MEASURE TWICE CUT ONCE- REFRACTIVE SURGERY PEARLS N-71802

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Abbott Medical Optics	C,L
Alcon	C,L,R
Allergan	C,L,R
Alphaeon	O
Bausch and Lomb	C,L
Nidek	C,L,R
Pogotec	C,O
Presbia	C,R
Refocus	C,L,R
Shire	C,L
Strathspey Crown	O
TLC	E
Espansione	C,L,R

C-Consultant/Advisor
E-Employee
L-Lecture/Travel Fees
O-Owner/Equity
P-Patents/Royalty
R-Research

Experience means you have done it wrong before

“In light of my past experience, my present circumstances, and my future hopes and dreams, what’s the wise thing to do?”

It’s so simple, it’s almost a little anticlimactic. But, there’s a wisdom to that simplicity. It challenges you to make wise decisions based upon what you’ve learned, where you are, and where you hope to be. It’s not rocket science, but when you process decisions like that, the chance of you making an unwise decision is greatly reduced.

THE BEST QUESTION EVER.

ANDY STALEY

Factor	PRK	LASEK	EPI-LASIK	LASIK
Range of correction	Low to moderately high			Low to moderately high
Postoperative pain	Mild to moderate 24–72 hours			Minimum 12 hours
Postoperative medications	1–3 months			1 week
Functional vision recovery	3 to 7 days			<24 hours
Refractive stability achieved	3 weeks to 3 months			1 week to 3 months
Specific complications	Haze formation, scarring	Haze formation, scarring	Haze formation, scarring, incomplete epithelial flap, stromal incursions	Free caps, incomplete pass of microkeratome, flap wrinkles, epithelial ingrowth, flap melt, interface debris, corneal ectasia, diffuse lamellar keratitis
Dry-eye sensitive	1 to 6 months			1 to 12 months
Thin corneas or wide pupils	Often not contraindicated			May be contraindicated depending on amount of intended correction
Special (relative) indications	Thin corneal pachymetry, wide scotopic pupil, LASIK complications in fellow eye, predisposition to trauma, keratoconus suspect (irregular astigmatism), glaucoma suspect, recurrent erosion syndrome, dry-eye syndrome, basement membrane disease			Concern about postoperative pain, requirement of rapid visual recovery
Special (relative) contraindications	Concern about postoperative pain, requirement of rapid visual recovery	Concern about postoperative pain, requirement of rapid visual recovery	Concern about postoperative pain, requirement of rapid visual recovery, glaucoma, scleral buckle, deep-set eyes, small palpebral fissure	Thin corneas, wide pupils, recurrent erosion syndrome, glaucoma, scleral buckle, deep-set eyes, small palpebral fissure

Surface Ablation Techniques. Suphi Taneri, MD, Michael Weisberg, MD, Dimitri T. Azar, MDJ Cataract Refract Surg 2011; 37:392–408 Q 2011 ASCRS and ESCRS

IF YOU START OUT WITH BAD DATA…WELL HOW CAN YOU GET GOOD OUTCOMES?

REFRACTION
REFRACTION
REFRACTION

WE ONLY HAVE TWO REFRACTIONISTS. ALL REFRACTIONS ARE REPEATED ON THE DAY OF SURGERY

- MEASURE TWICE
- CUT ONCE
- $%^&*!
- BUY MORE WOOD
- REPEAT STEPS 1-4

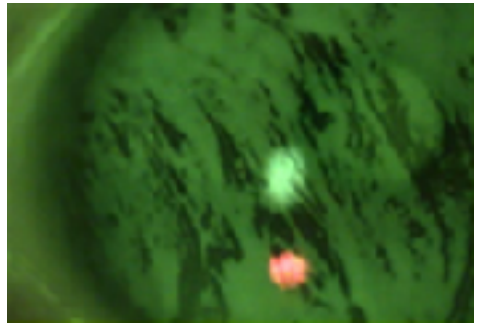
WE ONLY USE TWO LANES TO REFRACT AND THEY ARE BOTH CALIBRATED AND USE THE LATEST EQUIPMENT

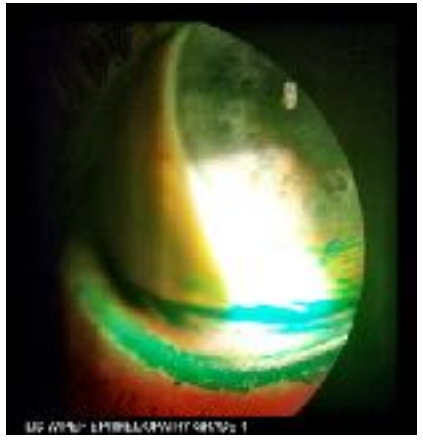
before

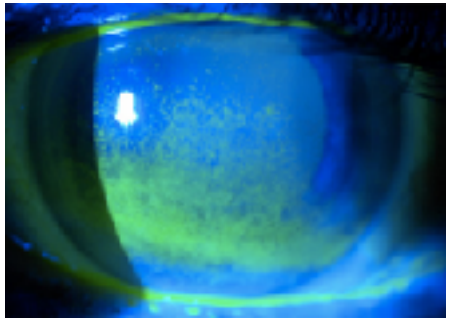
after

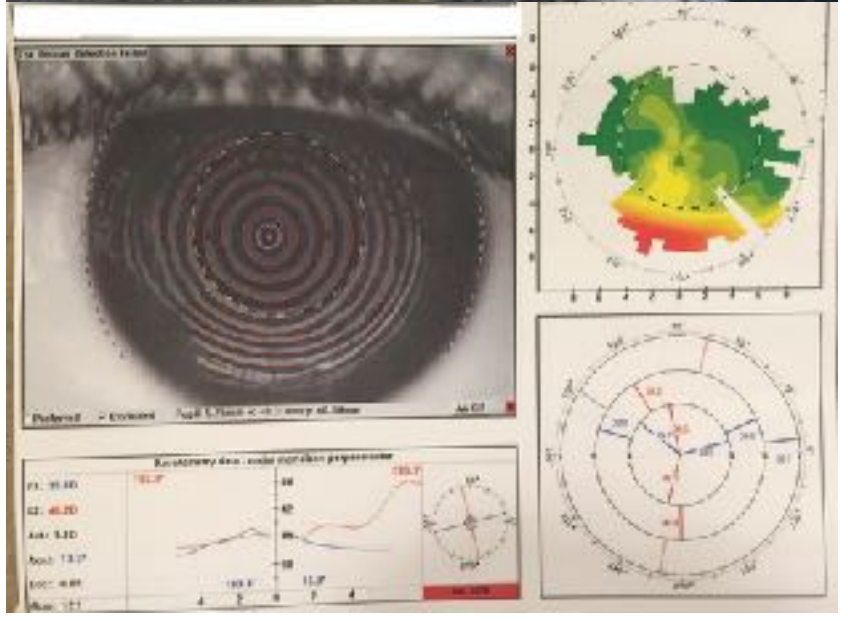
ALSO YOU'LL NEVER GET 20/10 UCVA IF YOUR CHART DOESN'T GO THAT LOW OR YOUR STAFF DOESN'T CHECK BELOW 20/20

IF YOU HAVE A BAD OCULAR SURFACE DON'T MEASURE UNTIL IT'S FIXED







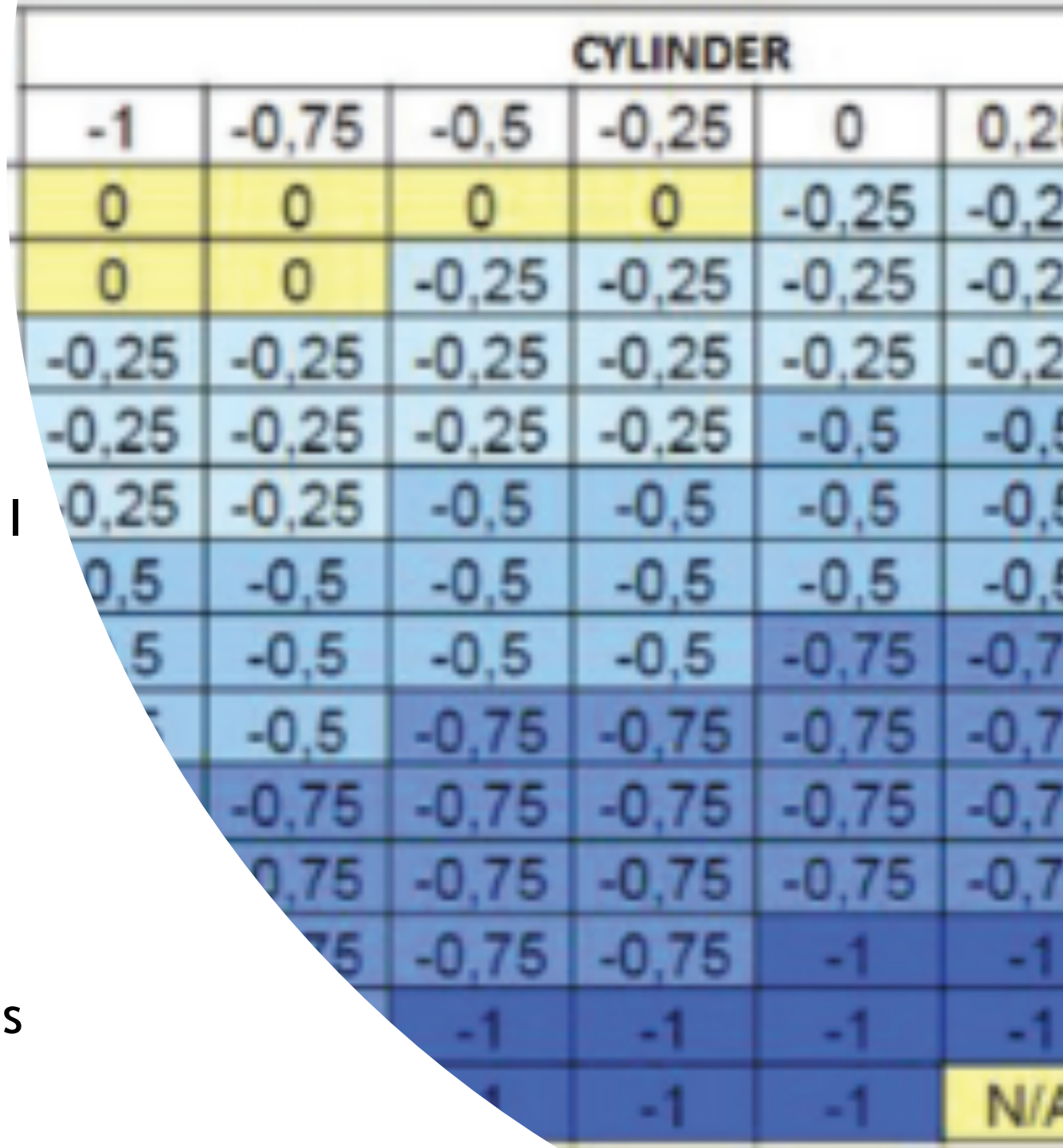


SURGERY IS NOT JUST PUSHING THE BUTTONS

HAVE AS MANY TOOLS IN YOUR HANDS AS YOU CAN BUT KNOW WHAT THE DO AND HOW TO USE THEM.

OUTCOMES

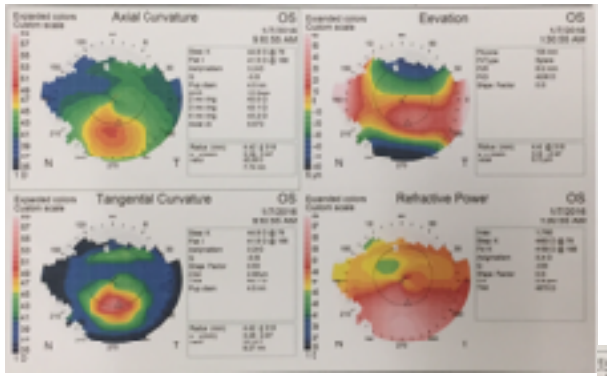
- IT ALWAYS AMAZES ME HOW EVERY ONE IS 20/20 OR BETTER AND WHEN I ASK THE SURGEON TO SHOW ME THEIR DATA THEY HAND ME A PAPER NOMOGRAM FROM 1999
- CONSTANTLY COLLECT YOUR DATA
- CHANGE ONLY ONE THING AT A TIME
- OUTCOMES SOFTWARE
  - Datalink Surgivision
  - Internet Based Refractive Analysis

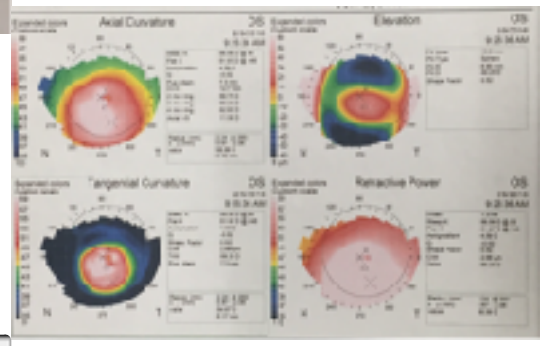


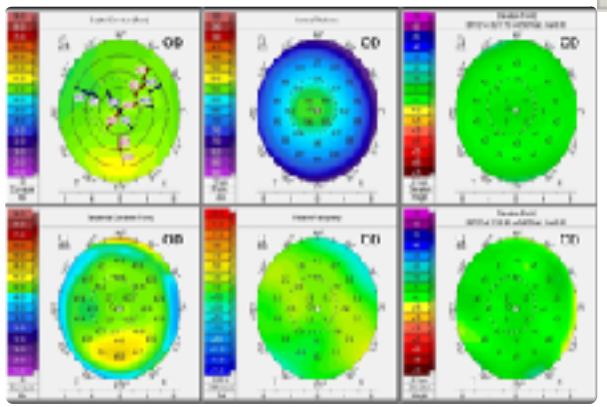
Everyone is a genius. But if you judge a fish on its ability to climb a tree, it will live its whole life believing that it is stupid.

