

# ÖZELLİKLİ GİL'LERİ NE ZAMAN?

PROF. DR. İZZET CAN

26. TOD YAZ SEMPOZYUMU, İZMİR, 21.06.2013

# FİNANSAL İLİNTİ BEYANI

- Bu toplantıya katılımım için VSY Biotechnology firmasından destek sağlanmıştır.

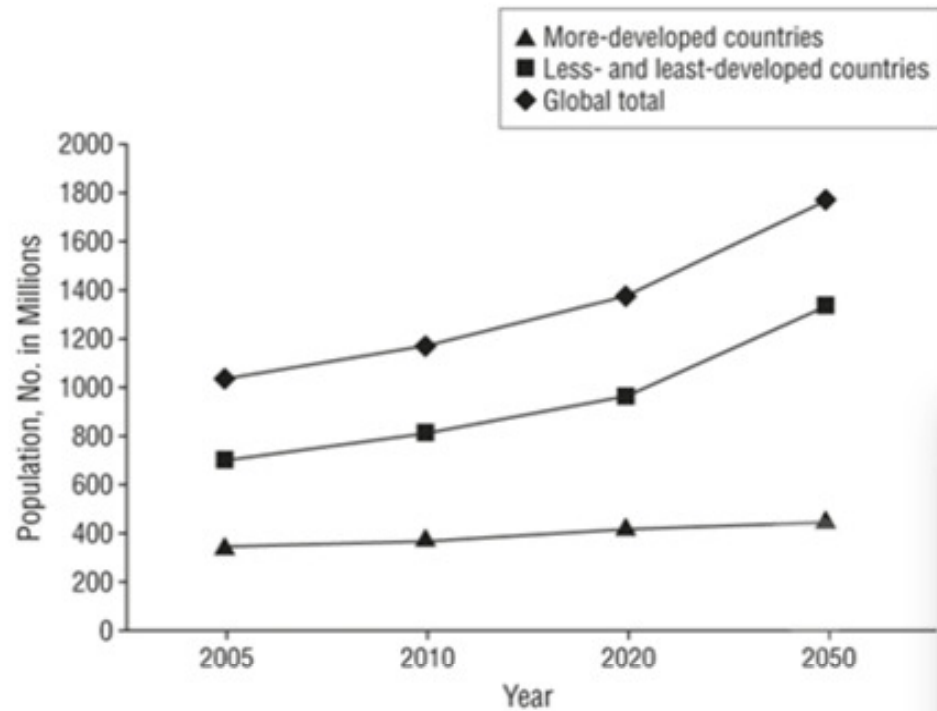
# PREMIUM LENS NEDİR?

- Premium
  - Ödül, ikramiye
  - Nitelikli, önde gelen lensler
- Specialty
  - Özel, özellikli lensler
- Advanced Technology
  - İleri teknoloji lensleri
- Presbiyopi düzelten lensler
  - Akomodatif
  - Multifokal
- Torik lensler

« There's little room for forgiveness when you implant premium IOLs. Patient expectations are higher any time a patient pays an out-of-pocket cost »

Terry Kim, M.D., Professor of Ophthalmology, Duke University School of Medicine, Duke University Eye Center, Durham, N.C.

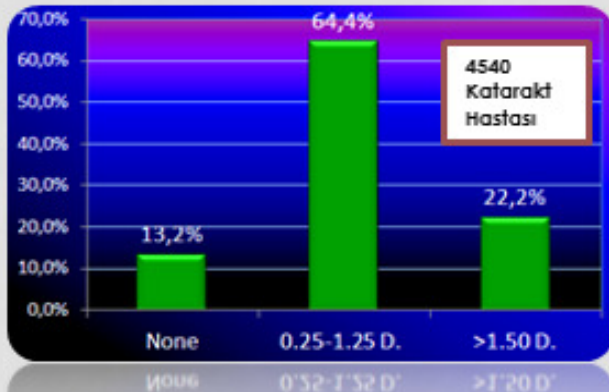
# PRESBIYOPI / PREVALANS



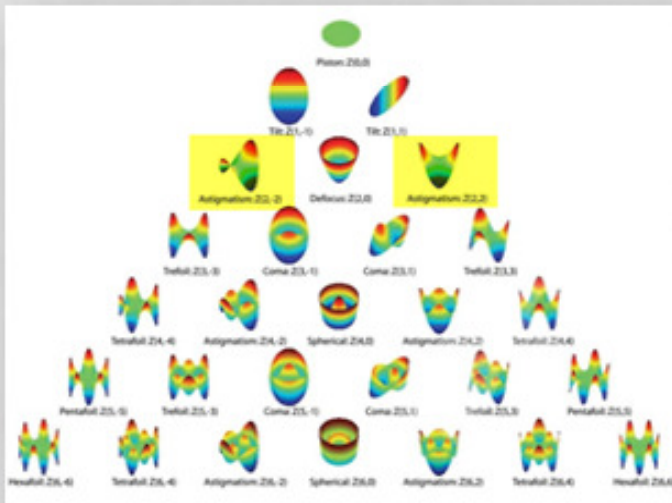
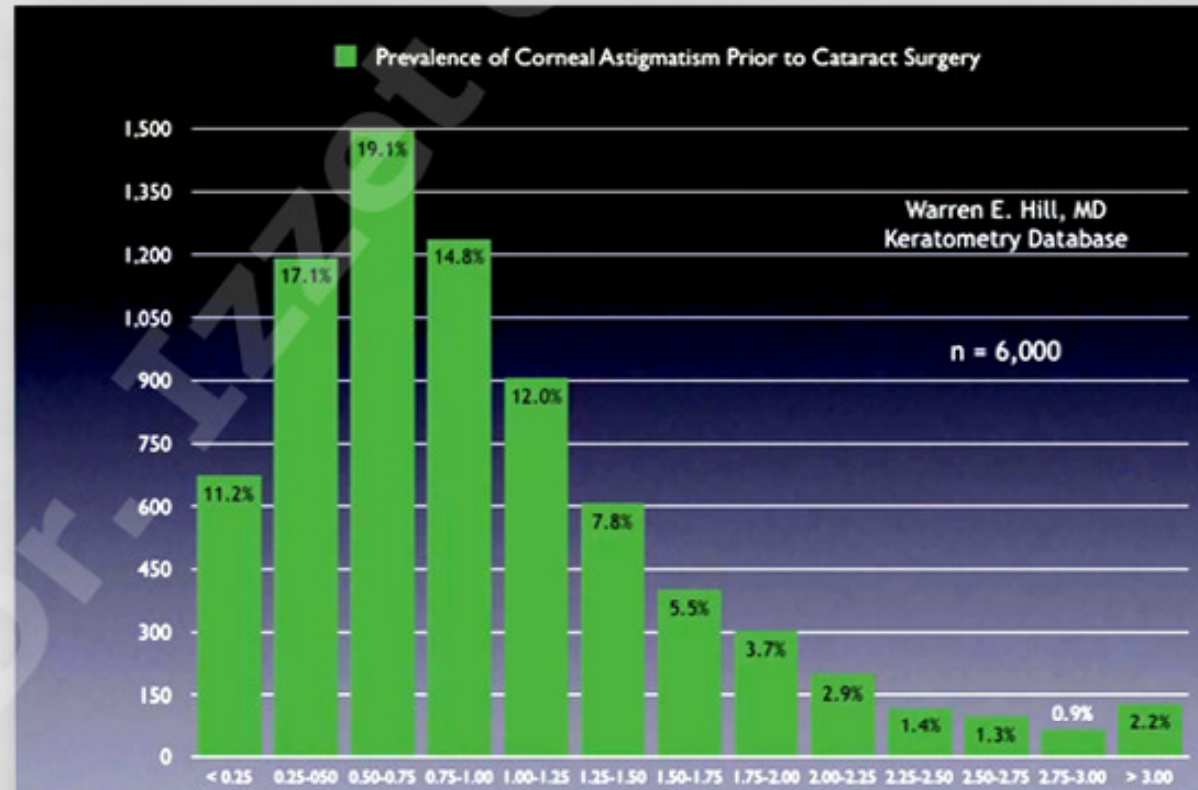
Near vision testing in a rural community. TANZANIA



# ASTİGMATİZMA / PREVALANS



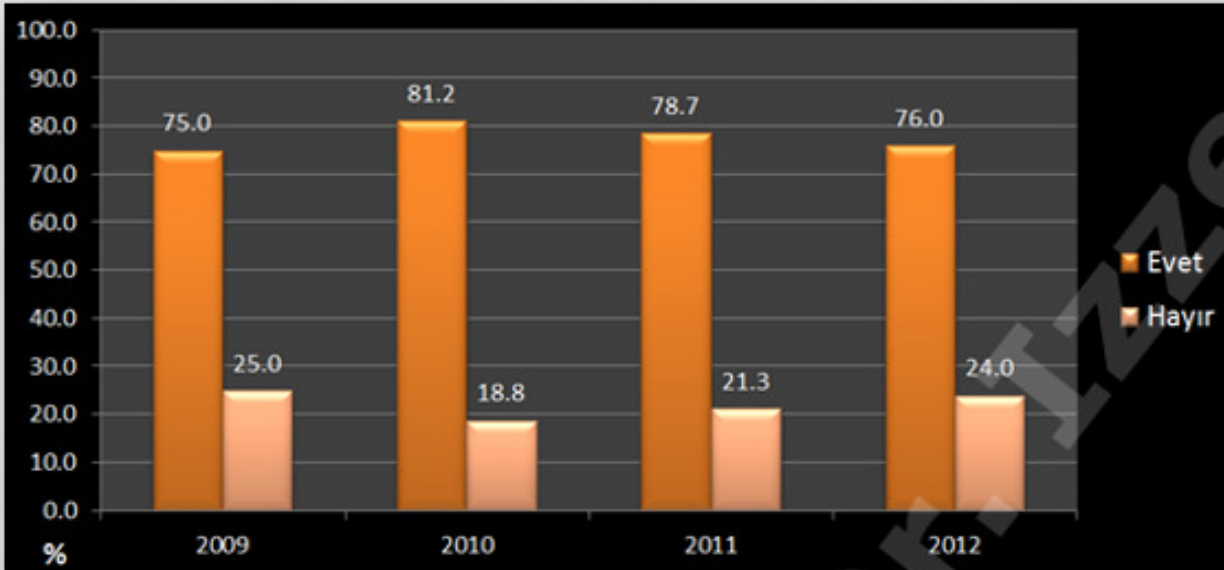
Ferrer-Blasco T et al. Prevalence of corneal astigmatism before cataract surgery. J Cataract Refract Surg 2009; 35:70-75.



