Zeiss
Mel 80 and Visumax
Refractive Laser Systems

Richard S. Hoffman, MD

Clinical Associate Professor of Ophthalmology
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No Financial Interest

ZEISS Workstation

CRS-Master
Customized Ablation

- ReLEx ®
- ICR
- Keratoplasty

VisuMax®
Femtosecond Laser System

- Femto-LASIK

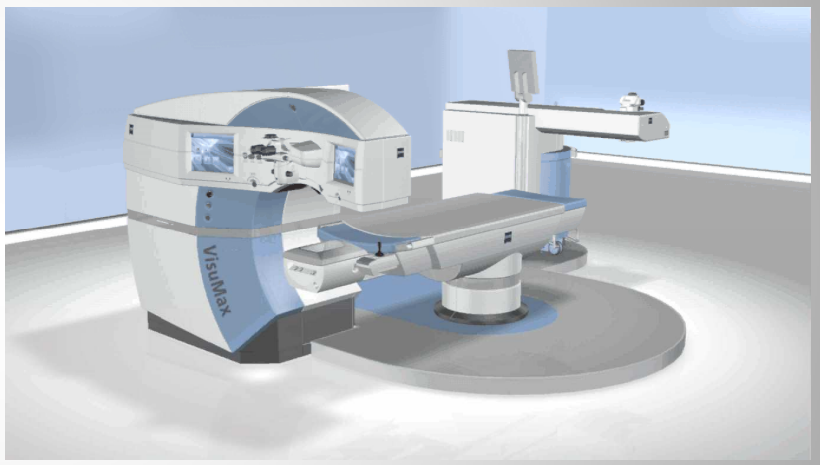
MEL 80™
Excimer Laser

- Topoguided treatment
- Wavefrontguided treatment
- Laser Blended Vision

ZEISS Precise Vision
With the words of a customer

“As a refractive surgeon with approximately 45,000 LASIK procedures experience, I have never used a better combination than the VisuMax ® /MEL 80™ system. I can now predictably and confidently make 90 micron flaps which are safer and heal quicker, improving the “wow” effect beyond anything previously experienced. The low energy used for flap creation translates into crystal clear corneas at day one. Our excellent results, which are almost always 20/20 or better the first day post-op, have greatly improved our number of referrals.”

Jon G. Dishler, MD, FACS
Denver, Colorado USA



not FDA approved

CRS-Master

Customized Diagnosis and Treatment Planning

CRS-Master and MEL 80 Excimer Laser

CRS-Master: Customized diagnosis, treatment planning, refraction correction

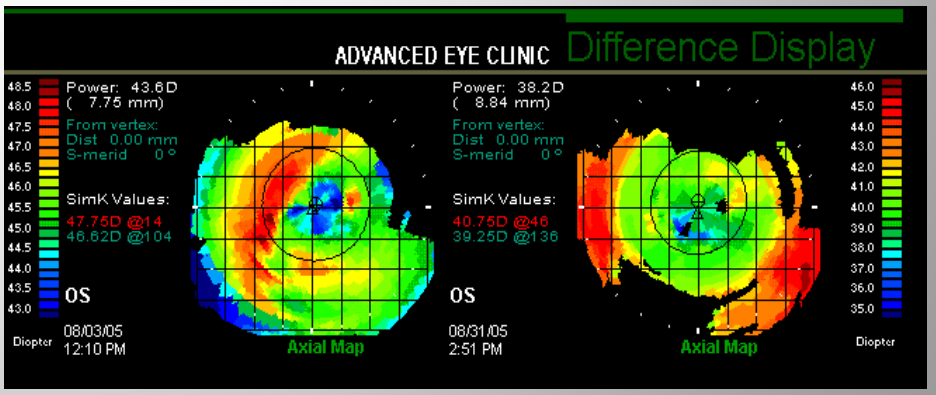
- Wavefront-guided treatment – WASCA Analyser
- Topography-guided treatment – ATLAS 9000
- Treatment for presbyopic patients – Laser Blended Vision
- OcuLign eye registration
- System-internal networking for documentation and data backup

CRS-Master and MEL 80 Excimer Laser

Topography-guided treatment for repair cases

The option for treating complex cases

- Restore original corneal shape in repair cases
- Best match of subjective refraction
- Ablation depth optimization
- ATLAS 9000 linked
- Angle kappa compensation



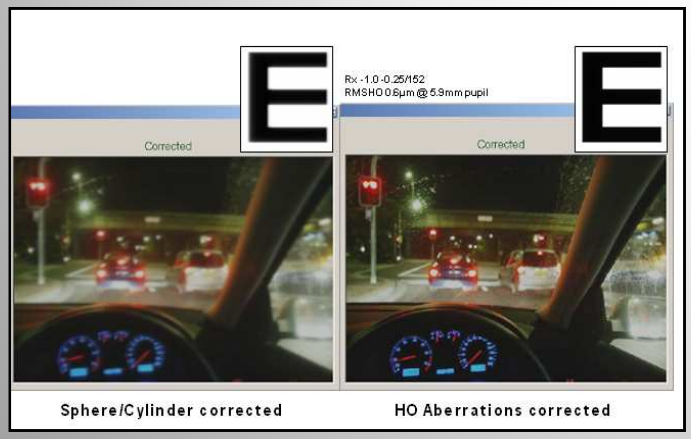
pre-op Incomplete flap correction post-op

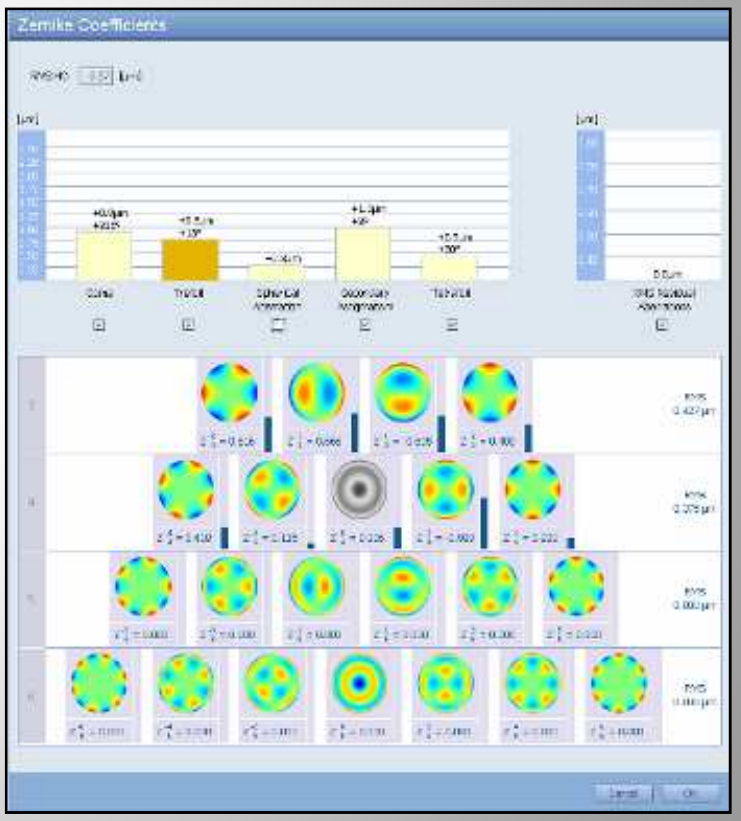
CRS-Master and MEL 80 Excimer Laser

Wavefront-guided treatment for less aberrations

Wavefront measurement by WASCA Analyzer

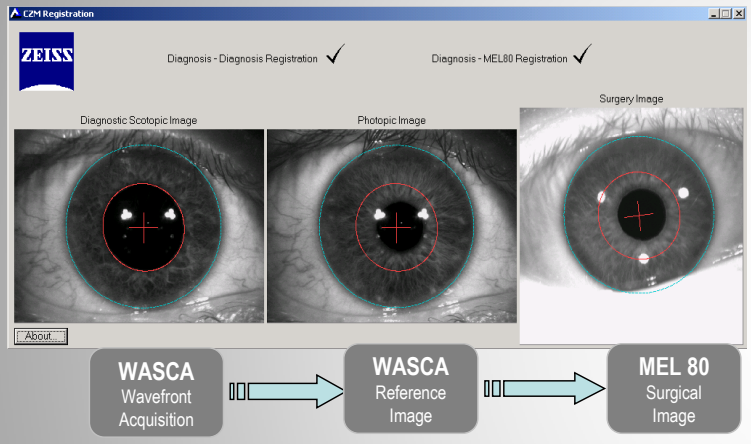
- Corrections up to 6th order Zernike
- OcuLign™ eye registration for precise positioning