-A Einstein

CONTRAINDICATIONS FOR LASIK:
WE HAVE GOTTEN MUCH BETTER WITH THIS ISSUE

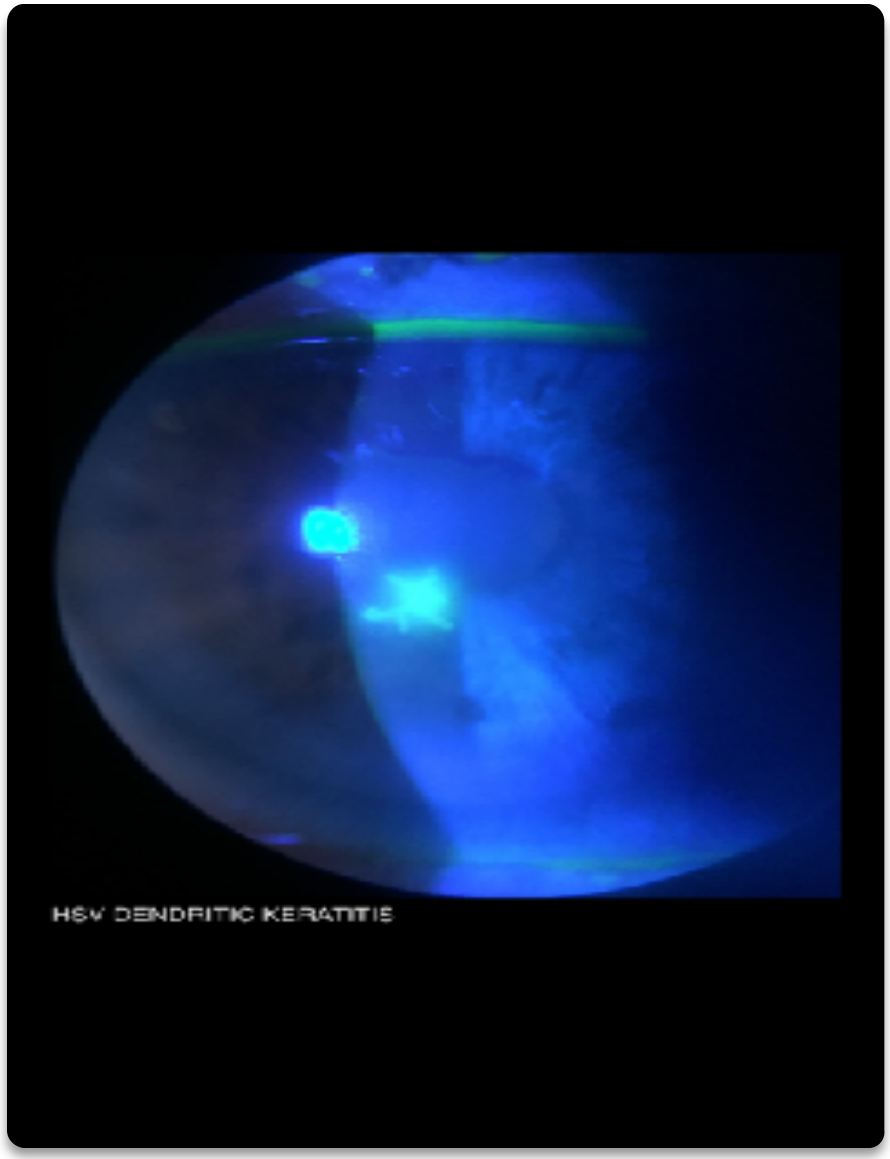






- ***Keratoconus***
  - ➢ Irregular Astigmatism
- ***Monocular Patients***
  - ➢ Amblyopic patients must have BCVA 20/40 or better
- ***Herpes Viral Keratitis***
- ***Severe Dry Eye***
  - ➢ Exposure Keratopathy
- ***Pacemaker-??????***

Common Concerns



- ***Dry Eye***
  - No current symptoms, stable RX
- ***Previous ocular Herpetic infection***
  - Some surgeons consider this an absolute contraindication
  - No occurrence for 6-12 months
  - Pre-treat with oral Acyclovir
- ***Connective tissue disease***
- ***Diabetes***
- ***Corneal Scar***
  - Consider PRK depending on placement
- ***EBMD or Recurrent Corneal Erosion***
  - Consider PRK

Common Concerns

Pregnant/Breastfeeding

- 3 normal cycles and stable RX

Diabetes

- No retinopathy, stable RX, stable/low A1C

Autoimmune Conditions

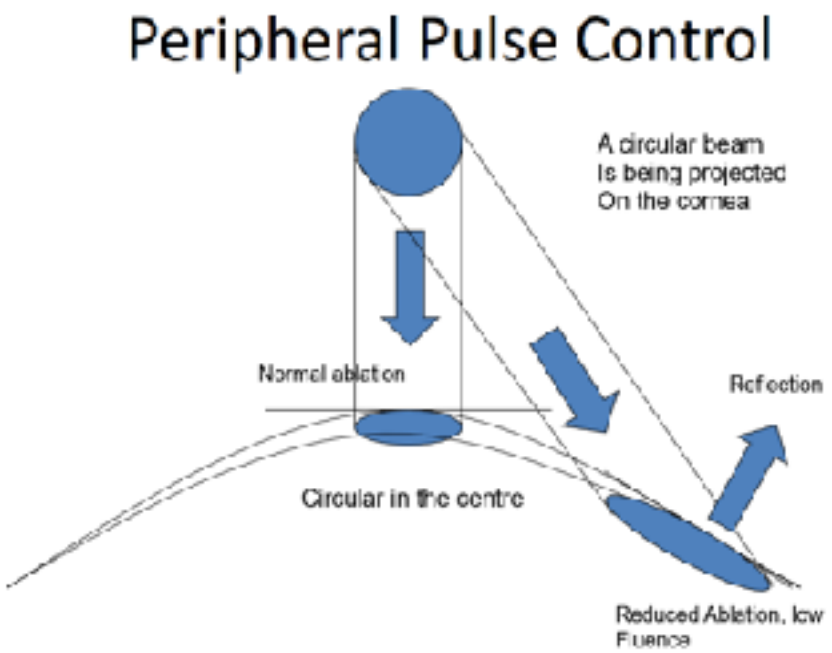
- Concern about DES
- Rheumatoid Arthritis = relative contraindication

HIV

- Do they need blood work

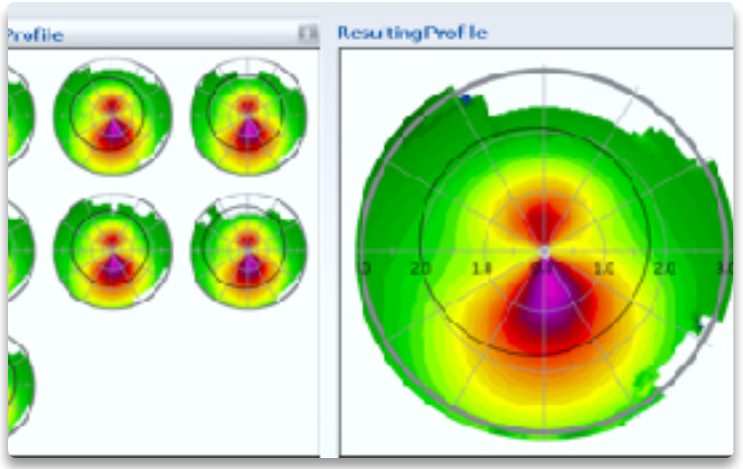
Types of Corneal Ablation

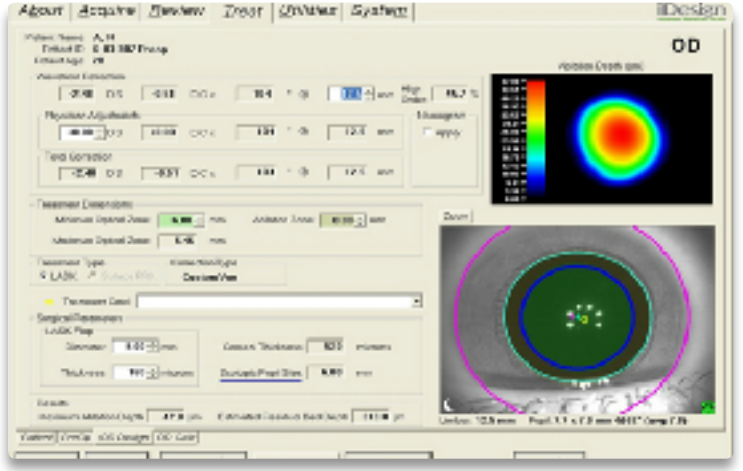
- ***Conventional Spherical treatment***
  - ➢Induces significant spherical aberration
  - ➢Rarely performed
- ***Prolate – Wavefront-Optimized***
  - ➢Age-related prolate pattern
  - ➢Induce less spherical aberration compared to conventional ablations
  - ➢Increase Quality of Vision



Types of Corneal Ablation

- ***Contoura-Topographic Guided***
  - ➢ Uses patient's topography guide treatment
  - ➢ Treats corneal asymmetry and normal irregularities
  - ➢ Increase Quality of Vision
- ***Wavefront Guided – Custom***
  - ➢ Uses patient's aberrometry to guide treatment
  - ➢ Induce less spherical aberration compared to conventional ablations
  - ➢ Increase Quality of Vision





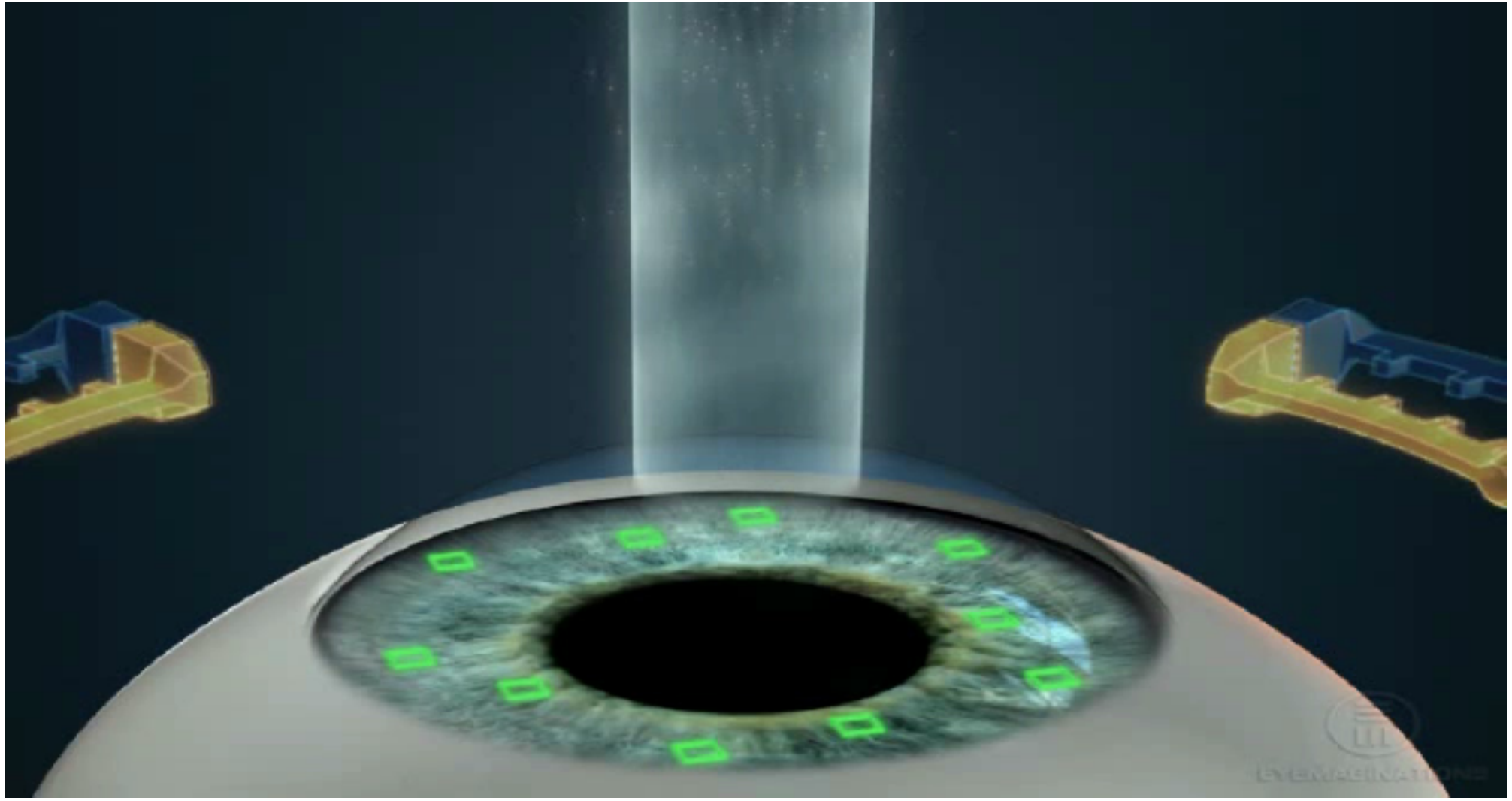
FDA Approved LASERS

- Alcon – Allegretto
- B&L – Zyoptix
- AMO – VISX CustomVue
- Nidek – EC5000
- Zeiss- Meditec Mel 80
- Schwind-Amaris-1050
- Zeiss-Smile

Alcon Refractive Surgery Suite

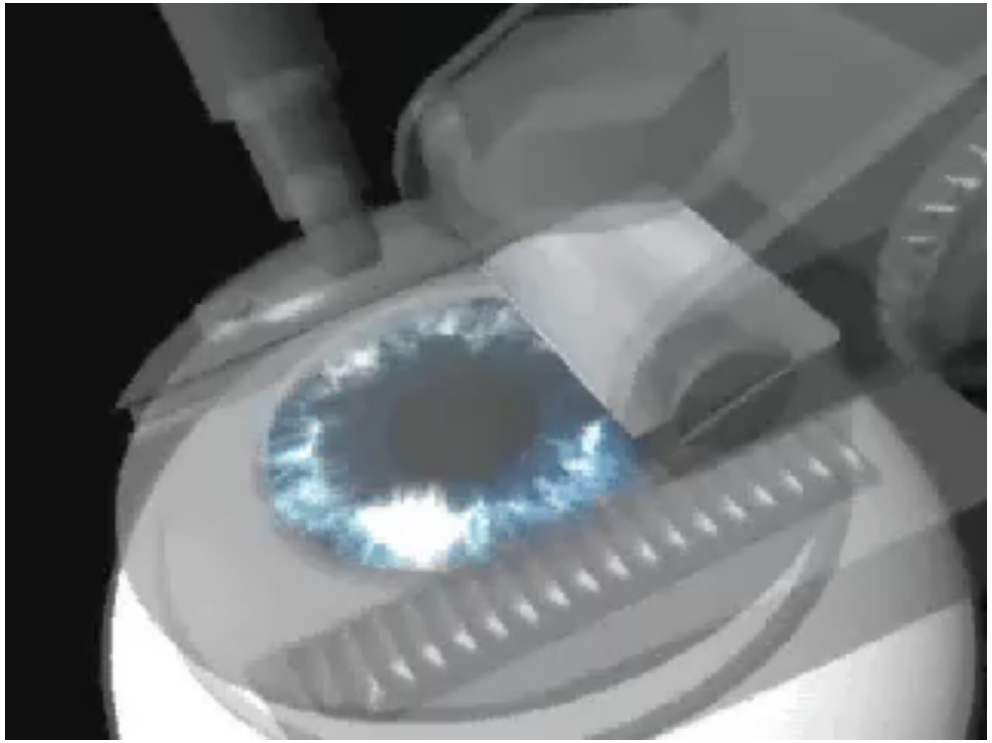
CustomVue Platform

Registration



Mechanical Microkeratome

Still used in close to 30% of cases. I abandoned this technology in 2002 and never looked back.



