

ASCRS ♦ ASOA Symposium & Congress
Technicians & Nurses Program
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Cataract Evaluation and Surgical Planning

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<http://www.nykeergroup.com/Chief/Flavell/chiu>

No financial interest

Effort \longrightarrow

Goal: 20/Happy

<http://img4.wikia.nocookie.net/commons-media/2014/06/20140620-ThumbUp-200x100.jpg>

Part 1: All About Cataracts

http://i2.hakim.com/new_img/2017/11/18/1000000000.jpg


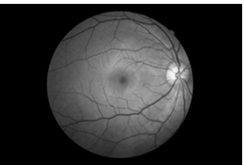
Demographics

- ◆ Leading cause of blindness worldwide (WHO)
- ◆ 51% of world blindness (20 million people)
- ◆ \$3.4 billion each year from Medicare
- ◆ Risk factors: female gender, tobacco, diabetes, UV and other radiation, obesity

Complete Medical History

- ◆ **Medical History:**
 - Surgical risks?
 - DM, HTN, CAD, CVA?
 - Psychiatric disease?
 - Dementia?
 - Tremor? Cough?
 - Orthopnea?
 - Language barrier?
- ◆ **Medications:**
 - Anti-Coagulation?
 - Steroids?
- ◆ **Ocular History:**
 - LASIK? Contact lens?
 - Glaucoma?
 - Macular disease?
 - Vitrectomy?
 - Strabismus?
 - Uveitis?
- ◆ **Social History:**
 - What visual demands?
 - Occupation? Hobbies?


Complete Eye Exam

- ◆ Corneal disease?
- ◆ Pseudoexfoliation?
- ◆ Dimensions:
 - Pupil dilation? Lens stability? AC depth?

- ◆ Optic nerve disease?
- ◆ Macular disease?
- ◆ Peripheral retinal disease?

Optical Biometry

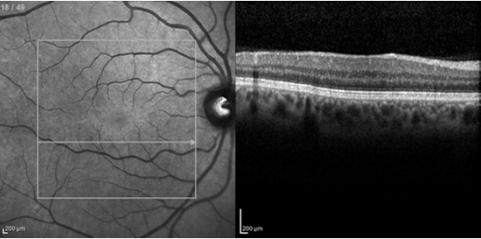


		OD		OS	
Measuring mode	Mode	Platonic	Platonic	Platonic	Platonic
Axial length	AL	27.14 mm	27.02 mm	27.38 mm	27.03 mm
Central thickness	CT	585 µm	585 µm	585 µm	577 µm
Anterior depth	AD	3.47 mm	3.54 mm	3.10 mm	3.02 mm
Lens thickness	LT	4.72 mm	4.80 mm	4.87 mm	4.88 mm
Posterior radius	PR	2907 µm	2927 µm	2907 µm	2927 µm
Keratometry					
Flat keratometry	K1	43.07 D @ 181°	43.07 D	41.81 D @ 181°	41.82 D
Steep keratometry	K2	43.48 D @ 164°	43.54 D	42.21 D @ 164°	42.08 D
Aspherical	AS1	0.41 D @ 164°	0.51°	0.48 D @ 164°	0.51°
Aspherical index	n	1.376		1.376	
White-to-white					
White-to-white	WTW	12.70 mm	12.81 mm	12.80 mm	12.77 mm
Eye length	EL	23.87 mm	23.79 mm	23.17 mm	23.06 mm
Eye diameter	ED	23.87 mm	23.79 mm	23.17 mm	23.06 mm
Pupil diameter					
Pupil diameter	PD	5.48 mm	5.18 mm	5.38 mm	5.18 mm
Pupil expansion	PE	0.03 mm	0.00 mm	0.00 mm	0.00 mm
Pupil expansion	PEV	0.00 mm	0.00 mm	0.00 mm	0.00 mm

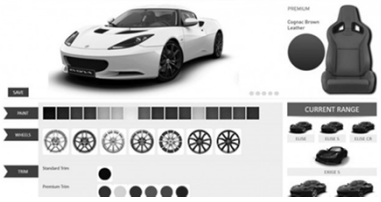
LENSSTAR Software Version 10.2.1 13.061.06.061 V 11.0 ZEISS MEDICAL OPTICS