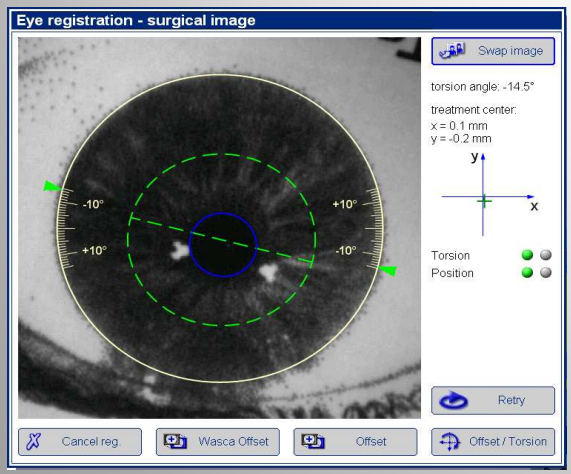




CRS-Master and MEL 80 Excimer Laser
Registration

Flying spot combination with eye registration and kHz-tracking





- Combination of iris and scleral vessels for reference and cyclotorsion control
- Independent of pupil size during wavefront measurement
- Independent of pupil size by limbus tracking

NEW

CRS-Master and MEL 80 Excimer Laser
Laser Blended Vision for presbyopic patients

Binocular treatment planning for Laser Blended Vision (LBV)

- Simple
- Clear
- Full planning control at one glance

not FDA approved

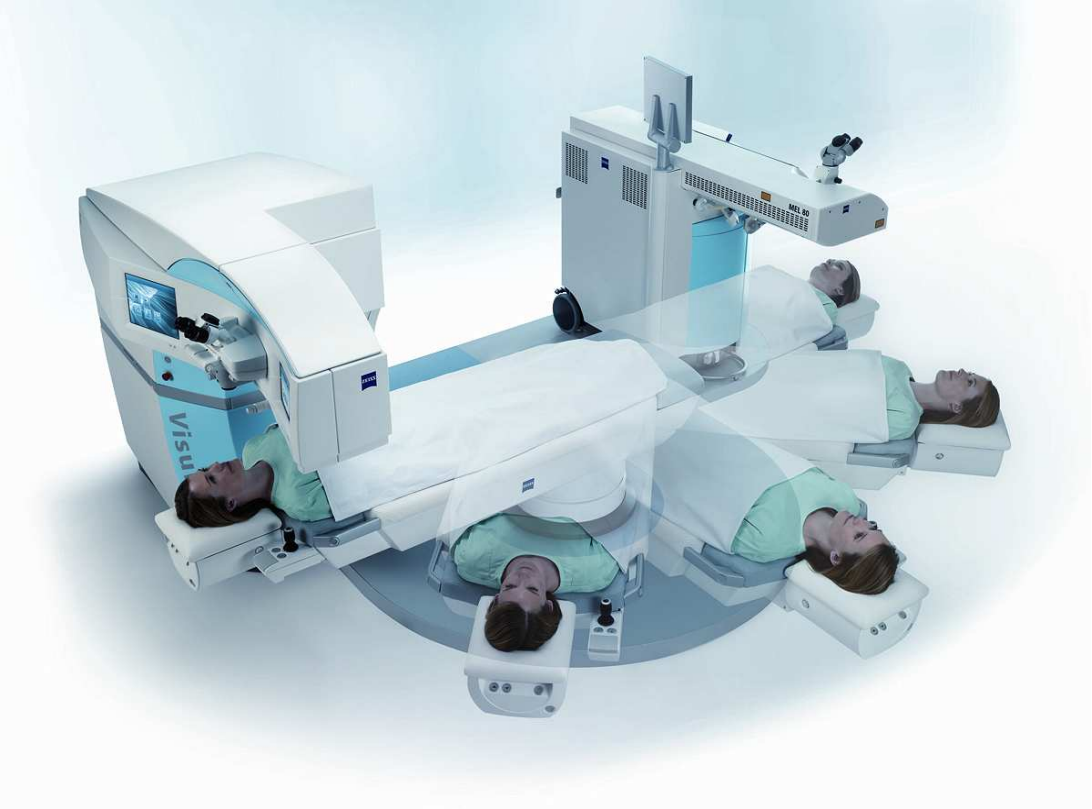
MEL 80

State of the Art Excimer Technology

MEL 80 Excimer Laser

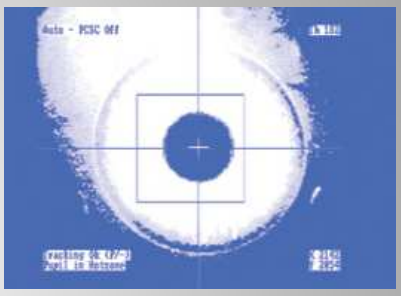
Fast flying spot excimer laser with:

- Common data flow from
  - custom treatment planning over
  - fs-laser to
  - refractive treatment
- Eye tracker feedback speed beating laser repetition rate
- Topo-link, wavefront-link and OcuLignTM eye registration features

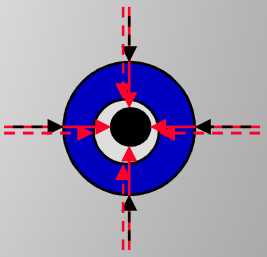


MEL 80 Excimer Laser

Fast flying spot excimer laser with:



- kHz-tracking **and** eye registration
- High speed pupil **and** limbus tracking
- Dynamic online pupil center shift compensation during ablation

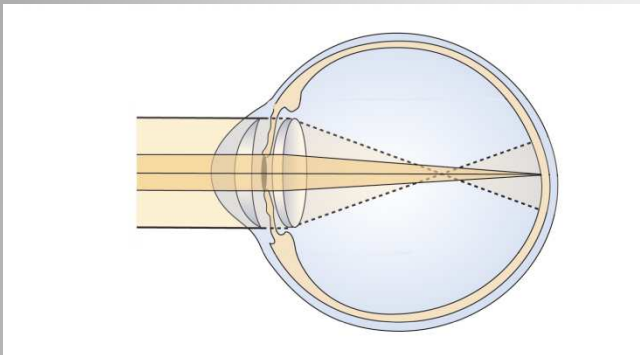


- Reduced total feedback time
- Eye tracker feedback speed beating laser repetition rate
- Increased ablation quality due to improved laser spot placement

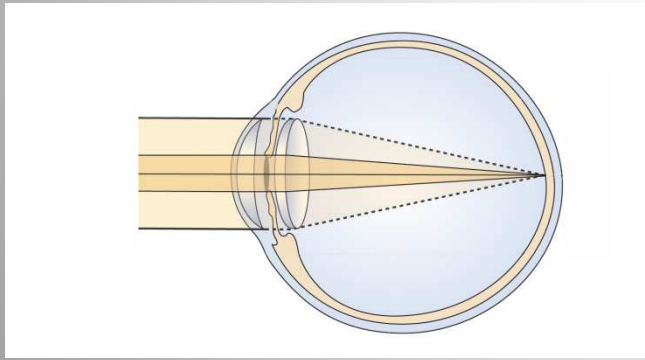
not FDA approved

MEL 80 Excimer Laser
Aberration optimized ablation profile

Aberration Smart Ablation - optimized for mesopic vision



Spherical cornea



Aspheric cornea

“Prolate-Lens-Design”

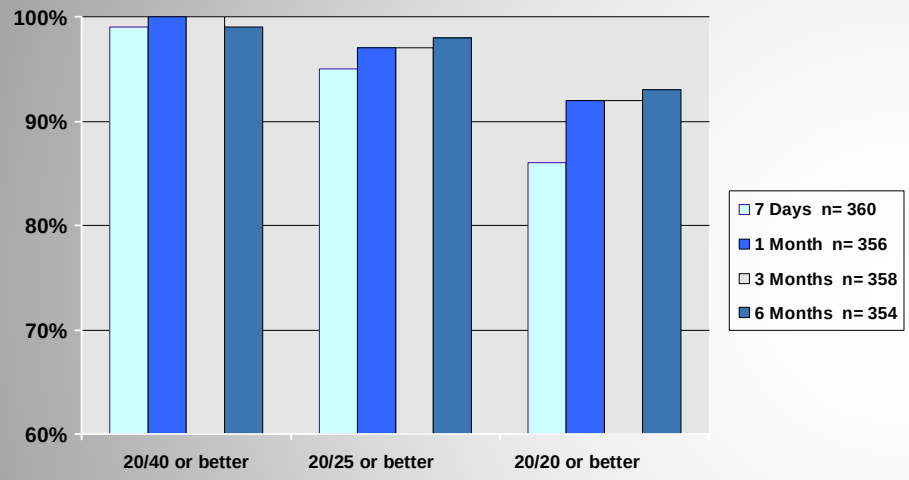
- Large optical zones
- Improved mesopic vision
- Less induced aberrations