-Kezirian G.K., Stonecipher, K.G. Comparison of the Intralase femtosecond laser and mechanical keratomes for LASIK. *J. Cataract and Refractive Surg*. 30(4): 803-810, 2004
-Kezirian G. K., Stonecipher, K. G. Subjective Assessment of Mesopic Visual Function after LASIK. *Opthalmology Clinics of North America:* 2004
-Stonecipher K.G., Ignacio T.I., Stonecipher, MN Advances in Refractive Surgery: Microkeratome and femtosecond laser flap creation in relation to safety, efficacy, predictability, and biomechanical stability. *Current Medical Opinion*, 2006
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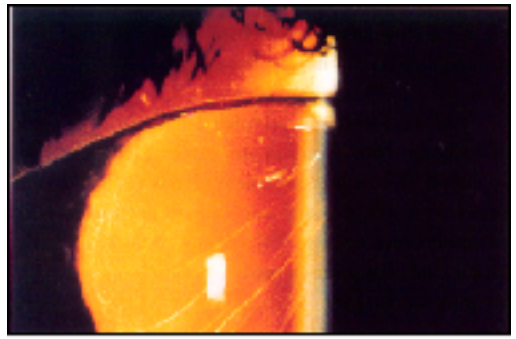
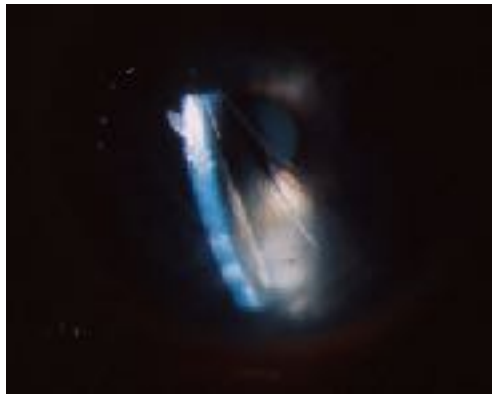
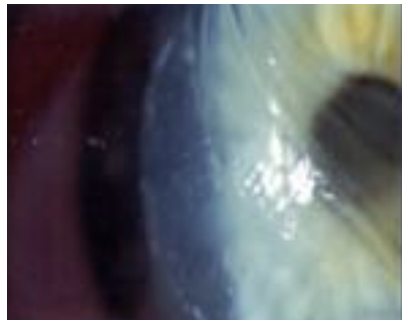
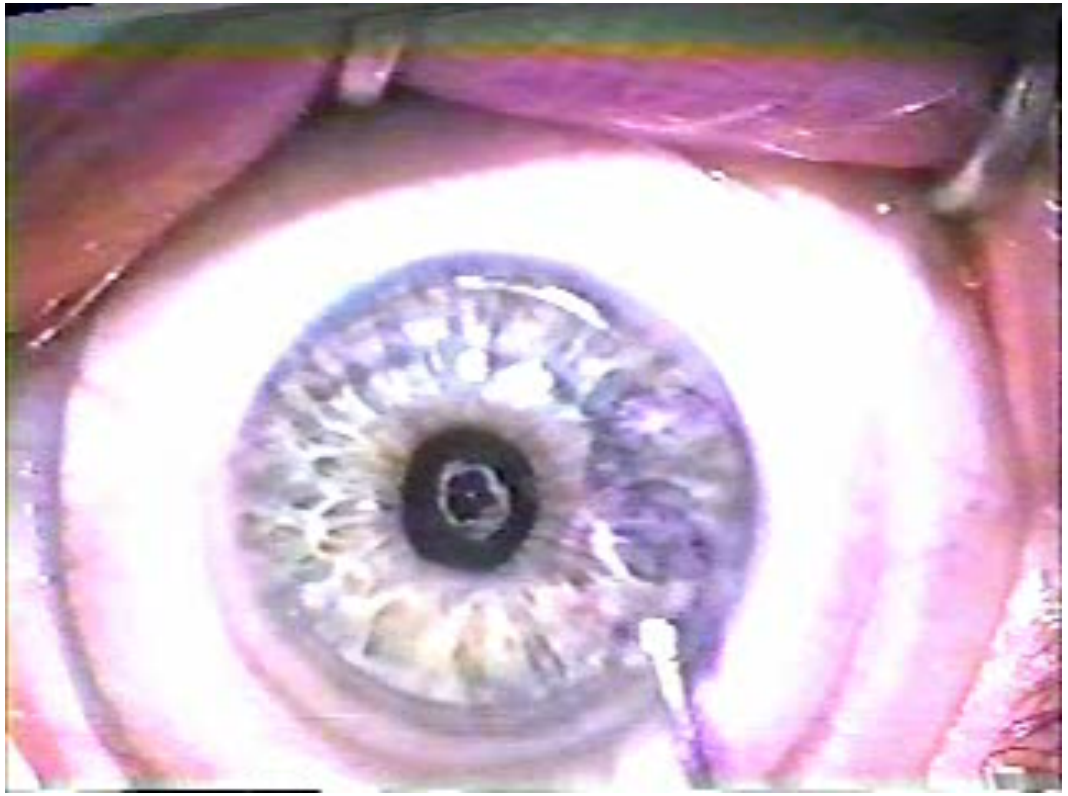
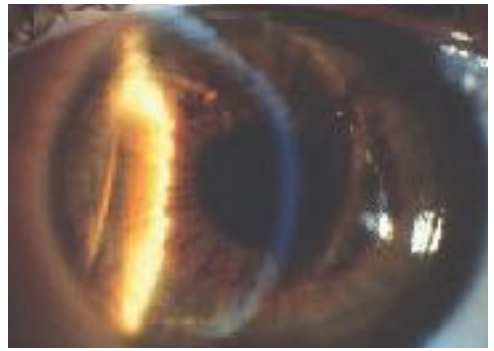
I REDUCED MY COMPLICATION DRAMATICALLY BY GOING TO FS LASER ONLY FLAPS

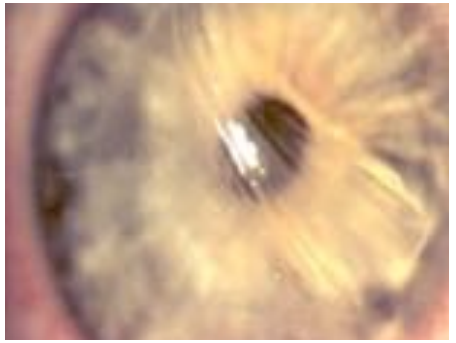












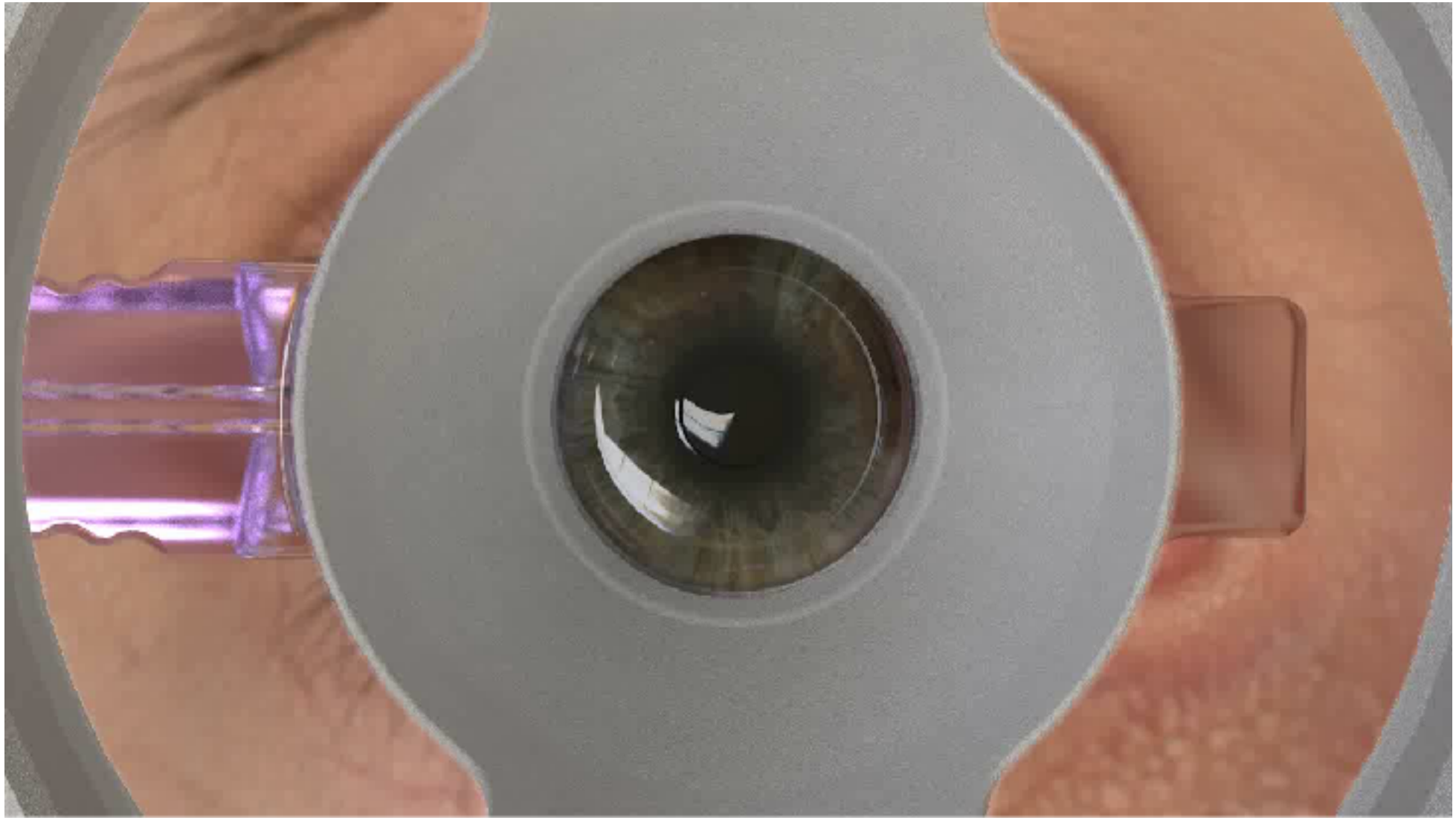
“…The way I see it, if you want to see the rainbow you have to deal with the rain.”
Dolly Parton

NOT REALLY!

Femtosecond Lasers

- Intralase
  - ➢ iFS
- Ziemer
  - ➢ LDV
- Femtec
  - ➢ 2010 Perfect Vision
- Zeiss
  - ➢ VisuMax
- Technolas
  - ➢ Victus

Femtosecond LASIK Flap



Intralase iFS

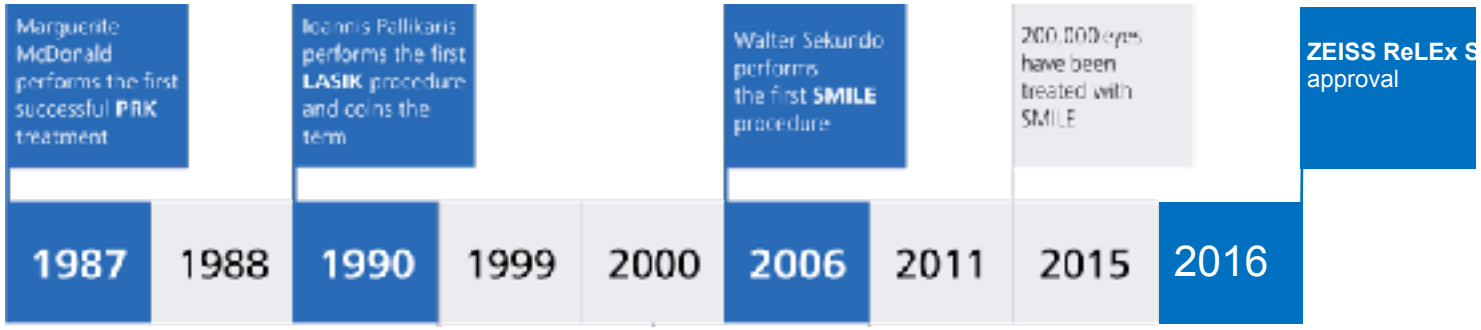
A flap is a flap and that's that SOMEWHAT……

SO DO WE ONLY SMILE?

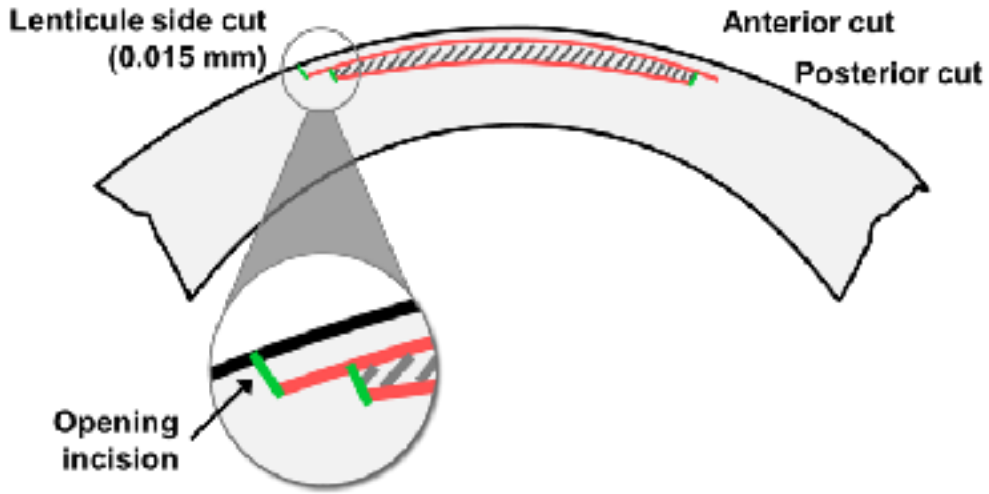
U.S. LVC Market
Impact of ReLEx SMILE

ZEISS ReLEx® SMILE will (hopefully!) grow LVC market

- First major innovation in U.S. LVC market in 16 years (Femto-LASIK in 2000)
- New LVC option for refractive surgeons to offer patients fearful of LASIK and those waiting for the “next thing.”
- Unlike PRK and LASIK, SMILE was developed in Europe and arrives in the U.S. as an established technology; 700,000+ procedures performed internationally to bolster physician and patient confidence.



ReLEx® SMILE
Procedure Step-by-Step



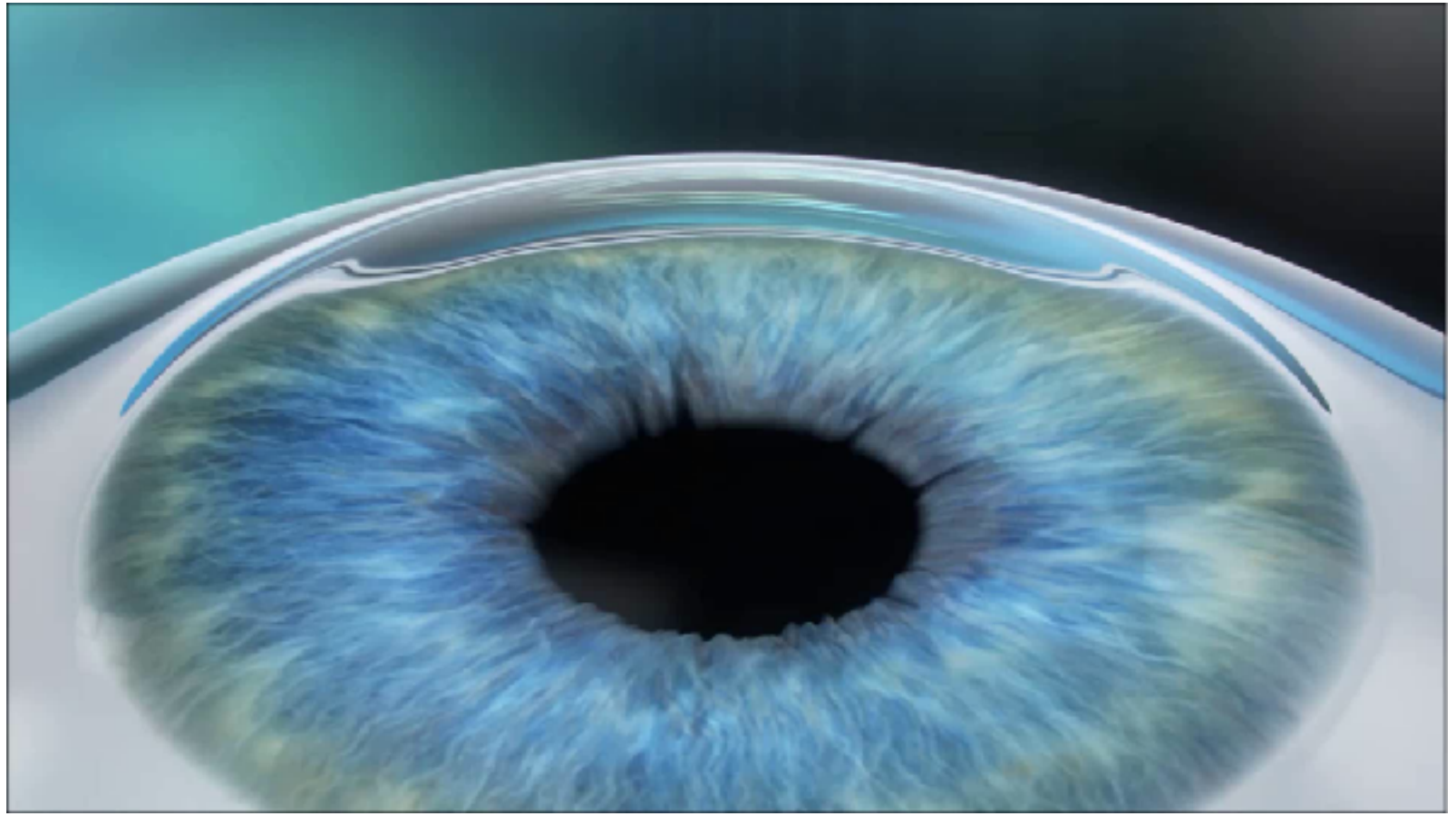
For illustrative purposes only and not to scale

Series of lamellar resections

- 1st lamellar cut defines posterior surface of lenticule
- 1st side cut defines lenticule diameter
- 2nd lamellar cut defines anterior surface of lenticule/posterior surface of attached cap
- 2nd side cut creates incision for removal of lenticule

VisuMax® Femtosecond System

ReLEx® SMILE



ReLEx® SMILE

Difference Between U.S. and O.U.S.