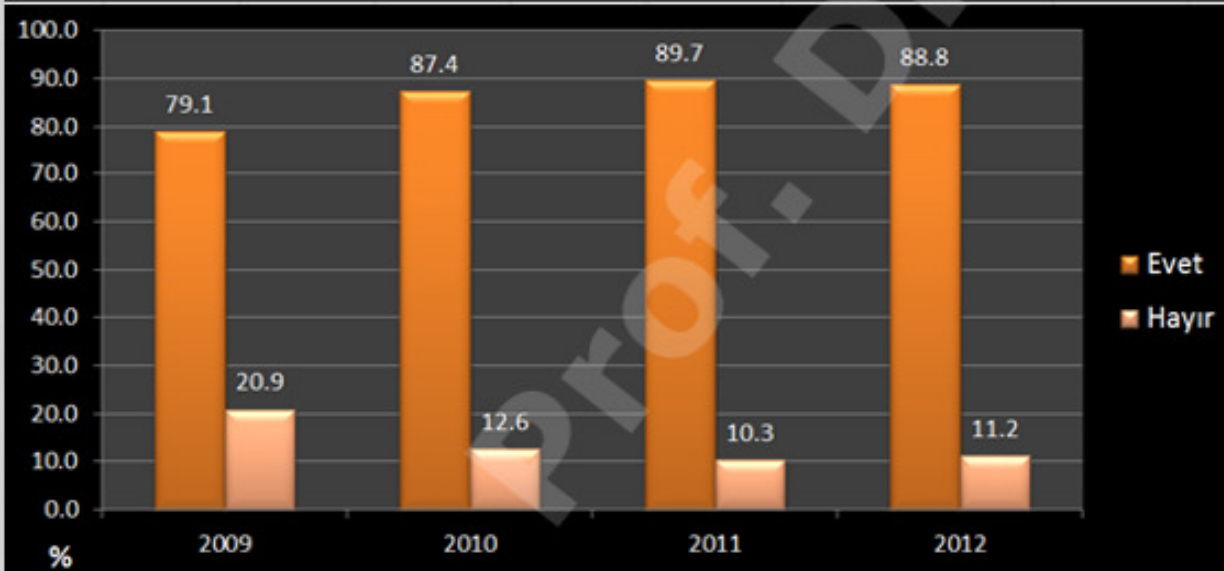
**%37.7**

**%17.9**

# ASCRS / PREMIUM LENS KULLANMA ORANLARI / DAVID LEAMING

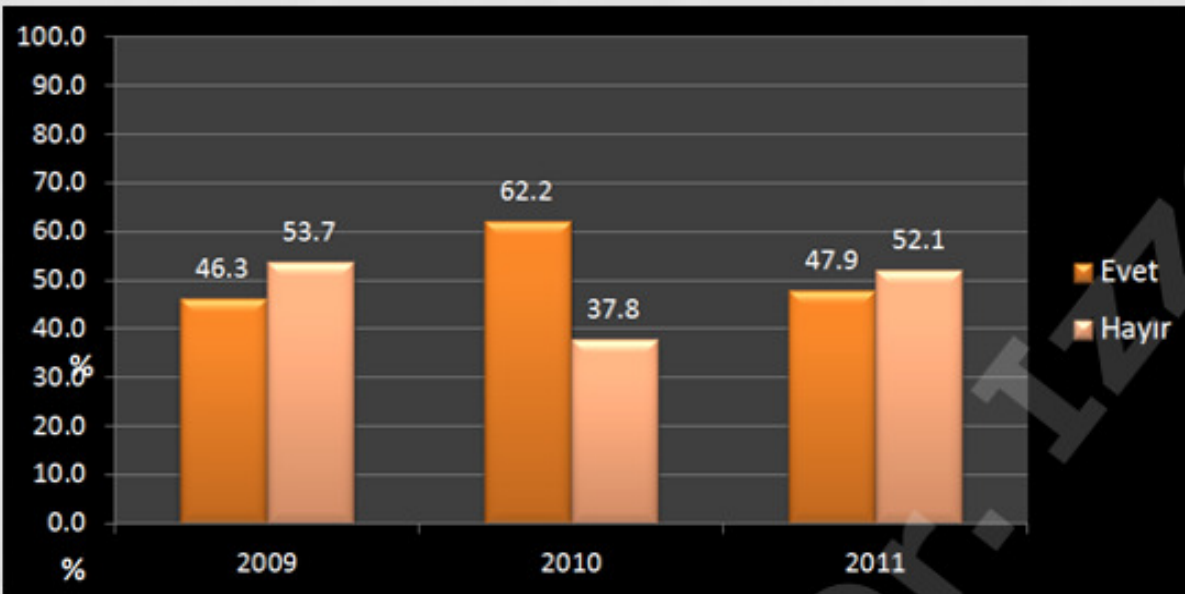


**Presbiyopik** Lens  
Kullanıyor musunuz?

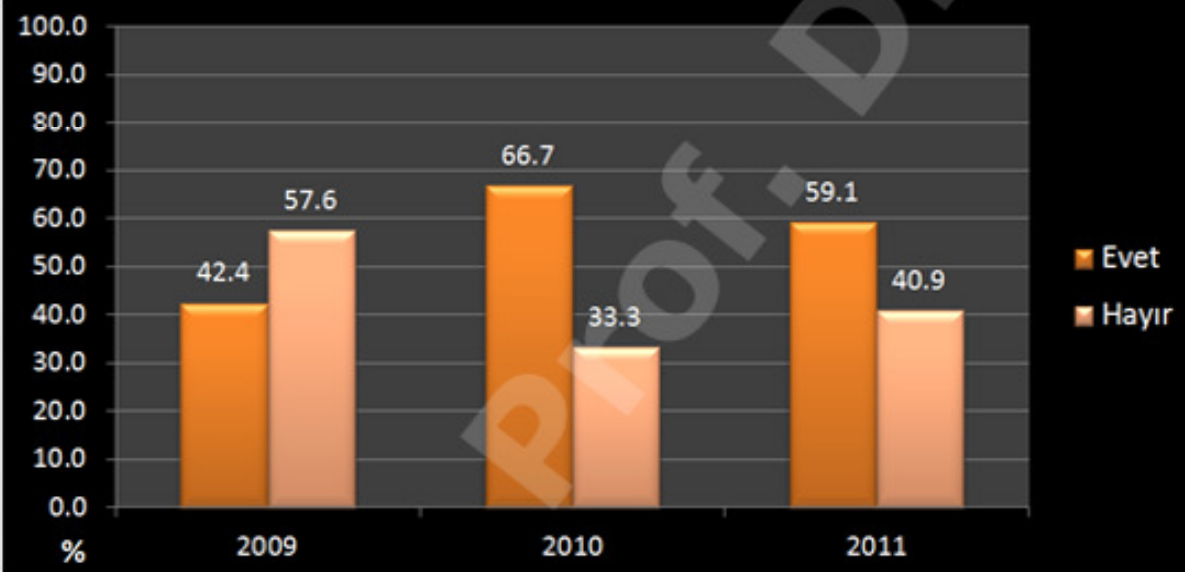


**Torik** Lens Kullanıyor  
musunuz?

# ESCRS / PREMIUM LENS KULLANMA ORANLARI / DAVID LEAMING



Presbiyopik Lens  
Kullanıyor musunuz?



Torik Lens Kullanıyor  
musunuz?



# ASCRS / PREMIUM LENS KULLANMA ORANLARI / DAVID LEAMING

	2010		2011		2012	
	Presbiyopik GİL (%)	Torik GİL (%)	Presbiyopik GİL (%)	Torik GİL (%)	Presbiyopik GİL (%)	Torik GİL (%)
%0	15.4	12.6	15.3	10.3	21.9	7.4
%1-5	43.8	28.8	46.5	32.3	43.3	37.0
%6-10	18.8	34.5	14.9	25.4	14.1	23.1
%15	9.6	13.7	10.8	16.3	7.4	17.5
%20	8.5	8.8	10.1	13.6	8.3	12.9
%40	2.8	1.4	2.3	1.8	4.1	0.7
%60	0.7	0.2	0.2	0.2	0.7	0
%80	0.2	0	0	0	0	0
%100	0.2	0	0	0	0.2	0



# KİMLERE PREMIUM LENS?

- Torik GİL, 0.75 - 1.0 D. ve üzeri astigmatı olan bilateral monofokal düzeltme isteyen ya da monovizyon isteyen her hastaya önerilebilir.
- Multifokal GİL'ler yakın düzeltmesi isteyen ve halo-glare sorunu olacağı şüphesi olmayan her hastaya önerilebilir.
- Akomodatif GİL, Glare ve haloya duyarlı olma olasılığı olan bilgisayar kullanan ancak gerektiğinde yakın gözlüğü takmayı dert etmeyecek hasta grubuna önerilebilir.
- Torik Multifokal GİL, 1.0 D. ve üzeri korneal astigmatizması olan ve presbiyopik düzeltme isteyen hastalara takılabilir.