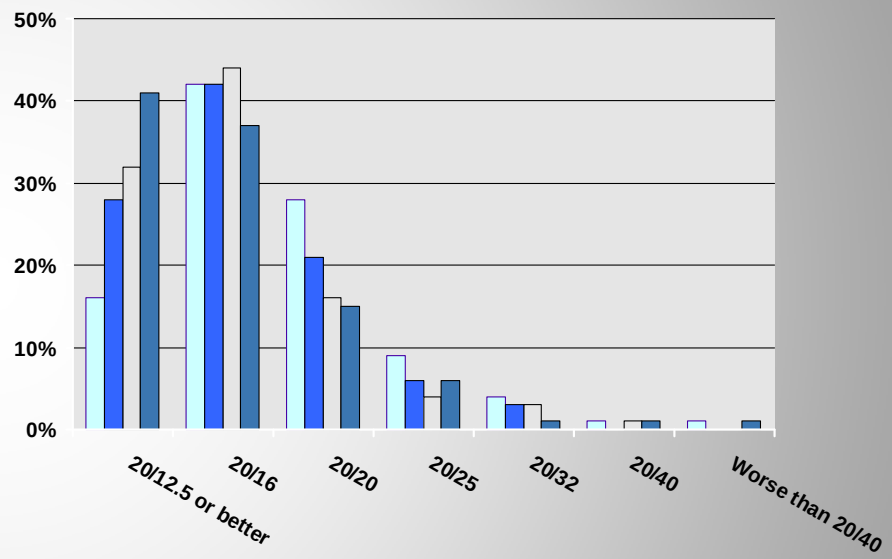
not FDA approved

MEL 80 Excimer Laser

Clinical outcomes – FDA MYOPIA study

Uncorrected visual acuity





93% of eyes see 20/20 or better (UCVA)

41% of eyes see 20/12.5 at six months (UCVA)

not FDA approved

MEL 80 Excimer Laser
Excellent clinical outcomes - FDA HYPEROPIA study

76% of eyes see 20/20 or better and 77% are within ± 0.5 D				
	Carl Zeiss Meditec MEL 80 P06004/S1	**WaveLight Allegretto** P030008 (10/2003)	**Bausch & Lomb Technolas 217a** P990027/S4 (2/2003)	**Alcon LadarVision** P970043/S7 (9/2000)
Hyperopia Corrections range Sphere : Cylinder : Stability :	0 to +6.0 D > +0.5 to + 3.50 D proposed @ 6 months	0 to + 6.0 D 0 to + 5.0 D shown @ 6 months	+1.0 to +4.0 D 0 to + 2.0 D shown @ 6 months	0 to + 6.0 D 0 to 6.0 D shown @ 6 months
UCVA 20/20 or better at stability Sphere : Astigmatic :	66/87 **(75.9%)** 173/272 (63.6%)	All eyes 143/212 (67.5%)	88/145 (59.3%) 57/88 (64.8%)	59/115 (48.8%) 41/110 (37.3%)
UCVA 20/40 or better at stability Sphere : Astigmatic :	84/87 (96.6%) 265/272 (97.4%)	All eyes 202/212 (95.3%)	139/145 (95.9%) 82/88 (93.2%)	113/115 (93.4%) 100/110 (90.9%)
MRSE ± 0.5 D Sphere : Astigmatic :	67/87 (77.0%) 194/272 (71.3%)	All eyes 188/260 (72.3%)	105/178 (59.0%) 69/112 (61.6%)	93/143 (65.0%) 75/124 (60.5%)
MRSE ± 1.0 D Sphere : Astigmatic :	84/87 **(96.6%)** 246/272 (90.4%)	All eyes 235/260 (90.4%)	153/178 (86.0%) 98/112 (87.5%)	125/143 (%) 110/124 (%)
Safety, all treated eyes Loss ≥ 2 lines BSCVA: Loss > 2 lines BSCVA:	most recent visit 1/368 (0.3%) 0/368 (0%)	4/260 (1.5%) data not available	8/290 (2.7%) 2/290 (0.7%)	12/262 (4.6%) 0/262 (0.0%)

not FDA approved

NEW

MEL80 Laser Blended Vision
High level of spectacles independence

not FDA approved

NEW

MEL 80 Laser Blended Vision
Sharper vision at all distances

Laser Blended Vision combines nonlinear aspheric ablation profiles with micro-monovision to create a blend zone.

Who can benefit from this procedure?

- **emmetropic**
- **myopic** (up to -9.00 D)
- **hyperopic** (up to +5.00 D)

presbyopic patients

not FDA approved

NEW

MEL 80 Laser Blended Vision
A winning team for treating presbyopic patients

The new CRS-Master Laser Blended Vision option meets the needs of the growing group of patients now approaching the presbyopic age.

Pushing the barriers of customized ablation:

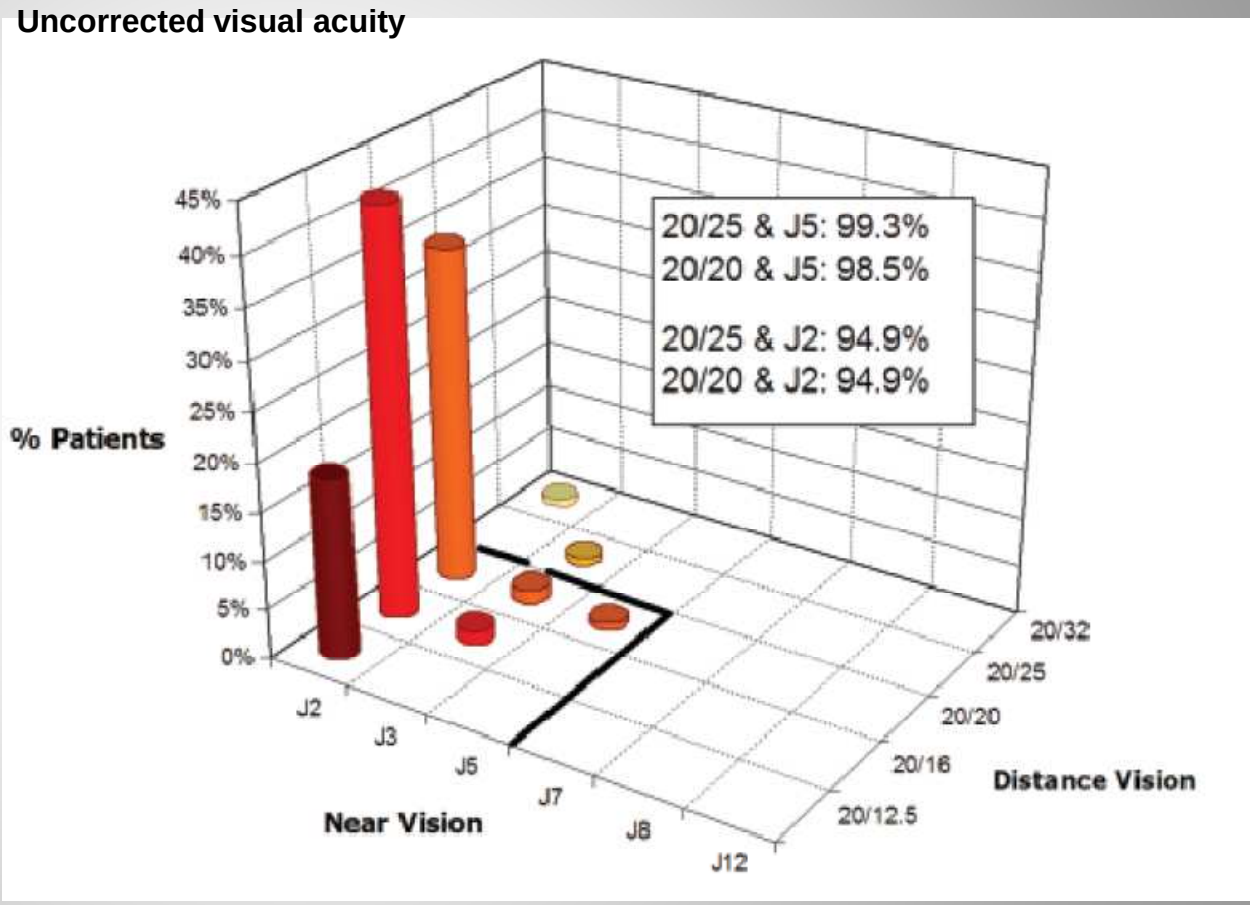
- Laser Blended Vision with eye registration
- K-value optimized ablation algorithm
- Easy binocular treatment planning

not FDA approved

NEW

MEL 80 Laser Blended Vision
Excellent visual outcomes – highest patient tolerance

Patient tolerance: 97%
(Monovision: 60 %)