U.S. Indications

- Sphere: -1.00 to -8.00 D
- Cylinder: Not FDA approved.
- MRSE: -8.25 D

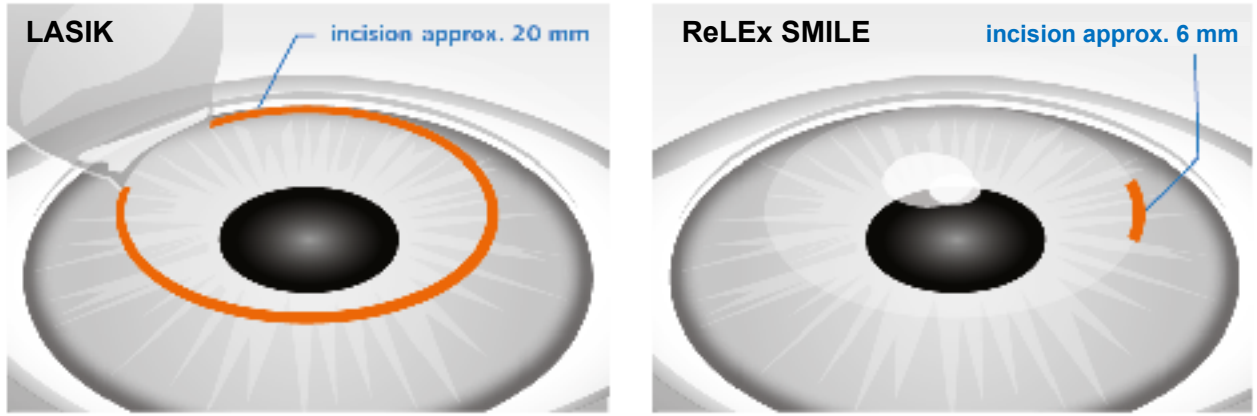
O.U.S. Indications

- Sphere: -0.50 to -10.00 D
- Cylinder: 0 to 5.00 D
- Spherical equivalent: -0.50 to -12.50 D

ReLEx® SMILE
Characteristics and Benefits

LASIK-like outcomes with a one-step, minimally-invasive procedure[1]

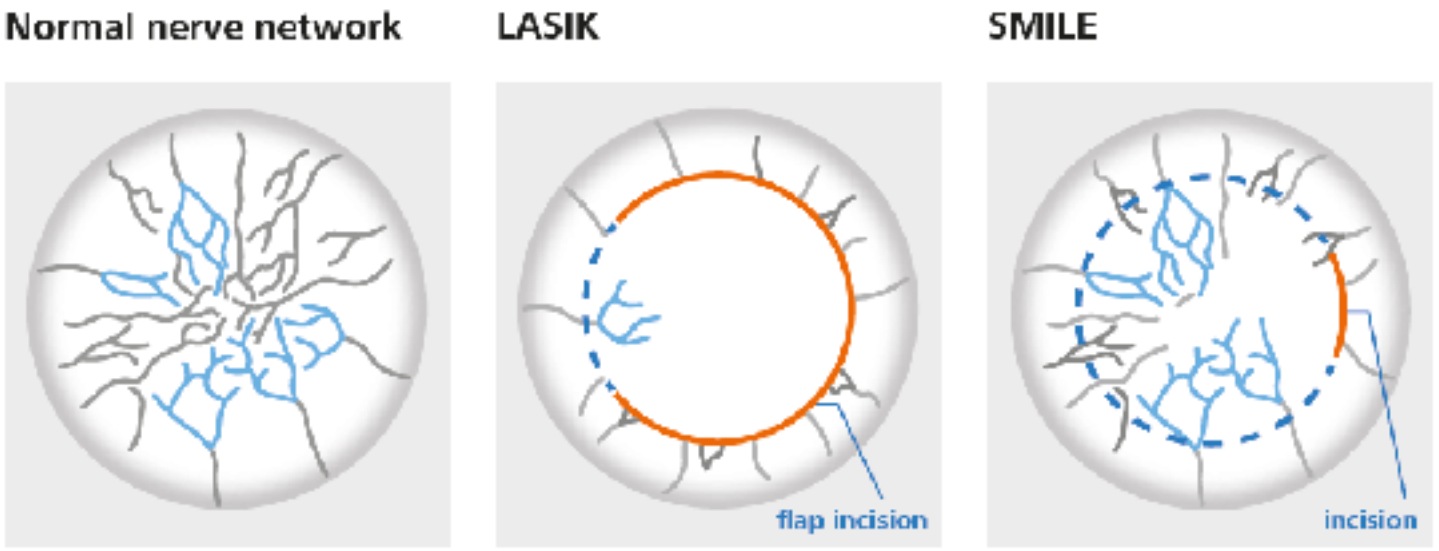
- Effectiveness and safety of procedure well received by patients (99% satisfied, 96% would have refractive surgery again).[2]
- No flap-related complications (e.g. flap detachment)
- All-femtosecond laser procedure in one step without need to move the patient



1. Comparison of visual ad refractive outcomes following femtosecond laser assisted LASIK with SMILE in patients with myopia or myopic astigmatism. Journal of Refractive Surgery 2014 Sep, Sri Ganesh, Rishika Gupta.
2. Survey conducted as part of FDA clinical study.

ReLEx® SMILE
Characteristics and Benefits

Removing tissue from deeper corneal layers result in less impact on the corneal surface and nerves and lower risk of dry eye.[1]



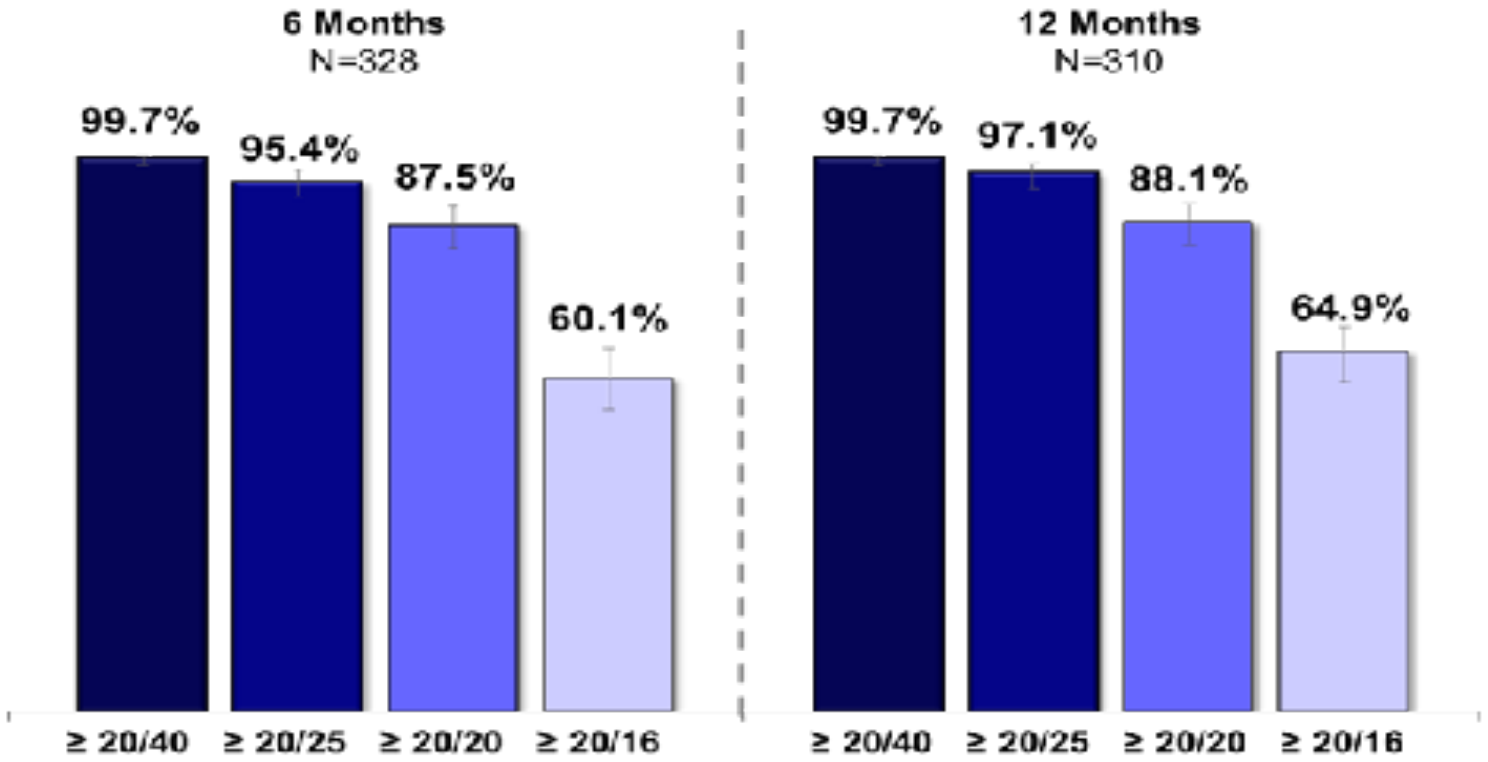
1. Dry eye disease after refractive surgery: comparative outcomes of small incision lenticule extraction versus LASIK. Ophthalmology 2015 Apr, Denoyer A, Landman E, Trinh L, Faure JF, Auclin F, Baudouin C.

ReLEx® SMILE
Characteristics and Benefits

While overall visual recovery closely parallels that of LASIK, the minimally invasive nature of SMILE may enable more rapid resumption of regular activities.

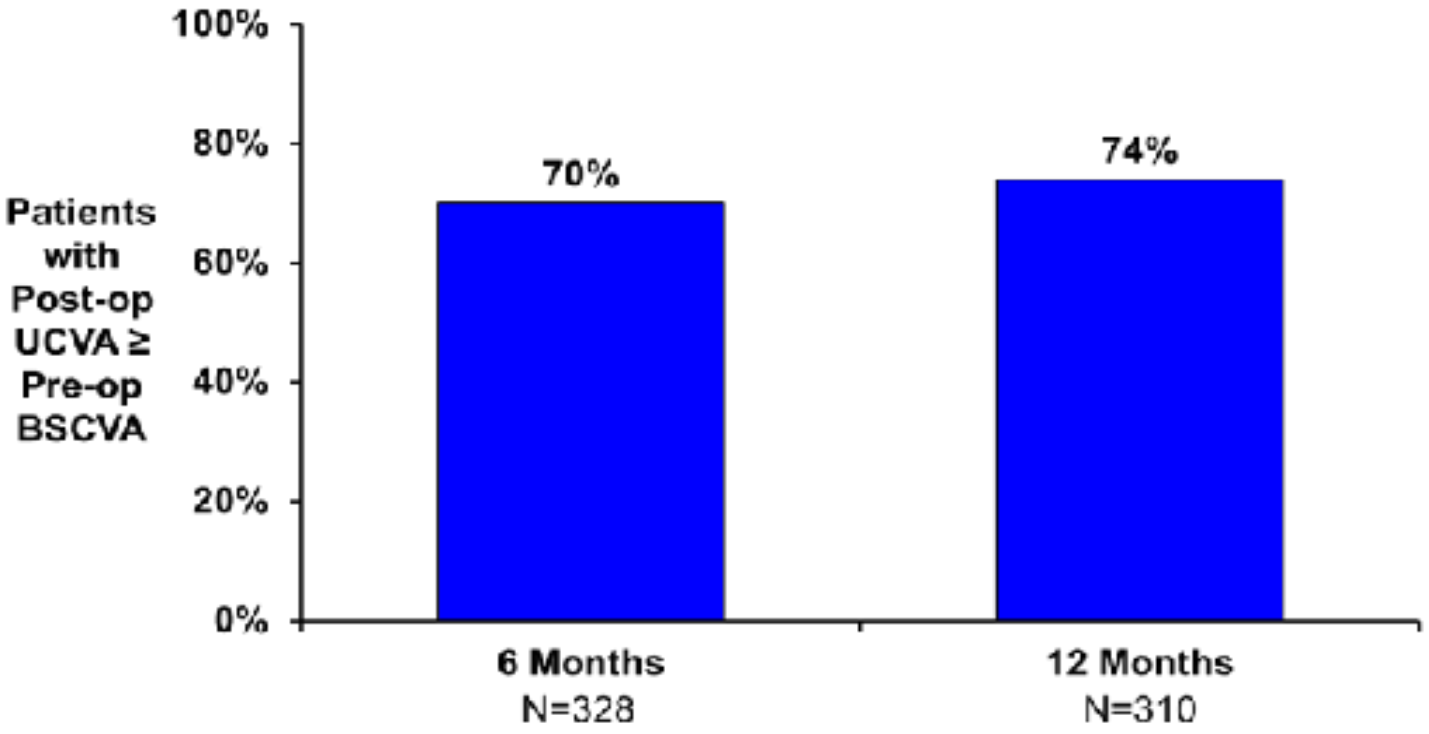
FDA Study

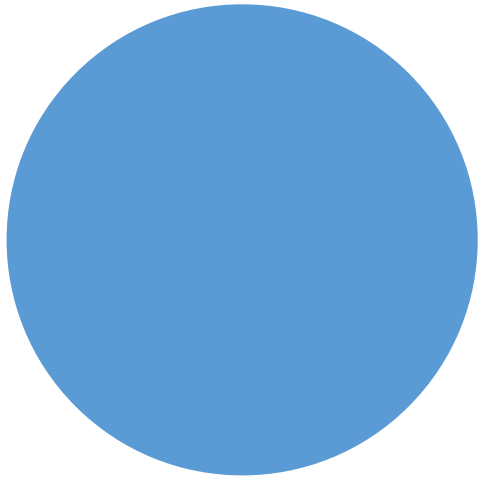
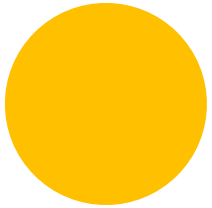
Effectiveness: Post-Operative UCVA



