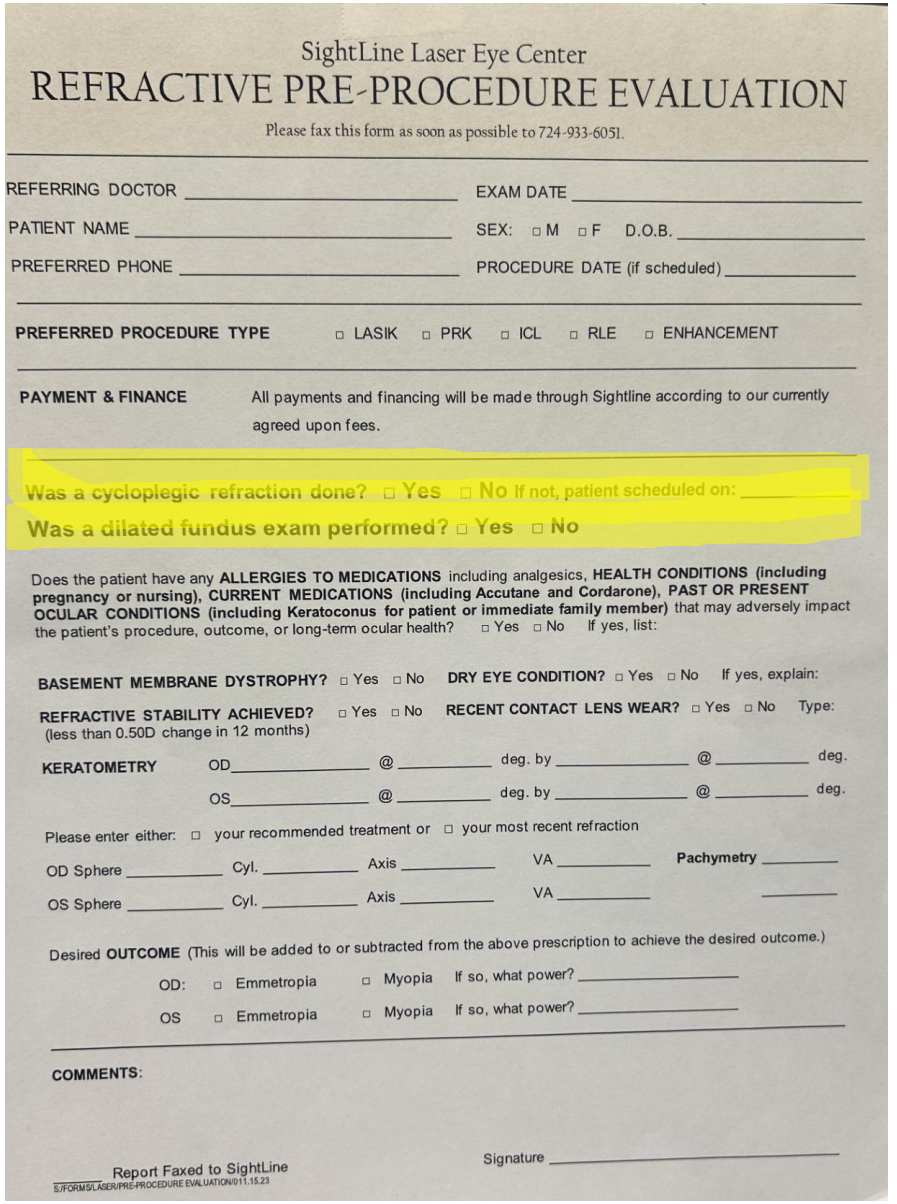
K'S:
OD: 46.05@169 x 48.06
OS: 46.06@013 x 47.74

MANIFEST REFRACTION:
OD: -1.75-1.50x150 20/20
OS: -1.50-1.00x025 20/20

SLIT LAMP:
anterior segment clear ou, no spk, bmd or guttae

CYCLOPLEGIC REFRACTION:
OD: done with referring
OS:

FUNDUS:
done with referring



SightLine Laser Eye Center

REFRACTIVE PRE-PROCEDURE EVALUATION

Please fax this form as soon as possible to 724-933-6051.

REFERRING DOCTOR _____ EXAM DATE _____

PATIENT NAME _____ SEX: ☐ M ☐ F D.O.B. _____

PREFERRED PHONE _____ PROCEDURE DATE (if scheduled) _____

PREFERRED PROCEDURE TYPE ☐ LASIK ☐ PRK ☐ ICL ☐ RLE ☐ ENHANCEMENT

PAYMENT & FINANCE All payments and financing will be made through Sightline according to our currently agreed upon fees.

Was a cycloplegic refraction done? ☐ Yes ☐ No If not, patient scheduled on: _____

Was a dilated fundus exam performed? ☐ Yes ☐ No

Does the patient have any **ALLERGIES TO MEDICATIONS** including analgesics, **HEALTH CONDITIONS (including pregnancy or nursing), CURRENT MEDICATIONS (including Accutane and Cordarone), PAST OR PRESENT OCULAR CONDITIONS (including Keratoconus for patient or immediate family member)** that may adversely impact the patient's procedure, outcome, or long-term ocular health? ☐ Yes ☐ No If yes, list:

BASEMENT MEMBRANE DYSTROPHY? ☐ Yes ☐ No **DRY EYE CONDITION?** ☐ Yes ☐ No If yes, explain:

REFRACTIVE STABILITY ACHIEVED? (less than 0.50D change in 12 months) ☐ Yes ☐ No **RECENT CONTACT LENS WEAR?** ☐ Yes ☐ No Type:

KERATOMETRY OD _____ @ _____ deg. by _____ @ _____ deg.
OS _____ @ _____ deg. by _____ @ _____ deg.

Please enter either: ☐ your recommended treatment or ☐ your most recent refraction

OD Sphere _____ Cyl. _____ Axis _____ VA _____ **Pachymetry** _____
OS Sphere _____ Cyl. _____ Axis _____ VA _____ _____

Desired **OUTCOME** (This will be added to or subtracted from the above prescription to achieve the desired outcome.)
OD: ☐ Emmetropia ☐ Myopia If so, what power? _____
OS ☐ Emmetropia ☐ Myopia If so, what power? _____

COMMENTS:

_____ Report Faxed to SightLine
S:/FORMS/LASER/PRE-PROCEDURE EVALUATION/011.15.23

Signature _____

Refractive Evaluation - History

ACCUTANE

-SLOW WOUND HEALING

-INCREASED DES

-INCREASED PHOTOSENSITIVITY

D/C FOR 6 MONTHS PRE/POST

Refractive Evaluation – HX

PREGNANT/NURSING

- RESTARTED MENSTRUAL CYCLE
- D/C BREASTFEEDING (PREFERRABLE 3 MO)
- STABLE REFRACTION

HISTORY OF OCULAR HSV OR HZV?

HISTORY OF AUTOIMMUNE DISEASE? COMMUNICATION/CLEARANCE W/ RHEUMATOLOGIST

H/O KC IN IMMEDIATE FAMILY? IF SO, CONSIDER GENETIC TESTING FOR RISK ASSESSMENT

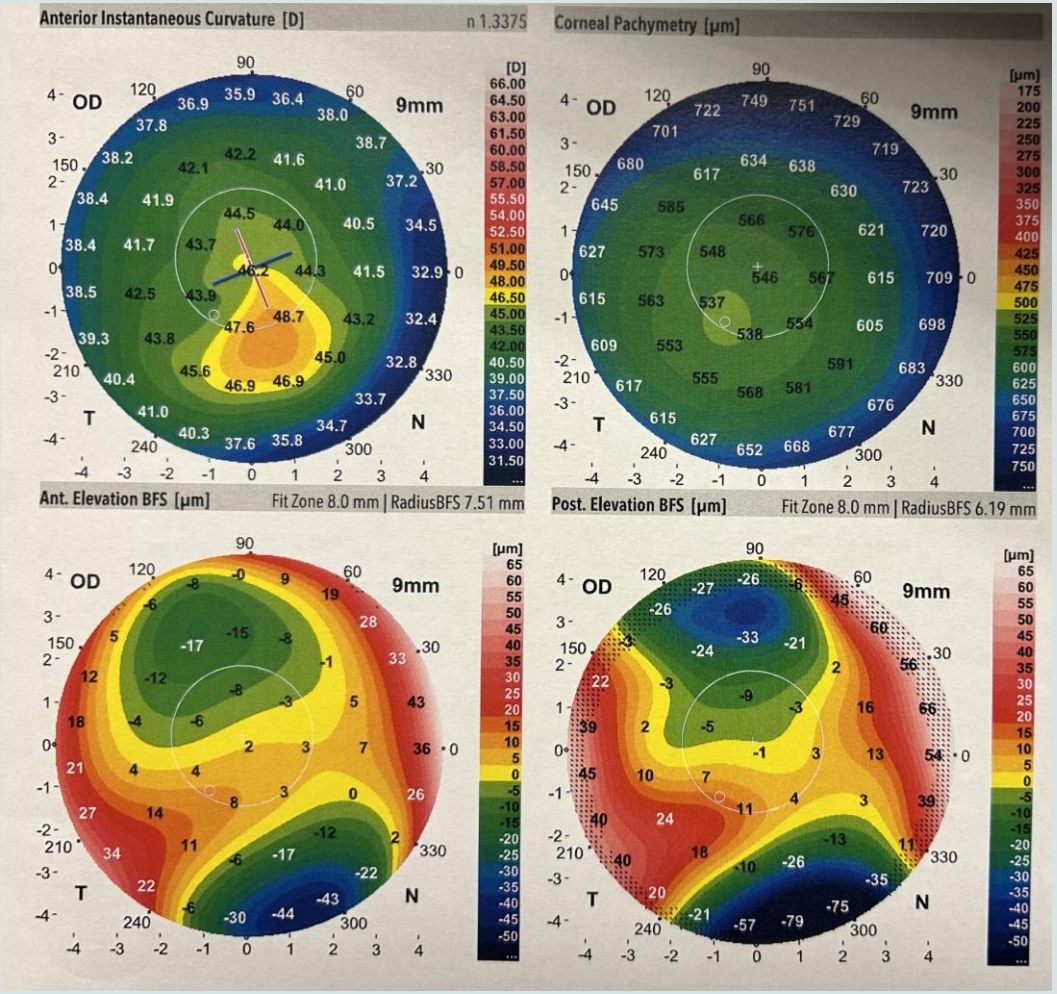
DIABETES? CONTROLLED? STABLE REFRACTION? ANY CONCERN FOR WOUND HEALING?