Source:
Reinstein et al.: LASIK for Myopic Astigmatism and Presbyopia Using Non-Linear Aspheric Micro-Monovision with the Carl Zeiss Meditec MEL 80 Platform, J Refract Surg 2011 Jan;27(1):23-37

not FDA approved

NEW

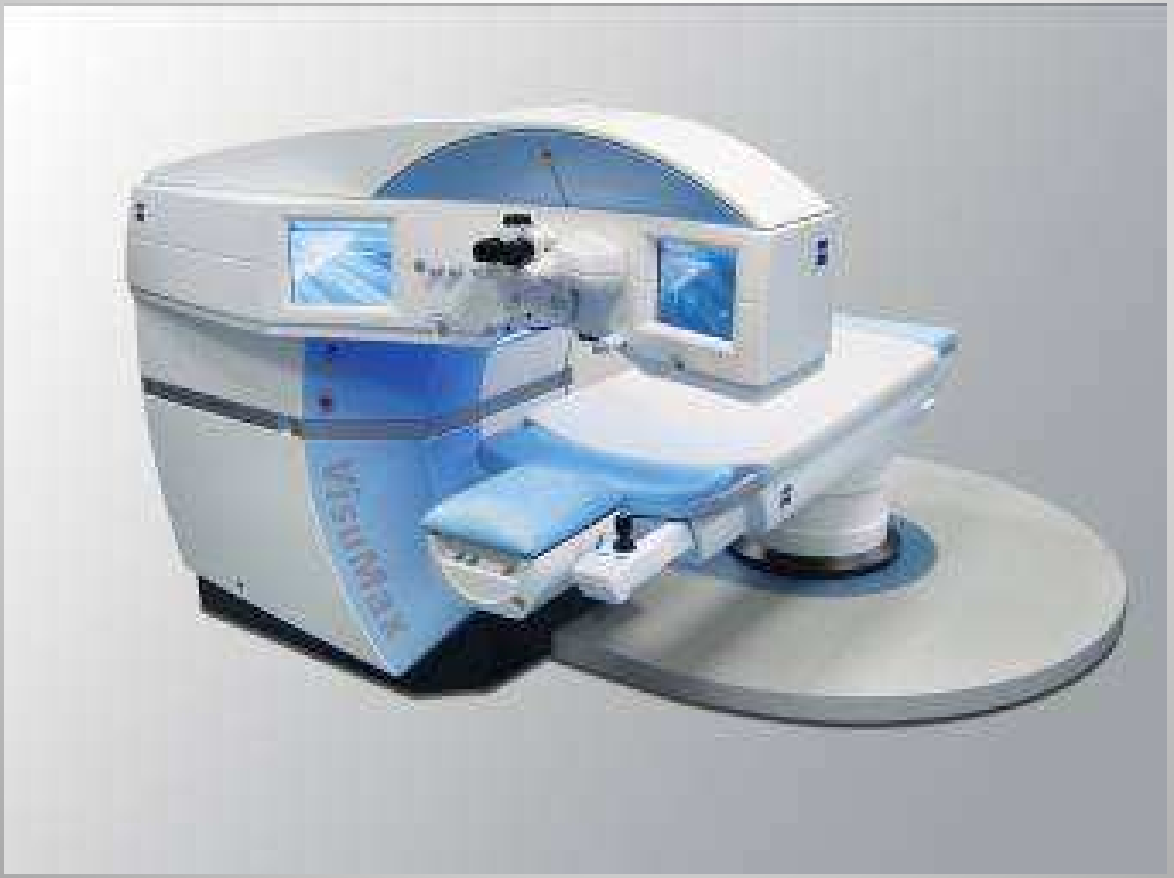
MEL 80 Excimer Laser
Laser Blended Vision: Precision for presbyopic patients

not FDA approved

By courtesy of
Dan Z. Reinstein, MD

VisuMax

Femtosecond Laser

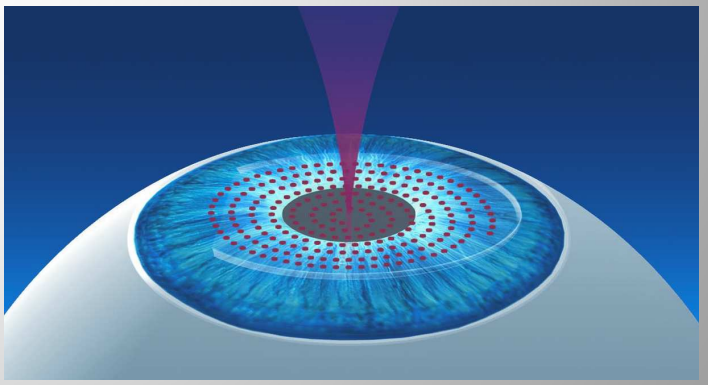


not FDA approved

VisuMax Femtosecond System

- 500 kHz laser pulse repetition rate yields short procedure time

- Femtosecond laser for:
  - Flapcutting
  - ReLEx and ReLEx with smile
  - Incision for ICR
  - Keratoplasty

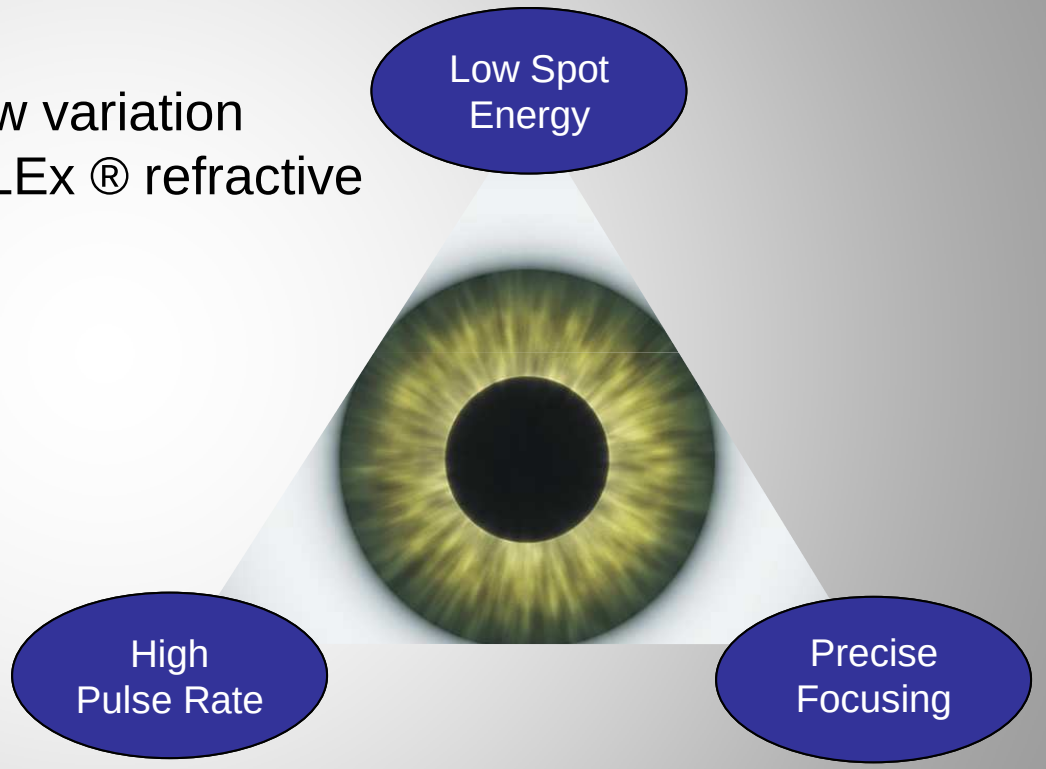


VisuMax Femtosecond System

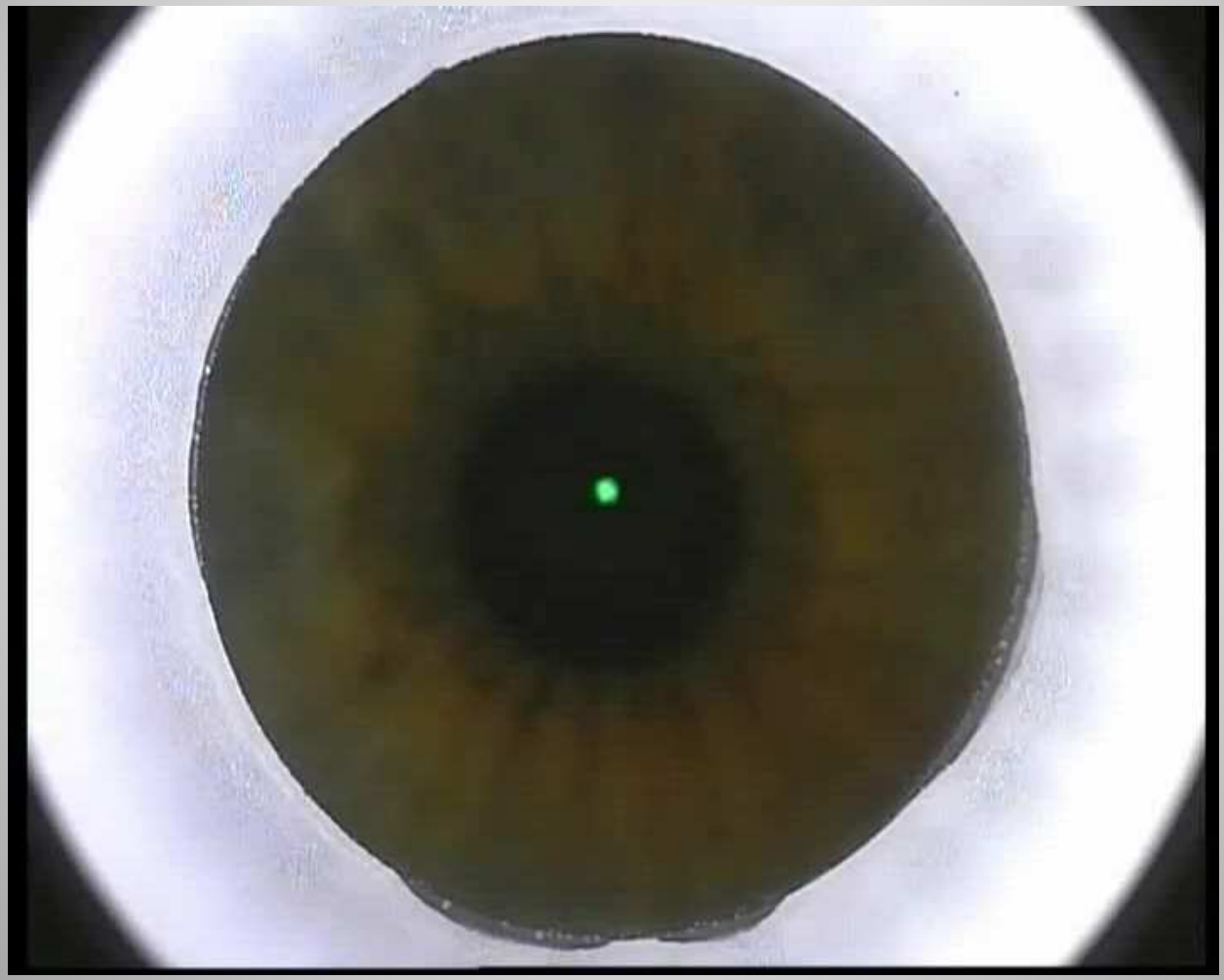
- Accurate flap thickness with low variation
- Precise lenticule shape for ReLEx ® refractive corrections