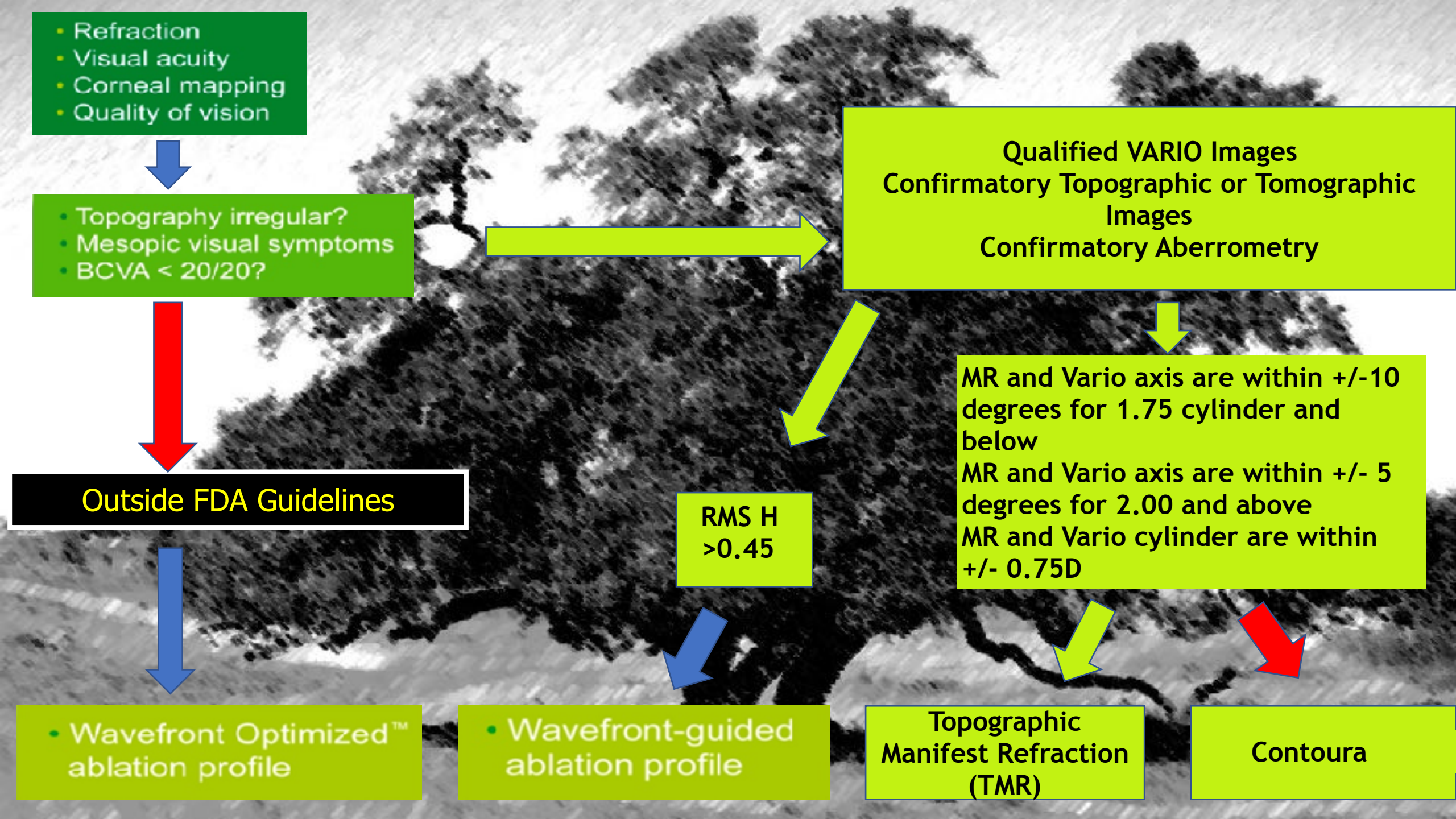
FDA Study

Patients with Post-op UCVA ≥ Pre-op BSCVA



DECISION TREES


• Refraction
• Visual acuity
• Corneal mapping
• Quality of vision
• Topography irregular?
• Mesopic visual symptoms
• BCVA < 20/20?
Outside FDA Guidelines
Qualified VARIO Images
Confirmatory Topographic or Tomographic Images
Confirmatory Aberrometry
MR and Vario axis are within +/-10 degrees for 1.75 cylinder and below
MR and Vario axis are within +/- 5 degrees for 2.00 and above
MR and Vario cylinder are within +/- 0.75D
RMS H >0.45
• Wavefront Optimized™ ablation profile
• Wavefront-guided ablation profile
Topographic Manifest Refraction (TMR)
Contoura

ON LABEL US CONTOURA

Reduction or elimination of up to -9.00 D of spherical equivalent myopia or myopia with astigmatism

With up to -8.00 D of spherical component & up to -3.00 D of astigmatic component at the spectacle plane

In patients age 18+ with stable manifest refraction (0.5 D or less of preoperative spherical equivalent shift over one year prior to surgery)

In eyes without previous refractive surgery, keratoconus, forme fruste keratoconus, or any other topographic abnormality

SUMMARY OF PEARLS

Similar and consistent K readings and axis

Similar Q Values (not necessary to change)

Similar pupil size

MR and Vario axis are within +/-10 degrees for 1.74 cylinder and below

MR and Vario axis are within +/- 5 degrees for 1.75 and above

MR and Vario cylinder are within +/- 0.75D

OUTCOMES

THE US FDA TCAT STUDY

ARTICLE

Results of topography-guided laser in situ keratomileusis custom ablation treatment with a refractive excimer laser

R. Doyle Stulting, MD, PhD, Barbara S. Fant, PharmD, the T-CAT Study Group

PURPOSE: To evaluate the safety and effectiveness of topography-guided custom ablation treatment (T-CAT) to correct myopia and myopic astigmatism with laser in situ keratomileusis (LASIK).

SETTING: Nine clinical sites in the USA.

DESIGN: Prospective observational nonrandomized unmasked study.

METHODS: The study comprised patients aged 18 to 65 years old with myopia or myopic astigmatism with a manifest refraction spherical equivalent (MRSE) up to −9.0 diopters (D) and astigmatism of 6.0 D or less. Patients with previous refractive surgery or abnormal topography were excluded. Corneal topographies were obtained using the Allegro Topolyzer, and laser treatment was delivered with the Allegretto *Wave* Eye-Q excimer laser system. Visual outcomes were evaluated postoperatively at 1 day, 1 week, and 1, 3, 6, 9, and 12 months.

RESULTS: The clinical trial enrolled 212 patients (249 eyes). The T-CAT procedure significantly reduced the MRSE and cylinder, with stability of outcomes evident from 3 to 12 months after surgery. Compared with the preoperative corrected distance visual acuity (CDVA), the postoperative uncorrected distance visual acuity (UDVA) improved by 1 line or more in 30% of eyes and the postoperative UDVA was at least as good as the preoperative CDVA in 90% of eyes. Most visual symptoms improved after T-CAT. There were no significant treatment-related adverse events or loss of vision.

CONCLUSION: The T-CAT procedure performed with the diagnostic device and the refractive excimer laser system safely and effectively achieved predictable refractive outcomes and reduced visual symptoms with stable results through 12 months.

Financial Disclosure: Dr. Stulting is a paid consultant to Alcon Laboratories, Inc., and was a medical monitor for the U.S. Food and Drug Administration (FDA) clinical trial. Dr. Fant is president of Clinical Research Consultants, Inc. (CRC), the clinical and regulatory consulting group that sponsored the FDA clinical trial. Dr. Fant and CRC were supported by Alcon Laboratories, Inc.

J Cataract Refract Surg 2016; 42:11–18 © *2016 ASCRS and ESCRS*

Supplemental material available at www.jcrsjournal.org.

THE EMERGENCE OF TOPOGRAPHY-GUIDED LASIK

Developed to correct higher-order aberrations based on corneal topography

Provides an alternative to the correction of higher-order refractive errors based on aberrometry

- Not dependent upon pupil size
- Can be measured reproducibly
- Unaffected by lenticular opacities and vitreous opacities
- Accurately measures peripheral corneal irregularities, which are responsible for many visual complaints

IMPACT ON PATIENTS[1]

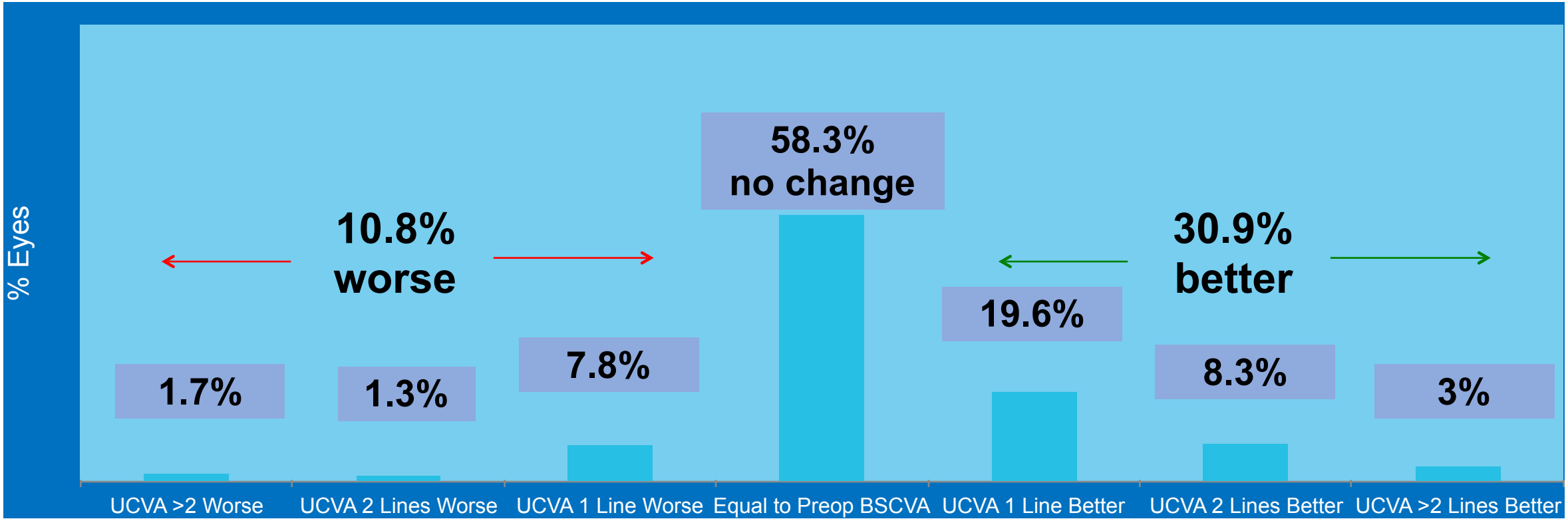
At 12 months, without correction, Contoura™ Vision patients, experienced the following results:

- **34.4% could see 20/12.5 or better**
- **64.8% could see 20/16 or better**
- **92.6% could see 20/20 or better**

1.Results from FDA T-CAT-001 clinical study for topography-guided vision correction (with the 400 Hz ALLEGRETTO WAVE® Eye-Q Excimer Laser).

IMPACT ON PATIENTS: BEST CORRECTED VA

Postop UCVA Better Than Or Equal to Preop BSCVA In 89% of Eyes[1*]



Postop UCVA Compared to Preop BSCVA at 12 mo. (n=230)

*Results from FDA T-CAT-001 clinical study for topography-guided vision correction (with the 400 Hz ALLEGRETTO WAVE® Eye-Q Excimer Laser).. Post hoc analysis of postoperative UCVA compared to preoperative BSCVA of 230 eyes contained in the FDA T-CAT pivotal trial at 12 months. The primary end point evaluated changes in BSCVA

IMPACT ON PATIENTS: VISUAL SYMPTOMS

Post-op symptoms at 12 months vs. baseline[1]:

Light sensitivity	**5.2% decrease**
Difficulty driving at night	**8.0% decrease**
Reading difficulty	**8.7% decrease**
Complaints of glare	**4.8% decrease**

1. **Results from FDA T-CAT-001 clinical study for topography-guided vision correction (with the 400 Hz ALLEGRETTO WAVE® Eye-Q Excimer Laser).**

SO WE DECIDED TO LOOK AT IT

PROSPECTIVE SINGLE SURGEON SINGLE SITE STUDY OF LASIK POD 1 UCVA SINGLE VS BILATERAL (N-717)

NEW DATA

Clinical Ophthalmology

Dovepress

open access to scientific and medical research

Open Access Full Text Article

ORIGINAL RESEARCH

Topography-modified refraction (TMR): adjustment of treated cylinder amount and axis to the topography versus standard clinical refraction in myopic topography-guided LASIK

Anastasios John Kanellopoulos[1,2]

[1]LaserVision Clinical and Research Institute, Athens, Greece; [2]Department of Ophthalmology, NYU Medical School, New York, NY, USA

Purpose: To evaluate the safety, efficacy, and contralateral eye comparison of topography-guided myopic LASIK with two different refraction treatment strategies.

Setting: Private clinical ophthalmology practice.

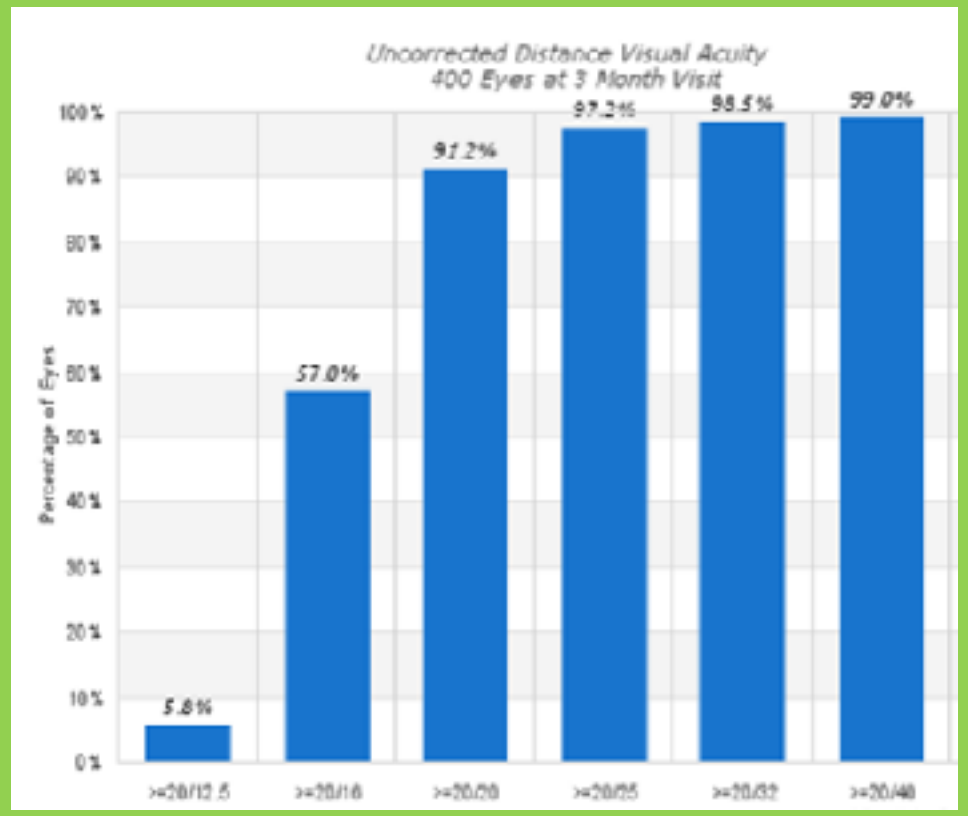
Patients and methods: A total of 100 eyes (50 patients) in consecutive cases of myopic topography-guided LASIK procedures with the same refractive platform (FS200 femtosecond and EX500 excimer lasers) were randomized for treatment as follows: one eye with the standard clinical refraction (group A) and the contralateral eye with the topographic astigmatic power and axis (topography-modified treatment refraction; group B). All cases were evaluated pre- and post-operatively for the following parameters: refractive error, best corrected distance visual acuity (CDVA), uncorrected distance visual acuity (UDVA), topography (Placido-disk based) and tomography (Scheimpflug-image based), wavefront analysis, pupillometry, and contrast sensitivity. Follow-up visits were conducted for at least 12 months.

Results: Mean refractive error was −5.5 D of myopia and −1.75 D of astigmatism. In group A versus group B, respectively, the average UDVA improved from 20/200 to 20/20 versus 20/16; post-operative CDVA was 20/20 and 20/13.5; 1 line of vision gained was 27.8% and 55.6%; and 2 lines of vision gained was 5.6% and 11.1%. In group A, 27.8% of eyes had over −0.50 diopters of residual refractive astigmatism, in comparison to 11.7% in group B ($P<0.01$). The residual percentages in both groups were measured with refractive astigmatism of more than −0.5 diopters.