# KİMLERE PREMIUM LENS? / HAYIR

## Kişilik yapısı

- Gerçekçi olmayan beklentileri olan hastalar
- Eleştirel
  - argumentative
- Tartışmacı
  - combative
- Müşkölpesent
  - demanding
- Diğer negatif davranış biçimleri
  - titiz, uyumsuz
  - picky, dissonant



20 / unhappy

## Yaşam Biçimi ve Meşguliyet

- Sürekli gece araba kullanma
- Yoğun bilgisayar kullanımı
- Yüksek KD gerektiren işler, hobi ve spor aktiviteleri

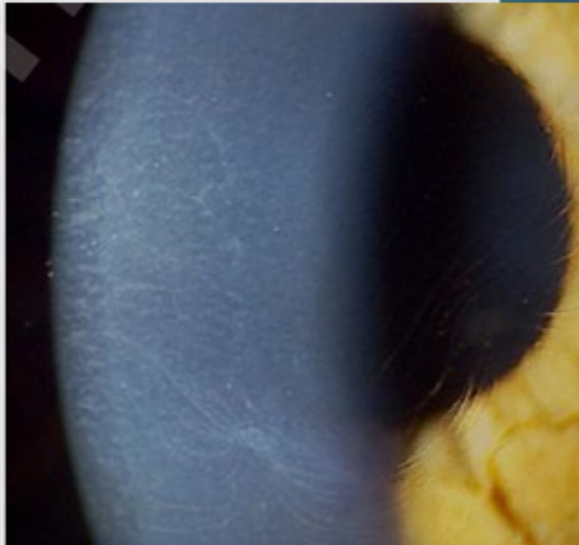
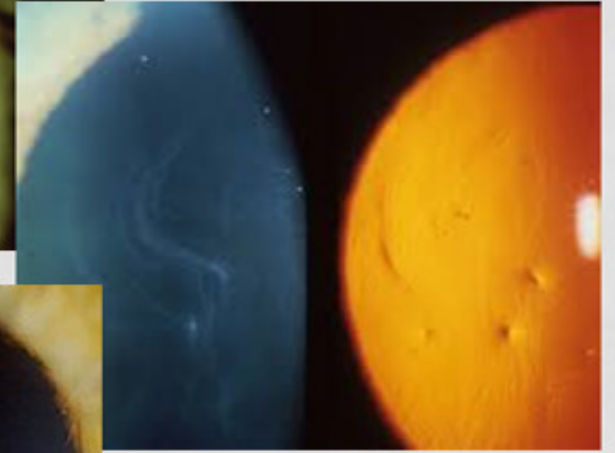
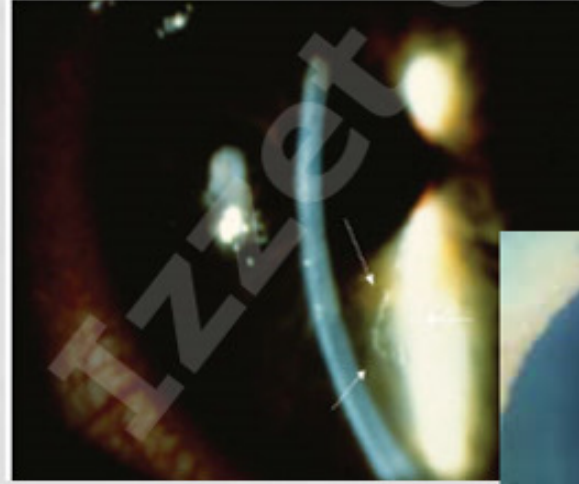


# KİMLERE PREMIUM LENS? / EVET AMA

- Hastaların gözlükten bağımsız olma konusunda istekli olmaları
- Hastaların bu cerrahinin sınırları konusunda bilgilendirilmiş olmaları
- Hastalar ilerde
  - YAG kapsülotomi
  - Lasik veya laser yardımcı destek tedavigerekebileceğini bilmelidirler.
- Bu hastalara geleneksel uygulamadan farklı ayrı bir değerlendirme zamanı ayrılması şarttır.

# KORNEAL DEĞERLENDİRME

- Anterior bazal membran distrofisi
- Görme aksındaki küçük anterior stromal skarlar





# KURU GÖZ / BLEFARİT

Tratter W, Goldberg D, Chaz R, Majmudar P, Donnenfeld E, McDonald M, Stonecipher K, Packer M, Vukich J, Berdy G, Malahotra R.

## **Prevalance of dry eye in patients scheduled for cataract surgery. AAO 2010**

- 10 merkez
- 55 yaş üzeri katarakt hastaları
- Ort Yaş : 71
- 204 göz (102 hasta)
- Ort GKZ : 4.93 sn.
- GKZ  $\leq$  5 sn : 126 göz (%61.7)
- GKZ  $\leq$  7 sn : 169 göz (%82.8)
- Santral korneal boyanma : 92 göz (%45.1)
- Schirmer skoru  $\leq$  10 : 95 göz (%46.6)

Luchs J, Buznego C, Trattler W.

## **Blepharitis in patients scheduled for cataract surgery. AAO 2010**

- 100 hasta
- Ort. Yaş: 72
- Blefarit : %59
- GKZ  $\leq$  9 sn : %85

# HASTANIN DEĞERLENDİRİLMESİ VE HASTA SEÇİMİ

## Pupil Çapı

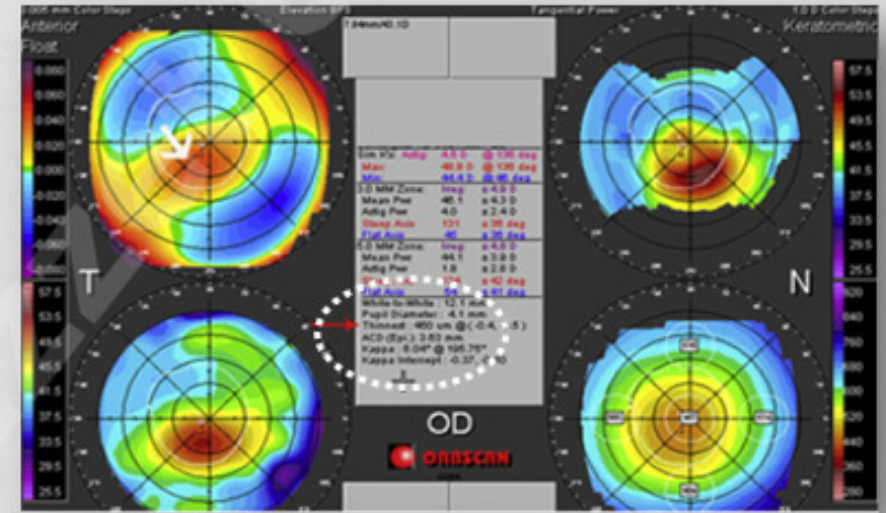
- Halo, glare, gece görme semptomları
- M-GİL'deki pupil çapına bağlı enerji dağılımı
- % 42 gözde: preoperatif / postoperatif pupil çapı en az 0.5 mm farklıdır
- % 10 gözde: 1 mm ve üzeri değişmiştir.

Koch DD J Cataract Refract Surg 1996; 22: 579-84.

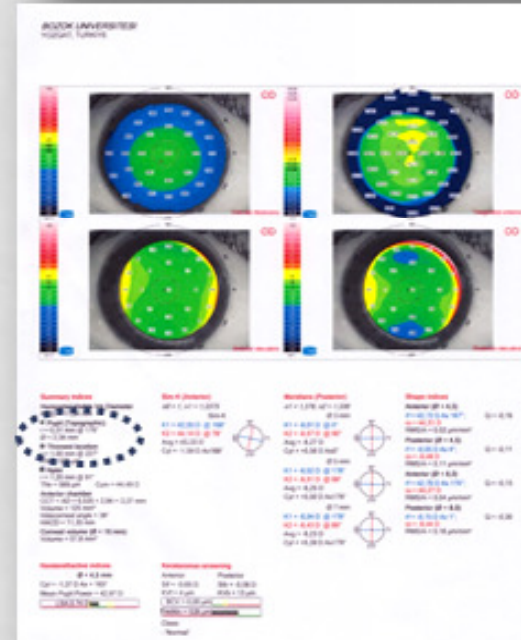
MGİL ?

Mezopik  $\geq 6.0$  mm

Normal ışık şartları  $\leq 2.5$  mm



Orbiscan II



Sirius

# DOĐRU KERATOMETRİ

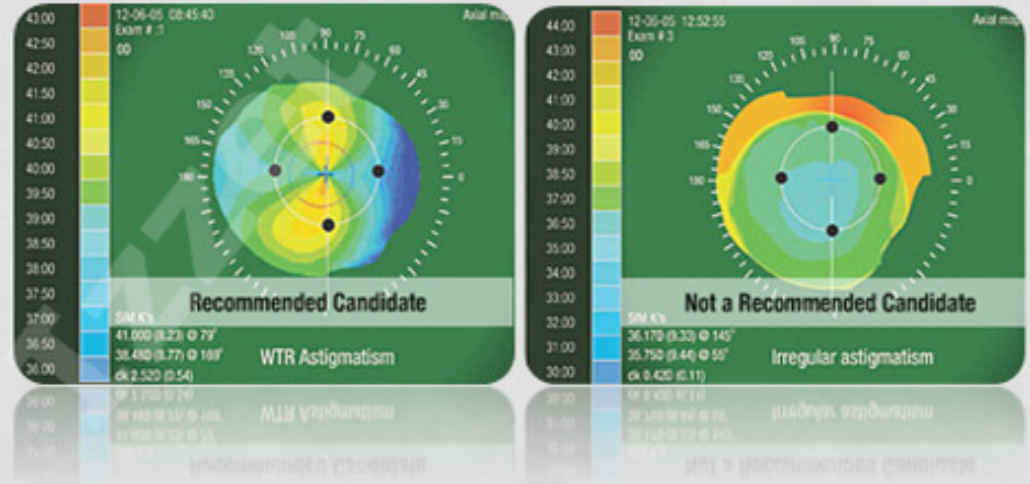
- Ölçüm öncesi kapak ve gözyaşı durumu gözden geçirilmelidir.
- Her türlü ölçüm göze damla damlatılmadan yapılmalıdır.
  - Tek istisna: Suni gözyaşı damlası
- KL 2-3 haftadır kullanılmıyor olmalıdır.