OCT

Is this patient a good candidate? Yes No

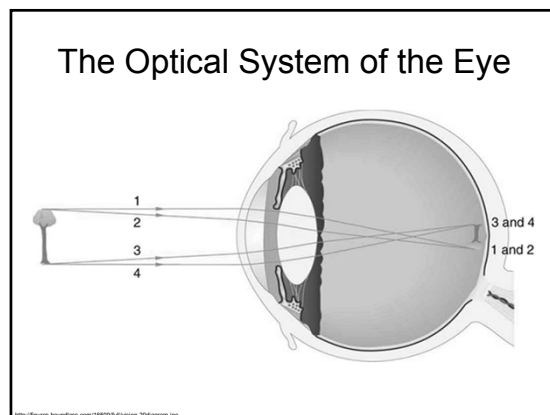


Part 3: Surgical Options



Goals of Cataract Surgery

- ◆ **Primary:** Remove cataract
 - Clear pathway for visual function
 - Assist in treatment of other ocular disease
- ◆ **Secondary:** Provide best optical system for individual needs of the patient
 - Lens implant
 - Corneal shape



Monofocal Lens Implant

- ◆ Mono-focal = single focal point
- ◆ Distance vision
- ◆ Near vision
- ◆ Mono-vision
 - One eye for distance
 - One eye for near
- ◆ Current standard of care
- ◆ Covered by most insurances

A 3D illustration of a monofocal lens implant, showing its circular shape and the haptics used for insertion.

http://imageseye.com/Res141325168784/Gaerofre-South-Carolina-LASIK-Cataract-Eye-Care-01.jpg

Mono-vision

- ◆ Best candidates have tried it before
- ◆ True monovision (2-3D)
- ◆ Mini-monovision (1-1.5D)

A black and white illustration of a woman wearing glasses, looking thoughtful with her hand to her chin.

http://www.eyegallery.com/Photos/eyes08.JPG



Multifocal Lens Implant

- ◆ Multi-focal = multiple focal points
- ◆ Diffractive light technology allows near and distance focal points

A diagram showing light rays entering a lens and being split into multiple focal points. A vertical scale on the right indicates different focal lengths.

Davison JA, Simpson MJ. J Cataract Refract Surg. 2008 May;32(5):849-58.

Multifocal IOL: Benefits

- ◆ Can achieve distance, intermediate, and near vision without glasses

Two images: on the left, a 3D illustration of a multifocal lens implant; on the right, a diagram showing light rays passing through a lens and being split into multiple focal points.

http://www.garibonini.com/wp-content/uploads/2011/01/multifocal.jpg
http://www.eyegallery.com/Photos/eyes08.JPG

Multifocal IOL: Drawbacks

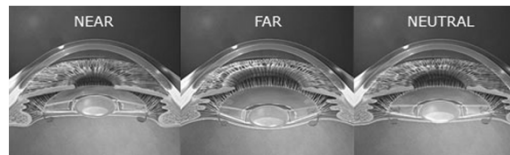
- ◆ Out-of-pocket cost
- ◆ Rings and halos
- ◆ Decreased image quality
- ◆ Difficulty with night vision
- ◆ Need implants in both eyes for reading



<http://www.crystalens.com/Content/Images/00-Start-up-or-halos.jpg>

Accommodative Lens Implant

- ◆ Accommodation = movement of the lens to improve near vision
- ◆ Crystalens



<http://www.novartis.com/regis/eyes/implant/near/far/neutral.jpg>

Crystalens: Benefits

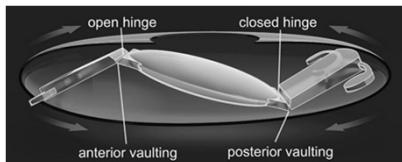
- ◆ Can achieve distance and intermediate vision without glasses
- ◆ No rings or halos
- ◆ No difficulty with night vision



<http://www.bausch+lomb.com/india/images/Products/Surgical/2002/18-crystalens-ai.png>

