Physikalisch Optische Betrachtung Unterschiedlicher (Torischer) MIOL/EDOF IOL und Auswirkung auf die Patientenselektion

Detlev R.H. Breyer

DOC 2022

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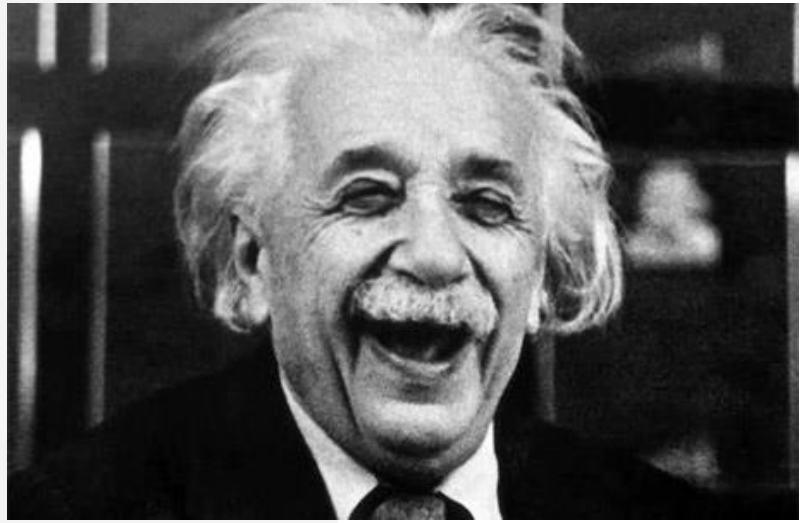
Einstein - Problemlösung

„Es ist wichtiger ein Problem zu erkennen,

Als seine Lösung zu wissen,

Denn die exakte Beschreibung des Problems

Führt zu seiner Lösung“



Problemerkenntnis: Warum brauchen wir dringend eine MIOL-Strategie?

- Internationale Studien: Zufriedenheit der MIOL Patienten liegt bei über 90%

  Bessere Lebensqualität

  Über 90% Weiterempfehlungsrate an Freunde

Aber der Blick auf die Fakten: Das MIOL-Dilemma

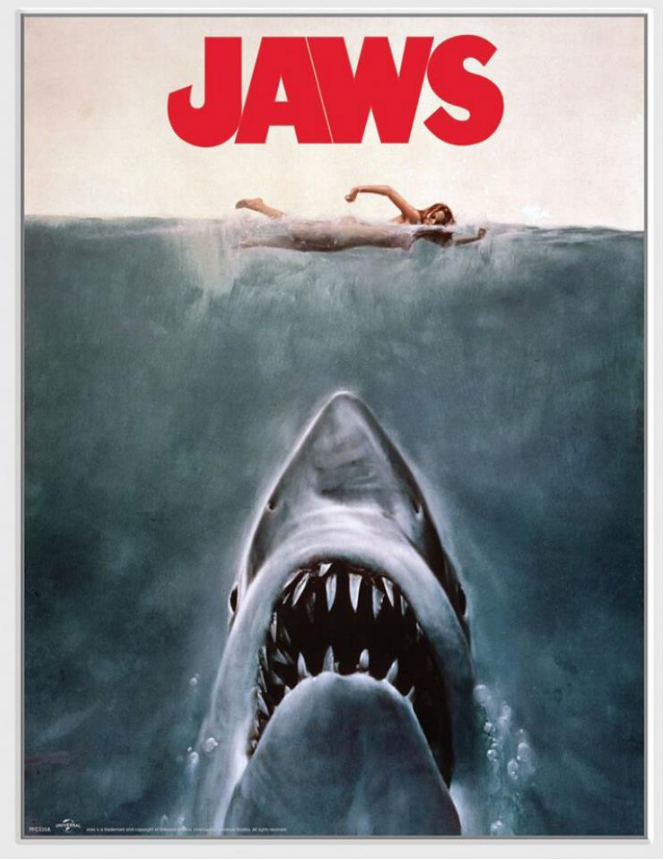
die häufigste Ursache für IOL-Explantationen

Dennoch ist die internationale MIOL-Implantationsrate 1-5%

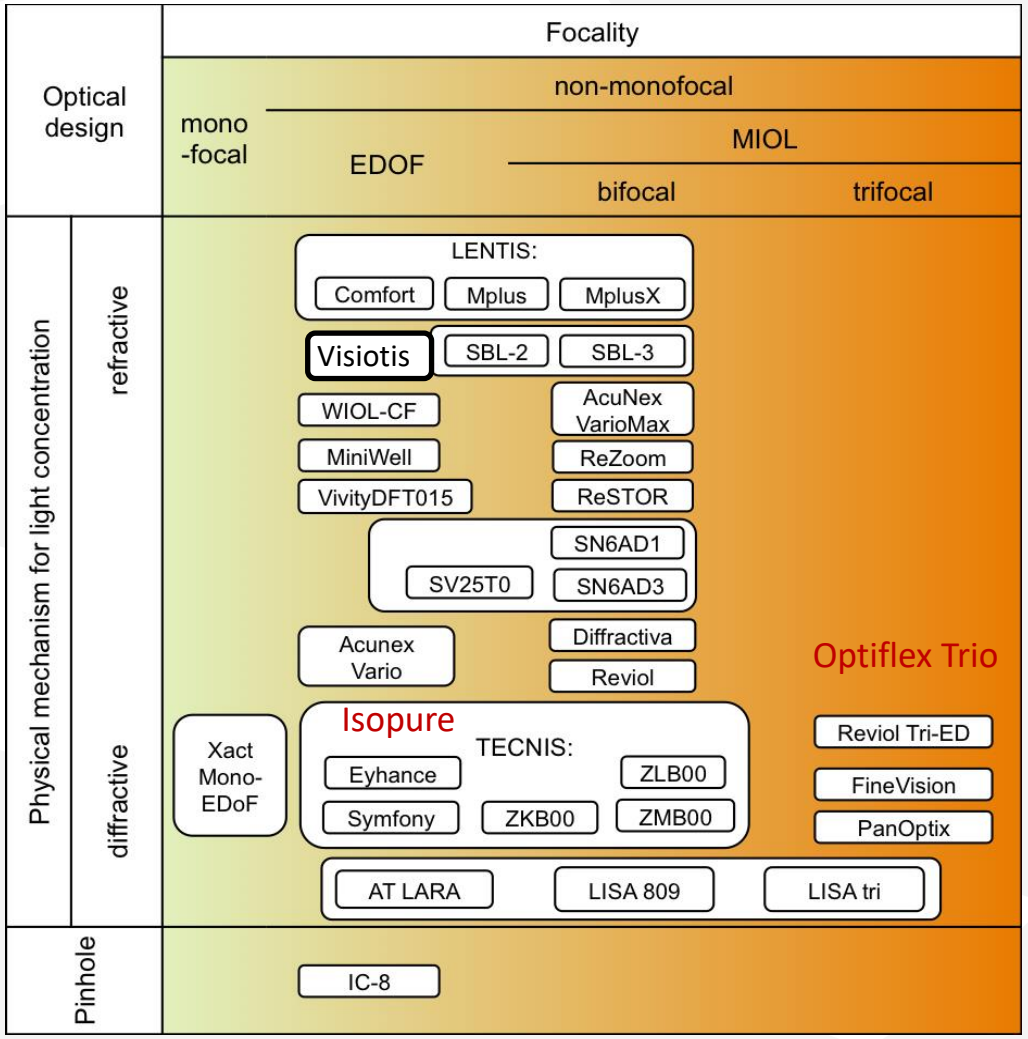
und MIOL sind

Problembeschreibung: Der unzufriedene Patient

- Patienten IOL Mismatch



KLIMO Review: MIOL und EDOF



Review > Klin Monbl Augenheilkd. 2020 Aug;237(8):943-957. doi: 10.1055/a-1111-9380. Epub 2020 Aug 14.