- Ölçümler arası büyük farklılıklar varsa; 2-3 hafta sonra tüm şartlar düzeltilip, ölçümler tekrarlanmalıdır.



# KORNEAL TOPOGRAFI

- Forme Fruste Keratokonus
- Keratokonus
- Pellucid Marjinal Dejenerasyonu
- Düzensiz Astigmatizma





# DOĐRU BİYOMETRİ

- Aksiyel uzunluk ideal: 22.0 – 24.0 mm.
- Yeni nesil GİL güç hesaplama formülleri
  - Holladay II
  - Haiges ve SRK/T AU  $\geq 25$  mm
  - Hoffer Q AU  $\leq 22$  mm
- Optik biyometri
  - Parsiyel koherans interferometri (IOLMaster)
  - Düşük koherens interferometri (Lenstar 900)
- C- sabiti

# HASTANIN DEĞERLENDİRİLMESİ VE HASTA SEÇİMİ

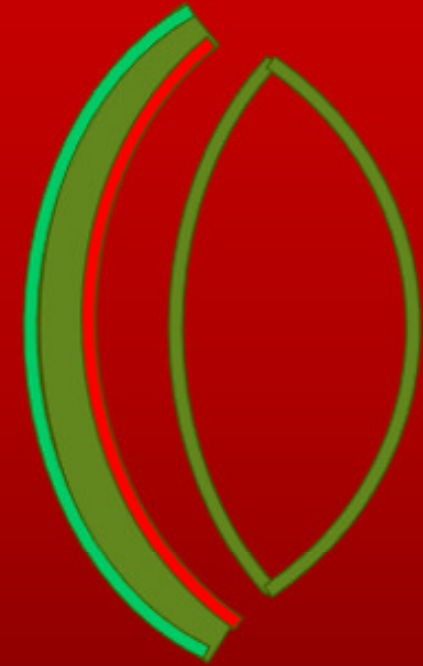
## Kırma kusuru

- Düşük miyoplar
  - Kataraktın ilerlemesini bekle
- Yüksek miyoplar
  - Psödofakik RD
- Hipermetroplar
  - Düşük biyometri güvenliği
  - Geniş kappa açısı

Hoffer JK J Cataract Refract Surg 2000; 26: 1233-7.

# POSTERİOR KORNEAL ASTİGMATİZMA

Çalışma	Kullanılan Görüntüleme Modeli	Posterior Astigmatizma	
		Ort. $\pm$ SD	Aralık
Royston, 1990	Purkinje imajları (Poloroid kamera)	0.38	0.17-0.78
Dunne, 1991	Purkinje imajları (Poloroid kamera)	0.26	
Prisant, 2002	Scanning Slit Topografi (Orbscan)	0.66 $\pm$ 0.23	0.32-1.38
Modis, 2004	Scanning Slit Topografi (Orbscan)	0.78 $\pm$ 0.61	0.16-3.30
Dubbelman, 2006	Scheimpflug fotoğrafı (Topcon SL-45 kamera)	0.31	
Ho, 2009	Rotasyonel Scheimpflug görüntüleme (Pentacam)	0.33	0.00-0.94
Koch, 2012	Rotasyonel Scheimpflug görüntüleme (Galilei)	0.30	0.01-1.10



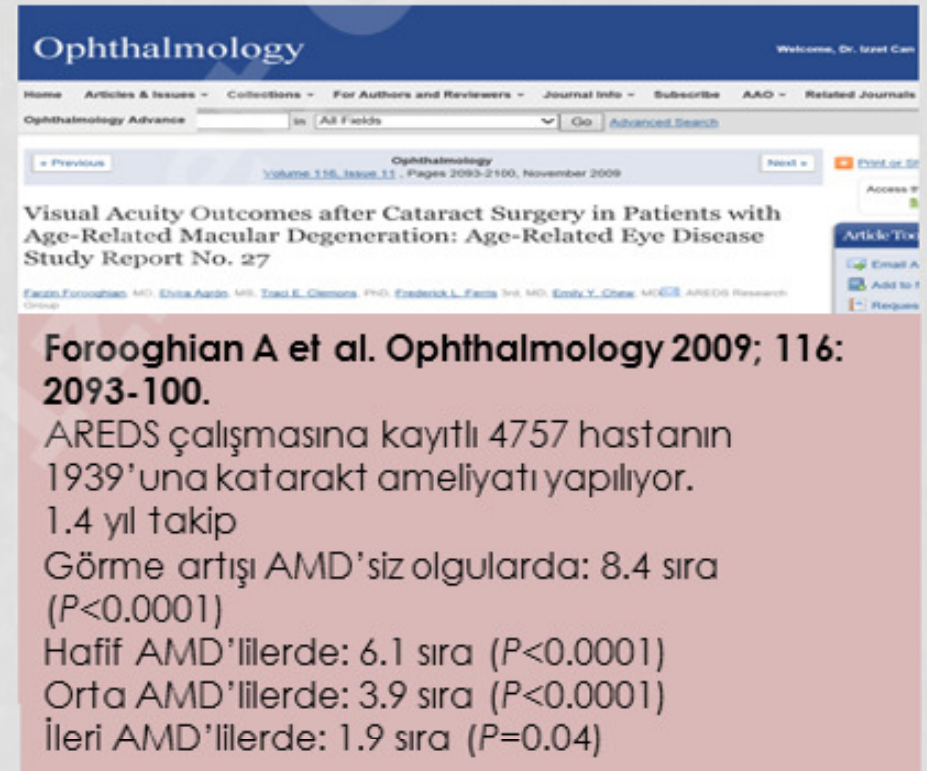
%9 gözde 0.50 D.'den fazla posterior korneal astigmatizma vardır ve bunların %86.8 'i vertikal pozisyonudur.

Koch DD et al. JCRS 2012; 38: 2080-7.



# RETİNA DEĞERLENDİRİLMESİ VE MAKÜLER OCT

- Epiretinal membran (Ameliyat sonrası KMÖ olasılığı)
- Vitreomaküler traksiyon sendromu
- Erken maküla delikleri
- Maküler dejenerasyonlar
- Diabetik retinopati
- Periferel retinal lezyonlar
- Glokomotöz optik sinir değişiklikleri



**Ophthalmology** Welcome, Dr. Izuel Cam

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**Visual Acuity Outcomes after Cataract Surgery in Patients with Age-Related Macular Degeneration: Age-Related Eye Disease Study Report No. 27**

Farzin Forooghian MD, Erica Aguila MD, Tracy E. Clemons PhD, Elizabeth L. Fuchs MD, Emily Y. Chew MCE AREDS Research Group

**Forooghian A et al. Ophthalmology 2009; 116: 2093-100.**

AREDS çalışmasına kayıtlı 4757 hastanın 1939'una katarakt ameliyatı yapılıyor. 1.4 yıl takip

Görme artışı AMD'siz olgularda: 8.4 sıra ( $P<0.0001$ )

Hafif AMD'lilerde: 6.1 sıra ( $P<0.0001$ )

Orta AMD'lilerde: 3.9 sıra ( $P<0.0001$ )

İleri AMD'lilerde: 1.9 sıra ( $P=0.04$ )



# MULTİFOKAL GİL'LERİ

REVIEW/UPDATE

## Multifocal intraocular lenses in cataract surgery: Literature review of benefits and side effects

Niels E. de Vries, MD, PhD, FEBO, Rudy M.M.A. Nuijts, MD, PhD

This literature review looks at the current status of multifocal intraocular lenses (IOLs) in cataract surgery. The results of implantation of multifocal IOLs of diffractive, refractive, and hybrid diffractive–refractive design are described with regard to uncorrected near and distance visual acuity and spectacle independence. The occurrence of photic phenomena and contrast sensitivity loss with multifocal IOLs are also addressed.

**Financial Disclosure:** Neither author has a financial or proprietary interest in any material or method mentioned.

*J Cataract Refract Surg* 2013; 39:268–278 © 2013 ASCRS and ESCRS

- Toplam 128 makale incelendi
- 87'si çalışma dışı bırakıldı.
- 41'i değerlendirmeye alındı.

de Vries NE, Nuijts R. Multifocal intraocular lenses in cataract surgery: Literature review of benefits and side effects. *J Cataract Refract Surg* 2013; 39: 268-78.