Crystalens: Drawbacks

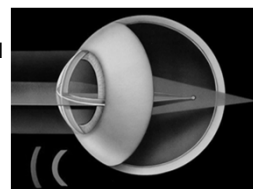
- ◆ Out-of-pocket cost
- ◆ Unable to achieve near vision
- ◆ Often need laser capsulotomy
- ◆ Difficult to exchange



<http://www.bausch+lomb.com/india/images/Products/Surgical/2002/18-crystalens-ai.png>

Astigmatism

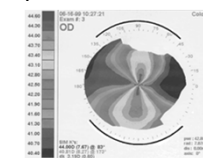
- ◆ Astigmatism = Cornea is not spherical
 - Steep axis
 - Flat axis
- ◆ Blurry images at all distances



http://www.bdmrgallery.com/the_www.vishalsharma.com/Astigmatism-graphics.jpg

Toric Lens Implant

- ◆ Toric lens corrects astigmatism
 - Toric monofocal
 - Toric Crystalens
- ◆ Out-of-pocket cost



<http://30.30.73.142/india/med/india/india/images/Products/Surgical/2002/18-crystalens-ai.png>

Limbal Relaxing Incisions


- ◆ Surgical incisions on the cornea
- ◆ Alternative to toric IOL for low corneal astigmatism



Incisions

http://www.capecornealcenter.com/assets/images/Stock%20Photo/LRI.jpg

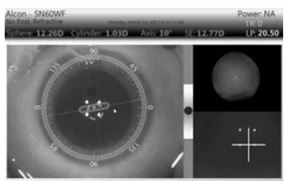
Femtosecond Laser



http://weaverinteractive.com/images/cleara/limbolasera/limo_machine.png
http://vimeo.com/104744038/4mca6d8d91e

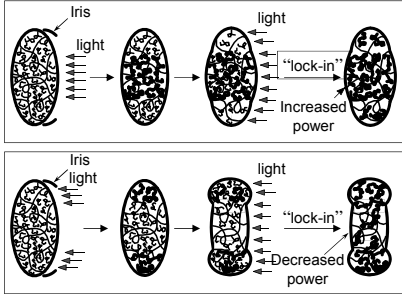
Intraoperative Aberrometry

- ◆ IOL targeting for:
 - biometric challenges
 - h/o refractive surgery
 - monovision
- ◆ Toric IOL alignment
- ◆ LRI management




http://vimeo.com/104744038/4mca6d8d91e

Light-Adjustable Lens Implant



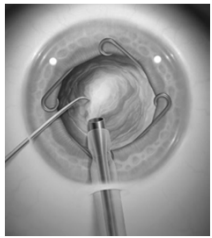
Courtesy of Dan Schwartz, MD, Calhoun Vision Inc.

Part 4: Complex Cases



http://www.henryhughes.com/wp-content/uploads/2012/10/complex2.jpg

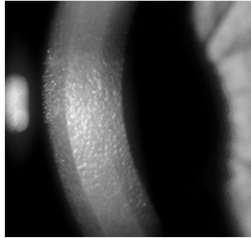
Small Pupil & Floppy Iris



- ◆ Medications
 - tamsulosin (Flomax)
 - doxazosin (Cardura)
 - terazosin (Hytrin)
- ◆ DM, PXF
- ◆ Shugarcaine (epi)
- ◆ Lido 1%/Phenyl 1.5%
- ◆ Malyugin Ring
- ◆ Iris Hooks

http://www.eyesand2000.com/wp-content/uploads/2009/04/05115198834024531082814-800w.jpg

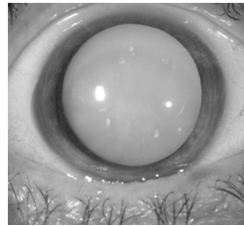
Fuchs' Dystrophy



- ◆ Loss of corneal endothelial cells
- ◆ Check pachymetry
- ◆ Plan posterior surgical incision
- ◆ IOL: target -1.00D in case of future DSEK
- ◆ Delayed recovery

<http://www.communication.org/issue/52-2/inside/features/fuchs11028.jpg>

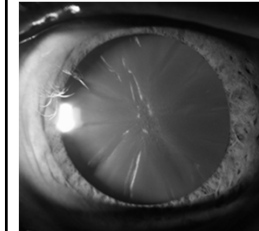
White Cataract



- ◆ Poor visibility
- ◆ Need B-scan
- ◆ High risk of capsular rupture
- ◆ Trypan blue
- ◆ Needle decompression
- ◆ Phaco-assisted capsulorrhexis