[Current Review: Multifocal Intraocular Lenses and Extended Depth of Focus Intraocular Lenses]

[Article in German]

Detlev R H Breyer [1 2 3], Lena Beckers [1 2 3], Timon Ax [1 2 3], Hakan Kaymak [1 2 3], Karsten Klabe [1 2 3], Florian Tobias Alwin Kretz [3 4]

Affiliations + expand

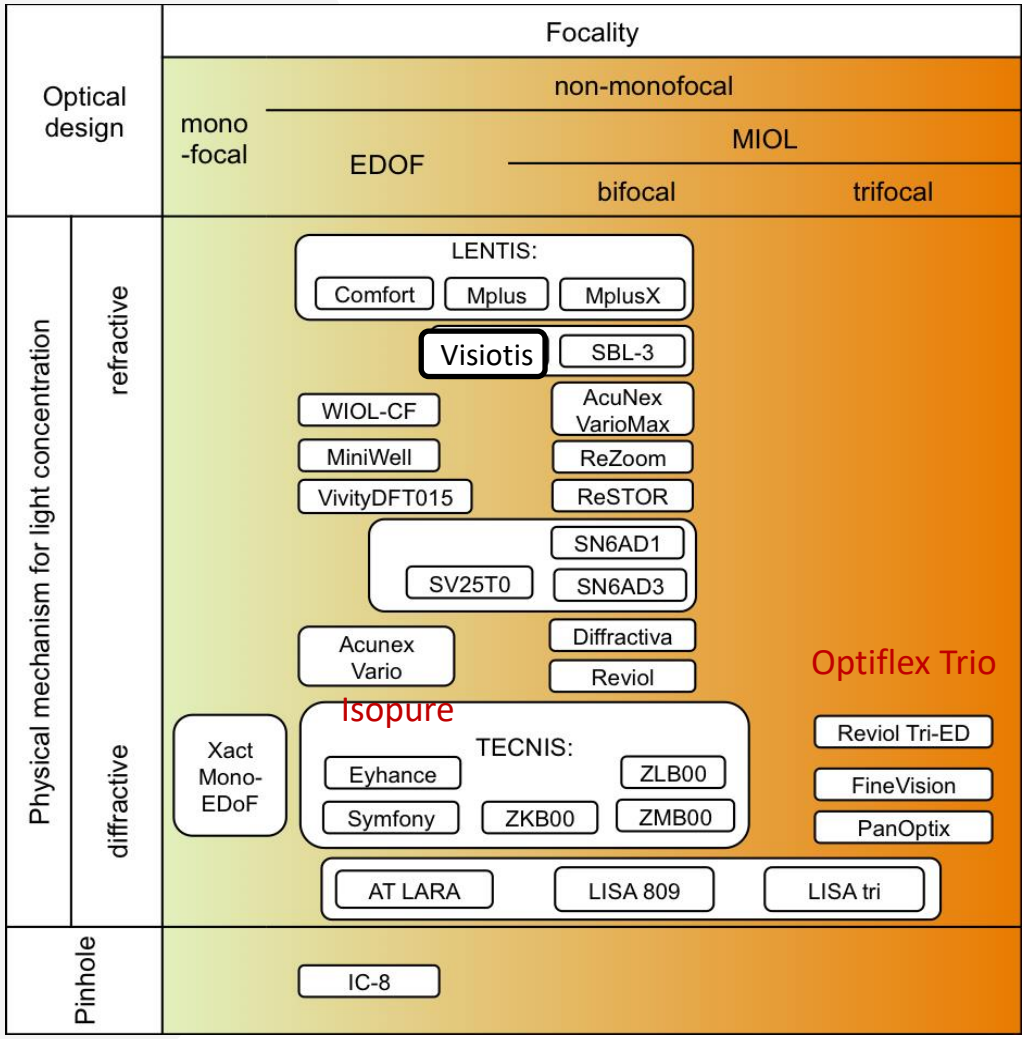
PMID: 32797470 DOI: 10.1055/a-1111-9380

Abstract in English, German

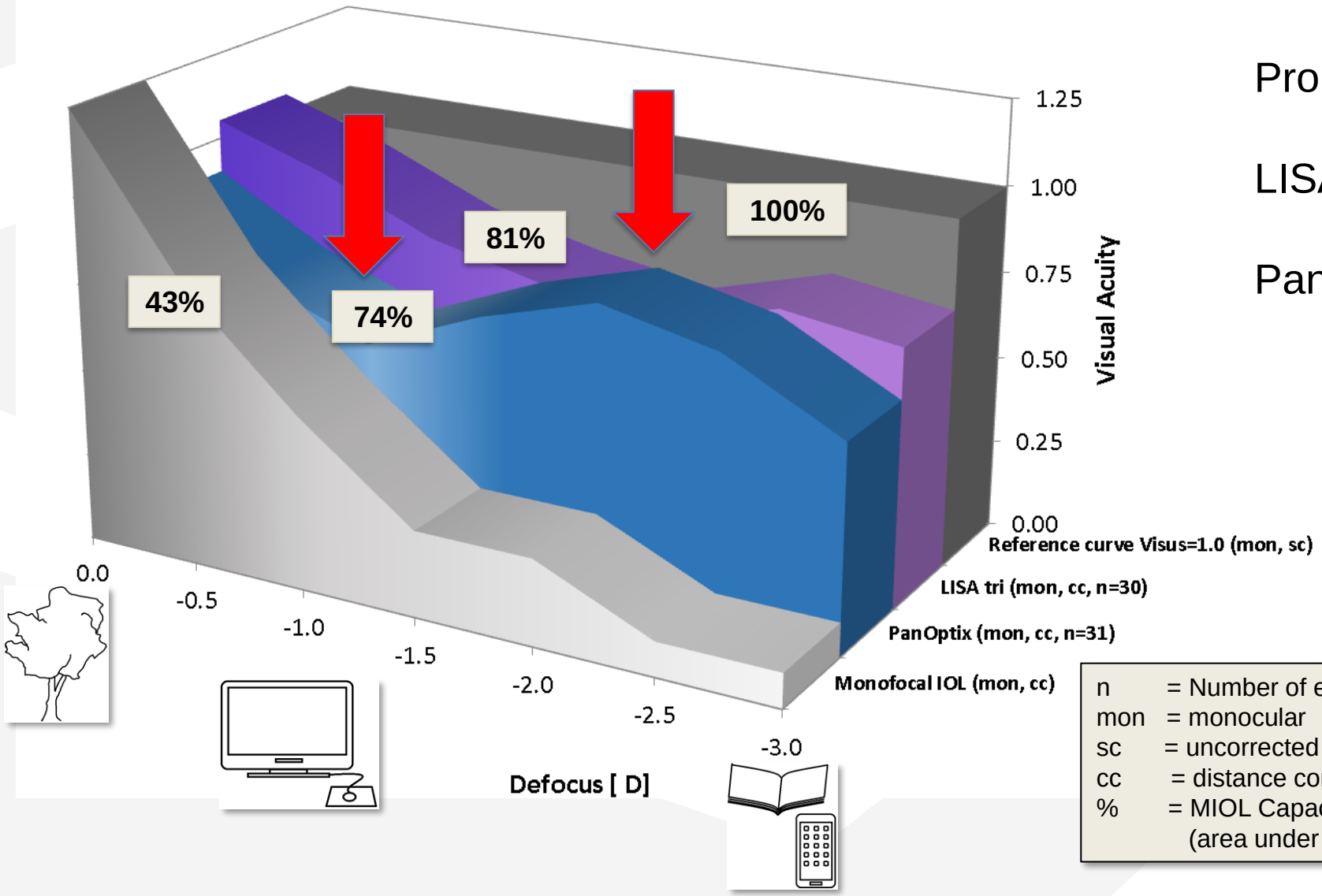
Presbyopia and cataract patients' wish to be increasingly independent of spectacles after surgery and this is one of the main drivers for the development of multifocal intraocular lenses (MIOL) and extended depth of focus (EDOF) intraocular lenses (IOL). As education, biometry, diagnostics, surgical techniques, and MIOL/EDOF IOL designs have improved over the past decade, an increasing number of cataract surgeons have become cataract refractive surgeons to help address this need. There is not one single MIOL/EDOF IOL, however, that suits all patients' needs. The wide variety of MIOL and EDOF IOL, their optics, and their impact on our patients' quality of vision have to be fully understood if we have to choose the appropriate IOL for each individual; MIOL/EDOF IOL surgery has to be customized. This review article looks at the different optical aspects and clinical consequences of MIOL/EDOF IOL, in order to help surgeons find an appropriate solution for each of their individual patients.