PRE-OPERATIVE EVALUATION

- Corneal Thickness - accurate measurement and what is “normal”
- Determine residual corneal stromal bed thickness (assuming a 110um flap)
- Ultimately want to leave the stromal bed closer to 300 and the PTA (percent tissue altered) to 40% or less.
- *IBRA

SUSPICIOUS TOPOGRAPHY

- **ASYMMETRY WITH INFERIOR STEEPENING OR EVEN A SKEWED RADIAL AXIS**

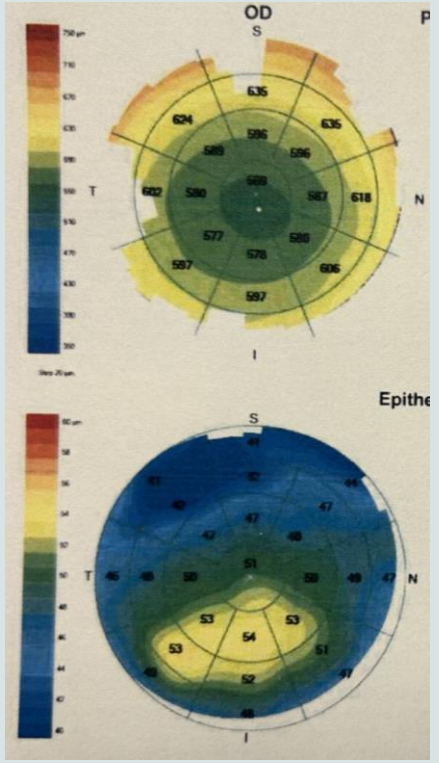


EPITHELIAL MAPPING

AUXILLARY METHOD FOR EARLY DIAGNOSIS OR EXCLUSION OF KC

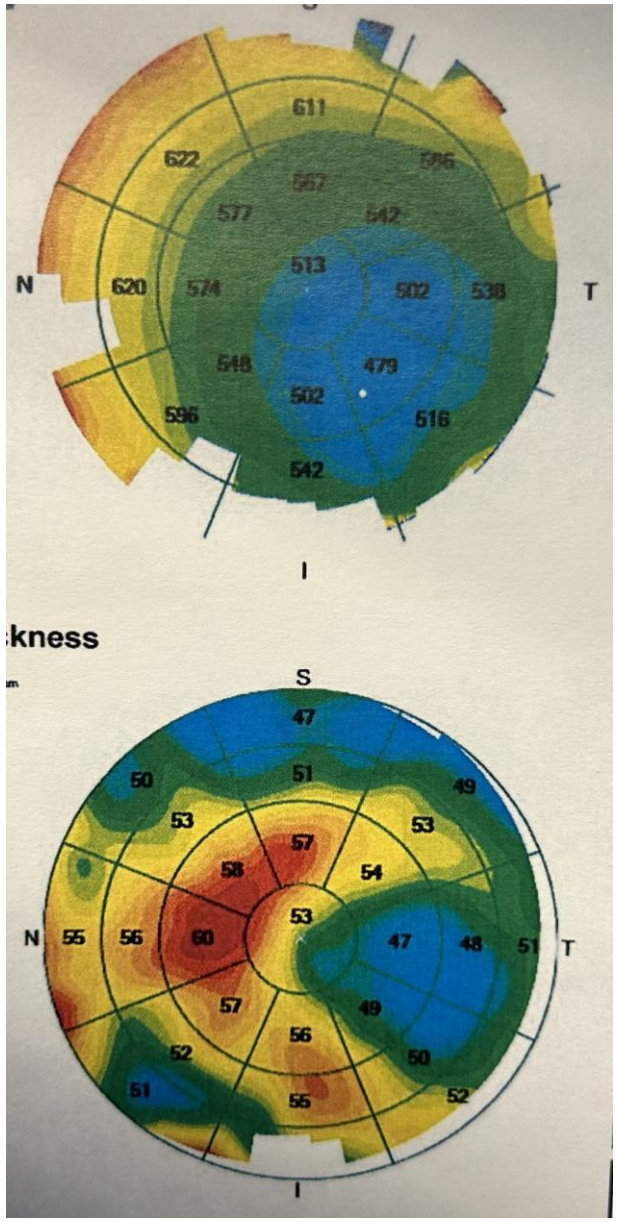
- THE CORNEAL EPITHELIUM IS KNOWN TO REMODEL – THIS CAN MASK UNDERLYING STROMAL IRREGULARITIES
- *EPI IS THICKER INFERIORLY (AND NASALLY) IN NORMAL EYES*

NORMAL EYE



EPITHELIAL MAPPING

- "DONUT-SHAPED" W/ THINNING AT THE APEX OF THE CONE SURROUNDED BY A RIM OF THICKENED EPITHELIUM IN A KERATOCONIC/SUSPECT EYE



EPITHELIAL MAPPING IN LVC EVALUATION

- EPI THINNING IN AREA WITH SURROUNDING THICKENING OF EPITHELIUM WITH A SUSPICIOUS TOPO - DEFER SURGERY
- EPI THICKENING IN AN AREA OF TOPOGRAPHIC STEEPENING, KC LIKELY NOT A CONCERN. STILL CONSIDER ALL RISK FACTORS, INCLUDING AGE, RX, RANDLEMAN

Ectasia Risk Score System or "Randleman Criteria"

- **Risk factors identified:**
  - Topographic pattern
    - Higher risk when more abnormal
  - Residual stromal bed (RSB) thickness
    - Higher risk with lower RSB thickness
  - Patient age
    - Higher risk with younger age
  - Central corneal thickness
    - Higher risk with thinner corneas
  - Manifest refractive spherical equivalent (MRSE) treated
    - Higher risk with larger treatments

RANDLEMAN CRITERIA FOR LASIK

Table 1. Randleman Risk Scoring Protocol

	Points				
Parameter	*4*	*3*	*2*	*1*	*0*
Topography	Abnormal	Inferior Steepening/ Skewed radial axis		Asymmetric Bowtie	Normal
RSB	<240µm	240µm to 259µm	260µm to 279µm	280µm to 299µm	≥300µm
Age		18 to 21	22 to 25	26 to 29	≥30
CT	<450µm	451µm to 480µm	481µm to 510µm		≥510µm
MRSE	>-14D	>-12D to -14D	>-10D to -12D	>-8D to -10D	-8D or less

Table 2. Scoring Recommendation on Whether or Not to Proceed with LASIK

0 to 2 (Low risk)	Proceed with LASIK or surface ablation.
3 (Moderate risk)	Proceed with caution, consider special informed consent; safety of surface ablation has not been established. Consider refractive stability, degree of astigmatism, between-eye topographic asymmetry, and family history.
4 (High risk)	Do not perform LASIK; safety of surface ablation has not been established.

ASSESS CORNEAL HEALTH

- Implications of pre-existing corneal disease

  Evaluate for EBMD, DES, FUCH'S

  - BMD patients will do better with PRK (as long as not central/affecting VA/RX)
  - Treat dry eyes before the patient has surgery
  - Corneal guttata may lead to decreased flap adherence, poor healing and sub-optimal visual results with LASIK. Consider an ECC (endothelial cell count) if suspicious (or do PRK or if significant, nothing)

INFORMED CONSENT IF MOVING FORWARD

- Dry eyes post-operatively
- Over/Under-corrections
  - ENH rate 1-5%, considered after 3 months and stable refraction
- Presbyopia and Monovision
- Glare – less common today, still discuss
- Decreased VA, Flap-Related Issues

PATIENT EXPECTATIONS

- LASIK

  Speedy visual recovery

  VA 20/30 or better at day 1

  Initial discomfort (burning, tearing) 2 hours following, but then relatively no discomfort

- PRK

  Slower visual recovery ("Marathon vs Sprint")

  Most patients are 20/40 or better by 1 week

  Discomfort minimized with present day use of Neurontin post-operatively, NSAID 1st 48hrs

LVC POST-OP CARE

LASIK

PRED AND OFLOXACIN QID X 4 DAYS

ART TEARS ENCOURAGED

EARLY – WATCHING FOR FLAP ISSUES, EPI INGROWTH, STRIAE

ONGOING WATCHING FOR STABILITY, DRY EYES, ETC

F/U 1 D, 1 W, 1 MO, 3 MO, 6 MO, 1 YR, YEARLY

LVC POST-OP CARE

PRK

BCL IN PLACE UNTIL EPI HEALED (TYPICALLY DAY 3-5)

FML QID W/ TAPER (~ 4 WKS UNLESS MODIFIED D/T RX)