<http://webeye.cphr.uwax.edu/eyeforum/cases/case144/Morgagnian-Cataract-1.JPG>

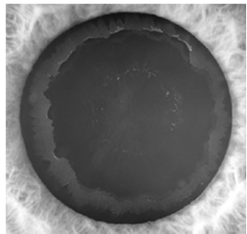
Brown Cataract



- ◆ Poor visibility
- ◆ Corneal injury
- ◆ High risk of capsular rupture
- ◆ Trypan blue
- ◆ ECCE

<http://webeye.cphr.uwax.edu/eyeforum/Atlas/LARGE/brunescant-cataract-111.jpg>

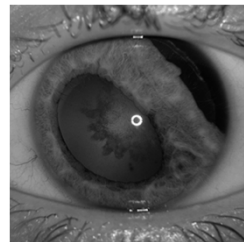
Pseudoexfoliation



- ◆ Protein deposits on lens and angle
- ◆ Glaucoma
- ◆ Poor dilation
- ◆ Zonular weakness
- ◆ Phacodonesis
- ◆ IOL dislocation

<http://www.eyeworld.com/issue/52-2/inside/features/pseudoexfoliation-10148.jpg>

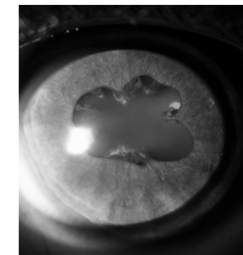
Traumatic Cataract



- ◆ Zonular loss
- ◆ High risk of complication
- ◆ Capsular tension ring
- ◆ Capsular hooks
- ◆ Iris repair

<http://www.eyeworld.com/issue/52-2/inside/features/traumatic-cataract-10149.JPG>

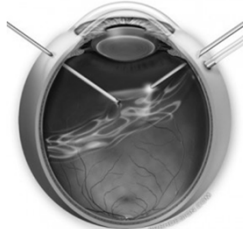
Uveitic Cataract



- ◆ Quiet eye x 6 months
- ◆ Systemic steroids
- ◆ Synechiolysis
- ◆ Post-op inflammation
- ◆ Macular edema

<http://webeye.cphr.uwax.edu/eyeforum/Atlas/Case/central-posterior-synerchid-CPS-2-180.jpg>

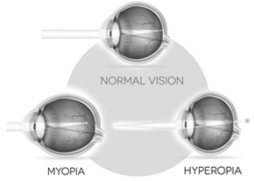
Post-Vitrectomy



- ◆ Unstable lens position during surgery
- ◆ Capsular injury
- ◆ Silicone oil

http://vitrectomyforloaders.com/wp-content/uploads/2013/12/ID_SUV/8021-1PPV-280x300.jpg

Biometric Challenges



- ◆ Hyperopia < 22 mm
- ◆ Myopia > 26 mm
- ◆ Refractive surgery
- ◆ RGP lens wear
- ◆ Difficulty targeting IOL
- ◆ Intraoperative aberrometry

http://clarkeya.com/wp-content/uploads/2015/03/clarkeya-eye-care_blog-header_myopia-and-hyperopia.jpg
http://www.improvementofhq.com/images/ask-into.jpg

EAST BAY EYE SPECIALISTS

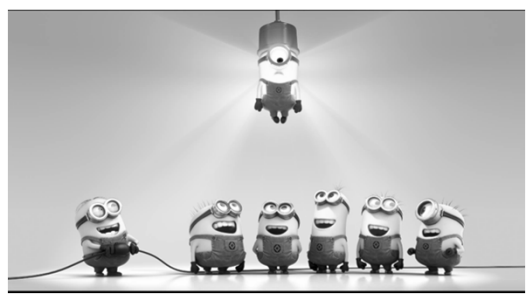


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http://www.sfn.com/system/uploads/legacy_image/image/151080714_demo_Burbank.2.3.jpg

Thank You!



http://603.deviantart.net/171/2013/2/3/5/minions_welcome_by_sabotix_dk-4850290.jpg