KLIMO Review: MIOL und EDOF Pfeile im Köcher

1. Refraktiv vs. Diffraktiv
2. Bifokal gg. trifokal
3. Niedrige gg. Hohe Nahaddition
4. Enhanced gg. EDOF gg. MIOL
5. Segmental gg. Konzentrisch
6. Pupillenunabhängig gg. Pupillenabhängig
7. Pinhole gg. Komplette Optik
8. Mix and Match gg. Binokulär gleiche Optiken
9. Überblendvisus gg. Emmetropes Sehen
10. Blaulichtfilter gg. Violettlichtfilter
11. Platte gg. C Loop



Problembeschreibung: Selbst Trifokale MIOL ist nicht Trifokale MIOL



Problem:

LISA tri: „better“ for PC distance

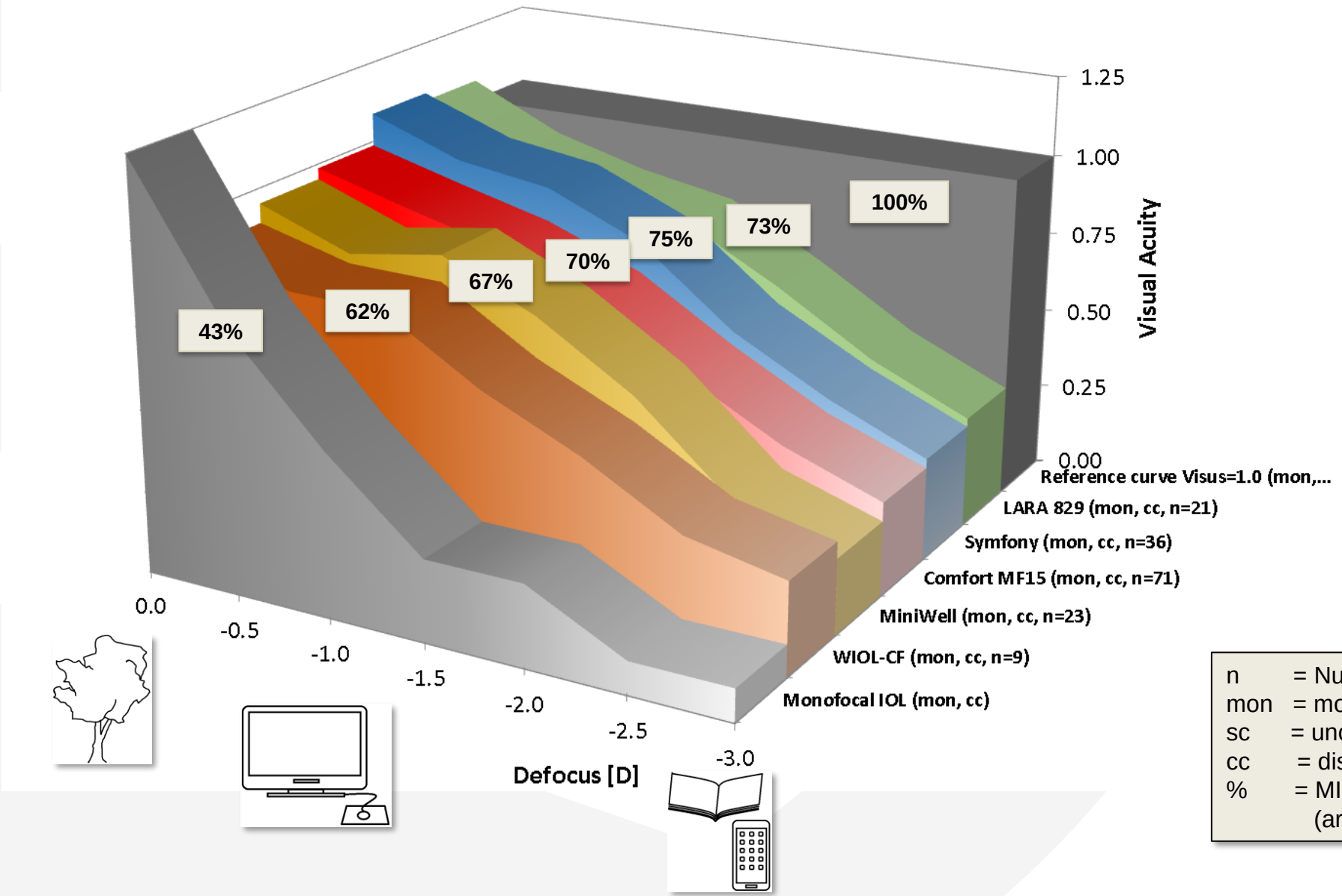
Panoptix: „better“ for laptop distance

Regarding bilateral implantation you can vary:

- IOL Type
- Target Refraction

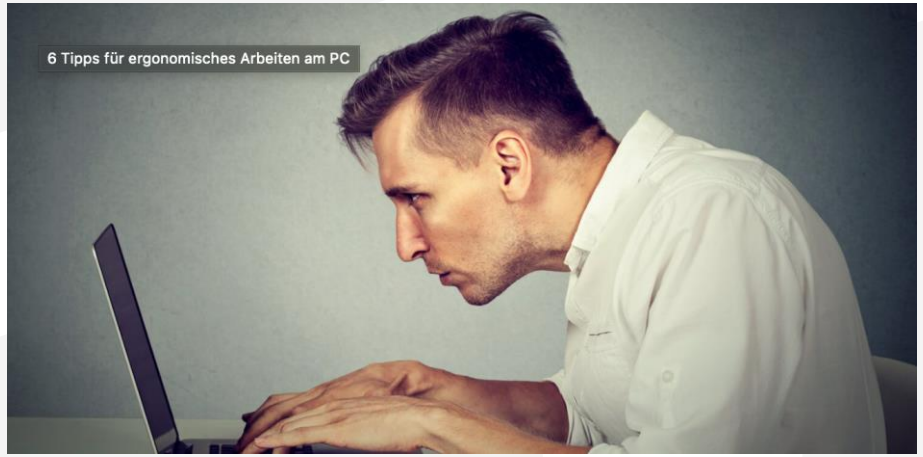
n = Number of eyes
mon = monocular
sc = uncorrected
cc = distance corrected
% = MIOL Capacity (area under the curve)