NEURONTIN

MOXIFLOXACIN – AT LEAST UNTIL EPI HEALED AND BCL IS LEFT OUT

*SUN PROTECTION TO LIMIT HAZE FORMATION**

VIT C – 1000 mg

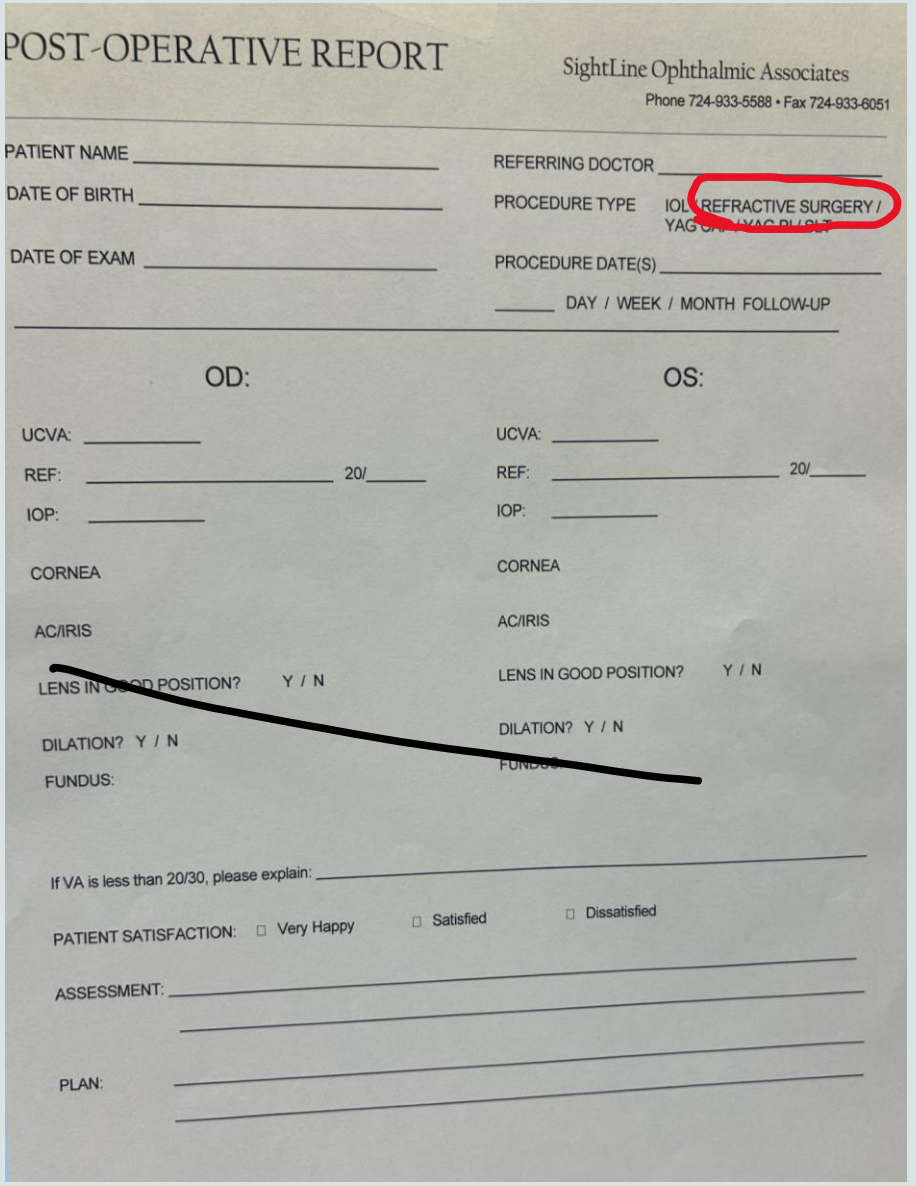
PATIENT RE-ASSURANCE

F/U 1 D, 3-5 D, THEN MAY DEPEND ON VISION IF MORE FREQUENT, OTHERWISE 3-4 WK, 3 MO, 6MO, 1Y, YEARLY

POST-OPERATIVE REPORT (IF CO-MANAGING)

- *THIS IS A PART OF CO-MANAGED CARE*

  Not only does this information help with improving our outcomes analysis, but it is required as part of co-management.



POST-OPERATIVE REPORT

SightLine Ophthalmic Associates

Phone 724-933-5588 • Fax 724-933-6051

PATIENT NAME _____ REFERRING DOCTOR _____

DATE OF BIRTH _____ PROCEDURE TYPE IOL / REFRACTIVE SURGERY / YAG

DATE OF EXAM _____ PROCEDURE DATE(S) _____

_____ DAY / WEEK / MONTH FOLLOW-UP

OD:	OS:
UCVA: _____	UCVA: _____
REF: _____ 20/_____	REF: _____ 20/_____
IOP: _____	IOP: _____
CORNEA	CORNEA
AC/IRIS	AC/IRIS
LENS IN GOOD POSITION? Y / N	LENS IN GOOD POSITION? Y / N
DILATION? Y / N	DILATION? Y / N
FUNDUS:	FUNDUS:

If VA is less than 20/30, please explain: _____

PATIENT SATISFACTION: ☐ Very Happy ☐ Satisfied ☐ Dissatisfied

ASSESSMENT: _____

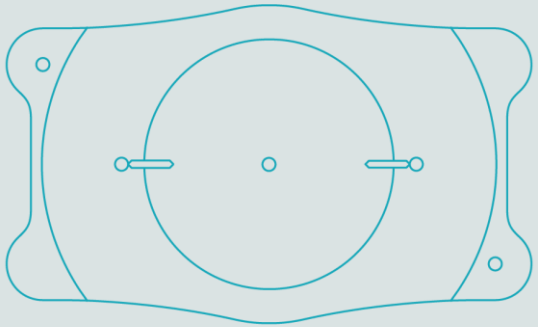
PLAN: _____

OTHER SURGICAL OPTIONS

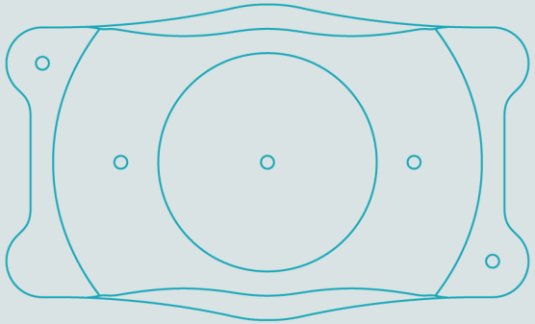
- PHAKIC IOL
- RLE

The EVO ICL Family of Lenses

- The addition of the central port to EVO facilitates the flow of aqueous humor through the lens, eliminating the need for peripheral iridotomies (PIs) prior to implantation.
- Indicated for use in adults 21-45 years of age for myopia with or without astigmatism.
- STAAR's Collamer® material has a proven history of over 20 years with **more than 1 million EVO lens implants worldwide**.
- The EVO ICL has a large treatable market and very favorable demographics.



EVO/EVO+ Toric



EVO/EVO+ Sphere

EVO Indications

Models	Indication
EVO/EVO+ ICL	For the correction (spherical equivalent: -3.0 D to ≤ -15.0 D) or reduction (spherical equivalent: >-15.0 D to -20.0 D) of myopia in patients at the spectacle plane with less than or equal to 2.5 D astigmatism
EVO/EVO+ Toric ICL	For the correction (spherical equivalent: -3.0 D to ≤ -15.0 D) or reduction (spherical equivalent: >-15.0 D to -20.0 D) of myopic astigmatism with cylinder of 1.0 D to 4.0 D at the spectacle plane

EVO is intended for posterior placement in the phakic eye of patients:

21 to 45 years of age

ACD (from endo) ≥ 3.00 mm

Stable refractive history (within 0.5 D change for spherical equivalent and cylinder in last 12 months)

Preoperative Peripheral Iridotomies No Longer Required

EVO ICL Lens Models in US Market

EVO models available:

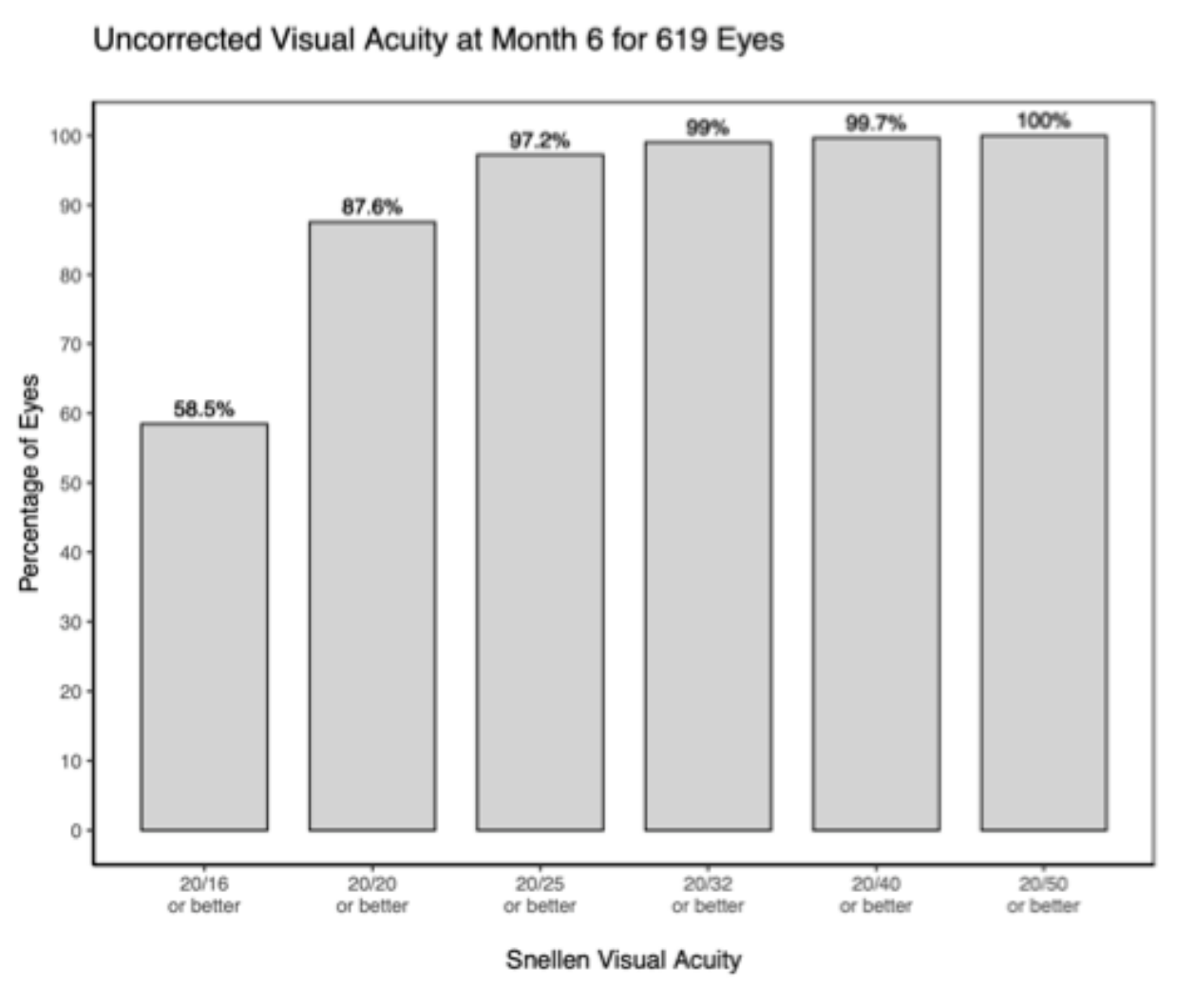
Models	Spherical Power (D)	Cylindrical Power (D) (For EVO/EVO+ Toric)	Overall Diameters (mm)
EVO+	-3.0 to -14.0 -3.5 to -14.0*** (EVO+ Toric)	1.0 to 4.0	12.1 12.6 13.2 13.7
EVO	-14.5 to -16.0 -14.5 to -18.0*** (EVO Toric)		

