

The Future of Cataract Surgery

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Handout

Disclosures

- Center Director, Omni Eye Services of Atlanta
- Chairman, SECO International CE Committee
- No industry relationships to disclose

Finally some recognition that co-management is “ok”!



OPHTHALMIC POSTOPERATIVE CARE

A Joint Position Paper of the American Academy of Ophthalmology and the American Society of Cataract and Refractive Surgery

This position paper, co-authored by The American Society of Cataract and Refractive Surgery (ASCRS) and the American Academy of Ophthalmology (AAO), offers guidelines on co-management and transfer of care, and when these arrangements are appropriate.

Definitions:

Co-management is a relationship between an operating ophthalmologist and a non-operating practitioner for shared responsibility in the postoperative care when the patient consents to multiple providers, the services being performed are within the providers' respective scope of practice and there is agreement between the providers to share patient care.

Transfer of care occurs when there is complete transfer of responsibility for a patient's care from one qualified healthcare provider operating within his/her scope of practice to another who also operates within his/her scope of practice.

Federal Medicare policy concerning co-management has been adapted and interpreted by states and carries with variations in details and restrictions. The qualified operating ophthalmologist has the ultimate responsibility for the preoperative and postoperative care of the patient, beginning with the determination of the need for surgery and ending with completion of the postoperative care contingent on medical stability of the patient. Economic considerations, such as inducement for surgical referrals or coercion by the referring practitioner, should never influence the decision to co-manage, or the timing of the transfer of a patient's care following surgery. This is unethical and, in many jurisdictions, illegal.

The management of a patient with the participation of a non-operating practitioner rather than solely by the operating ophthalmologist, whether as part of a co-management arrangement or as a transfer of care, may be appropriate when the conditions set forth in this position paper are met. Examples of circumstances in which co-management and transfer of care are appropriate (assuming compliance with conditions in this position paper) include the following:

Basic Principles of Co-Managed Care

- Make sure patient knows of any co-management arrangement and agrees to it willingly
- Surgeon must have a form that patient signs indicating patient's willingness to have post-op care provided by OD
- Other than this, nothing should be in writing; there should be NO CONTRACT between practices

Basic Principles of Comanaged Care

- ⦿ Make sure that you document your charts carefully
- ⦿ Be ready to justify the extra work you do when you receive a comanagement fee from the surgeon for anything.....lasik, premium lenses, etc.
 - Topography, OCT, pachymetry, slit lamp photos

History

- Procedure, Eye, Date, Surgeon
 - S/P Pterygium resection OD x 1 day (Status-post)
 - S/P Trabeculectomy with MMC. POD # 1

History

- Subjective complaints
 - Foreign body sensation
 - Pain, discomfort, sleep
 - Nausea, vomiting
 - Visual status/improvement
 - Photopsias, other visual sensations

History

- Post-operative medications/instructions
- Earliest opportunity to assess compliance
- Ask to see bottles and to bring to future visits

Visual Acuity

- Assess best corrected visual acuity
 - Critical to early identification of problems
 - Must always be able to explain change or unexpected visual acuity loss

External Exam

- ⊙ Specific to procedure performed
- ⊙ Be sensitive to peri-orbital pain and photophobia
- ⊙ Remove any patches/shields
- ⊙ Gently clean peri-orbital skin with attention to lid and lashes (tape adhesives, dried mucous, clotted blood)

S/L Exam

- Specific to procedure
- Don't miss cell and flare

IOP: don't be afraid to do Goldmann!

Fundus Examination

- At the very least a red reflex should be noted
- If unexpected or otherwise unexplained decrease in VA...you must dilate and explain

Basic to all CoManagement

- Two way communication
- You must communicate your findings to surgeon
- You must expect that surgeon will communicate with you regarding what went on in surgery

The most important factor that determines if a patient is ready for cataract surgery in the eyes of CMS is:

- A. Visual acuity
- B. Glare testing
- C. Lifestyle complaint
- D. Density of cataract

Component 1:
History

- Eye: functional history such as “problems with glare/TV/driving at night”
 - Activities of Daily Living: **MUST BE DOCUMENTED!**
- Social History: ?chronic depression, bipolar, anxiety disorders
- Observation during exam: ambivalence, excessive questioning, unrealistic expectations, wanting guarantees