Problembeschreibung: EDOF ist nicht gleich EDOF



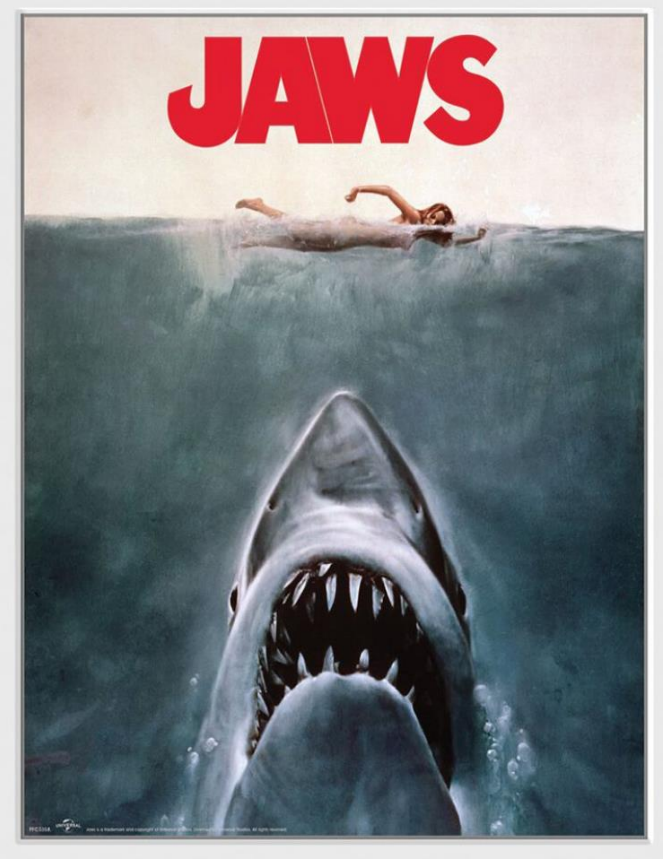
n = Number of eyes
mon = monocular
sc = uncorrected
cc = distance corrected
% = MIOL Capacity
(area under the curve)

Problembeschreibung: Intermediärvisus (IV) ist nicht gleich IV



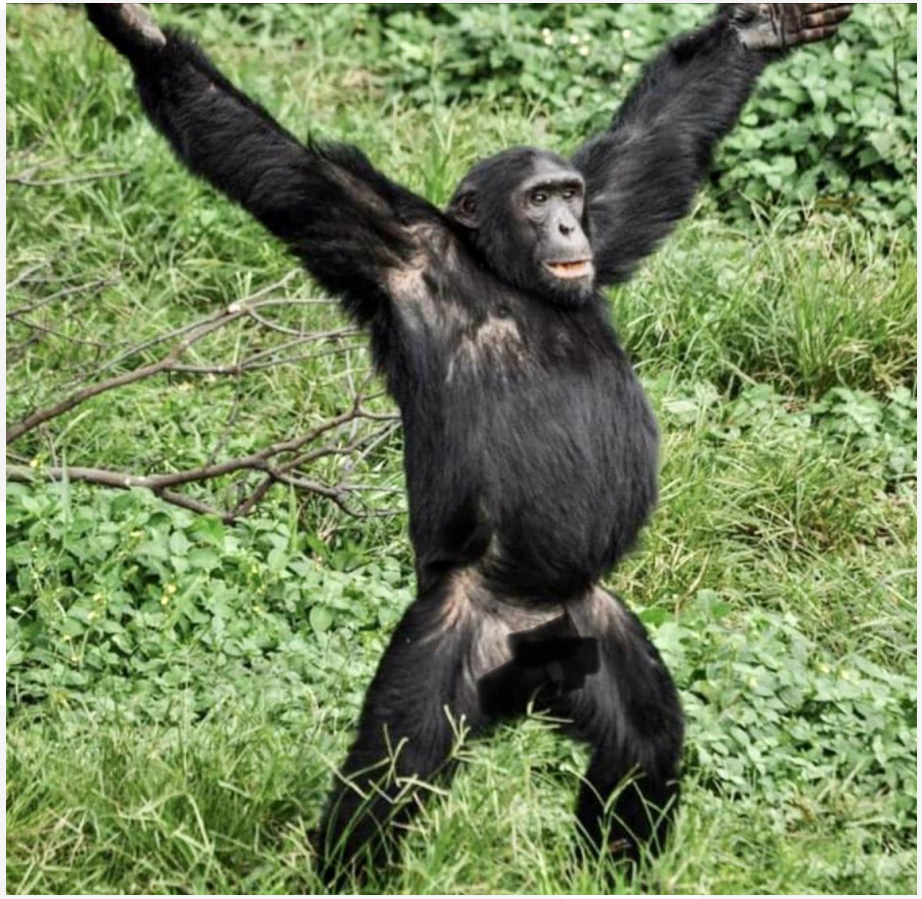
Problembeschreibung: Der unzufriedene Patient

- Patienten IOL Mismatch

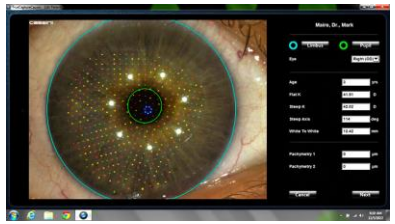
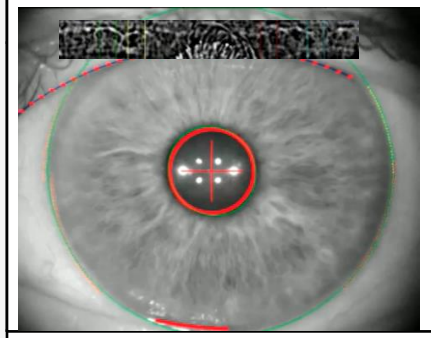
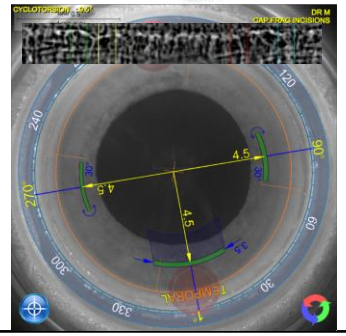
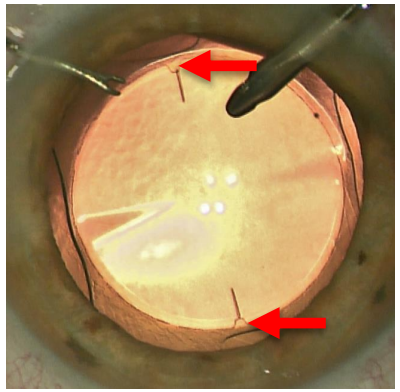


In Times of Social Media:

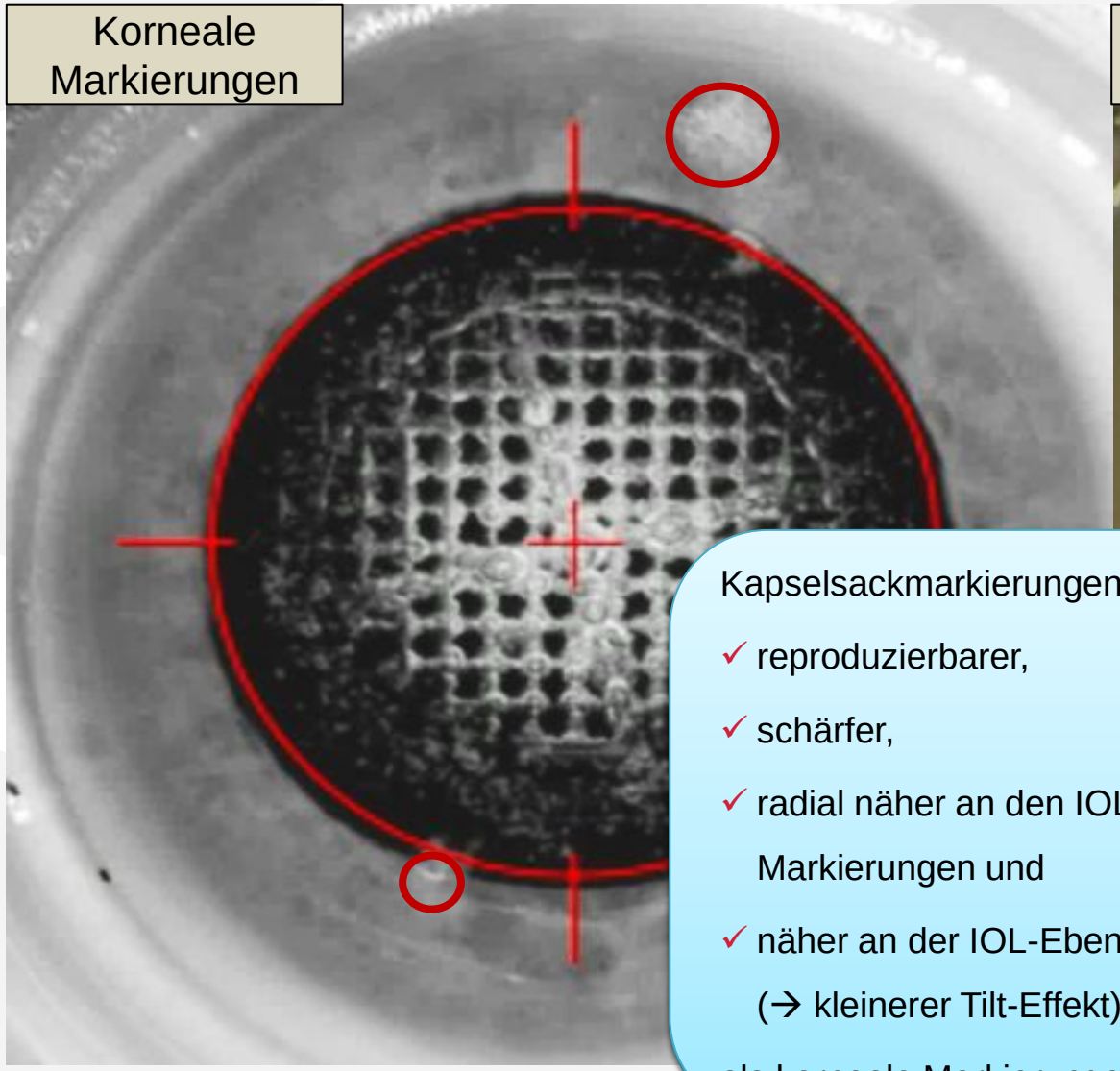
Unhappy Patient Becomes An Even More Dangerous Species

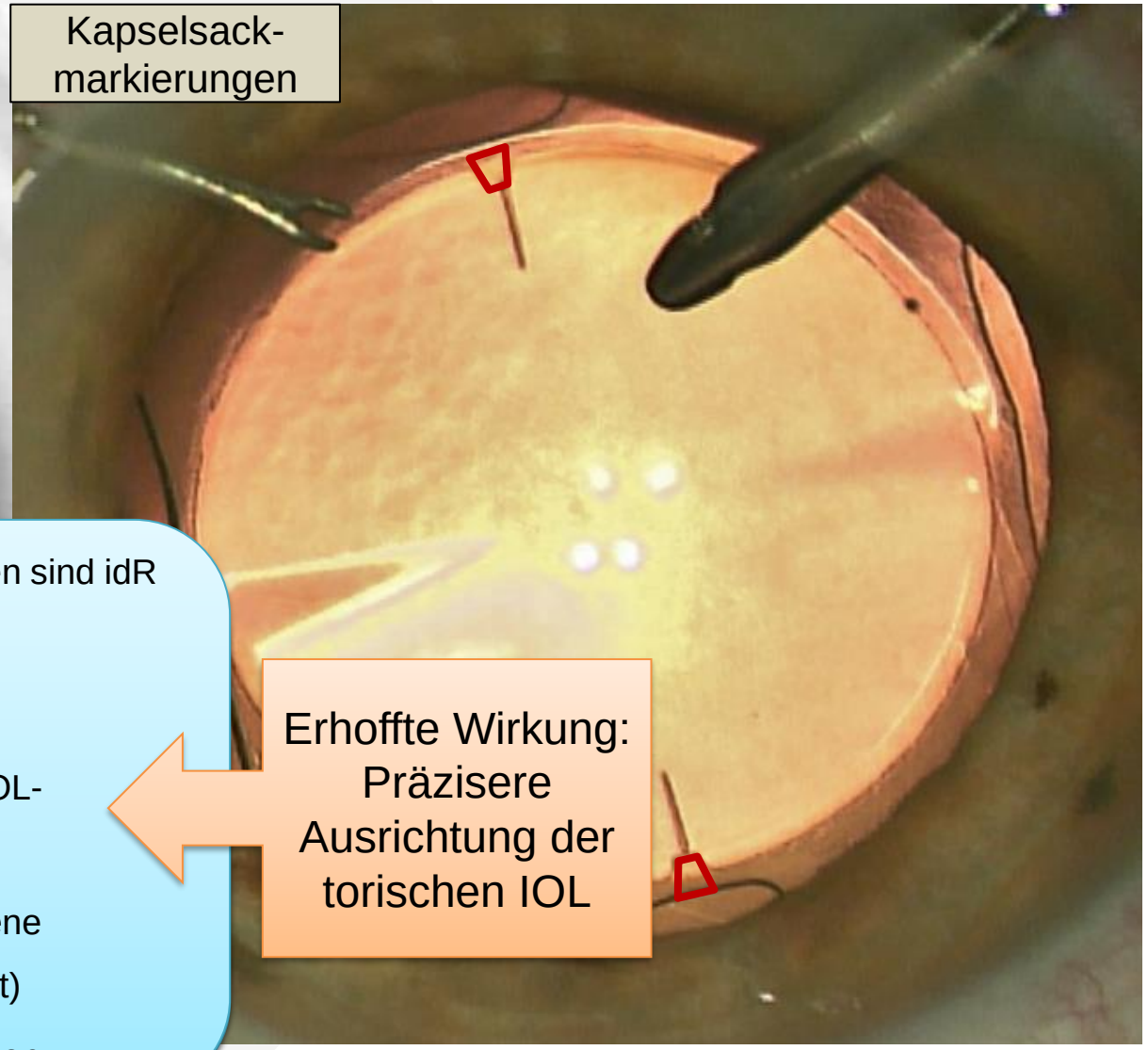


Problembeschreibung: Torische MIOL: Gradgenaue Ausrichtung

Verfahren zur Achsenausrichtung der Markierungen bei torischen IOL	
  	**IntelliAxis-L™**
	Bestimmung der steilsten Achse: Corneale Topografie (Cassini) relativ zur Iris
	Daten werden über Cloud (Streamline) an LENSAR übertragen
	LENSAR kompensiert Zyklorotation durch Abgleich der Irisbilder
	Kapselsackmarkierungen werden in Kapsulotomie integriert
Linsenfragmentation und Capsulorhexis mittels LENSAR	
Phakoemulsifikation und Implantation der torischen IOL	
	Ausrichtung der torischen IOL-Achse anhand der LENSAR-Markierungen

Vorteile von Kapselsackmarkierungen





Kapselsackmarkierungen sind idR

- ✓ reproduzierbarer,
- ✓ schärfer,
- ✓ radial näher an den IOL-Markierungen und
- ✓ näher an der IOL-Ebene (→ kleinerer Tilt-Effekt)

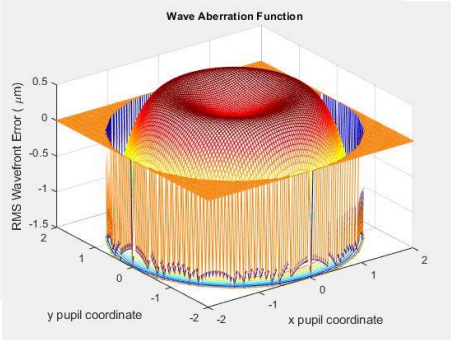
als korneale Markierungen.