****Product is unavailable if Spherical Equivalent (SEQ) is outside the -3.0 D to -16.0 D range*

Spherical and Cylindrical Powers available in 0.5 D steps

The EVO+ model offers an increase in optic diameter of 0.1 mm to 0.5 mm larger than the available EVO model

EVO/EVO+ ICL FDA Study: Efficacy



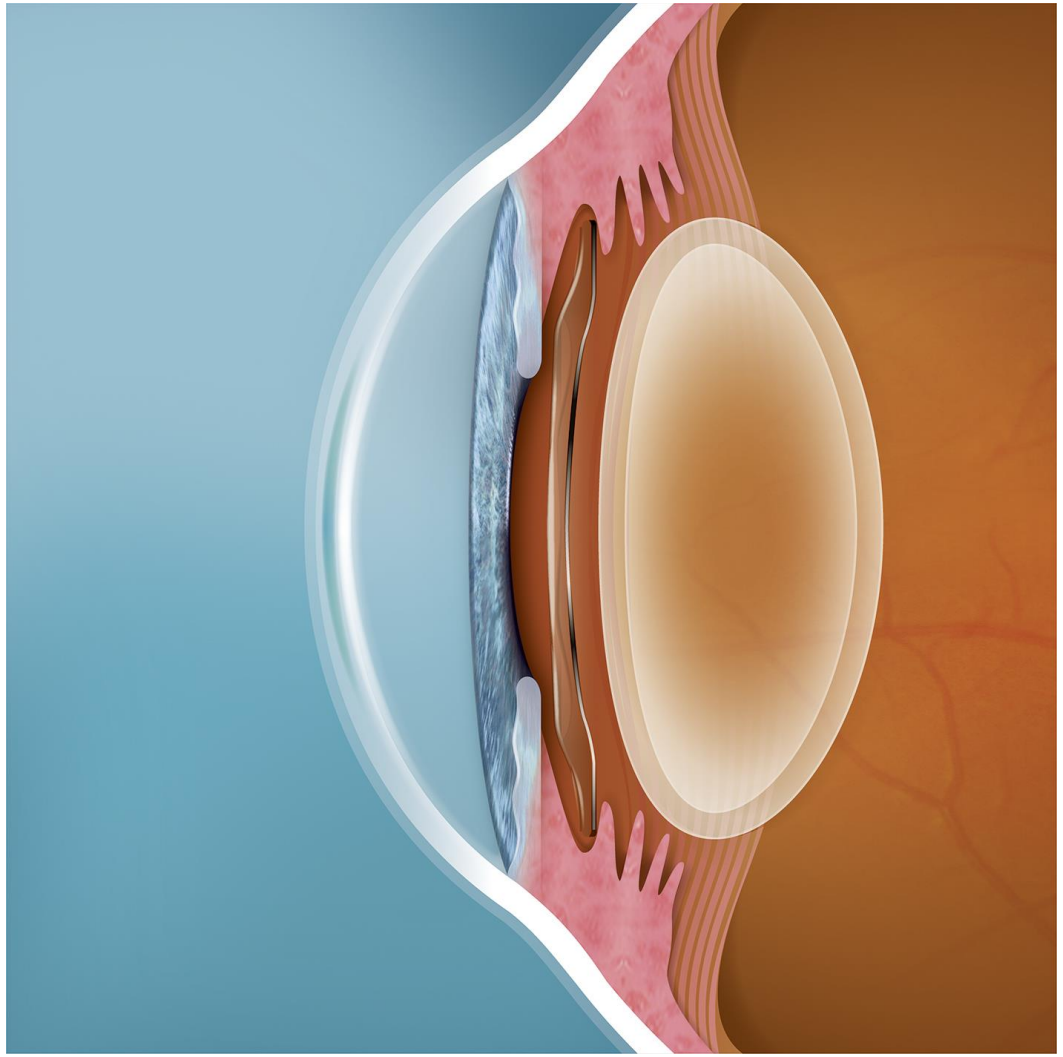
- Mean postoperative UDVA better than 20/20 at all time points
- Efficacy index at 6 months = 1.06

Packer M. United States Multicenter Clinical Trial of a Posterior Chamber Phakic Implantable Lens with a Central Port for Myopia or Myopic Astigmatism. American Society of Cataract and Refractive Surgery Annual Meeting. Washington DC, 24 April 2022.

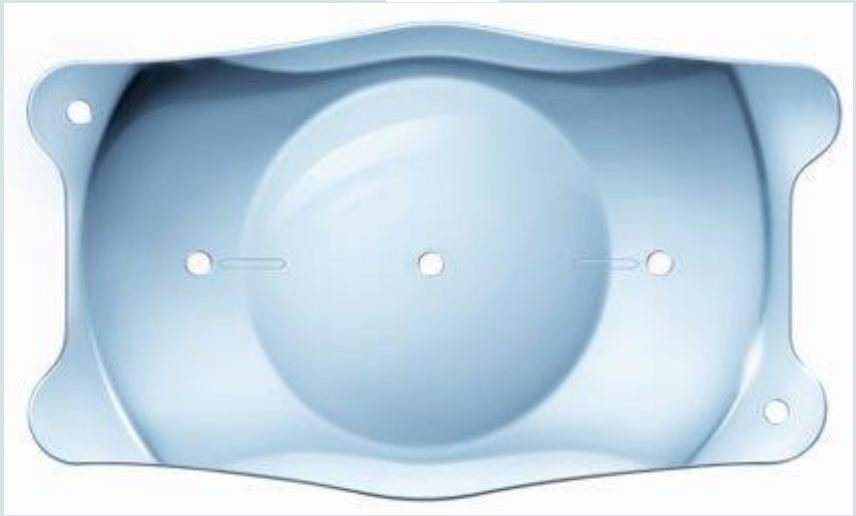
EVO Family Contraindications

- The EVO Visian ICL is **contraindicated** in patients:
  1. *With an anterior chamber depth (true ACD) of <3.00 mm*;*
  2. *With anterior chamber angle less than Grade III as determined by gonioscopic examination;*
  3. *Who are pregnant or nursing;*
  4. *Less than 21 years of age;*
  5. *Who have moderate to severe glaucoma*
  6. *Who do not meet the minimum endothelial cell density (ECD);*

The true ACD is defined as the distance from the apex of the **posterior corneal surface to the apex of the anterior crystalline lens surface. Many measuring devices provide an ACD measurement defined as the distance from the apex of the **anterior** corneal surface to the apex of the anterior crystalline lens surface. If the surgeon is using an instrument that measures from the anterior corneal surface, the thickness of the cornea must be subtracted to get the true ACD.*