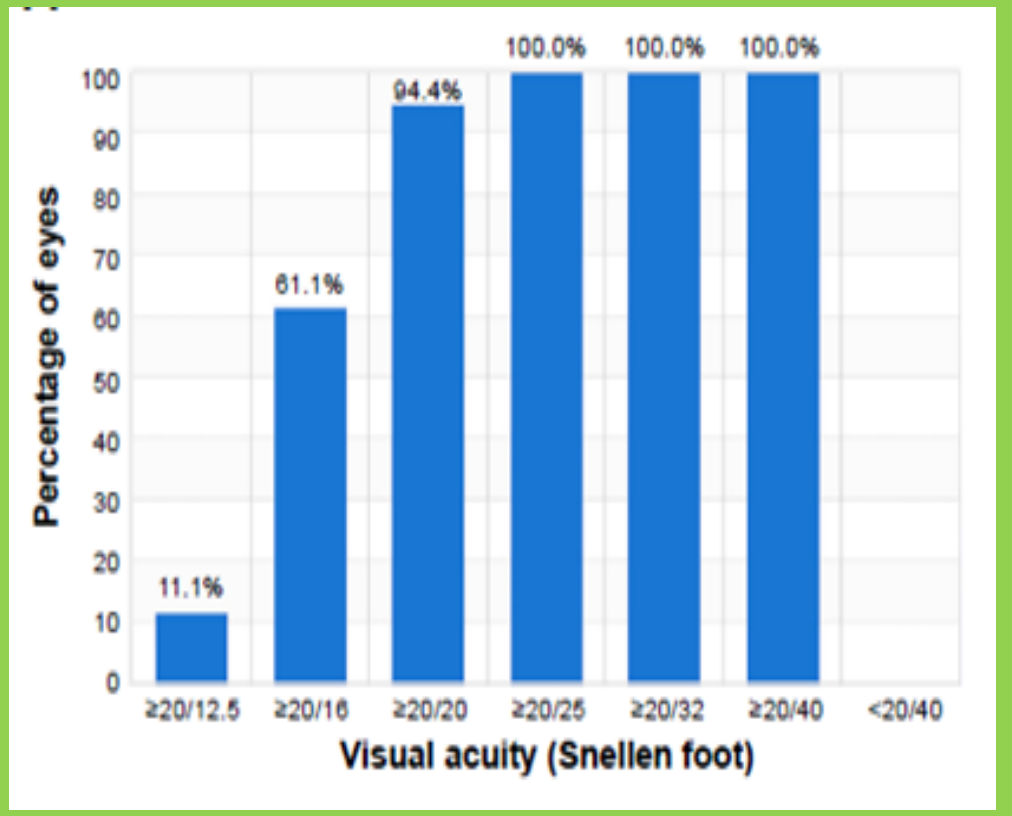
Conclusion: Topography-modified refraction (TMR): topographic adjustment of the amount and axis of astigmatism treated, when different from the clinical refraction, may offer superior outcomes in topography-guided myopic LASIK. These findings may change the current clinical paradigm of the optimal subjective refraction utilized in laser vision correction.

Comparison of Results

Stonecipher-WFO MR



Kanellopoulos-Contoura TMR



Comparison with IBRA Reference Database

Selection

Cases: user

Keys: p: c: d: t:

Method: LASIK

Intervention: first

Date OP from: to:

Date Birth from: to:

IOL:

Laser: WaveLight EX500

Preoperative Parameters:

SE from: -8 to: 0

Cyl from: -3 to: 3

Visit: 3m

Start Analysis

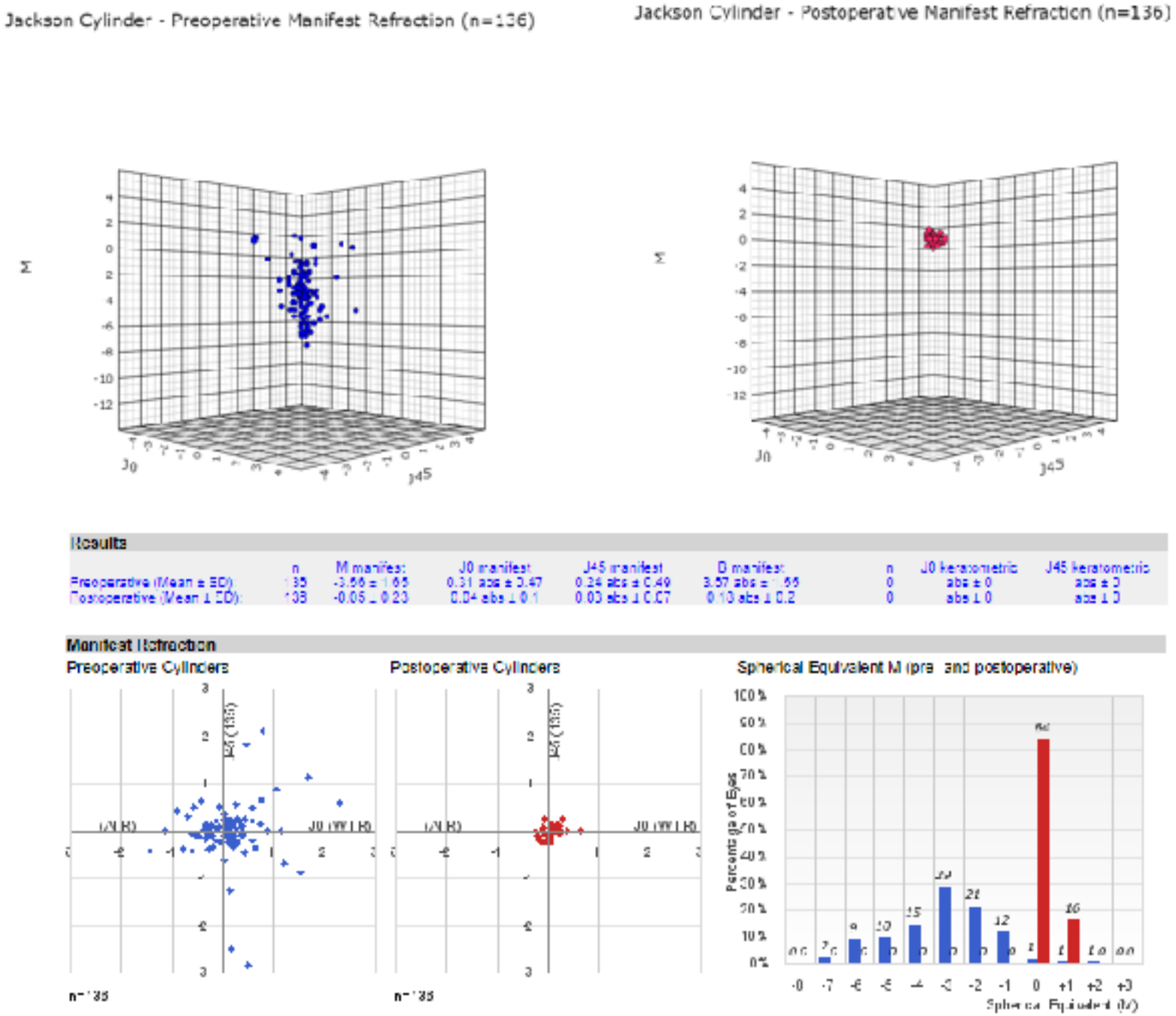
Results

Parameter	User	Reference	Red/Green = Significantly worse/better outcome	Significance
UDVA mean ± SD in LogMAR	-0.03 ± 0.06	-0.01 ± 0.09	0.001 0.01 0.1 0 0.1 0.01 0.001	U-test p=0.001
UDVA ≥ 20/20	96.62 %	88.61 %	0.001 0.01 0.1 0 0.1 0.01 0.001	Chi2 p=0.0022
CDVA gain of ≥ 1 Line	14.81 %	27.32 %	0.001 0.01 0.1 0 0.1 0.01 0.001	Chi2 p=0.0011
CDVA loss of ≥ 1 Line	23.7 %	6.58 %	0.001 0.01 0.1 0 0.1 0.01 0.001	Chi2 p<0.0001
SE mean ± SD in D (aim=emmetropia)	-0.04 ± 0.21	-0.05 ± 0.31	0.001 0.01 0.1 0 0.1 0.01 0.001	U-test p=0.938
SE within 0.5D of emmetropia	97.76 %	93.49 %	0.001 0.01 0.1 0 0.1 0.01 0.001	Chi2 p=0.0452
SE within 1.0D of emmetropia	100 %	99.03 %	0.001 0.01 0.1 0 0.1 0.01 0.001	Chi2 p=0.2529
CYL mean ± SD in D (absolute)	+0.10 ± 0.21	+0.19 ± 0.28	0.001 0.01 0.1 0 0.1 0.01 0.001	U-test p=0.0002
CYL ≤ 0.5D	97.81 %	92.5 %	0.001 0.01 0.1 0 0.1 0.01 0.001	Chi2 p=0.0184

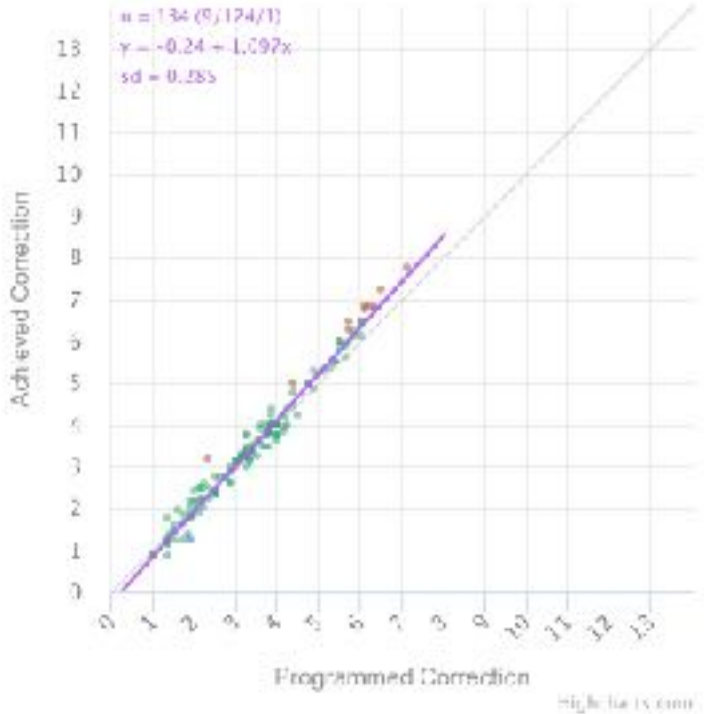
User: Karl Stonecipher, TLC Greensboro

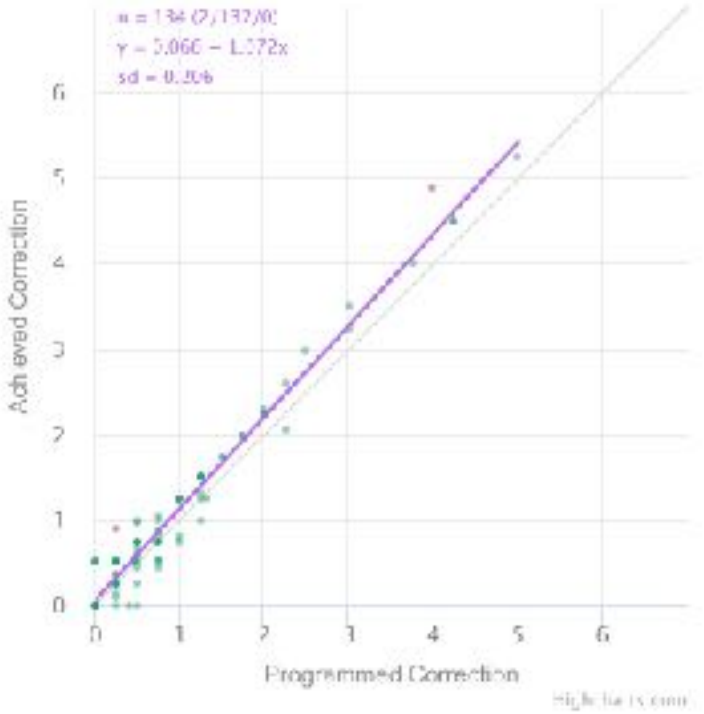
ASTIGMATISM

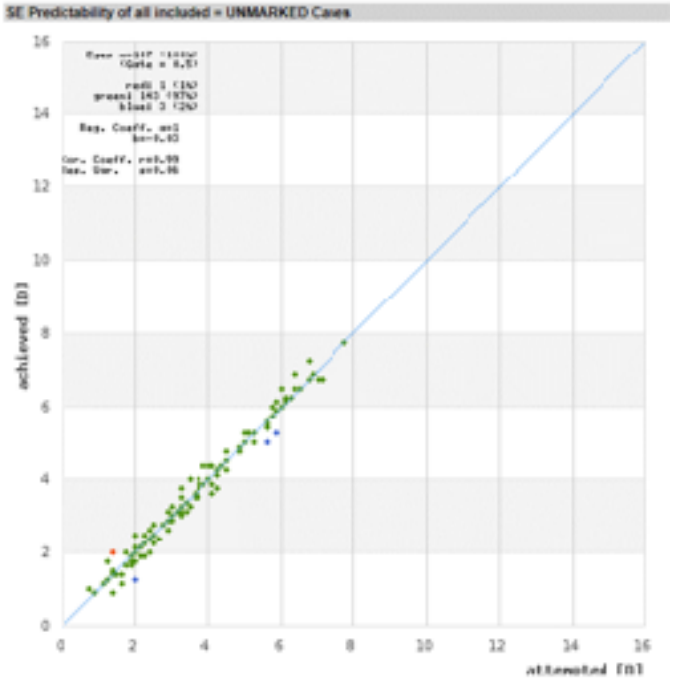
"EACH LASER IS A BIT DIFFERENT"