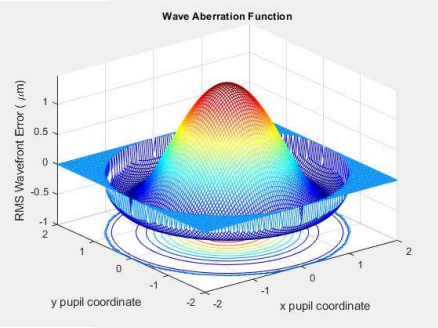
Erhoffte Wirkung: Präzisere Ausrichtung der torischen IOL

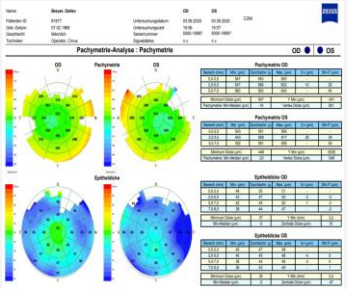
Problembeschreibung: Diagnostik und Komplikationsmanagement

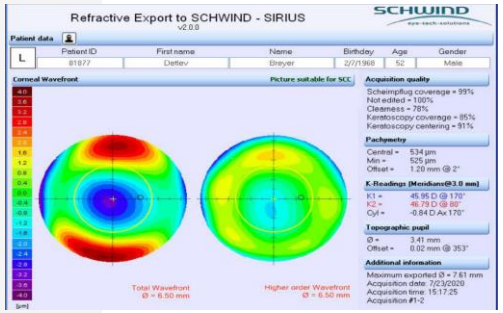
- Refraktive Kataraktchirurgie ist mehr Refraktive- als Kataraktchirurgie

- erfordert profunde Diagnostik: Aberrometrie, Pupillographie, epitheliale Pachymetrie, Keratographie etc.

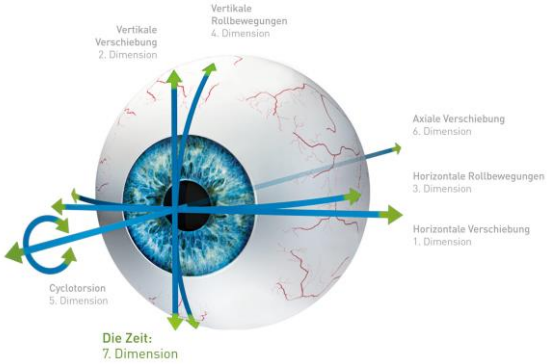






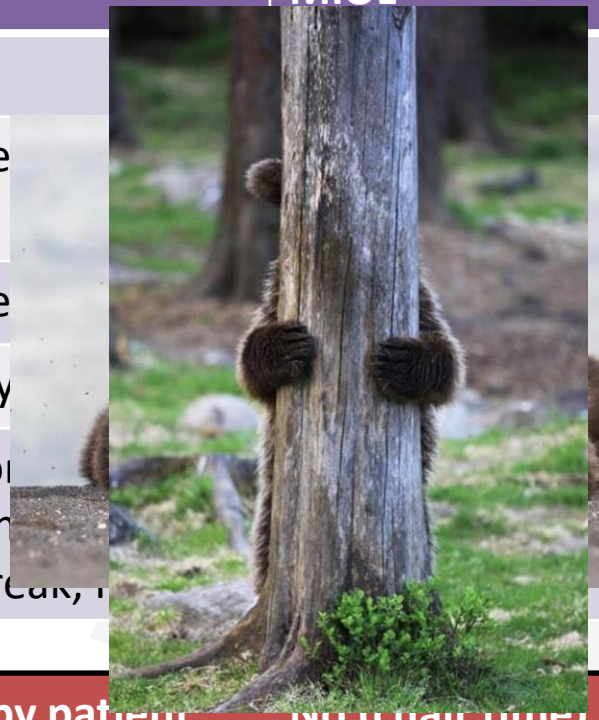


- erfordert perfektes intra- und postoperatives Komplikationsmanagement



Problembeschreibung: Retreatment Options – Comparison MIOL vs. Blended Vision

	MIOL	BV – DUS Formula
Outliers		
Wants bette		
Wants bette		
Poor Quality		
Complicatio management (capsular bre		
Finally happy patient	No (chair time)	YES



Korrektur der Altersichtigkeit: Lasern – ICL - IOL

Einstein - Problemlösung

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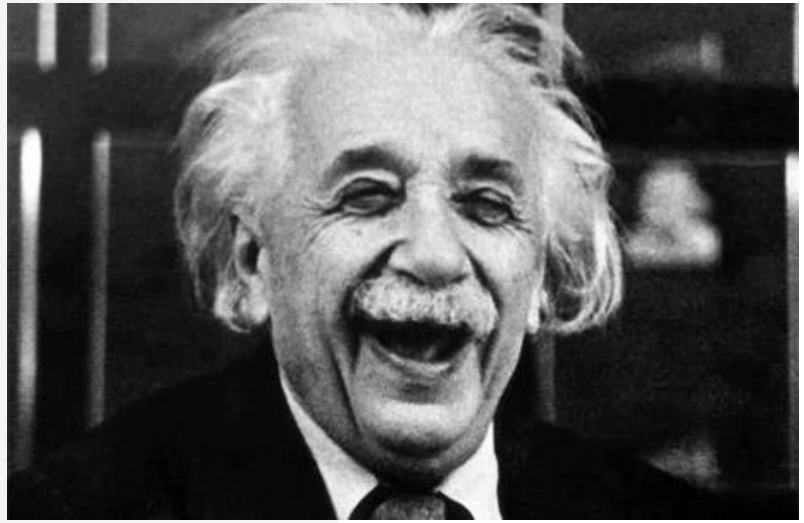
Als seine Lösung zu wissen,