Optimized parameters:

- Low single pulse energy
- Ultra high shot frequency
- Tight spot spacing



VisuMax Femtosecond System
< 15 seconds



VisuMax Femtosecond System

Good Patient Comfort

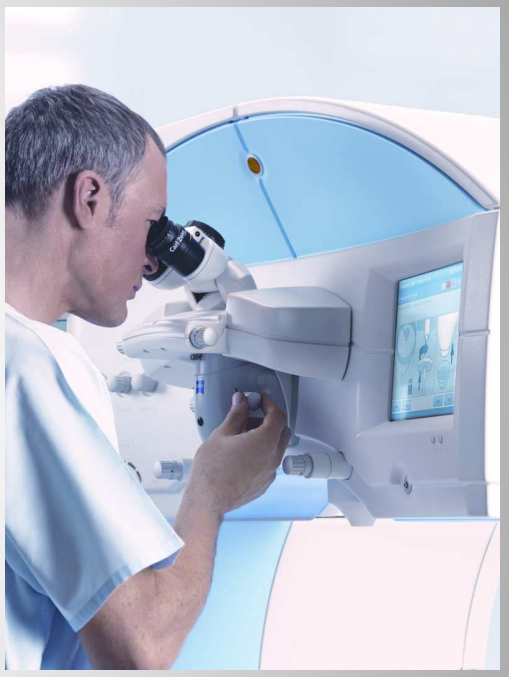
- Minimal IOP increase
- Low tissue compression
- No vision loss during suction
- Optimal fitting for individual eyes

Due to :

- Spherical contact interface
- Corneal suction
- Different sizes of contact glasses
- Automated vacuum system
- Short suction time

VisuMax Femtosecond System
Enhanced Ergonomics

- Ergonomic design for surgical focus due to:
  - Touch screen user interface
  - Interactive guidance
  - Microscope for permanent visual control
  - Integrated slit lamp for immediate evaluation
- Saving time and resources due to:
  - Integrated digital video recording
  - Short laser start-up time



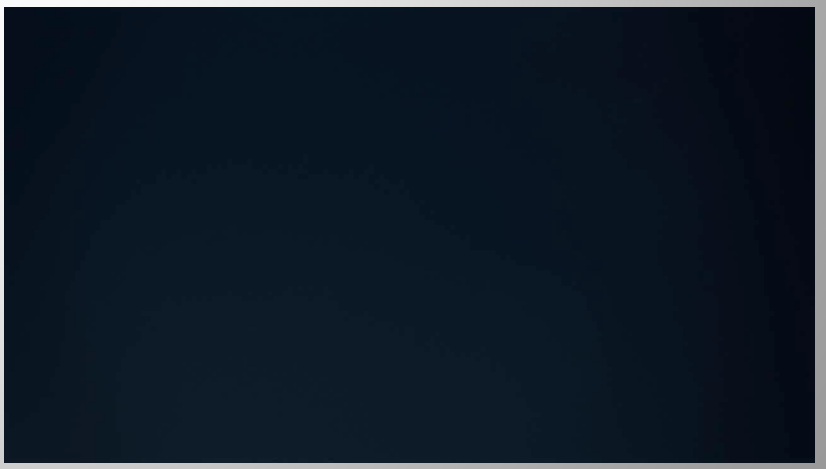
VisuMax Femtosecond System

ReLEx ® smile – Laser Vision Correction beyond LASIK

Flapless. All-Femto. Single-step
Laser vision correction

VisuMax Femtosecond System ReLEx® smile
Commercially Available Outside of the US

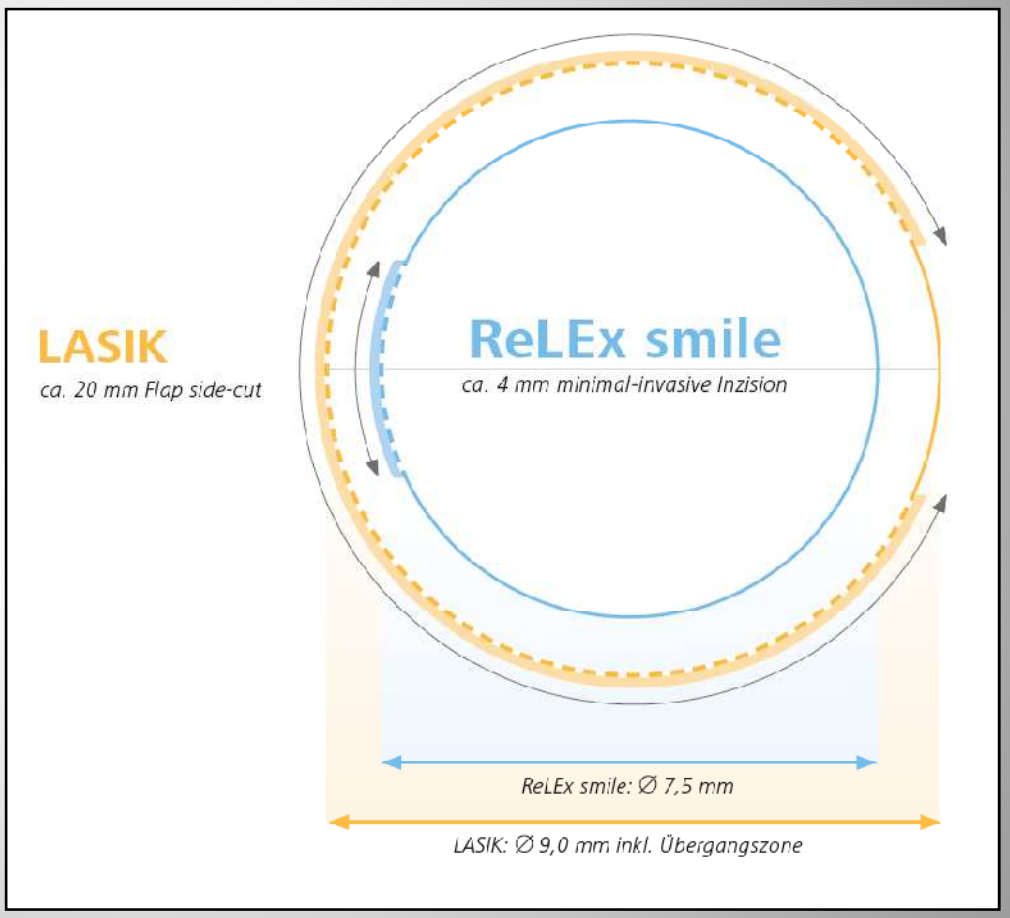
- **Flapless** small incision rather than a flap
- **All-Femto:** lenticule rather than excimer ablation
- **Single-step:** creating lenticule and incision in one step
- **Very predictable**



not FDA approved

VisuMax Femtosecond System
ReLEx Smile Advantages

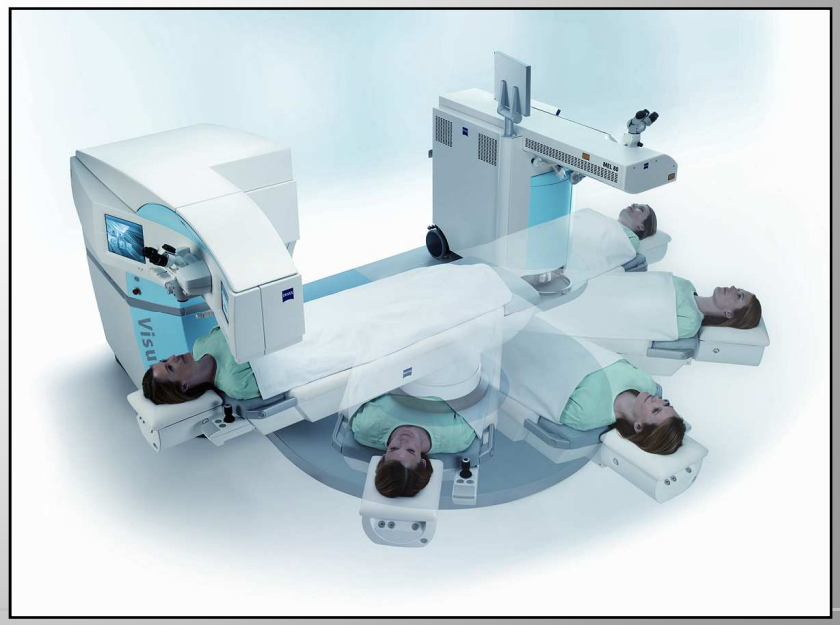
- **Flapless**
  - Integrity of upper corneal layers
  - Preservation of corneal biomechanical stability
  - Less nerves severed
  - Less varying severity of dry eye syndrome
  - Minimized risk for flap complications
  - Faster healing of epithelium