# MULTIFOKAL GİL'LERİ

**Table 1.** Characteristics of multifocal IOLs.

IOL	Company	Design	Pupil	Near Add (D)	Toric	Aspheric
Acri.LISA (366D, 376D, 536 D)	Carl Zeiss Meditec	Diff + Ref	Independent	+3.75	No	Yes
AT LISA (801, 802, 809M)						
Acri.LISA toric (466TD)	Carl Zeiss Meditec	Diff + Ref	Independent	+3.75	Yes	Yes
AT LISA toric (909M)						
Acri.Twin (733 + 737)	Acri.Tech/ Carl Zeiss Meditec	Diff	Independent	+4.0	No	Yes
AcuviaReviol (BB MF 613, BB MFM 611)	VSY Biotechnology	Diff	Independent	+3.75	No	Yes
Array (SA40N, SA40NB)	Abbott Medical Optics	Ref	Dependent	+3.50	No	No
CeeOn 811E*	Pharmacia	Diff	Independent	+4.0	No	No
FineVision	Physiol	Diff, trifocal	Dependent	+1.75, +3.50	No	Yes
LentisMplus (LS-312MF 15)	Oculentis GmbH	Ref, sector-shaped near zone	Independent	+1.50	No	Yes
LentisMplus (LS-312MF 30, LS-313MF 30)	Oculentis GmbH	Ref, sector-shaped near zone	Independent	+3.00	No	Yes
LentisMplus toric (LS-312T1-T6, LS-313T1-T6)	Oculentis GmbH	Ref, sector-shaped near zone	Independent	+3.00	Yes	Yes
M-flex (580F, 630F)	Rayner Ltd.	Ref	Dependent	+3.00, +4.00	No	Yes
M-flex T (588F, 638F)	Rayner Ltd.	Ref	Dependent	+3.00, +4.00	Yes	Yes
MS 6125 Diff	Dr. Schmidt Intraocular Linsen	Diff	Dependent	+3.50	No	Yes
MS 614 Diff	Dr. Schmidt Intraocular Linsen	Diff, sulcus	Dependent	+3.50	No	Yes
MS 714 PB Diff	Dr. Schmidt Intraocular Linsen	Diff, sulcus, add-on	Dependent	+3.50	No	Yes
MS 714 TPB Diff	Dr. Schmidt Intraocular Linsen	Diff, sulcus, add-on	Dependent	+3.50	Yes	Yes
OptiVis	Aaren Scientific	Diff	Dependent	+2.80	No	Yes
PA 154N*	Allergan	Ref	Dependent	+3.50	No	No
PY-60MV*	Hoya	Ref	Dependent	+3.00	No	No
ReStor (SA60D3, SN60D3, MN60D3)	Alcon Laboratories	Diff + ref	Dependent	+4.00	No	No
ReStor (SN6AD1, SN6AD3)	Alcon Laboratories	Diff + ref	Dependent	+3.00, +4.00	No	Yes
ReStor (SND1-T2/3/4/5)	Alcon Laboratories	Diff + Ref	Dependent	+3.00	Yes	Yes
ReZoom (NXG1)	Abbott Medical Optics	Diff + ref	Dependent	+3.50	No	No
SFX MV1*	Hoya	Ref	Dependent	+2.25	No	No
Sulcoflex multifocal (653F)	Rayner Ltd.	Ref, sulcus, add-on	Dependent	+3.50	No	No
Sulcoflex multifocal toric (653Z)	Rayner Ltd.	Ref, sulcus, add-on	Dependent	+3.50	Yes	No
Tecnis (ZM900, ZMB00)	Abbott Medical Optics	Diff	Independent	+4.00	No	Yes
TrueVista 68STUV*	Storz	Ref	Dependent	+4.00	No	No

de Vries NE, Nuijts R. Multifocal intraocular lenses in cataract surgery: Literature review of benefits and side effects. J Cataract Refract Surg 2013; 39: 268-78.



# MULTIFOKAL GİL'LERİ

**Table 3.** Randomized controlled trials comparing results of implanting different types of multifocal IOLs.

Study*	Year	IOL Type (Number of Eyes)	UNVA (LogMar)	UDVA (LogMar)	Complete SI (% of Patients)
Santhiago <sup>28</sup>	2012	ReStor SN6AD1 (40)	0.022 ± 0.08	0.032 ± 0.07	90%
		ReStor SN6AD3 (40)	0.027 ± 0.02	0.023 ± 0.12	90%
Alto <sup>29</sup>	2011	ReStor SN6AD3 (38)	0.28 ± 0.04 logRAD	0.13 ± 0.13	-
		Acri.LISA 366D (42)	0.19 ± 0.08 logRAD	0.10 ± 0.11	-
Santhiago <sup>30</sup>	2011	ReStor SN6AD1 (20)	0.022 ± 0.08	0.032 ± 0.07	90%
		ReStor SN6AD3 (20)	0.027 ± 0.02	0.023 ± 0.12	90%
Alto <sup>31</sup>	2011	ReStor SN6AD3 (78)	112 ± 22 wpm	0.15 ± 0.12	-
		Acri.LISA 366D (84)	115 ± 42 wpm	0.12 ± 0.11	-
		ReZoom NXG1 (70)	101 ± 16 wpm	0.12 ± 0.13	-
Alfonso <sup>32</sup>	2010	ReStor SN6AD3 (20)	0.03 ± 0.05 <sup>†</sup>	-0.04 ± 0.10 <sup>†</sup>	-
		ReStor SN6AD3 (20)	-0.05 ± 0.06 <sup>†</sup>	0.08 ± 0.10 <sup>†</sup>	-
		ReStor SN6AD1 (20)	-0.08 ± 0.04 <sup>†</sup>	-0.06 ± 0.05 <sup>†</sup>	-
		Acri.LISA 366D (20)	-0.02 ± 0.08 <sup>†</sup>	-0.08 ± 0.08 <sup>†</sup>	-
Santhiago <sup>33</sup>	2010	ReStor SN6AD3 (32)	0.03 ± 0.08 <sup>†</sup>	0.02 ± 0.07 <sup>†</sup>	-
		ReStor SN6AD1 (32)	0.02 ± 0.08 <sup>†</sup>	0.03 ± 0.07 <sup>†</sup>	-
Maxwell <sup>34</sup>	2009	ReStor SN6AD3 (228)	0.12 <sup>†</sup>	0.02 <sup>†</sup>	81.2%
		ReStor SN6AD1 (232)	0.10 <sup>†</sup>	0.02 <sup>†</sup>	78.3%
Martinez-Palmer <sup>35</sup>	2008	Tecris ZM900 (32)	0.06 ± 0.09 <sup>†</sup>	0.18 ± 0.10	77.0%
		ReZoom NXG1 (64)	0.22 ± 0.14 <sup>†</sup>	0.14 ± 0.12	44%
		Acri.Twin (64)	0.11 ± 0.12 <sup>†</sup>	0.16 ± 0.12	87.5%
Cillino <sup>36</sup>	2008	Array SA40N (32)	0.20 ± 0.06	0.06 ± 0.10	43.7%
		ReZoom NXG1 (30)	0.21 ± 0.10	0.07 ± 0.14	53.3%
		Tecris ZM900 (32)	0.14 ± 0.11	0.16 ± 0.10	87.5%
Hitz <sup>37</sup>	2008	Array SA40N (20)	0.43 ± 0.14	-	-
		ReStor SA60D3 (20)	0.28 ± 0.15	-	-
		Tecris ZM001 (20)	0.16 ± 0.11	-	-
Garcia <sup>38</sup>	2008	Array SA40N (20)	20% ≥ J1 <sup>†</sup>	90% ≥ 20/25	60%
		CeCh R1E (20)	40% ≥ J2 <sup>†</sup>	80% ≥ 20/25	60%
		CeCh R1E (20)	90% ≥ J1 <sup>†</sup>	80% ≥ 20/25	60%
Cham <sup>39</sup>	2007	ReStor SA60D3 (100)	0.11	0.06	86%
		ReZoom NXG1 (100)	0.23	0.02	70%
Mester <sup>40</sup>	2007	Array SA40 (50)	0.40 <sup>†</sup>	0.08 <sup>†,‡</sup>	33.3%
		Tecris ZM900 (30)	0.22 <sup>†</sup>	0.08 <sup>†,‡</sup>	82.6%
Hitz <sup>41</sup>	2006	Array SA40N (20)	69 wpm <sup>†</sup>	-	-
		Tecris ZM001 (20)	146 wpm <sup>†</sup>	-	-
		ReStor SA60D3 (20)	138 wpm <sup>†</sup>	-	-
Leyland <sup>42</sup>	2002	Array SA40NB (58)	0.43 ± 0.16	0.06 ± 0.10	28%
		TrueVista (30)	0.46 ± 0.21	0.10 ± 0.15	33%
Liekfeld <sup>43</sup>	1998	CeCh R1E (26)	0.04 ± 0.03	0.09 ± 0.12	-
		PA 154N (24)	0.32 ± 0.24	0.12 ± 0.10	-

IOL = intraocular lens; J = Jaeger optotype; SI = spectacle independence; UDVA = uncorrected distance visual acuity; UNVA = uncorrected near visual acuity; wpm = words per minute  
<sup>†</sup>First author  
<sup>‡</sup>Binocular  
<sup>§</sup>Binocular with distance correction  
<sup>¶</sup>Continued from page 4.