Denn die exakte Beschreibung des Problems

Führt zu seiner Lösung“

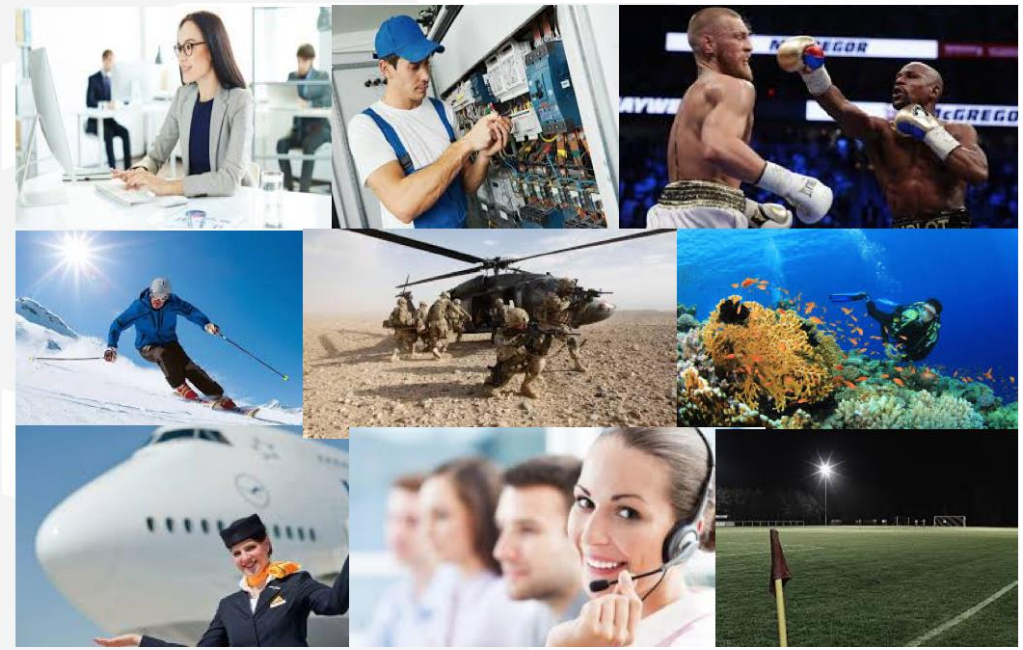


Unsere Lösung: Düsseldorfer miLens Strategie:

10 Jahre ebm Presbyopiekorrektur

Regel #1 DUS miLens® Strategie – Patientenwunsch

- Analysieren Sie den Wunsch des Patienten
- NICHT DRÄNGEN!
- Vorteile für die Lebensqualität erläutern
- Optische Nebenwirkungen <u>unterstreichen!</u>
- Mit Unterschrift dokumentieren

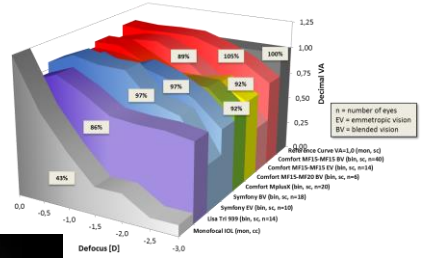


Regel #2 DUS miLens® Strategie – Voruntersuchung

MIOL Chirurgie ist refraktive Chirurgie: nur neueste Diagnostik wie Aberrometrie, Pupillographie....

Regel #3 DUS miLens® Strategie – Visusanamnese / Psycho „Analyse“

- Wichtigste Entfernung ohne Brille?
- Besondere Sehanforderungen im Beruf und bei Hobbys
- Risikosportarten? Schütze?
- Verträglichkeit photopischer Phänomene?



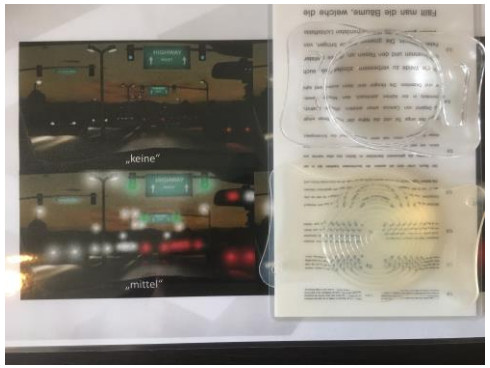
- Psycho „Analyse" :

  Veröffentlichung,

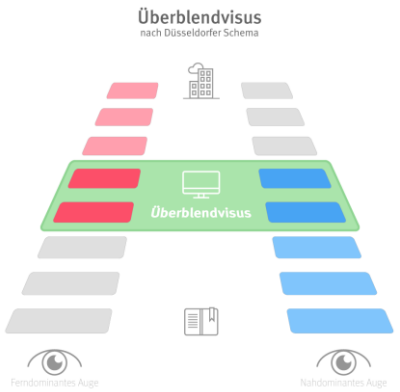
  Selbsteinschätzung (Pragmatischer Generalist oder dogmatischer Perfektionist)

Regel #4 DUS miLens® Strategie – Patientenaufklärung / SDM

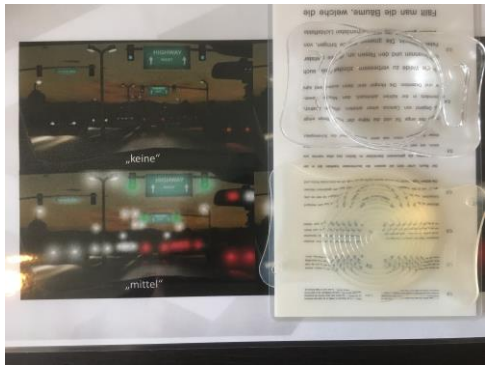
- Merkmale einer guten Einwilligungserklärung:
  - Nachteile betonen (Homo germanicus, Bedenkenträger)
  - Unbequeme Tatsachen nicht verschweigen (Kosten eines evtl. Folge Eingriffs ansprechen, Neuroadaptation)



SDM: Patient versteht nur, was Sie einfach erklären



Regel #5 DUS miLens® Strategie – Schaubilder / Verständniskontrolle

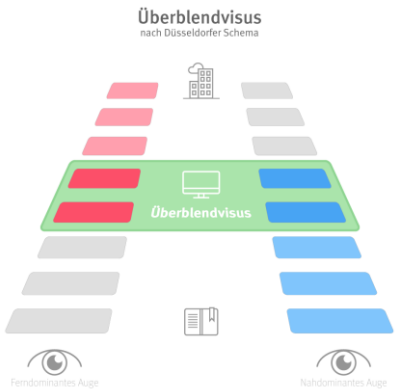


Schaubilder sind für das Verständnis zwingend erforderlich

Beweis für das Verständnis: Sie werden überrascht sein!!! 2 einfache Fragen:

1. Was können Sie nach der Operation ohne Brille sehen?

2. Was sind die visuellen Nachteile / Herausforderungen?



Regel #6 DUS miLens® Strategie – Refraktiv Manager / Checkliste

- Nettes, ruhiges Ambiente und ZEIT, kein Lärm - keine Eile
- Patient traut sich eher einem RM eine "dumme" Frage zu stellen als an einen Arzt
- Standardisierte Checkliste!
- Sehr wichtig: Dokumentation und Unterschrift: "Ich habe alles verstanden und hatte Zeit zu fragen"

Regel #7 DUS miLens® Strategie – Broschüren & Publikationen / Kontakt

- Geben Sie Ihren Patienten immer Informationsmaterial zum Nachlesen mit nach Hause
- Firmen-Broschüren
- (Eigene) Publikationen
- Kontaktdaten und Ansprechpartner

WDR 5 – Neugier Genügt – Feature „Keine Brille Ist So Schön Wie Keine Brille“

18:37 min

REVIEW ARTICLE

Multifocal Intraocular Lenses and Extended Depth of Focus Intraocular Lenses

Detlev R.H. Breyer, MD, Hakan Kaymak, MD,† Timon Ax,† Florian T.A. Kretz, FEBO,‡ Gerd U. Auffarth, MD,§ and Philipp R. Hagen, MD¶*

Abstract: Presbyopia and cataract patients' desire for increased spectacle independence after surgery is one of the main drivers for the development of multifocal intraocular lenses (MIOLs) and extended depth of focus (EDOF) intraocular lenses (IOLs). As education, biometry, diagnostics, surgical techniques, and MIOL/EDOF IOL designs have improved over the past decade, an increasing number of cataract surgeons have become cataract/refractive surgeons to help address this need. There is not 1 single MIOL/EDOF IOL, however, that suits all patients' needs. The wide variety of MIOLs and EDOF IOLs, their optics, and their respective impact on our patients' quality of vision have to be fully understood to choose the appropriate IOL for each individual; MIOL/EDOF IOL surgery has to be customized. This review article looks at the different optical aspects and clinical consequences of MIOLs/EDOF IOLs to help surgeons find an appropriate solution for each of their individual patients.