VisuMax Femtosecond System

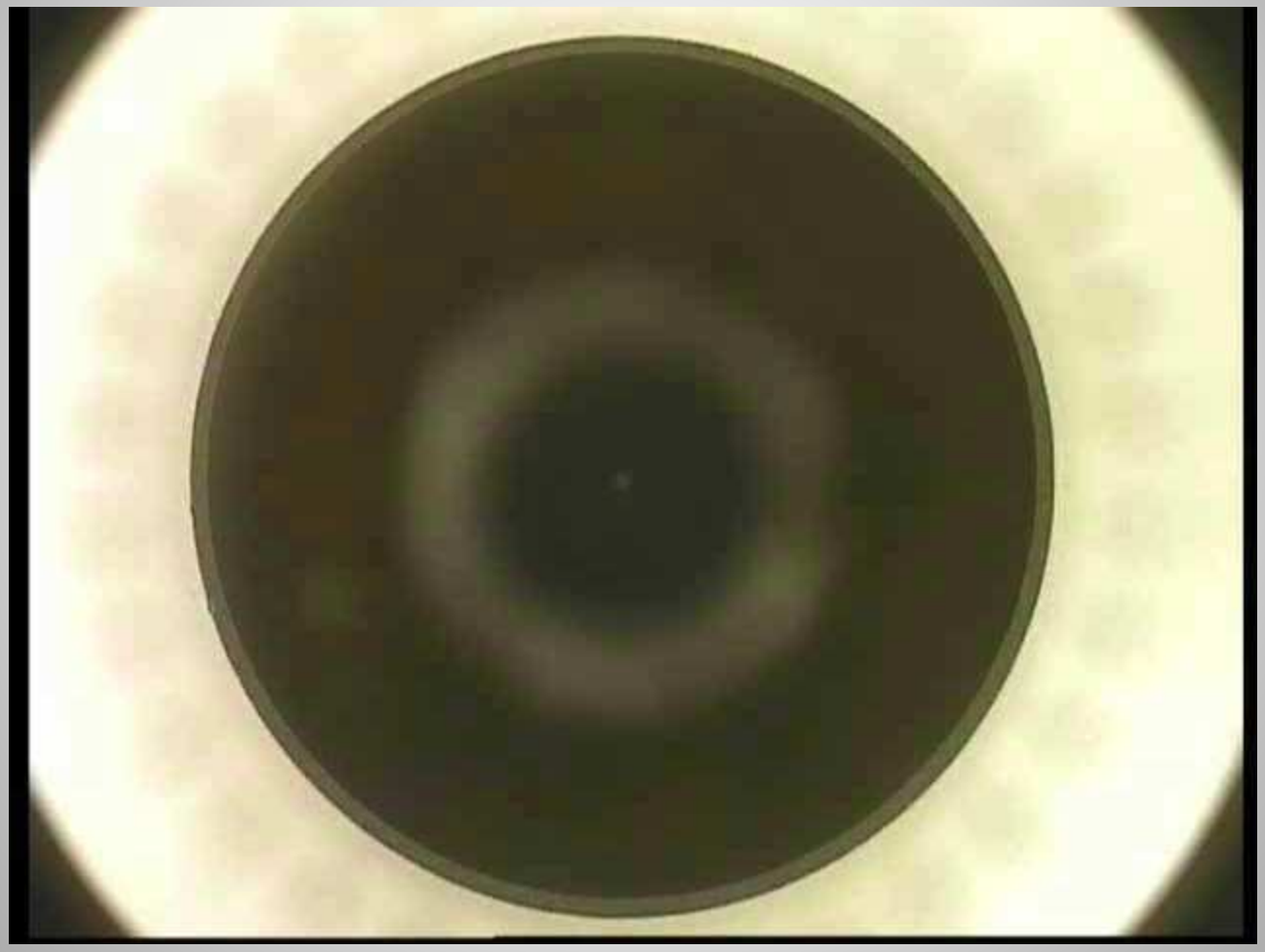
ReLEx® smile

- **All-Femto:**
  - Lenticule creation in the intact cornea
  - Using femtosecond technology: Precise, reproducible, predictable lenticule creation
- **Single-step:**
  - One treatment plan
  - No patient shift to excimer laser



VisuMax Femtosecond System

ReLEx® smile



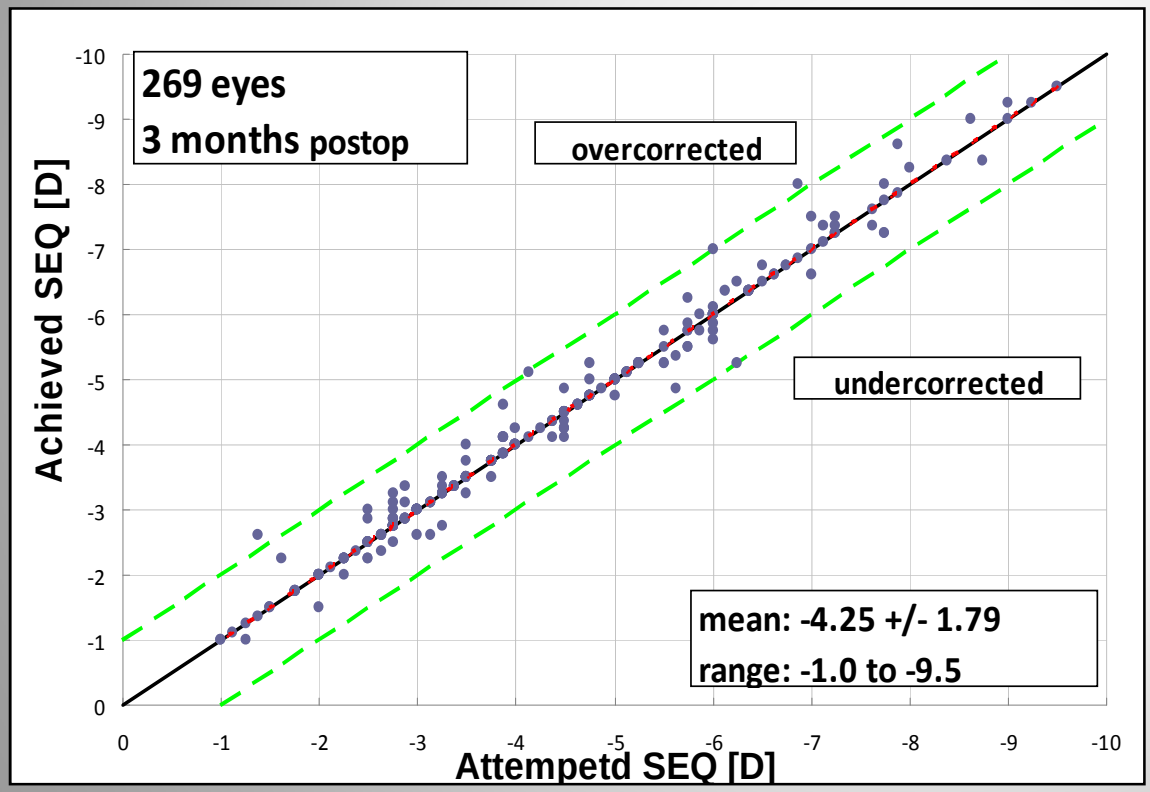
Courtesy of
Rupal Shah, MD

VisuMax Femtosecond System

ReLEx® smile - clinical outcomes

(269 eyes)