LOOK AT YOUR DATA AND CHECK OUT THE OUTLIERS



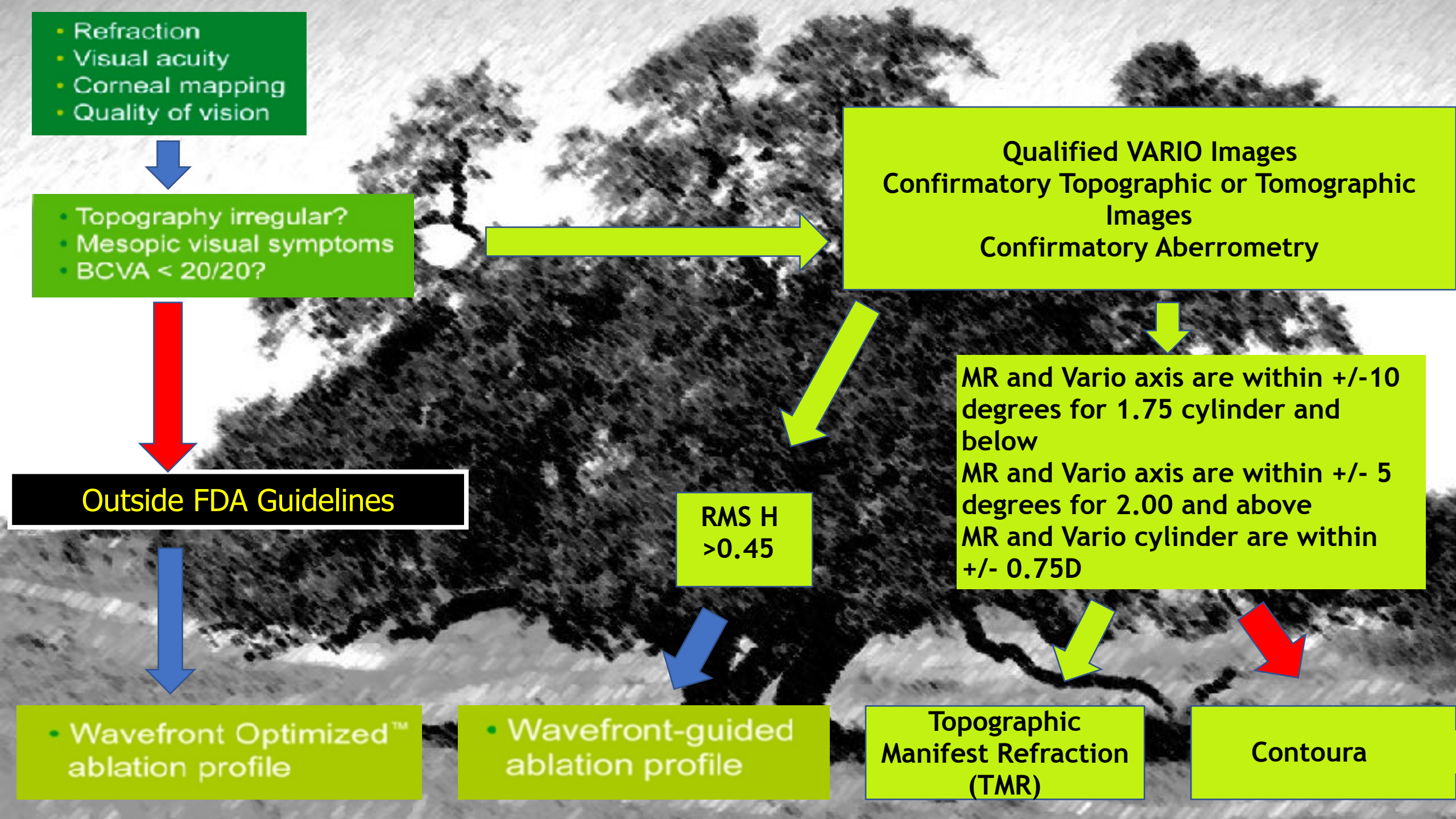




R SQUARED=.99

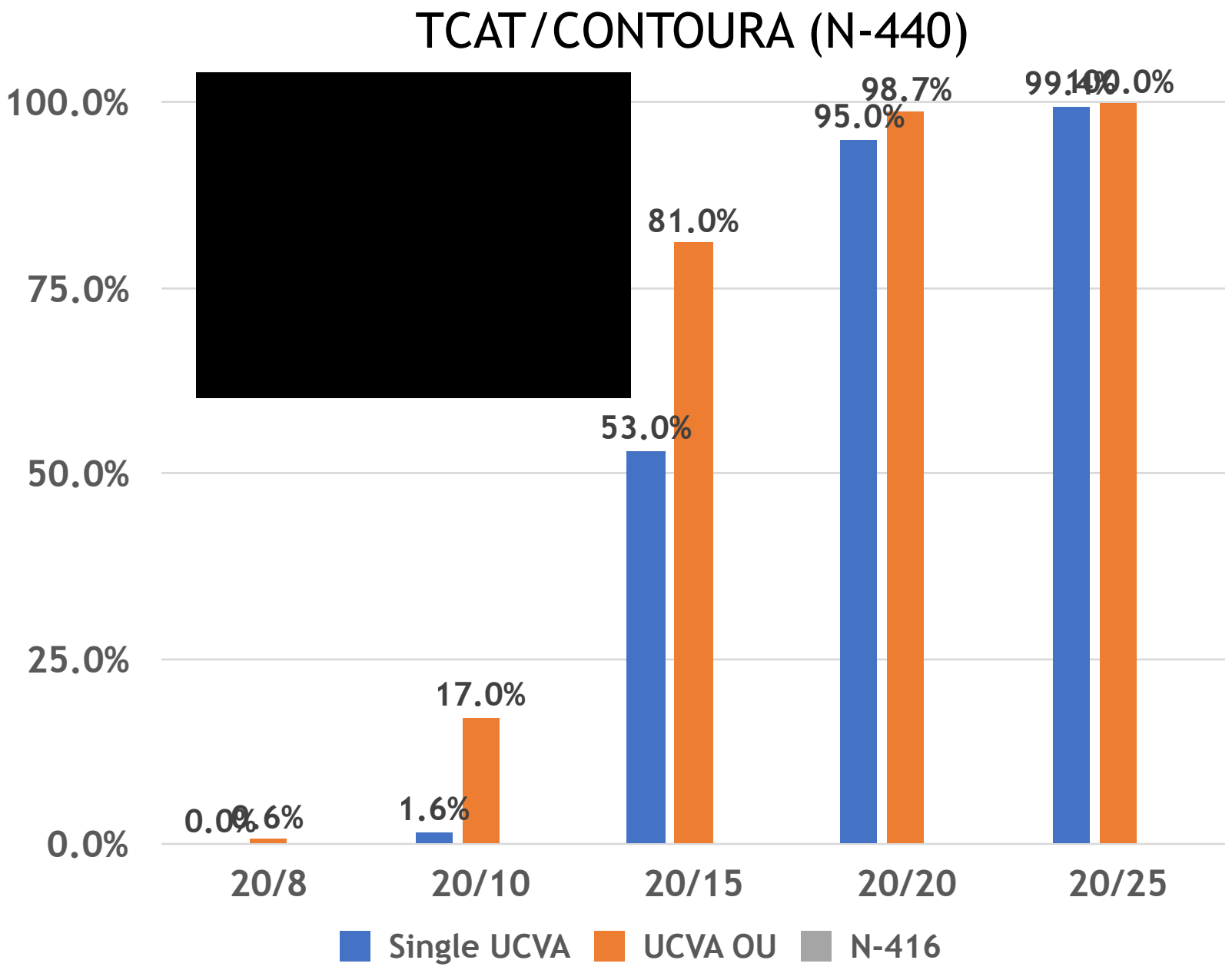
"NO BRAINERS"

- OCULAR SURFACE DISEASE
- REFRACTION. REFRACTION. REFRACTION
- NOMOGRAM. NOMOGRAM. NOMOGRAM
- ON LABEL IS THIS DISCUSSION

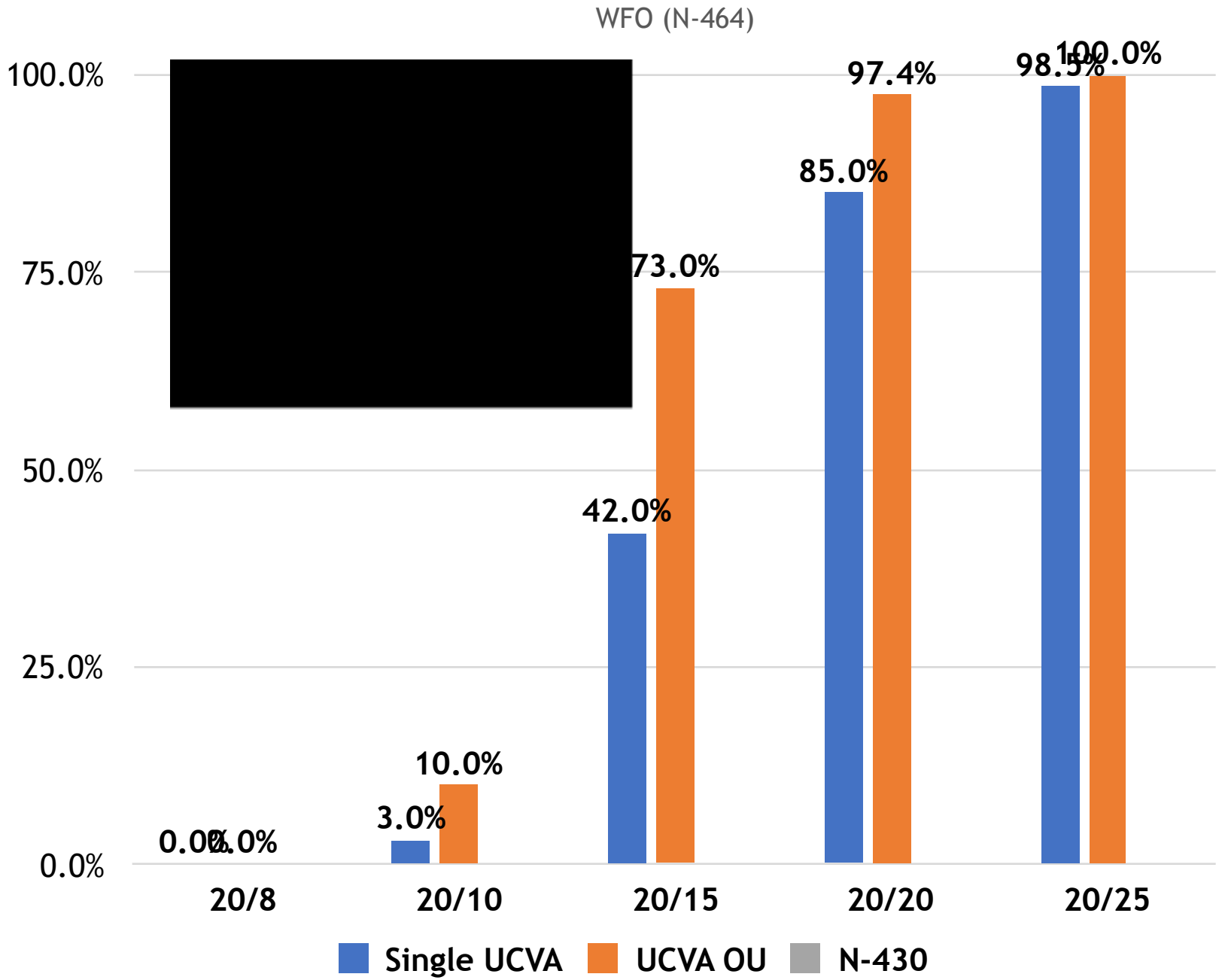

• Refraction
• Visual acuity
• Corneal mapping
• Quality of vision
• Topography irregular?
• Mesopic visual symptoms
• BCVA < 20/20?
Outside FDA Guidelines
Qualified VARIO Images
Confirmatory Topographic or Tomographic Images
Confirmatory Aberrometry
MR and Vario axis are within +/-10 degrees for 1.75 cylinder and below
MR and Vario axis are within +/- 5 degrees for 2.00 and above
MR and Vario cylinder are within +/- 0.75D
RMS H >0.45
• Wavefront Optimized™ ablation profile
• Wavefront-guided ablation profile
Topographic Manifest Refraction (TMR)
Contoura

A PERFECT RESULT……

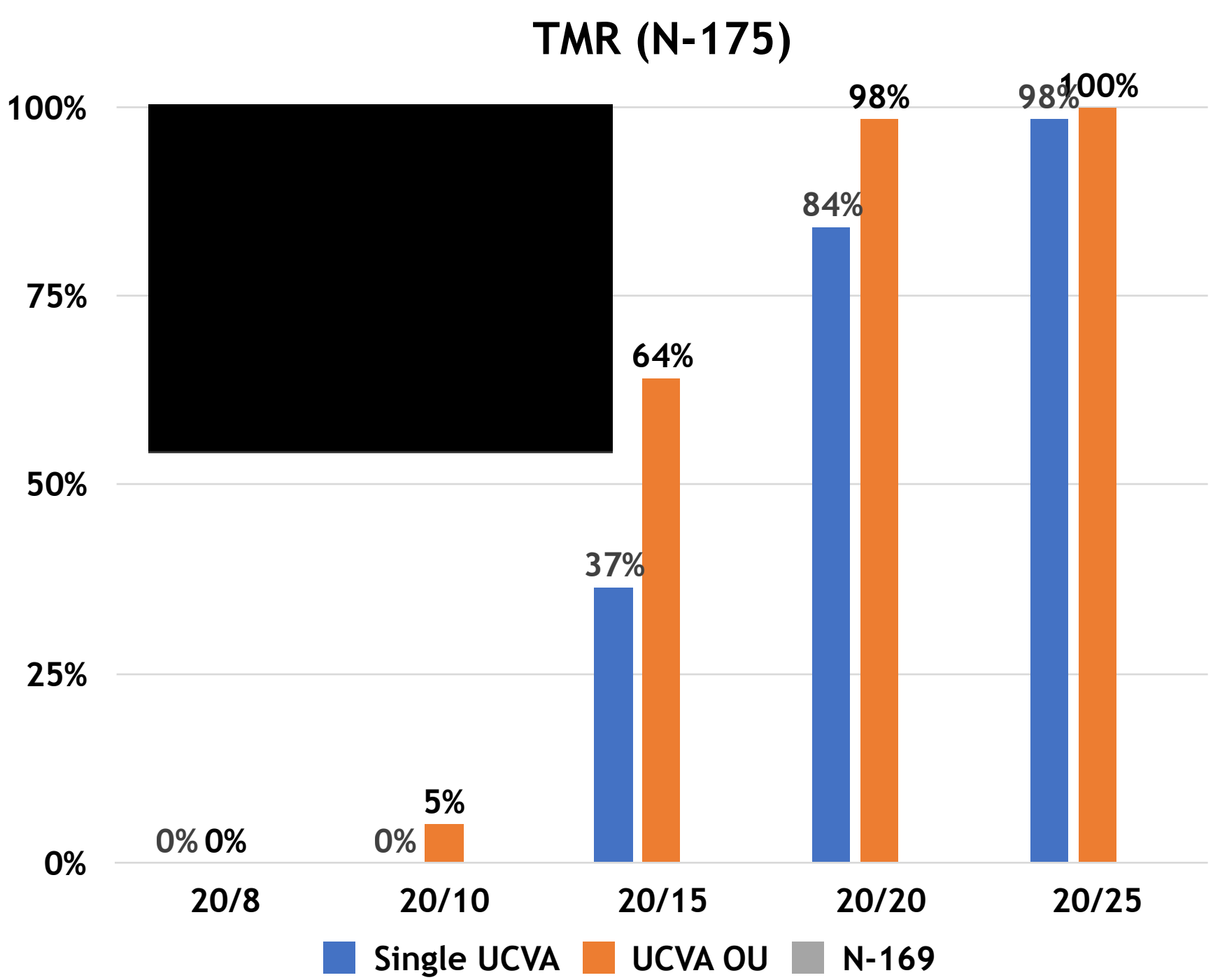
CONTOURA VISION
N-440
POD 1
SE:
-3.48+/-1.6D
CYL: 0.6+/-0.8 D



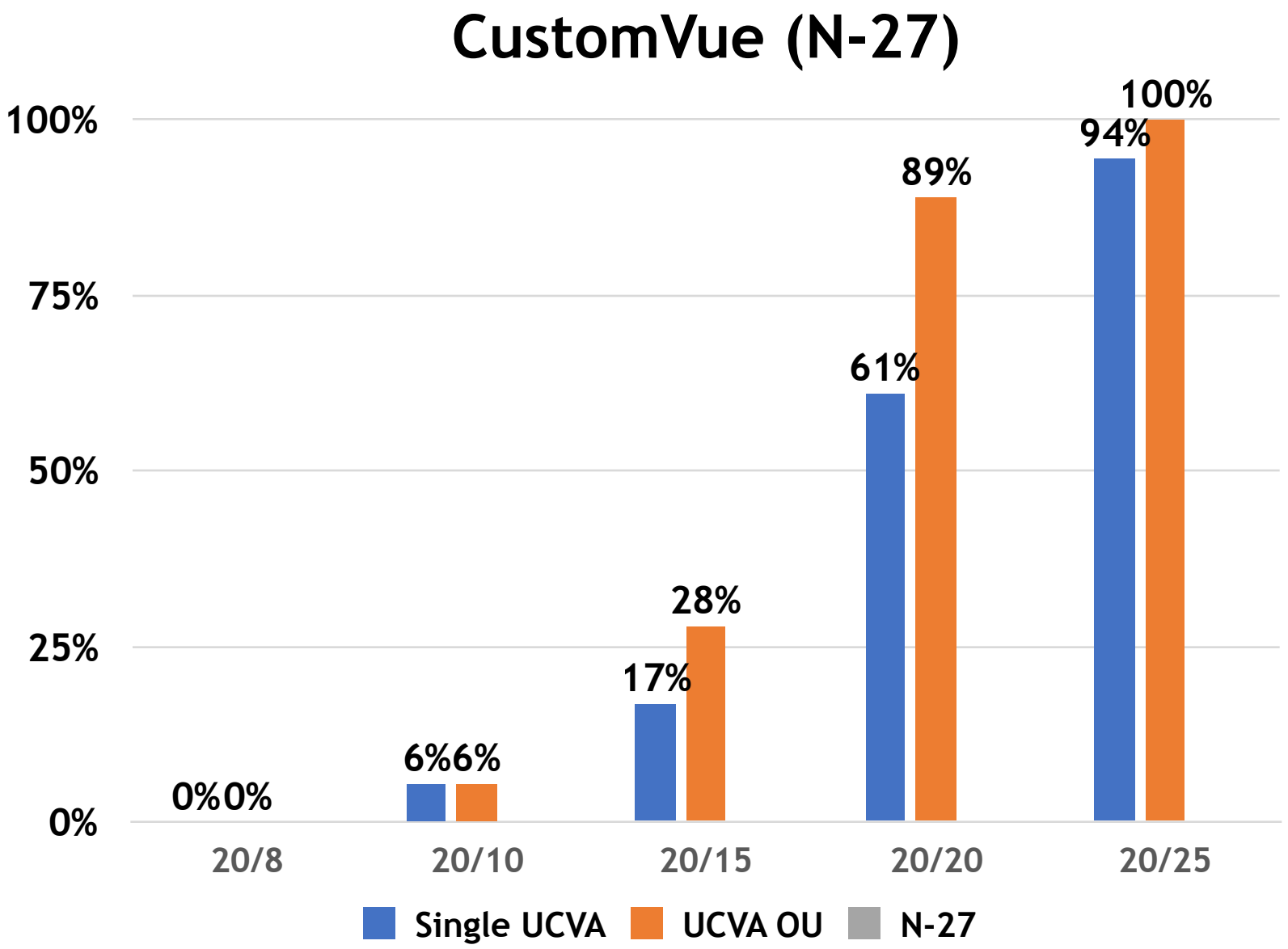
WAVEFRONT OPTIMIZED (WFO) N-464 POD 1 SE: -4.52+/-2.4D CYL: 0.9+/-0.9D