**Table 4.** Nonrandomized studies reporting results of implanting different types of multifocal IOLs.

Study*	Eyes	UNVA (LogMAR)	UDVA (LogMAR)	SI	
Acri.LISA 366D	Alfonso <sup>32</sup>	40	-0.05 ± 0.07 <sup>†</sup>	0.01 ± 0.18 <sup>†</sup>	-
	Alto <sup>31</sup>	40	0.12 ± 0.12	0.10 ± 0.12	-
	Can <sup>44</sup>	30	0.08 ± 0.20	0.10 ± 0.07	100% (n) 96.6% (f) 100% (d)
	Castillo-Grima <sup>45</sup>	20	0.06	0.15	-
Fernández-Vega <sup>46</sup>	170	0.00 ± 0.02	0.07 ± 0.02	-	
	Can <sup>44</sup>	30	0.02 ± 0.05	0.07 ± 0.08	100% (n) 100% (f) 100% (d)
AcryaRevol MFM 611	Fujimoto <sup>48</sup>	72	0.24	0.06	34.7%
	Ito <sup>49</sup>	44	0.19 ± 0.12 <sup>†</sup>	-0.10 ± 0.00 <sup>†</sup>	-
Array	Mojzis <sup>50</sup>	23	0.24 ± 0.15	0.17 ± 0.13	-
	Viana <sup>51</sup>	41	0.10 ± 0.09	0.12 ± 0.10	-
AT LISA 900M	Viana <sup>51</sup>	45	0.20 ± 0.16	0.04 ± 0.15	53%
	Alto <sup>31</sup>	22	0.45 ± 0.19	0.20 ± 0.14	-
LentisMplus LS-312 MF15	Alto <sup>31</sup>	43	0.21 ± 0.17	0.15 ± 0.21	-
	Alto <sup>31</sup>	21	0.21 ± 0.10	0.14 ± 0.11	-
LentisMplus LS-312 MF30	Alto <sup>31</sup>	24	0.30 ± 0.21	0.25 ± 0.33	-
	van der Linden <sup>52</sup>	90	0.16 ± 0.21	0.04 ± 0.15	-
M-flex 630F	McAlinden <sup>54</sup>	44	162 wpm	0.04 ± 0.25	-
	Adlam <sup>55</sup>	20	65% ≥ J <sup>†</sup>	0.18 ± 0.20	-
	Cezán-Prieto <sup>56</sup>	32	0.28 ± 0.11	0.09 ± 0.09	70% (n) 80% (f) 90% (d)
MG 714 PB	Costen <sup>58</sup>	56	0.16 ± 0.13	0.10 ± 0.11	93.3%
	White <sup>59</sup>	50	0.20	0.05	-
	Roesler <sup>60</sup>	121	86.6% ≥ 0.10	84.1% ≥ 0.10	-
Optiva	Piovella <sup>61</sup>	36	-0.04 ± 0.18 <sup>†</sup>	0.02 ± 0.13 <sup>†</sup>	-
	Alfonso <sup>32</sup>	36	-0.04 ± 0.18 <sup>†</sup>	0.02 ± 0.13 <sup>†</sup>	-
ReStor SA60D3, SN60D3, SN6AD3	Alto <sup>31</sup>	40	0.19 ± 0.12	0.19 ± 0.18	-
	Blaylock <sup>62</sup>	74	0.06 <sup>†</sup>	0.00 <sup>†</sup>	-
	Chang <sup>63</sup>	30	0.07 <sup>†</sup>	0.08 <sup>†</sup>	72.7%
	Cionni <sup>64</sup>	190	0.11	0.05	80.6%
	Gienko-Ciacara <sup>65</sup>	20	0.11 ± 0.01	0.17 ± 0.02	80.0%
	Hayashi <sup>66</sup>	63	0.1 <sup>†</sup>	0.1 <sup>†</sup>	-
	Hitz <sup>37</sup>	40	85% > J <sup>†</sup>	0.03 ± 0.05	-
	Mester <sup>40</sup>	40	0.24 ± 0.18 <sup>†</sup>	0.17 ± 0.22	-
	Peterman <sup>68</sup>	30	0.0 ± 0.07 <sup>†</sup>	0.0 ± 0.07 <sup>†</sup>	100% (n) 80% (f) 93% (d)
	de Vries <sup>70</sup>	46	0.01 ± 0.05 <sup>†</sup>	0.05 ± 0.12 <sup>†</sup>	-
	Zelichenka <sup>71</sup>	46	-	0.03 ± 0.05	-

(continued on next page)

de Vries NE, Nuijts R. Multifocal intraocular lenses in cataract surgery: Literature review of benefits and side effects. *J Cataract Refract Surg* 2013; 39: 268-78.



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**de Vries NE, Nuijts R. Multifocal intraocular lenses in cataract surgery: literature review of benefits and side effects. J Cataract Refract Surg 2013; 39: 268-78.**

# MULTİFOKAL GİL SONRASI TATMİNSİZ HASTALAR

ARTICLE

## Dissatisfaction after multifocal intraocular lens implantation

Maria A. Woodward, MD, J. Bradley Randleman, MD, R. Doyle Stulting, MD, PhD

**PURPOSE:** To analyze the reasons for patient dissatisfaction after phacoemulsification with multifocal intraocular lens (IOL) implantation and the outcomes after intervention.

**SETTING:** Emory Eye Center, Atlanta, Georgia, USA.

**METHODS:** This retrospective review comprised eyes of patients dissatisfied with visual outcomes after multifocal IOL implantation. Outcomes analyzed included type of visual complaint, treatment modality for each complaint, and degree of clinical improvement after intervention.

**RESULTS:** Thirty-two patients (43 eyes) reported unwanted visual symptoms after multifocal IOL implantation, including in 28 eyes (65%) with an AcrySof ReSTOR IOL and 15 (35%) with a ReZoom IOL. Thirty patients (41 eyes) reported blurred vision, 15 (18 eyes) reported photic phenomena, and 13 (16 eyes) reported both. Causes of blurred vision included ametropia (12 eyes, 29%), dry eye syndrome (6 eyes, 15%), posterior capsule opacification (PCO) (22 eyes, 54%), and unexplained etiology (1 eye, 2%). Causes of photic phenomena included IOL decentration (2 eyes, 12%), retained lens fragment (1 eye, 6%), PCO (12 eyes, 66%), dry-eye syndrome (1 eye, 2%), and unexplained etiology (2 eyes, 11%). Photic phenomena attributed to PCO also caused blurred vision. Thirty-five eyes (81%) had improvement with conservative treatment. Five eyes (12%) did not have improvement despite treatment combinations. Three eyes (7%) required IOL exchange.

**CONCLUSIONS:** Complaints of blurred vision and photic phenomena after multifocal IOL implantation were effectively managed with appropriate treatment. Few eyes (7%) required IOL exchange. Neodymium:YAG capsulotomy should be delayed until it has been determined that IOL exchange will not be necessary.

*J Cataract Refract Surg* 2009; 35:992-997 © 2009 ASCRS and ESCRS

- 43 göz / 32 hasta
- Bulanık görme: 41 göz / 30 hasta
  - Ametropi: 12 göz (%29)
  - Kuru Göz: 6 göz (%15)
  - PCO: 22 göz (%54)
  - Açıklanamayan: 1 göz (%2)
- Fotik fenomen: 18 göz / 15 Hasta
  - GİL desantralizasyonu 2 göz (%12)
  - Bakiye lens fragmanı: 1 göz (%6)
  - PCO: 12 göz (%66)
  - Kuru Göz: 1 göz (%2)
  - Açıklanamayan: 2 göz (%11)
- Konservatif tedaviye cevap: 35 göz (%81)
- GİL değişimi: 3 göz (%7)



# MULTİFOKAL GİL SONRASI TATMİNSİZ HASTALAR

ARTICLE

## Dissatisfaction after implantation of multifocal intraocular lenses

Niels E. de Vries, MD, Carroll A.B. Webers, MD, PhD, Wouter R.H. Touwslager, MD, Noel J.C. Bauer, MD, PhD, John de Brabander, PhD, Tos T. Berendschot, PhD, Rudy M.M.A. Nuijts, MD, PhD

**PURPOSE:** To analyze the symptoms, etiology, and treatment of patient dissatisfaction after multifocal intraocular lens (IOL) implantation.

**SETTING:** Department of Ophthalmology, Maastricht University Medical Center, The Netherlands.

**DESIGN:** Case series.

**METHODS:** In this retrospective chart review, the main outcome measures were type of complaints, uncorrected and corrected distance visual acuities, uncorrected and distance-corrected near visual acuities, refractive state, pupil diameter and wavefront aberrometry measurements, and type of treatment.

**RESULTS:** Seventy-six eyes of 49 patients were included. Blurred vision (with or without photic phenomenon) was reported in 72 eyes (94.7%) and photic phenomena (with or without blurred vision) in 29 eyes (38.2%). Both symptoms were present in 25 eyes (32.9%). Residual ametropia and astigmatism, posterior capsule opacification, and a large pupil were the 3 most significant etiologies. Sixty-four eyes (84.2%) were amenable to therapy, with refractive surgery, spectacles, and laser capsulotomy the most frequent treatment modalities. Intraocular lens exchange was performed in 3 cases (4.0%).

**CONCLUSION:** The cause of dissatisfaction after implantation of a multifocal IOL can be identified and effective treatment measures taken in most cases.

**Financial Disclosure:** No author has a financial or proprietary interest in any material or method mentioned.

*J Cataract Refract Surg* 2011; 37:859-865 © 2011 ASCRS and ESCRS

- 67 göz / 49 hasta
- Bulanık görme: 72 göz (%94.7)
  - Sadece Uzak: %36.8
  - Sadece Yakın: %15.8
  - Uzak ve Yakın: %42.1
    - Rezidüel ametropi
    - Astigmatizma
    - PCO
    - Geniş pupilla
- Fotik fenomen: 29 göz (%38.2)
- Her iki semptom: 25 göz (%32.9)
- Hastaların %84.2'si tedavi edilebilir
  - PRK %48.7
  - Gözlük %18.4
  - Nd YAG kapsülotomi %15.8
  - Suni gözyaşı, punktum tıkaçı %3.9
  - Brimonidine %14.5
  - Reoperasyon %7.9
    - CCC genişletme %2.6
    - GİL repozisyone edilmesi %1.3
    - GİL değişimi: 3 olgu %4.0



# MULTİFOKAL GİL SONRASI TATMİNSİZ HASTALAR

Eye (2011) 25, 1187-1193  
doi:10.1093/eye/eyi200 (2011)  
doi:10.1093/eye/eyi200

Predictive factor and kappa angle analysis for visual satisfactions in patients with multifocal IOL implantation

G Prakash, DR Prakash, A Agrawal, DR Kumar, A Agrawal and S. Jais

CLINICAL STUDY

**Abstract**  
Purpose To evaluate the visual acuity and quality-related satisfaction of patients implanted with a refractive design multifocal intraocular lens (IOL), and evaluate the factors predicting or including angle kappa.

**Conclusions** Our study suggests that there may be a role of misalignment between the visual and pupillary axis (angle kappa) in the occurrence of photic phenomenon after refractive multifocal IOL implantation.  
Eye (2011) 25, 1187-1193, doi:10.1093/eye/eyi200  
published online 17 June 2011

**Methods** In this prospective trial, 50 eyes of 48 consecutive patients were included. All patients underwent phacoemulsification with multifocal IOL implantation (Bioson IOL, Abbott Medical Optics). The preoperative and postoperative assessment included slit lamp biomicroscopy, uncorrected visual acuity (UCVA), best-corrected visual acuity (BCVA), angle kappa.