STARR EVO ICL



FOOTPLATES REST IN THE CILIARY SULCUS

- HAS ADDITIONAL LINEAR ORIENTATION LANDMARKS TO FACILITATE ALIGNMENT OF THE LENS IN TORIC MODELS

EVO/EVO+ ICL FDA Study: Safety of the Central Port Design

- Maintains physiologic aqueous flow

  Zero pupillary block

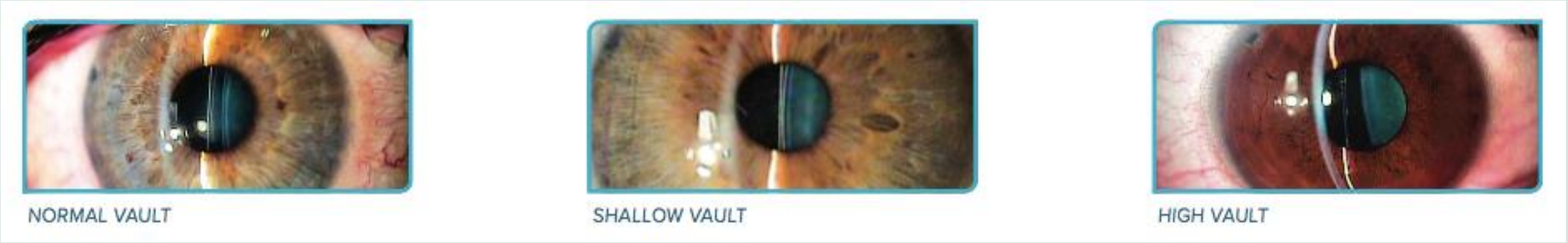
  Zero anterior subcapsular cataract

- Eliminates preoperative peripheral iridotomy

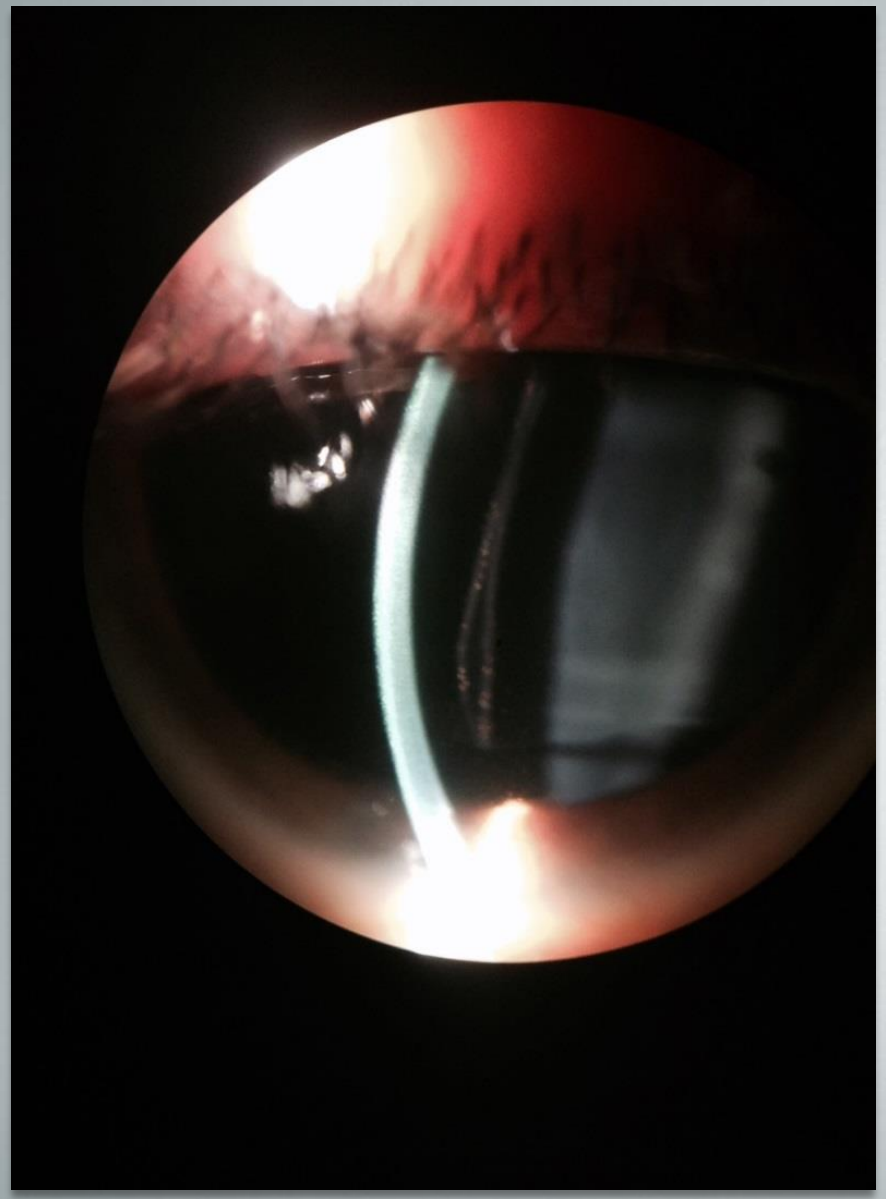
- The results of this clinical trial have definitively demonstrated the safety and effectiveness of EVO/EVO+ Sphere and Toric ICL lenses for the correction of myopia and myopia with astigmatism.

Measuring Vault

- Although the postoperative vault of EVO is intended to be approximately equal to the central corneal thickness, the optimal vault should be between 50% and 150% of central corneal thickness, this being equivalent to a range of 250 to 900 microns. However, in the absence of symptoms, lens vault outside this range may not necessarily require exchange or removal.[1]



1. STAAR EVO ICL Directions for Use



ICL VAULT

EVO ICL – POSSIBLE CANDIDATES

- MODERATE TO HIGH MYOPE
- THIN CORNEAS
- DRY EYE PATIENTS
- FLAT-K MYOPES
- BENEFITS: MAINTAINS ACCOMMODATION AND HAS SUPERIOR OPTICS FOR HIGHER MYOPES. ALSO DOES NOT HAVE LENS REMOVAL RISKS (IE: RD) THAT LENS REMOVAL HAS IN A HIGH MYOPE

RLE

"CATARACT SURGERY" WITH ALL THE ASSOCIATED RISKS

- CONSIDER 50+ (THOUGH THERE ARE OTHER SCENARIOS) SINCE ACCOMMODATIVE LOSS PLAYS A FACTOR
- HYPEROPES AND HIGH MYOPES
- TORIC AND MULTIFOCAL OR MONOVISION
- PATIENT WILL "NEVER GET A CATARACT"
- EXPECTATIONS, EXPECTATIONS, EXPECTATIONS

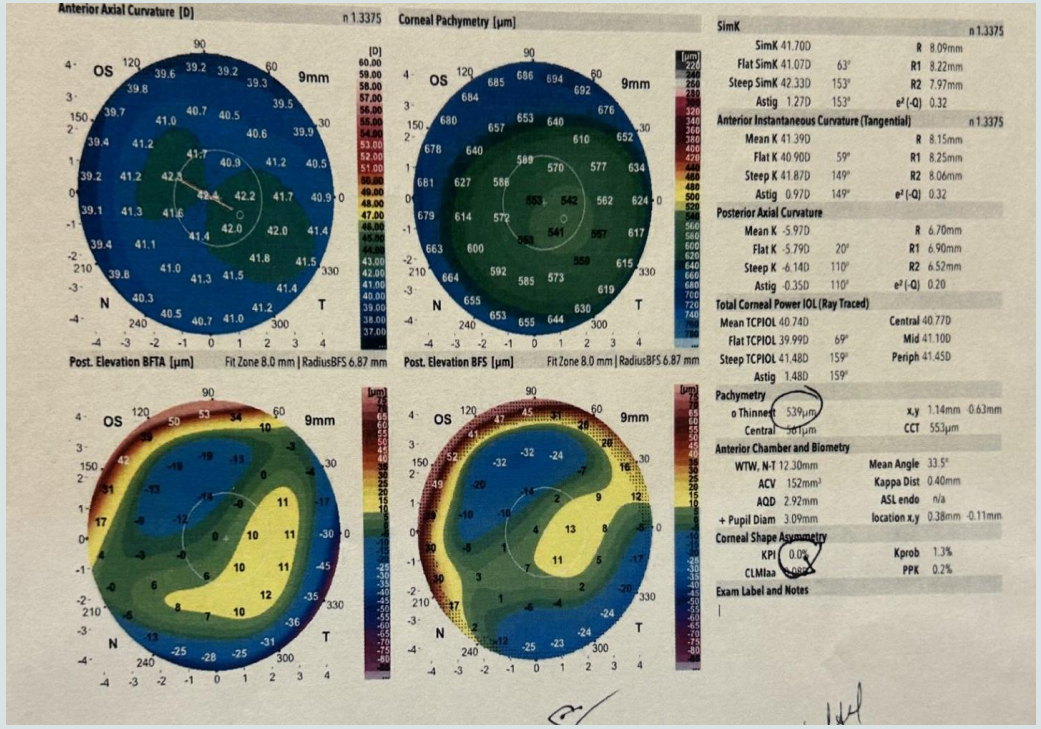
CASE EXAMPLES

40 YO

- REFRACTION: OD -4.50-0.25X11520/20, OS –4.25-0.50X055 20/20
- PACH 522 OD, 527 OS
- NORMAL TOPOS
- PLAN: LASIK OU BUT STRESSED LOSS OF NEAR AND PRESBYOPIA

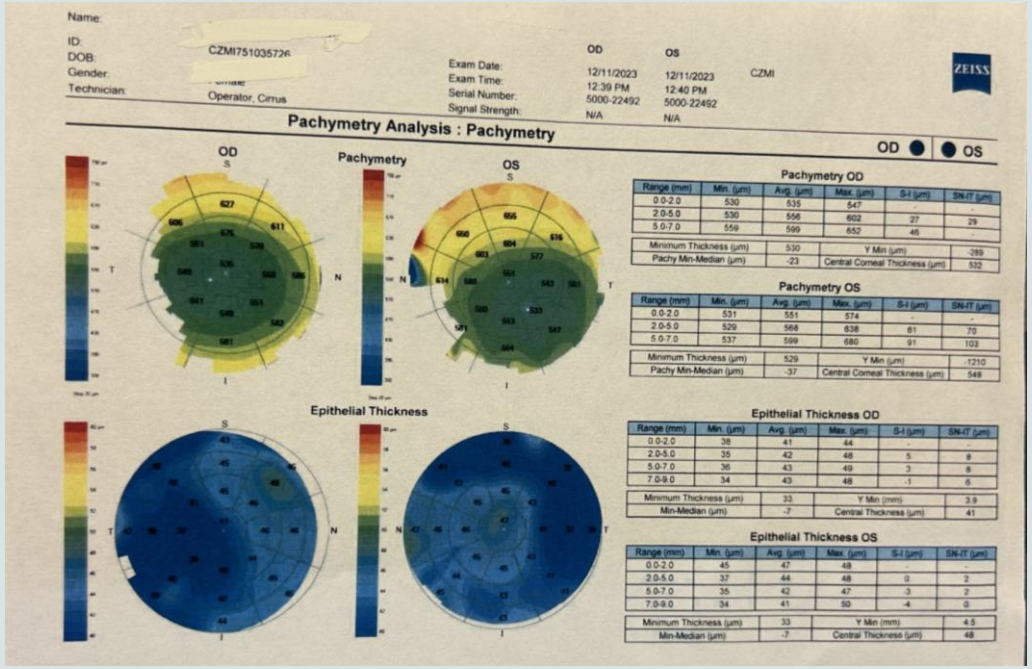
47 YO FEMALE

- REFRACTION: OD-3.75-2.00X110 20/20, OS –4.50-3.00X075 20/20
- PACH = 535 OD, 539 OS
- *IBRA CALCULATION: 39% PTA, 327 RSB
- TOPO:



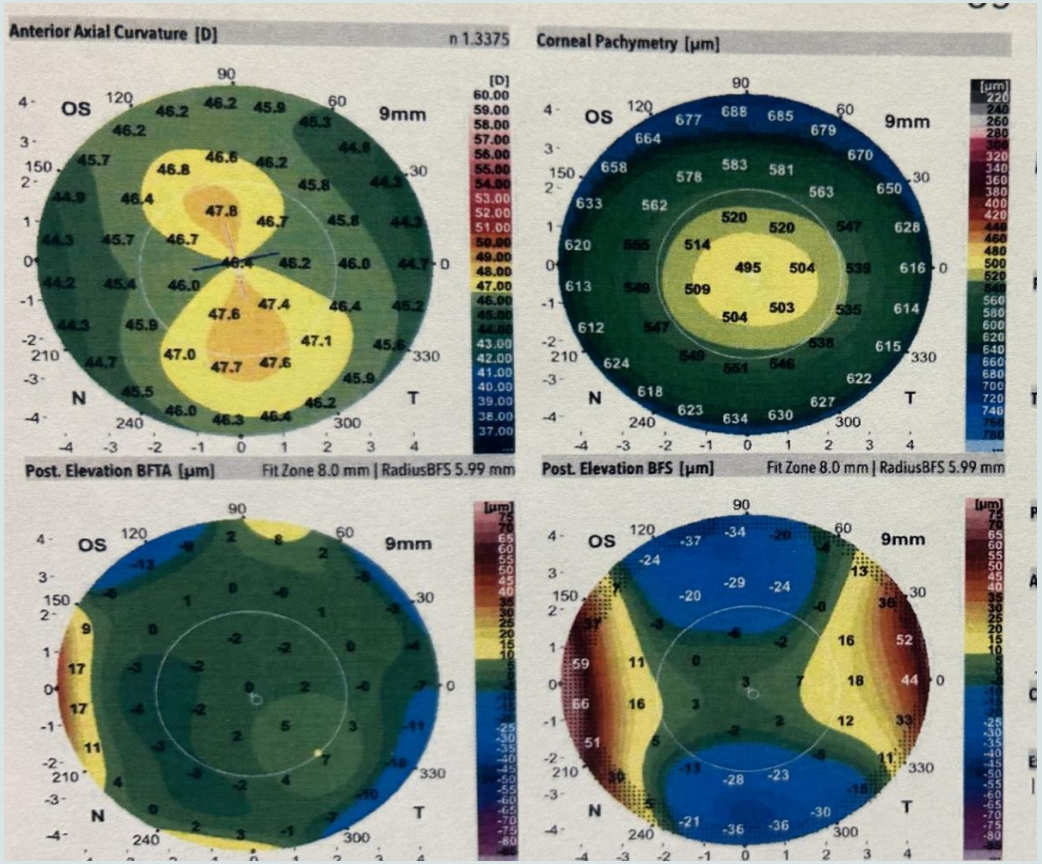
47 YO FEMALE

- EPITHELIAL MAP
- DISCUSSED LASIK, PRK – PREFERS LASIK, *REVIEWED WITH SURGEON – HER AGE HELPED IN THIS CASE IN REGARDS TO RF



LASER MORNING, 3 PRK – ALL DIFFERENT SCENARIOS – PATIENT ONE

- 22 YO WITH PACHS 502 OD AND 494 OS
- RX OD –1.75-1.25X152, OS –1.50-1.00 X 023
- BVA 20/20 OD, OS
- K'S 46 X 48 OU
- TOPO:
- AGE/PACHS/STEEP K'S/SLT INF STEEPING AND CORNEAL CYL...PRK



LASER MORNING, 3 PRK – ALL DIFFERENT SCENARIOS – PATIENT TWO

- 23 YO WM WITH MODERATE ALLERGIES
- RX: OD –6.75-1.00X160 20/20, OS –6.00-1.25X005 20/20
- PACHS 519 AND 516
- VERY NORMAL TOPOS OTHERWISE
- *IBRA: PTA W/ 110 = 43% AND RSB = 298 (RSB W/ 100 UM FLAP OD – 41% PTA, 308 RSB, 90UM FLAP 318 RSB AND 39%) *NOT IDEAL LASIK CANDIDATE*, ESPECIALLY W/ AGE (THOUGH THERE ARE CIRCUMSTANCES TO CONVERT TO A THINNER FLAP, YOU ARE DEALING WITH MORE FRAGILE TISSUE AND INCREASED CHANCE FOR INTRAOPERATIVE COMPLICATIONS)

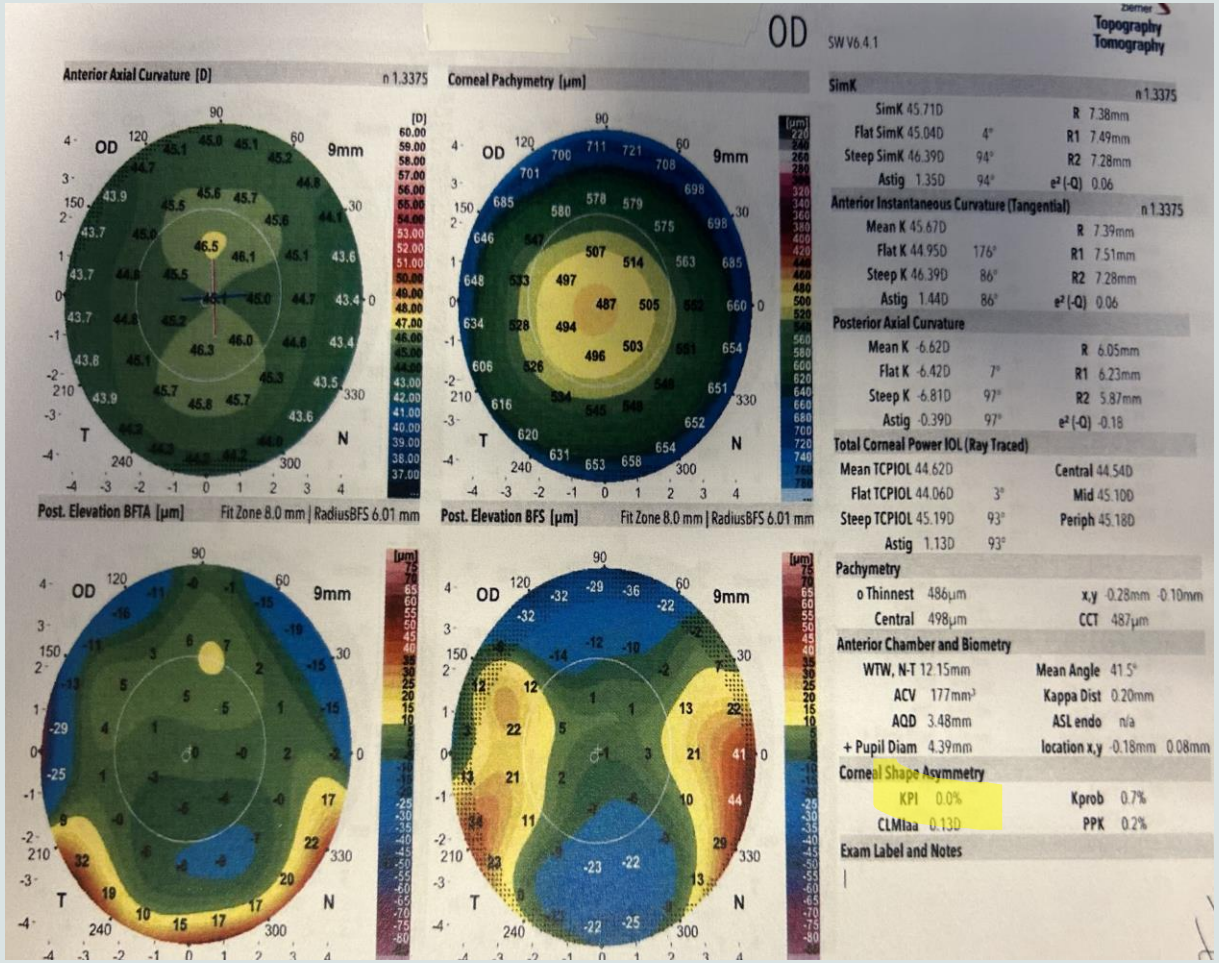
LASER MORNING, 3 PRK – ALL DIFFERENT SCENARIOS – PATIENT THREE

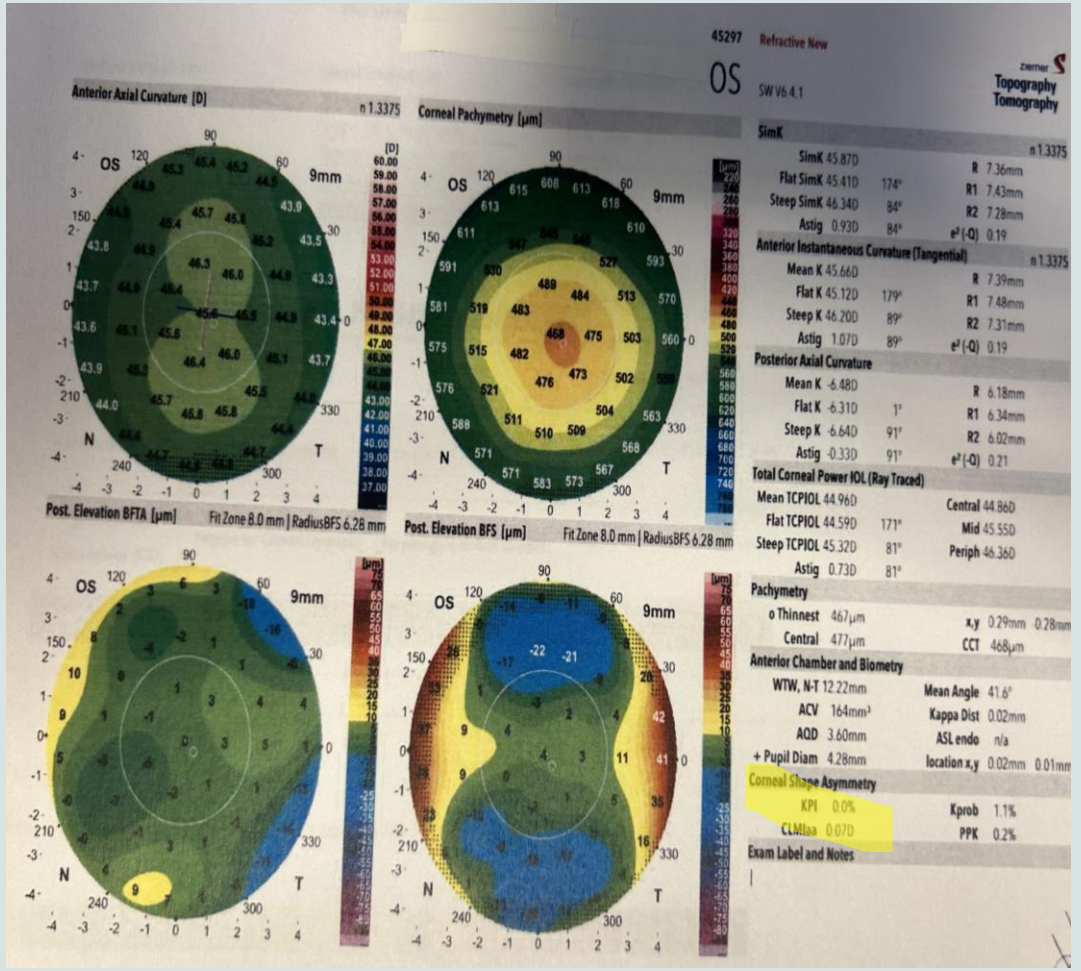
- 25 YO WM
- RX: OD –1.00-0.50X160 20/20, OS –1.25-0.25X032 20/20
- PACHS 537 OD, 521 OS
- PUPILS 7 MM OU
- NORMAL TOPOS
- DISCUSSED LASIK V PRK. DISCUSSED SLIGHT INCREASED R/O HALOS/GLARE
- PX COULD PROCEED W/ LASIK, BUT ELECTED PRK FOR HIS MILITARY CAREER