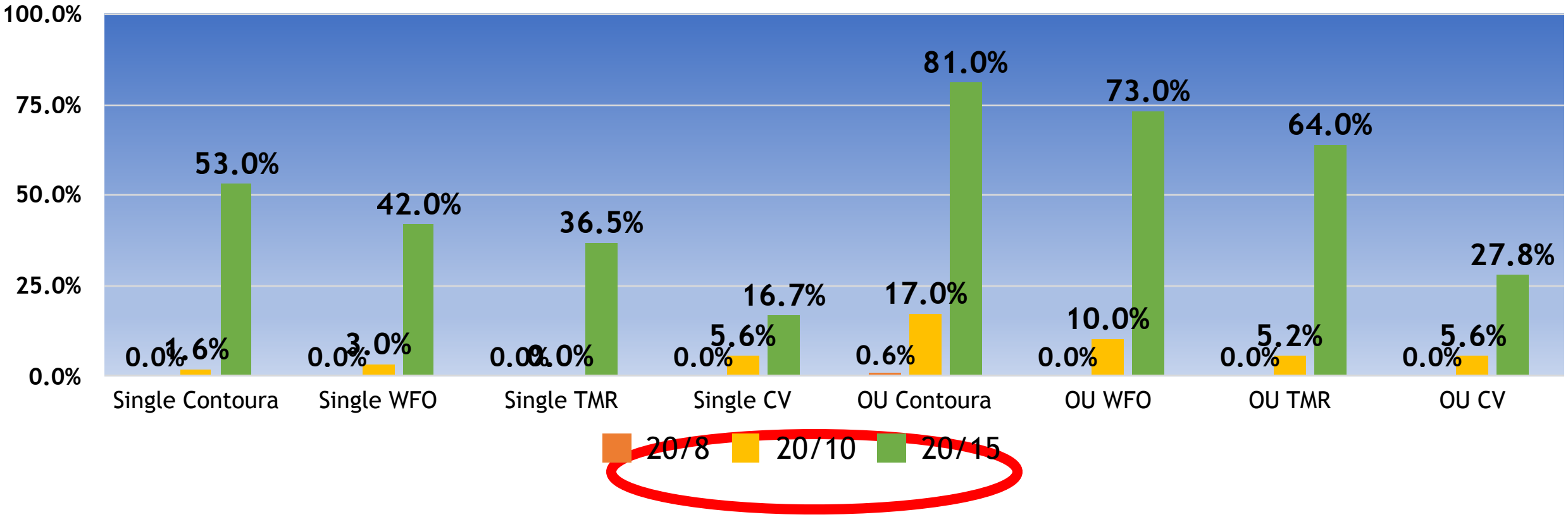
TOPOGRAPHIC MODIFIED REFRACTION (TMR)
N-175
POD 1
SE: -3.83+/-1.8D
CYL: .8+/-.7 D



CUSTOMVUE
WFG
(CV)
N-27
POD 1
SE: -3.00+/-1.8 D
CYL: 0.7+/-0.7
D
RMHS >0.4



POD 1 UCVA SINGLE V BILATERAL



COMPARISON
<20/15
N-1106
POD 1

Influences on Enhancement Rates in Laser Vision Correction

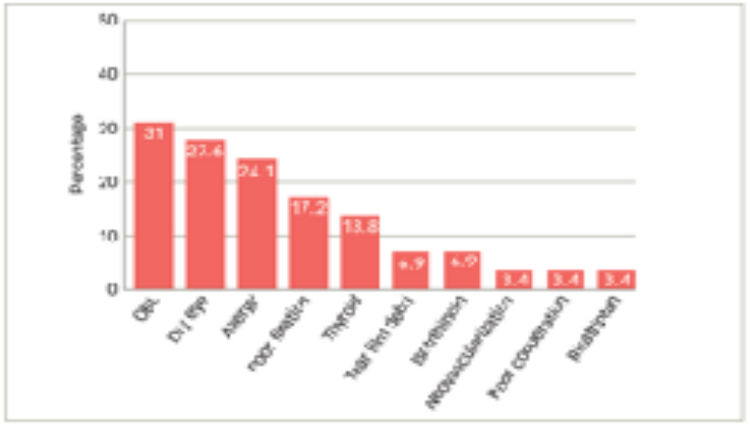
Megan Stonecipher and Karl Stonecipher

University of North Carolina at Chapel Hill, North Carolina, US

US Ophthalmic Review 9(2): 2-4,2016

Introduction: The design of the study was to look consecutively at what are the prime influences on enhancements in laser vision correction related to the perioperative environment. Methods: A prospective consecutive series of 4,079 cases was reviewed from a single surgeon at a single surgical site. Patients were followed prospectively and were only included after at least 2 years of postoperative follow-up. Results: The series ranged in primary treatments of spherical equivalents (SE) from 0 to -12 diopters (D) with up to 4 D of cylinder. The preoperative average SE was -4.59±2.79 D and the cylinder average was -0.90±0.90 D. Uncorrected visual acuity (UCVA) prior to the enhancement was 0.63±0.23 (20/32) and post-enhancement was 0.99±0.20 (20/20). The top four influences on enhancements were presence of an opaque bubble layer (31.00%); dry eye disease (27.60%); history of ocular allergy (24.10%); and poor fixation (17.10%). Patients could have more than one of the above influences. Conclusions: Laser platforms, outcomes analysis, nomograms, and other influences will be discussed to help produce enhancement rates below 1.00% which for this series was 0.71% overall.

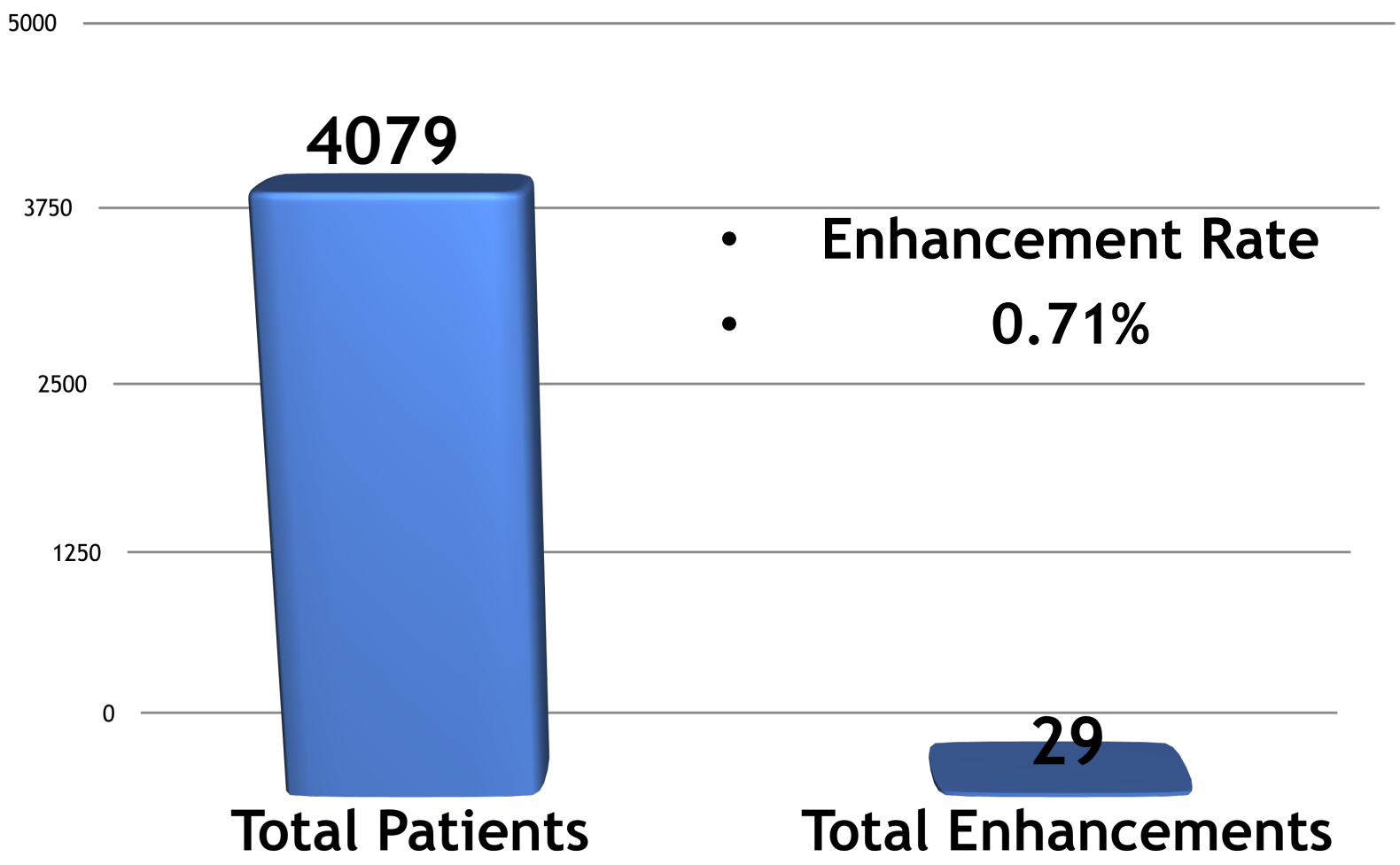
Figure 4 Major and minor influences on patients receiving enhancements, with several patients having multiple influences



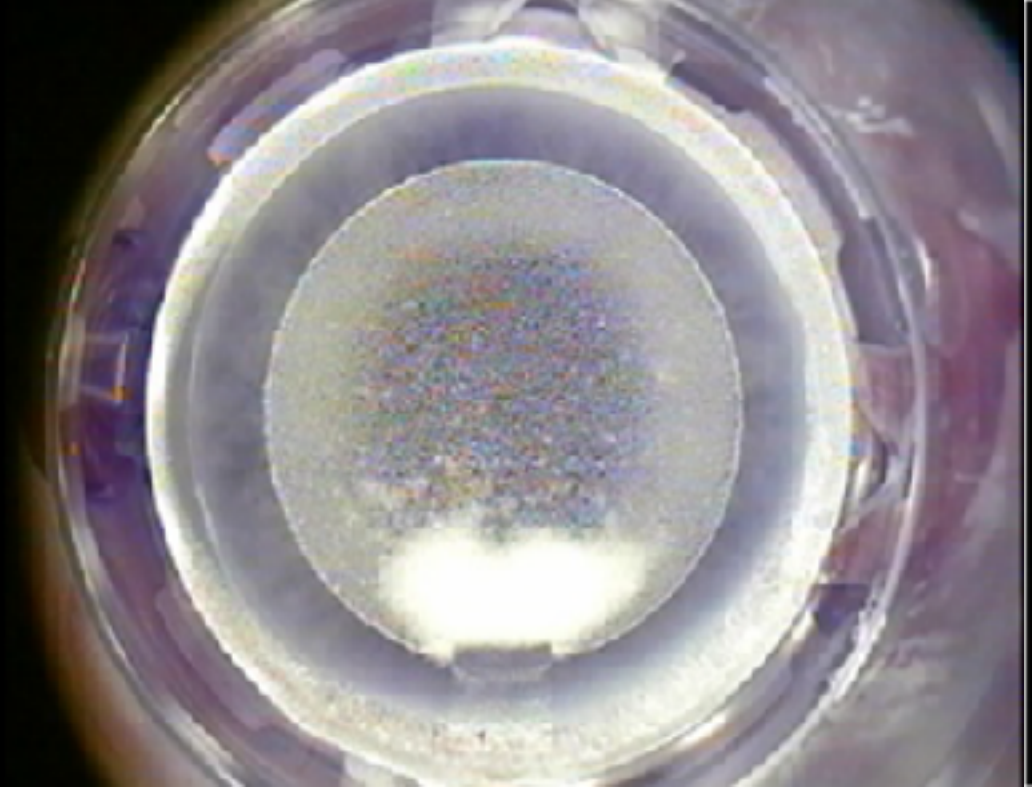
OBL – opaque bubble layer

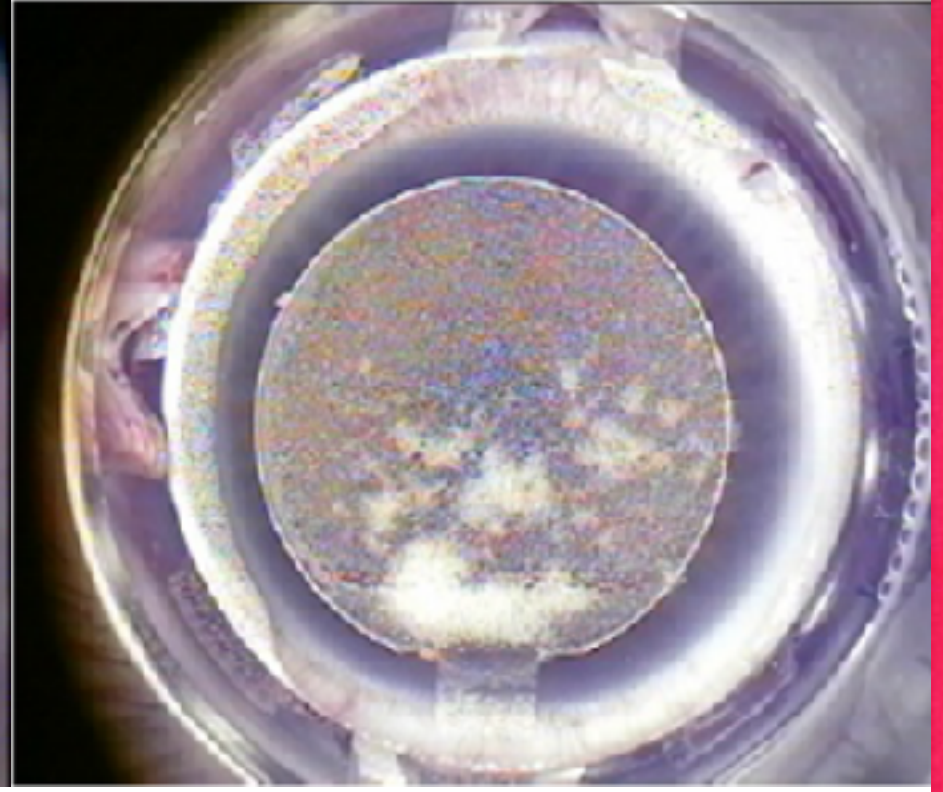
Treatment Group

Sphere up to -12 D
Cylinder up to 4 D



Stonecipher M, Stonecipher K. Influences on Enhancement Rates in Laser Vision Correction. *US Ophthalmic Review* 9(2): 2-4,2016





- I WAIT. YOU CAN WAIT AS WELL. IT MATTERS.

OCT Study of the Femtosecond Laser Opaque Bubble Layer

Gustavo K. Marino, MD; Marcony R. Santhiago, MD, PhD; Steven E. Wilson, MD

- **Journal of Refractive Surgery**
- January 2017 - Volume 33 · Issue 1: 18-22

CONCLUSIONS: The excimer laser ablation of a stroma with OBL may be different from that of a stroma without OBL. **Management of OBL when it occurs due to flap production, including allowing the bubble to dissipate when they overlie the pupil, is important to obtain the best outcomes with femtosecond laser-assisted LASIK**.
[*J Refract Surg.* 2017;33(1):18–22.]

WHAT DO WE NEED TO CONSIDER?

1

NOMOGRAM

NOMOGRAM

NOMOGRAM

2

TREAT OCULAR SURFACE DISEASE

WAIT ON OBL

3

WHAT CAN I DO TO MAKE A DECISION?

ADDITIONAL DATA

4

MAKE SURE YOUR STAFF AND REFERRAL DOCTORS CHECK BETTER THAN 20/15. SOME MAY NOT HAVE CHARTS THAT GO THAT LOW.

Thank You