Predictability



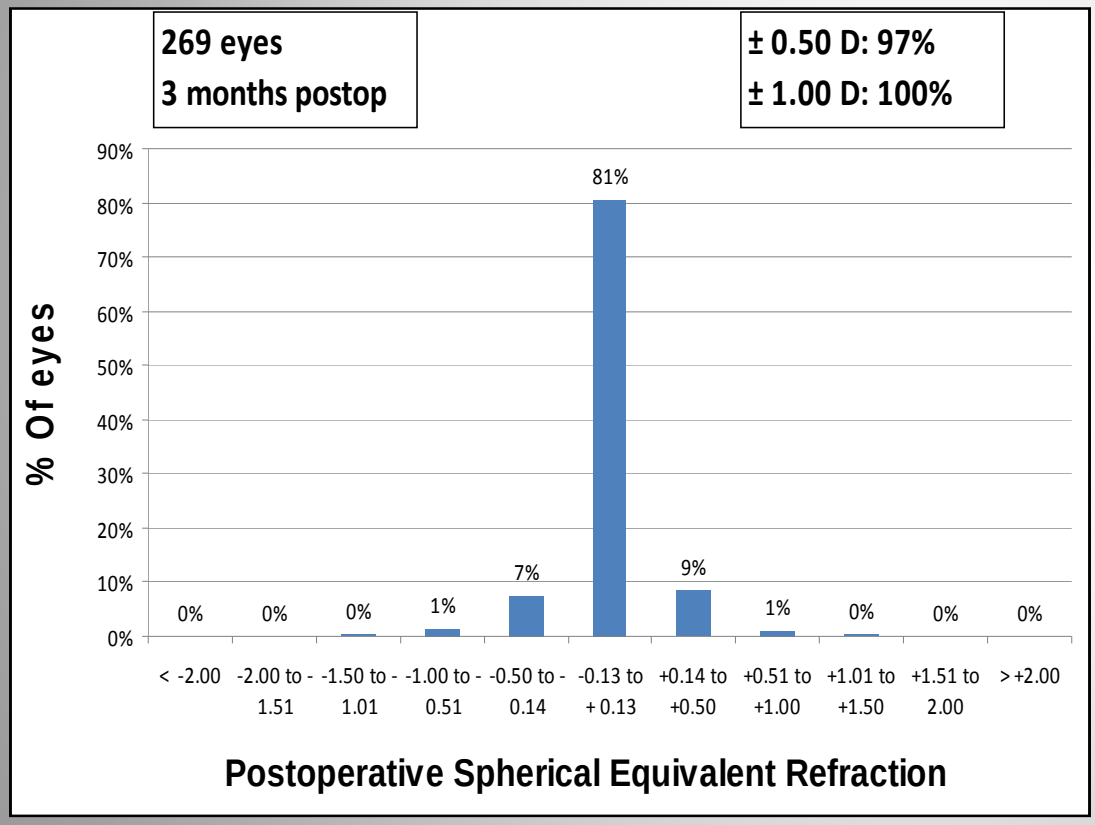
Predictability

- Consistent results
- Excellent predictability
- Very close to target refraction

VisuMax Femtosecond System

ReLEx® smile - clinical outcomes (269 eyes)

Accuracy



Predictability

- Consistent results
- Excellent predictability
- Very close to target refraction

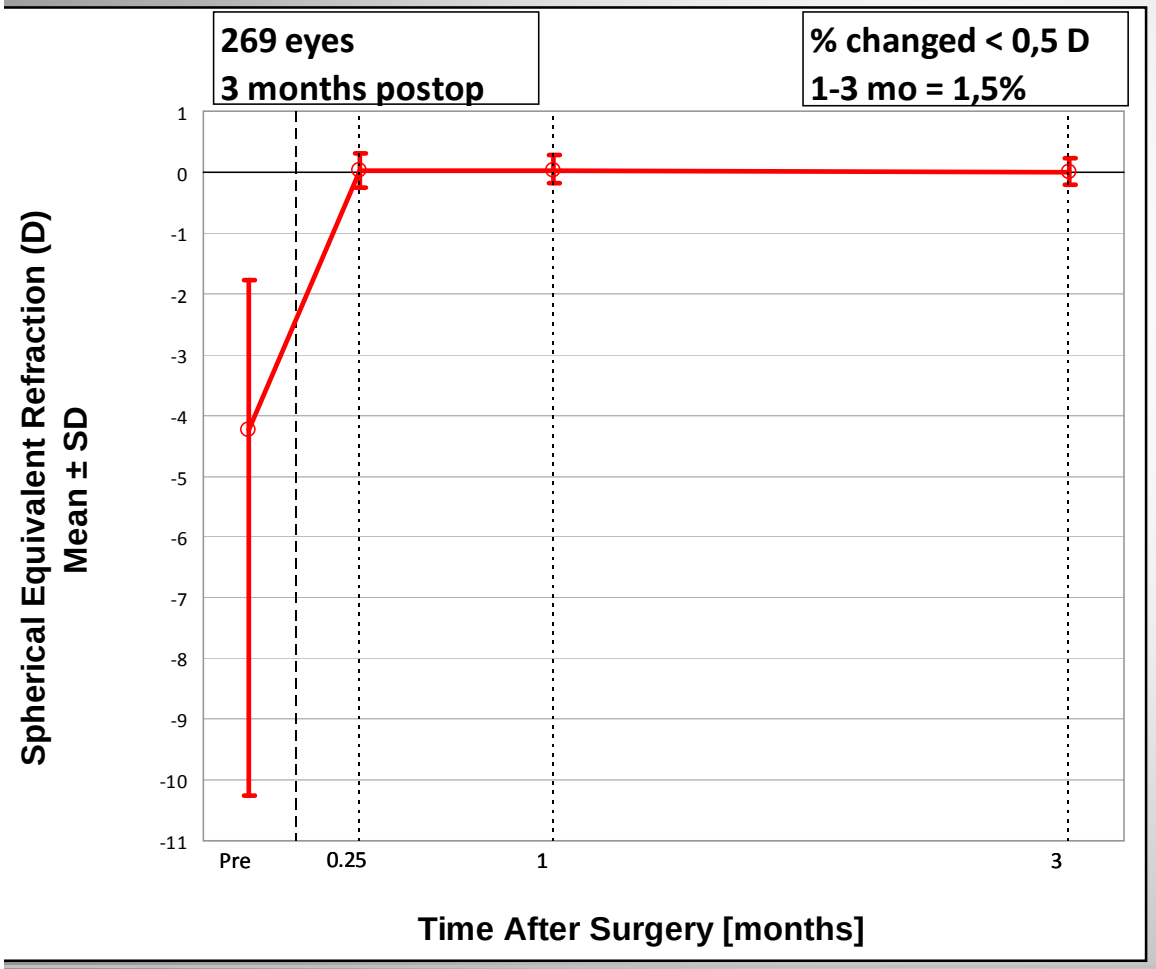
Accuracy

- 100 % are within ± 1.0 D
- 97% are within ± 0.5 D

VisuMax Femtosecond System

ReLEx® smile - clinical outcomes

Stability



Predictability
- Consistent results
- Excellent predictability
- Very close to target refraction

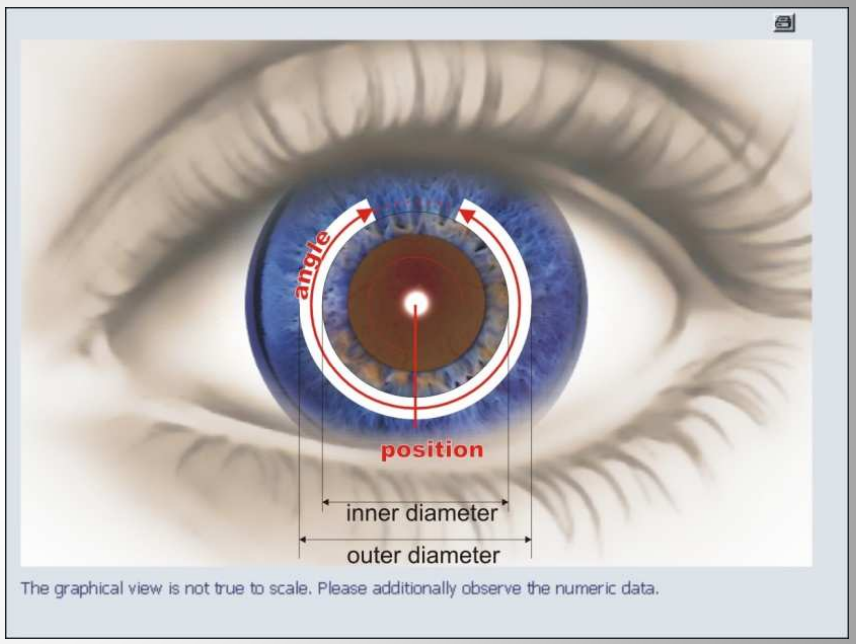
Accuracy
- 100 % are within ± 1.0 D
- 97% are within ± 0.5 D

Stability
- Convincing stability of refractive correction (MR SEQ)

VisuMax Femtosecond System

VisuMax - Incision for ICR

- All ICR on the market are supported
- Parameter configuration
  - Tunnel and incision parameters (diameter, depth, width…)