CASE EXAMPLE: 18 YO WM FOR LASIK EVALUATION

- ACTIVE LACROSSE PLAYER AND PLANNING TO ATTEND AVIATION SCHOOL AND PLAY LACROSSE IN COLLEGE – REQUESTING SURGERY OD ONLY
- RX: OD –1.25-0.50X005 20/20, OS PLANO-0.50X160 20/20
- PACHS 486 OD, 467 OS
- TOPOS: OTHER THAN BEING "THIN", NORMAL WITH KPI OF 0%

18 YO WM


OD
SW V6.4.1
Topography Tomography
Anterior Axial Curvature [D]
n 1.3375
Corneal Pachymetry [µm]
Post. Elevation BFTA [µm]
Fit Zone 8.0 mm | RadiusBFS 6.01 mm
Post. Elevation BFS [µm]
Fit Zone 8.0 mm | RadiusBFS 6.01 mm
SimK
SimK 45.71D
Flat SimK 45.04D 4°
Steep SimK 46.39D 94°
Astig 1.35D 94°
R 7.38mm
R1 7.49mm
R2 7.28mm
e² (-Q) 0.06
Anterior Instantaneous Curvature (Tangential)
Mean K 45.67D
Flat K 44.95D 176°
Steep K 46.39D 86°
Astig 1.44D 86°
R 7.39mm
R1 7.51mm
R2 7.28mm
e² (-Q) 0.06
Posterior Axial Curvature
Mean K -6.62D
Flat K -6.42D 7°
Steep K -6.81D 97°
Astig -0.39D 97°
R 6.05mm
R1 6.23mm
R2 5.87mm
e² (-Q) -0.18
Total Corneal Power IOL (Ray Traced)
Mean TCPIOL 44.62D
Flat TCPIOL 44.06D 3°
Steep TCPIOL 45.19D 93°
Astig 1.13D 93°
Central 44.54D
Mid 45.10D
Periph 45.18D
Pachymetry
o Thinnest 486µm
Central 498µm
x,y -0.28mm -0.10mm
CCT 487µm
Anterior Chamber and Biometry
WTW, N-T 12.15mm
ACV 177mm³
AQD 3.48mm
+ Pupil Diam 4.39mm
Mean Angle 41.5°
Kappa Dist 0.20mm
ASL endo n/a
location x,y -0.18mm 0.08mm
Corneal Shape Asymmetry
KPI 0.0%
CLMIaa 0.13D
Kprob 0.7%
PPK 0.2%
Exam Label and Notes


45297
Refractive New
OS
SW V6.4.1
Topography Tomography
Anterior Axial Curvature [D]
n 1.3375
Corneal Pachymetry [µm]
Post. Elevation BFTA [µm]
Fit Zone 8.0 mm | RadiusBFS 6.28 mm
Post. Elevation BFS [µm]
Fit Zone 8.0 mm | RadiusBFS 6.28 mm
SimK
SimK 45.87D
Flat SimK 45.41D 174°
Steep SimK 46.34D 84°
Astig 0.93D 84°
R 7.36mm
R1 7.43mm
R2 7.28mm
e² (-Q) 0.19
Anterior Instantaneous Curvature (Tangential)
Mean K 45.66D
Flat K 45.12D 179°
Steep K 46.20D 89°
Astig 1.07D 89°
R 7.39mm
R1 7.48mm
R2 7.31mm
e² (-Q) 0.19
Posterior Axial Curvature
Mean K -6.48D
Flat K -6.31D 1°
Steep K -6.64D 91°
Astig -0.33D 91°
R 6.18mm
R1 6.34mm
R2 6.02mm
e² (-Q) 0.21
Total Corneal Power IOL (Ray Traced)
Mean TCPIOL 44.96D
Flat TCPIOL 44.59D 171°
Steep TCPIOL 45.32D 81°
Astig 0.73D 81°
Central 44.86D
Mid 45.55D
Periph 46.36D
Pachymetry
o Thinnest 467µm
Central 477µm
x,y 0.29mm -0.28mm
CCT 468µm
Anterior Chamber and Biometry
WTW, N-T 12.22mm
ACV 164mm³
AQD 3.60mm
+ Pupil Diam 4.28mm
Mean Angle 41.6°
Kappa Dist 0.02mm
ASL endo n/a
location x,y 0.02mm 0.01mm
Corneal Shape Asymmetry
KPI 0.0%
CLMIaa 0.07D
Kprob 1.1%
PPK 0.2%
Exam Label and Notes

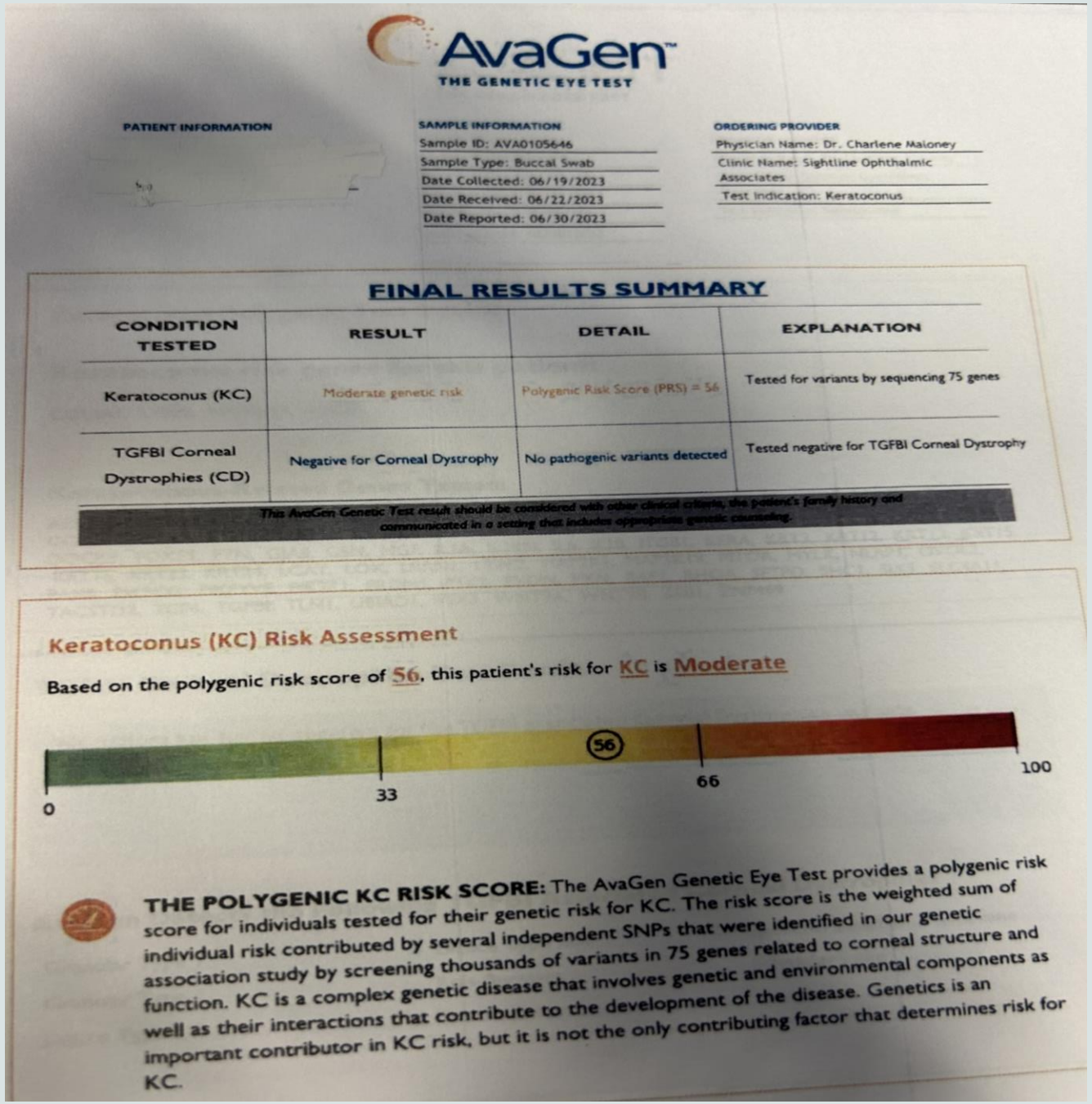
18 YO WM FOR LASIK EVALUATION

- DISCUSSION: NO LASIK, POSSIBLE PRK
- PATIENT IS ONLY 18 YEARS OLD – DISCUSSION WITH PATIENT AND MOTHER FOR RISKS HAVE TO INCLUDE HIGHER RISK OF ECTASIA – WE JUST DON'T KNOW
- DECISION TO PROCEED W/ GENETIC TESTING TO DETERMINE ADDITIONAL RISK
- PLAN TO FOLLOW UP ON 6-12 MONTH INTERVALS INITIALLY AS PRECAUTION