**Keywords:** multifocal intraocular lens, visual satisfaction, kappa angle

**Introduction**  
Multifocal intraocular lens (IOL) implantation for the correction of astigmatism aims for a good

**Prakash G et al. Eye 2011; 25: 1187-93.**

- Halo sorunu olmayan hasta: %72.1
- Glare sorunu olmayan hasta: %79.0
- Uzak görme sorunu olmayan hasta: %67.4
- Ara mesafe sorunu olmayan hasta: %51.1
- Yakın sorunu olmayan hasta: %72.1
- Ort. kappa açısı: 4.9°

- 44 hasta / 50 Göz
  - ReZoom ( AMO ) : Zonal Refraktif MGİL
- Preoperatif
  - UCVA: 0.38
  - BCVA: 0.47
- Postoperatif:
  - UCVA: 0.75
  - BCVA: 0.99
- Semptom skorları
  - Halo: 0.98±1.7
  - Glare: 0.69±1.48
  - Bulanık Görme
    - Uzak: 1.0±1.7
    - Ara mesafe: 1.34±1.6
    - Yakın: 1.06±1.8

## Regresyon Analizi

### Halo

- Kappa açısı ve Uzak UCVA (R<sup>2</sup>=0.26, P=0.029)

### Glare

- Kappa açısı (R<sup>2</sup>=0.26, P=0.033).

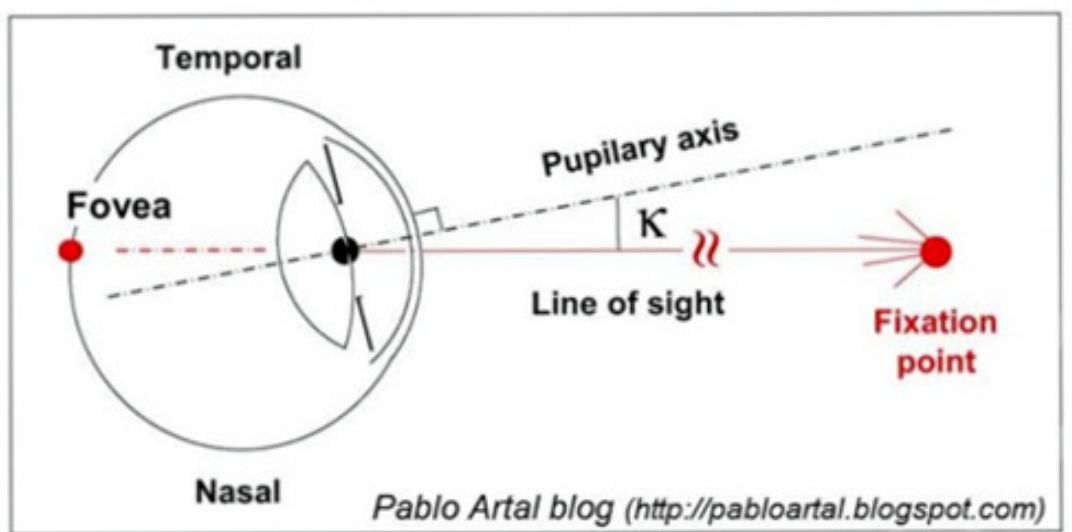
### Uzak, ara mesafe ve yakın görme ile ilgili tatminsizlik

- Uzak UCVA (R<sup>2</sup>=0.17, P=2.3 x 10<sup>-4</sup>)
- Uzak UCVA (R<sup>2</sup>=0.1, P=0.04),
- Yakın UCVA (R<sup>2</sup>=0.12, P=0.03),

### Genel olarak en önemli belirleyici faktör

- Uzak UCVA (R<sup>2</sup>=0.1, P=0.04).

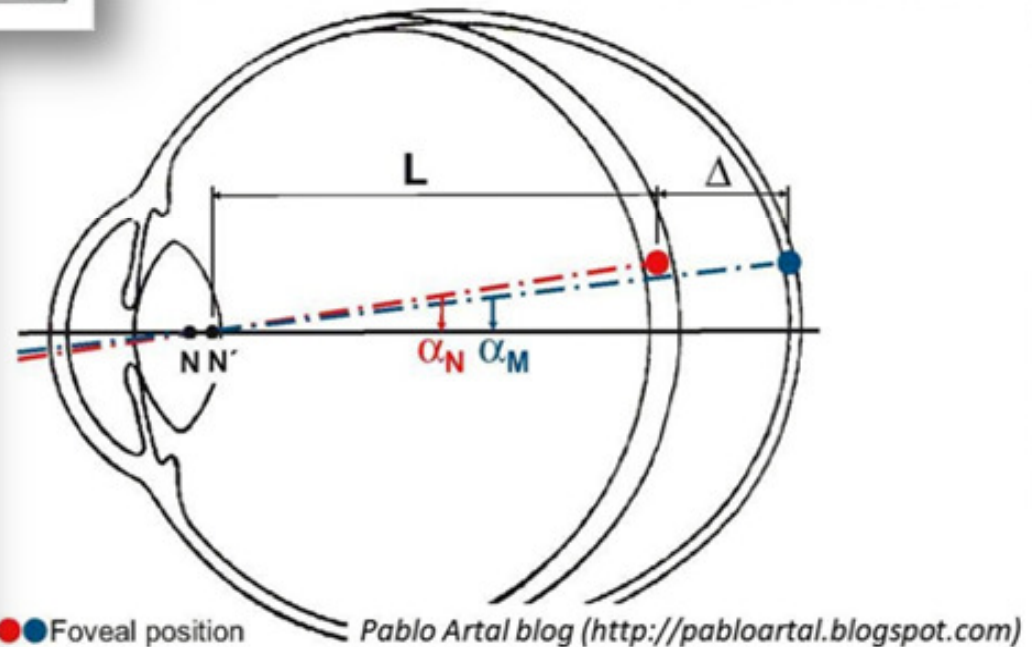
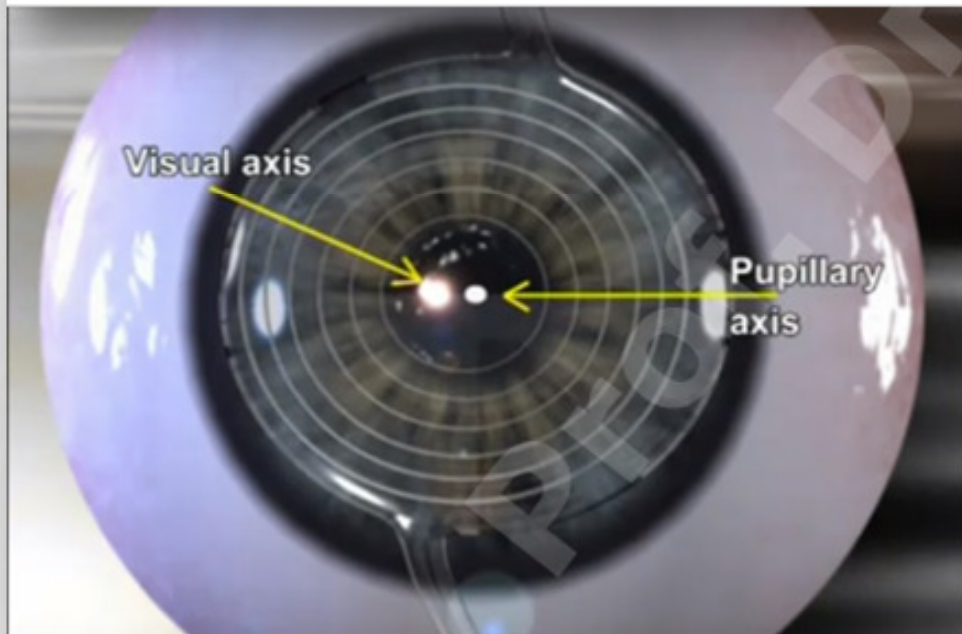
# KAPPA AÇISI



Ort. Kappa Açısı

- 2-5 °
- 0.36 mm ± 0.22 mm
- (18 çalışmanın ortalaması)

Rynders M, Lidkea B, Chisolm W, Thibos LN. J Opt Soc Am A 1995; 12: 2348-57.





# KAPPA AÇISI

## ORIGINAL ARTICLE

### Measurement of Angle Kappa With Synoptophore and Orbscan II in a Normal Population

Hikmet Başmak, MD; Afsun Sahin, MD; Nilgun Yildirim, MD; Thanos D. Papakostas, MD; A. John Kanellopoulos, MD

#### ABSTRACT

**PURPOSE:** To obtain normative values of angle kappa in a normal population by synoptophore and Orbscan II and to compare the reliability of these devices.

**METHODS:** Three hundred consecutive healthy individuals were enrolled in the study. A complete orthoptic and ophthalmologic examination was performed. Synoptophore and Orbscan II corneal topography were used to measure angle kappa. To evaluate the association of the angle kappa and refraction measures, individuals were further classified according to the degree of myopia and hyperopia. The spherical equivalent error measures were grouped into six categories:  $\geq -3.00$  diopters (D);  $-2.75$  to  $-1.50$  D;  $-1.25$  to  $-0.50$  D;  $+0.50$  to  $+1.25$  D;  $+1.50$  to  $+2.75$  D; and  $\geq +3.00$  D. Paired *t* test and Pearson's correlation test were used for statistical analysis.