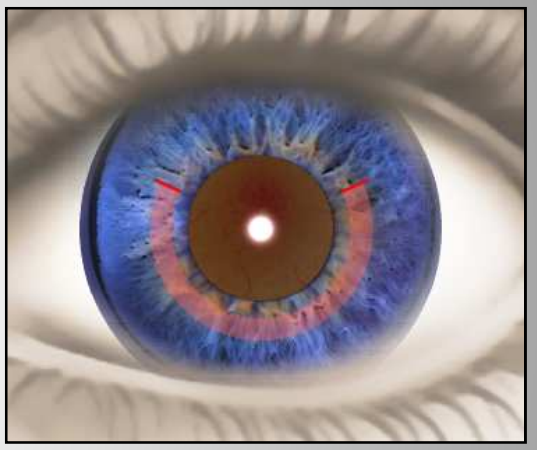


not FDA approved

VisuMax Femtosecond System

VisuMax - Incision for ICR

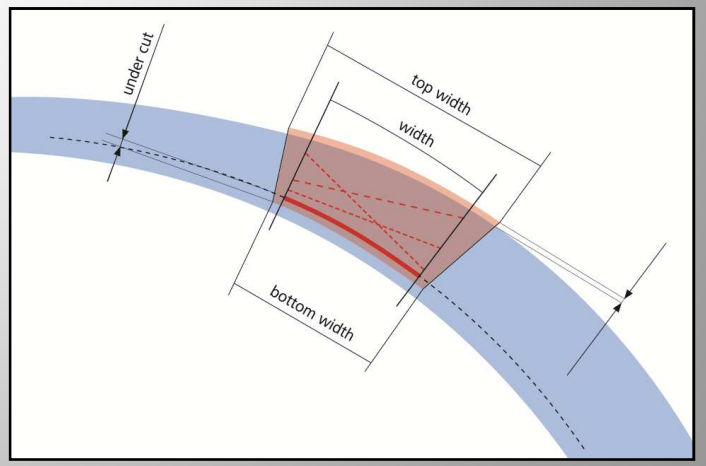
- Tailor-made tunnel segments
  - Complete tunnels with 360°
  - Partial tunnels with segments between 90°-270° for single corneal ring segments



- Tilt tunnel incision parallel to posterior surface
  - Adjustable inner and outer tunnel depths

- Adjustable width and shape of access cuts
  - Configurable trapezoid shape

- 0, 1 or 2 radial access cuts,
  - Free positioning



VisuMax Femtosecond System

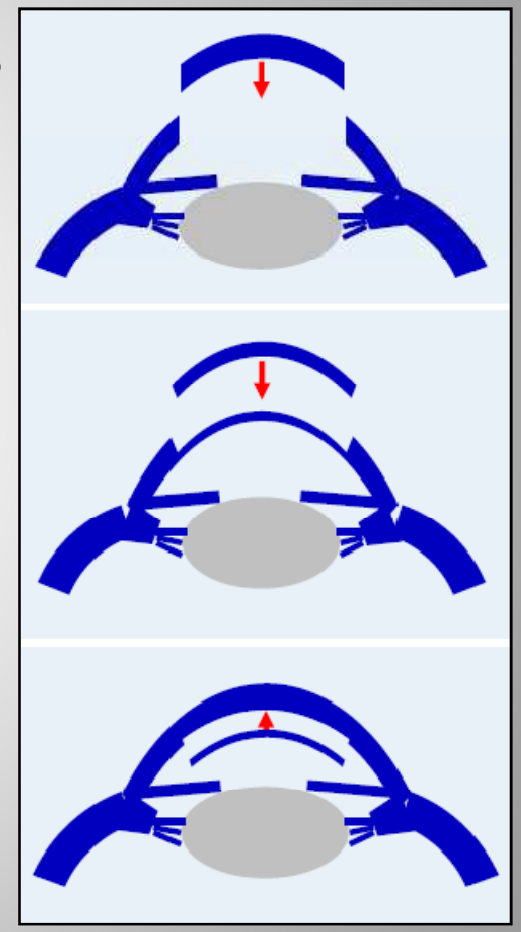
VisuMax Keratoplasty

- Lamellar corneal grafts for anterior and posterior KP
- PKP

- Low procedure time (< 1 min)
- High incision quality and easy tissue separation

Optimized parameters
  - Ultra high shot frequency (500 kHz)
  - Tight spot spacing

- Full visual microscope control
- Sterile operation workflow concept



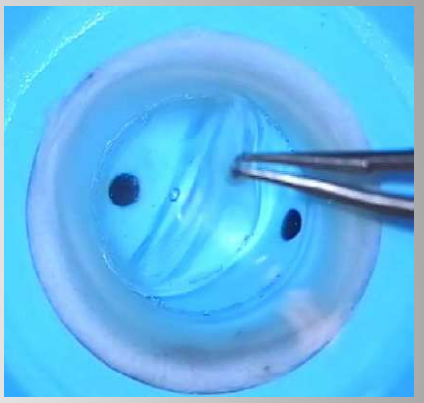
not FDA approved

VisuMax Femtosecond System
VisuMax Keratoplasty – the trend towards lamellar

VisuMax Keratoplasty – the trend towards lamellar

- Deep lamellar incision
  - Predictable deep lamellar incisions for real femtosecond Deep Anterior Lamellar Keratoplasty
  - Preparation of thin donor buttons for endothelial transplantations

- Physiological approach
  - Highly regular and smooth lamellar interfaces are key for good visual results
  - Less tissue compression and related effects on quality and accuracy of incisions due to curved corneal interface



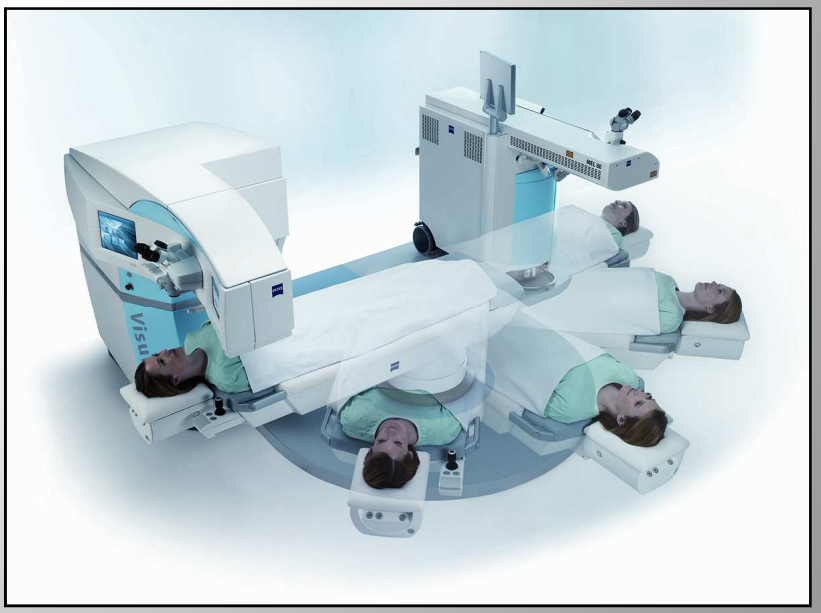
not FDA approved

ZEISS Refractive Laser Workstation

Efficient workflow

- Advanced diagnostics
- Tailored treatment planning
- Precise flaps
- Accurate vision correction

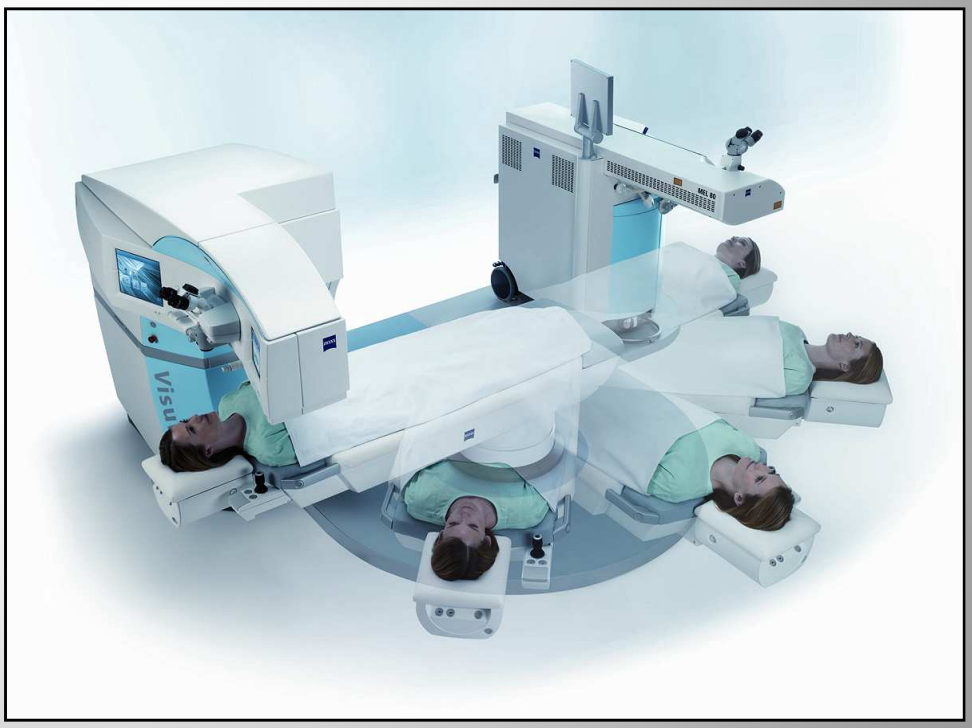
- Efficient workflow & patient comfort
- Systems that communicate with each other
  - No redundant data entry



ZEISS Refractive Laser Workstation

Complete System Solution

- Broad range of indications
- Continuous innovations



Obrigado