AVAGEN

- Assesses 75 genes related to corneal structure/function, including KC
- To Perform Test:
- 4 swabs and a test tube with media
- Swab cheek 15-20 seconds on both R/L side 2x, using a different swab each time
- Innoculate test tube media with sample for 15-20 sec b/t each sample
- Patient portal – results online
- Px cost approximately $300

RESULTS



AvaGen
THE GENETIC EYE TEST

PATIENT INFORMATION

SAMPLE INFORMATION
Sample ID: AVA0105646
Sample Type: Buccal Swab
Date Collected: 06/19/2023
Date Received: 06/22/2023
Date Reported: 06/30/2023

ORDERING PROVIDER
Physician Name: Dr. Charlene Maloney
Clinic Name: Sightline Ophthalmic Associates
Test Indication: Keratoconus

FINAL RESULTS SUMMARY

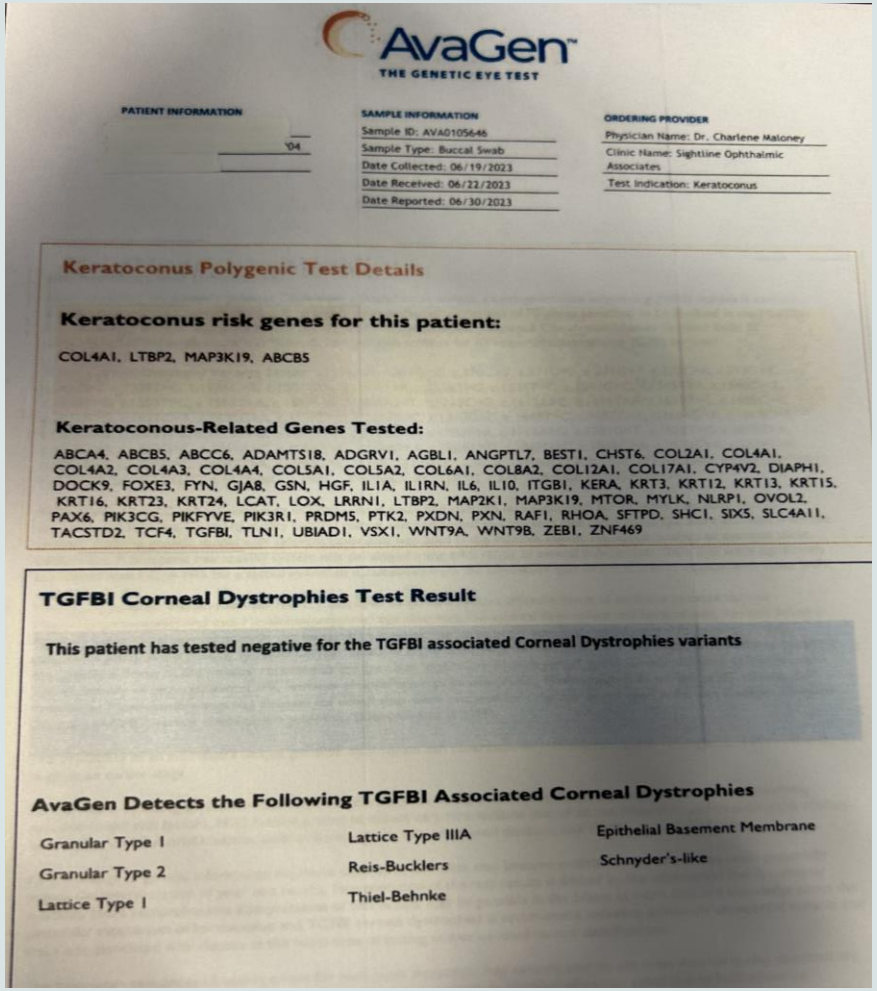
CONDITION TESTED	RESULT	DETAIL	EXPLANATION
Keratoconus (KC)	Moderate genetic risk	Polygenic Risk Score (PRS) = 56	Tested for variants by sequencing 75 genes
TGFBI Corneal Dystrophies (CD)	Negative for Corneal Dystrophy	No pathogenic variants detected	Tested negative for TGFBI Corneal Dystrophy

This AvaGen Genetic Test result should be considered with other clinical criteria, the patient's family history and communicated in a setting that includes appropriate genetic counseling.

Keratoconus (KC) Risk Assessment

Based on the polygenic risk score of 56, this patient's risk for KC is Moderate

THE POLYGENIC KC RISK SCORE: The AvaGen Genetic Eye Test provides a polygenic risk score for individuals tested for their genetic risk for KC. The risk score is the weighted sum of individual risk contributed by several independent SNPs that were identified in our genetic association study by screening thousands of variants in 75 genes related to corneal structure and function. KC is a complex genetic disease that involves genetic and environmental components as well as their interactions that contribute to the development of the disease. Genetics is an important contributor in KC risk, but it is not the only contributing factor that determines risk for KC.



AvaGen
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SAMPLE INFORMATION
Sample ID: AVA0105646
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ORDERING PROVIDER
Physician Name: Dr. Charlene Maloney
Clinic Name: Sightline Ophthalmic Associates
Test Indication: Keratoconus

Keratoconus Polygenic Test Details

Keratoconus risk genes for this patient:

COL4A1, LTBP2, MAP3K19, ABCB5

Keratoconous-Related Genes Tested:

ABCA4, ABCB5, ABCC6, ADAMTS18, ADGRV1, AGBL1, ANGPTL7, BEST1, CHST6, COL2A1, COL4A1, COL4A2, COL4A3, COL4A4, COL5A1, COL5A2, COL6A1, COL8A2, COL12A1, COL17A1, CYP4V2, DIAPH1, DOCK9, FOXE3, FYN, GJA8, GSN, HGF, IL1A, IL1RN, IL6, IL10, ITGB1, KERA, KRT3, KRT12, KRT13, KRT15, KRT16, KRT23, KRT24, LCAT, LOX, LRRN1, LTBP2, MAP2K1, MAP3K19, MTOR, MYLK, NLRP1, OVOL2, PAX6, PIK3CG, PIKFYVE, PIK3R1, PRDM5, PTK2, PXDN, PXN, RAF1, RHOA, SFTPD, SHC1, SIX5, SLC4A11, TACSTD2, TCF4, TGFBI, TLN1, UBIAD1, VSX1, WNT9A, WNT9B, ZEB1, ZNF469

TGFBI Corneal Dystrophies Test Result

This patient has tested negative for the TGFBI associated Corneal Dystrophies variants

AvaGen Detects the Following TGFBI Associated Corneal Dystrophies

Granular Type 1	Lattice Type IIIA	Epithelial Basement Membrane
Granular Type 2	Reis-Bucklers	Schnyder's-like
Lattice Type 1	Thiel-Behnke	

27 YO WF

- **PATIENT PRESENTS KNOWING SHE IS "NOT A LASIK CANDIDATE"**
- **RX: OD -4.50-0.50X28 20/20, OS -4.75-0.50 X 158**
- **PACHS: 456 OD, 448 OS**
- **TOPOS: NORMAL OTHER THAN BEING "THIN"**

27 YO WF

- DISCUSSED BOTH PRK AND ICL (WITH PRK, WOULD WANT TO CONFIRM STABILITY D/T AGE AND FH OF "THIN CORNEAS", THOUGH NO KC/TRANSPLANTS PER PATIENT)
- DISCUSSED AVAGEN TESTING – PX DEFERS
- PX MOTIVATED TO PROCEED NOW FOR PROFESSIONAL REASONS AND OPTED ICL

27 YO WF – ICL

- 1 DAY UNCVA 20/25 OD, 20/30 OS WITH GOOD "VAULT" OU AND IOP 13 OU
- 3 MO VISIT 20/20 OD, OS UNCVA – LEAVING FOR JOB TRAINING – FEDERAL AGENT AT THE CA/MEXICO BORDER
- SHE DID HAVE SOME HALOS AT NIGHT WHICH SHE USES BRIMONIDINE IF BOTHERED BY IT (HAS ONLY USED 3-4 X SINCE SURGERY)

56 YO WF

- RX: -9.00-0.50X115 20/20, OS -11.50-0.75X80 20/20
- PACH: 468 , BUT NORMAL TOPOS OTHERWISE
- AGE NML LENS CHANGES (TR NS)
- PX DOES NOT LIKE MONO
- NOT CANDIDATE FOR LASIK/PRK OR ICL
- RLE WITH VIVITY IOL - APPROPRIATE EXPECTATIONS
  - AWARE NEAR VISION EXPECTATIONS W/ VIVITY, OK WITH RX FOR CLOSE NEAR TASKS PRN, PREFERS LESS CHANCE WITH RINGS V PANTOPTIX
  - WHEN CONSIDERING LENSES IN HIGH MYOPES/HYPEROPES, SOMETIMES AVAILABILITY OF IOL IS LIMITING FACTOR*
  - 1 DAY: UNCVA 20/20 OD, 20/20-1 OS

25 YO WM

RX: OD +7.75-3.25X180 20/25, OS +8.75-3.75X003 20/50

STRABISMIC AMBLYOPIA OS

UNABLE TO ADAPT TO RGP AND SOFT CLS GET DRY AND ARE NOT CONDUCIVE IN HIS WORK ENVIRONMENT

PX OBVIOUSLY NOT A CANDIDATE FOR LASIK, PRK OR ICL

COULD CONSIDER RLE WITH TORIC IOL …BUT MUST STRESS ACCOMMODATIVE LOSS

STILL, COULD CONSIDER RLE DESPITE AGE/NEAR LOSS AND MILD AMBLYOPIA IF THROUGHLY EDUCATED AND APPROPRIATE EXPECTATIONS.

Corneal Refractive Surgery (LASIK/PRK) Remains

- **Safe (in appropriate candidates)**
- **The least expensive**
- **The most predictable**
- **The modality with the broadest correction range of all the refractive surgical options**

Sightline Surgical Suite

Thank you

Charlene Maloney, OD

Charlene.maloney@sightlinelaser.com