**RESULTS:** The mean age of the individuals was  $28.74 \pm 1.63$  years (range: 20 to 40 years). The angle kappa values obtained by synoptophore and Orbscan II were normally distributed. In the myopic group, angle kappa values decreased significantly towards negative refractive errors. In contrast, there was a correlation between large positive angles and positive refractive errors in the hyperopic group. Angle kappa values obtained by Orbscan II were significantly higher in all groups when compared to synoptophore ( $P < .0001$ ). A significant correlation was noted between synoptophore and Orbscan II measurements ( $r = 0.932$ ,  $P < .0001$ ).

**CONCLUSIONS:** A significant correlation exists between positive refractive errors and large positive angle kappa values. Refractive surgeons must take into account angle kappa, especially in hyperopic patients, to avoid complications related to decentration of the ablation zone. [*J Refract Surg.* 2007;xxxx-xx.]

**R**efractive surgery has gained significant popularity in the past two decades by reducing or eliminating the need for spectacles or contact lenses. Although lasers and software have become more sophisticated, alignment errors still occur during photoablation that could lead to decentration and inhomogenous ablation patterns. Decentered ablations can lead to negative visual effects including irregular astigmatism, reduced best corrected visual acuity,

Başmak H et al.  
J Refract Surg 2007;  
23: 456-60.

TABLE 1

Normative Values of Angle Kappa Among Groups According to Refractive Status

Method	Mean $\pm$ Standard Deviation					
	Myopic Group (Mean SE $< -0.50$ D)		Emmetropic Group (Mean SE $-0.50$ to $0.50$ D)		Hyperopic Group (Mean SE $> 0.50$ D)	
	Right Eye	Left Eye	Right Eye	Left Eye	Right Eye	Left Eye
Synoptophore	1.74 $\pm$ 0.13	1.91 $\pm$ 0.14	2.78 $\pm$ 0.12	3.32 $\pm$ 0.13	3.44 $\pm$ 0.14	3.84 $\pm$ 0.17
Orbscan II	4.51 $\pm$ 0.11	4.73 $\pm$ 0.11	5.55 $\pm$ 0.13	5.62 $\pm$ 0.10	5.65 $\pm$ 0.10	5.73 $\pm$ 0.10

SE = spherical equivalent refraction

Note. The hyperopic group and left eyes have larger angle kappa values. Also note that Orbscan II measured angle kappa significantly higher when compared to that of synoptophore in each group.

TABLE 2

Average Angle Kappa Values in Myopic Subgroups

Method	Right Eye			Left Eye		
	$\geq -3.00$ D	$-2.75$ to $-1.50$ D	$-1.25$ to $-0.50$ D	$\geq -3.00$ D	$-2.75$ to $-1.50$ D	$-1.25$ to $-0.50$ D
	Synoptophore	0.94 $\pm$ 0.19	2.05 $\pm$ 0.23	2.17 $\pm$ 0.17	0.92 $\pm$ 0.21	2.20 $\pm$ 0.29
Orbscan II	4.17 $\pm$ 0.19	4.32 $\pm$ 0.18	4.79 $\pm$ 0.17	4.41 $\pm$ 0.19	4.75 $\pm$ 0.22	4.90 $\pm$ 0.17

Note. Angle kappa values decrease significantly towards negative refractive errors.

TABLE 3

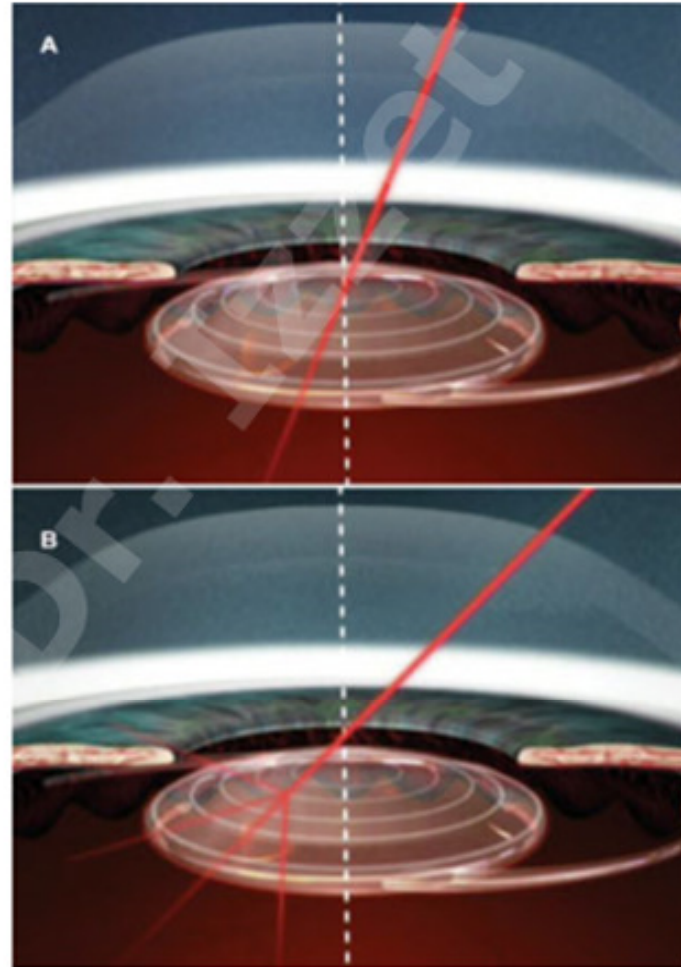
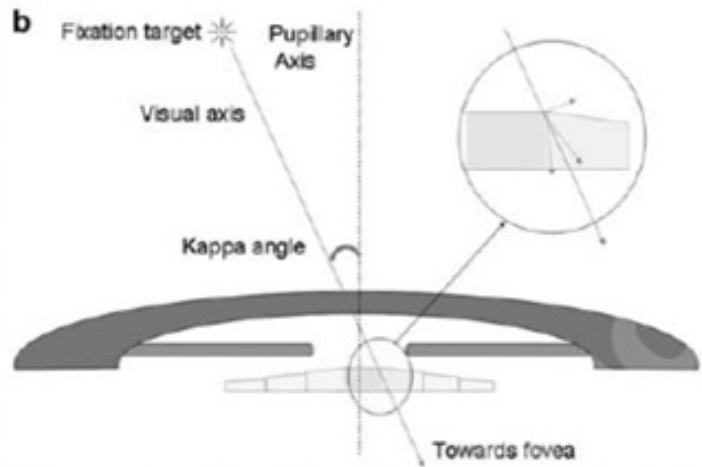
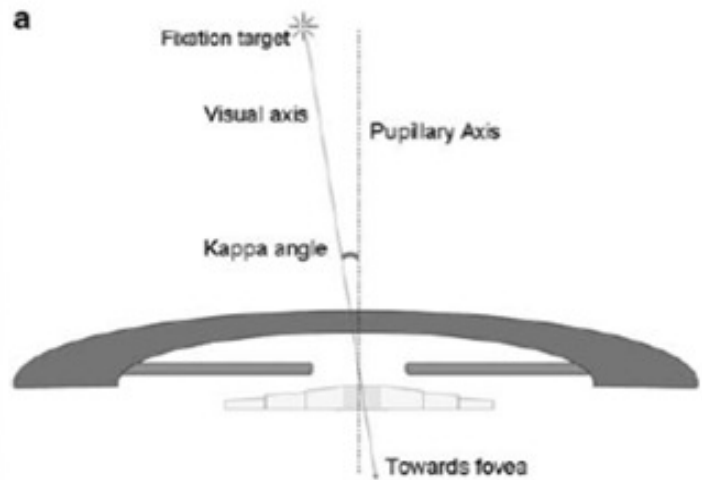
Average Angle Kappa Values in Hyperopic Subgroups

Method	Right Eye			Left Eye		
	$\geq +3.00$ D	$+2.75$ to $+1.50$ D	$+1.25$ to $+0.50$ D	$\geq +3.00$ D	$+2.75$ to $+1.50$ D	$+1.25$ to $+0.50$ D
	Synoptophore	4.81 $\pm$ 0.26	3.82 $\pm$ 0.20	2.63 $\pm$ 0.14	5.30 $\pm$ 0.20	3.94 $\pm$ 0.39
Orbscan II	6.07 $\pm$ 0.21	5.60 $\pm$ 0.17	5.05 $\pm$ 0.11	6.13 $\pm$ 0.21	5.74 $\pm$ 0.23	5.51 $\pm$ 0.12

Note. Angle kappa values increase significantly towards positive refractive errors.



# KAPPA AÇISI



Geniş  
Kappa  
AÇISI

$>5^{\circ}$  veya  
 $>0.4$  mm

Premium  
GİL K.E.

# BİLATERAL UYGULAMA

- Gözlükten bağımsız olma oranlarını ↑
- Fotik fenomenleri ↓
- Görme keskinlik ve kalitesi ↑

- İki göz arasında ideal süre
  - 1-4 hafta

Cionni RJ, Osher RH, Snyder ME, Nordlund ML. Visual outcome comparison of unilateral versus bilateral implantation of apodized diffractive multifocal intraocular lenses after cataract extraction: prospective 6-month study. *J Cataract Refract Surg* 2009; 35:1033–1039

# ÖZET

## • Ameliyat Öncesi

- Tüm uygun adaylara premium lens seçeneğini öner.
- İmkan olan tüm testleri yap
  - Parsiyel ya da düşük koherensli biyometri
    - Holladay II, Haigis, Hoffer Q, SRK/T tipi formüller
  - OCT
  - Topografi
  - Endotel sayımı
- Az söz ver, fazla uygula

## • Ameliyat Sırası

- Titiz, özenli cerrahi

## • Ameliyat Sonrası

- Hastanın endişeleri için zaman ayır
- Hastanın elini tut
- Dinle ve açıkla
- YAG kapsülotomiye gerektiğinde erken yap
- Rezidüel kırma kusurlarını LASIK'le düzelt

Silverman CM, Nov-Dec. CRS Today 2012; 12: 56-7.





Farkındalığınız ve İlginiz İçin Teşekkürler