Key Words: MIOL, EDOF, defocus curves, halo, glare

(Asia-Pac J Ophthalmol 2017;6:0–0)

Several review articles and meta-analyses regarding multifocal intraocular lenses (MIOLs) have been published in scientific journals, most of which investigate postoperative outcomes of visual acuity for far and near distance. The superiority of MIOLs over monofocal intraocular lenses (IOLs) with respect to near visual acuity has been demonstrated for more than a decade through meta-analyses of randomized controlled trials.[1,2] It has also been shown that this gain in near vision comes without a relevant decrease in distance vision. However, de Silva et al[3] questioned whether this intended improvement outweighed the possible adverse effects of MIOLs, such as halo and glare. This is an individual question that depends on the patient's motivation.[4]

Visual acuity values for MIOLs have also been reported by Agresta et al.[5] A systematic review was conducted to identify studies reporting uncorrected distance visual acuity (UDVA) and uncorrected near visual acuity (UNVA) after cataract surgery with different MIOLs in presbyopic patients. Their filtering method yielded 29 studies. Although the results varied, all studies that reported pre- and postoperative values demonstrated statistically significant improvements in UDVA and UNVA due to MIOL implantation.

Cochener et al[6] conducted a meta-analysis of comparative clinical trials published between 2000 and 2009 that included bilateral MIOL implantations and control groups with monofocal IOLs. Random effects models were used to obtain pooled estimates for binocular UDVA and UNVA. On the basis of the presented results, the authors concluded that the considered MIOLs offered patients significantly better UNVA than monofocal IOLs. The corresponding mean values were 0.14 logarithm of the minimum angle of resolution (logMAR) and 0.47 logMAR, resulting in higher spectacle independence for the MIOL group. There were no statistically significant UDVA differences between refractive and diffractive MIOL groups.

De Vries et al[7] also systematically collected monocular and binocular UDVA and UNVA outcomes along with spectacle independence rates from 16 randomized clinical trials and 41 nonrandomized case series. However, one general problem with collecting visual acuity data from different publications is the variation in the presentation of outcomes. Some give Jaeger optotypes whereas others give mean logMAR values with or without standard deviation and so on. With respect to measuring techniques, thus far there has been no standardized way of testing near visual acuity.

Rosen et al[8] conducted a comprehensive review of peer-reviewed papers published between 2000 and 2015 that comprises 4- to 6-month results for monocular and binocular UDVA and spectacle independence from a total of 203 studies. Monocular UDVA of 0.03 logMAR and 0.00 logMAR or better was achieved in 95.7% and 58.1% of the eyes, respectively. The mean value was 0.05 logMAR. Binocular UDVA of 0.03 logMAR and 0.00 logMAR or better was achieved in 99.9% and 79.2% of the eyes, respectively, with 0.04 logMAR being the mean value. Standard deviations were only given for a subset of the studies. The authors reported that 80.1% of the patients achieved spectacle independence. Although these averages were taken across all MIOL types, the values fall in line with visual outcomes after implantation of present-day MIOLs.

Additionally, stray light occurrence measured with the C-Quant device (Oculus Optikgeräte GmbH, Wetzlar, Germany) has been systematically assessed in a recent review by Labuz et al.[1] The authors showed that hydrophilic MIOLs, on average, showed less postoperative stray light than hydrophobic MIOLs.

A review article by Braga-Mele et al[9] provides a comprehensive overview of best practices regarding MIOL management, including thorough discussions of cornea-, pupil-, retina-, and optic nerve–related issues, along with previous refractive surgeries that contraindicate MIOL implantation. The authors present suggestions for how to deal with intraoperative problems and dissatisfied MIOL patients. Besides this, they present helpful

From the *Premium Eyes Augenlasern, Düsseldorf; †Breyer, Kaymak, Klabo Augenchirurgie, Düsseldorf; ‡Augenärzte Gerl. Kretz & Kollegen, Rheine; §Universitäts-Augenklinik, Heidelberg; and ¶International Innovative Ophthalmochirurgie GbR, Düsseldorf, Germany.
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Regel #8 DUS miLens® Strategie – Neueste OP Techniken

- Astigmatismus Management

- Erfahrener Chirurg, der intraoperative Komplikationen abdecken und vorausschauend operieren kann

- Erfahrener refraktiver high volume Chirurg, falls ein „touch up procedure“ notwendig ist

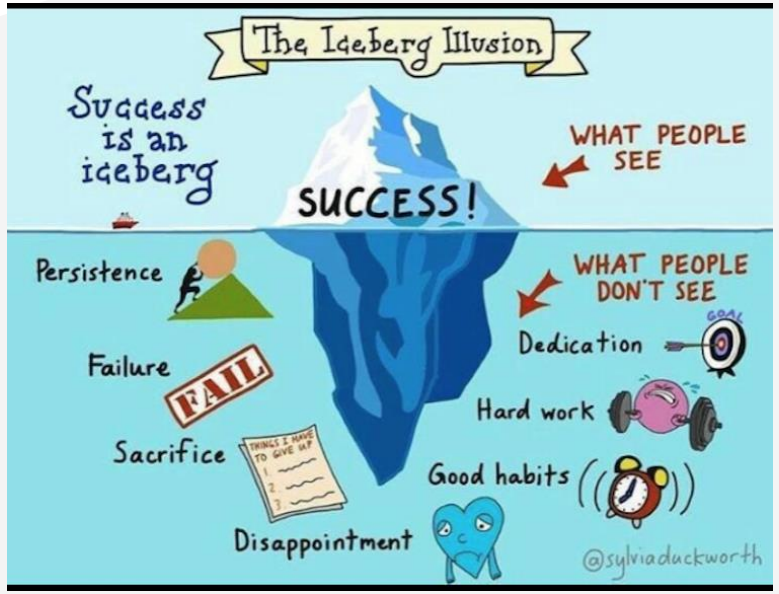
- Operateur sollte alle gängigen „touch up procedures“ beherrschen

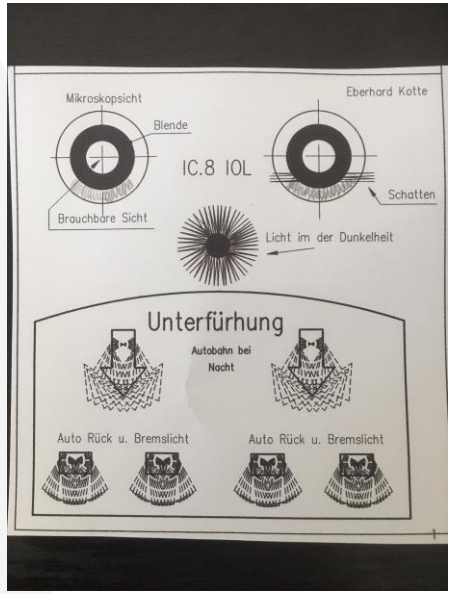
Regel #9 DUS miLens® Strategie – Standardisierte Nachkontrollen

3 Monate nach der Operation: "Ist es uns gelungen, Ihre Sehanforderungen zu erfüllen?"

Regel #10 DUS miLens® Strategie – Beschwerdemanagement

- LEAP Strategie
  - Zuhören
  - Betonen
  - Entschuldigen
  - Problemlösung





- Nehmen Sie die Bedürfnisse der Patienten ernst
- Unzufriedene Patienten immer wieder einbestellen

Physikalisch Optische Betrachtung Unterschiedlicher (Torischer) MIOL/EDOF IOL und Auswirkung auf die Patientenselektion

Detlev R.H. Breyer

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