Past Eye and Medical History Critical

- Medications: Flomax?
- Contact Lens Wearer or Refractive Surgery Hx?
- Trauma/PEX/COAG
- Diabetes/Hypertension
 - How long have you had it
 - What do you take for it
 - Is it under control/when last checked/A1C
 - Doctor's name

Component 2:
Vision and Refraction

- Visual Acuity (D & N)
- Pinhole should be part of vision
 - Monocular diplopia or glare alleviated?
- Glare testing or BAT (medium setting), or "Ambient Light" (room lights on)
for any patient who is 20/40 or better

Component 3:
Ocular Health

- Slit Lamp
- Dilated Fundus Exam

When in doubt about the retina, get an OCT.....especially with premium lenses!

Clean Up Crew

- Lid scrubs
- Azasite
- Dry eye and mgd management

Time to Write Down Your Impression and Plan

- Impression:
 - "Cataracts OD > OS with difficulty reading OU
 - 2+ NS consistent with reduced VA
 - Would like to rely less on glasses
- Plan:
 - Schedule bilateral Restor IOL's OD then OS
- Premium IOL discussed, patient not interested/Schedule conventional monofocal IOL OD then OS

Or.....

- Impression:
 - "Cataracts OU, night driving problems
 - 3+ NS consistent with reduced VA
 - 2 diopters of cylinder
- Plan:
 - IOL's OD then OS
 - Patient denies Toric due to \$, told unaided VA won't be 20/20

Communication Key!

- Detailed referral note with
 - ✓ Refractive Goal
 - ✓ Meds (Flomax) and Conditions
 - ✓ Glaucoma, Ocular Surface Disease
- Visit the surgeon so you know what patients will experience

As far as the IOL is concerned...

- The “old days” of sending the patient on to your surgeon and not thinking about the refractive result are over
- You know more about their refractive history than anyone else, so be involved and stay involved

The Choices in High Technology or “Premium” Lenses 2016

- Multifocal /
- Accommodating IOLs
- Toric IOLS

Custom Cataract Surgery w/
Advanced Technology IOL's
What's New and What's Coming?

ReSTOR +2.5: Who is this lens for?

Aspheric Monofocal AcrySof® IQ IOL	Aspheric Apodized Diffractive Multifocal ReSTOR® +2.5 D IOL	Aspheric Apodized Diffractive Multifocal ReSTOR® +3 D IOL
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The ReSTOR® +2.5 Patient

- Patient w/ active lifestyle that wants good intern. and dist. Va
- Not willing to compromise distance for a full range
- Desires more opportunity for a range of vision vs monofocal
- Desires spectacle independence at 21 inches and beyond
- May need +1.00 reader for 16-20 inches

Optic Design Differences:

ReSTOR® +2.5 vs. ReSTOR® +3.0
7 rings vs 9 rings

Reduced the add power from 3.0D to 2.5D by:

- Reducing diffractive rings from 9 to 7 and increasing spacing

Altered the light distribution by:

- Increasing the distance energy of the center zone from 40% to 100%
- Reducing apodized diffractive area by 18%
- Increasing the outer distance area by 6%

RESTOR TORIC

- FDA “approved” for Fall 2015 release but delayed again until sometime this year!
- **1st multifocal toric**
- +3.0 add
- 1D-2.5D corneal astigmatism

Bausch & Lomb Trulign Toric

- Only accommodative toric IOL approved in U.S.
- Good distance/intermediate
- Refractive surprises post-op

Tecnis Multifocal in **+2.75/3.25**

AND

Tecnis Toric

- Corneal astigmatism
 1. ZCT150- **1.03D**
 2. ZCT225- **1.54D**
 3. ZCT300- **2.06D**
 4. ZCT400- **2.74D**

Acrysof Toric- Extended Power Range

- SNGAT3- 1.03D corneal plane
- SNGAT4- 1.55D
- SNGAT5- 2.06D
- SNGAT6- 2.57D
- SNGAT7- **3.08D**
- SNGAT8- **3.60D**
- SNGAT9- **4.11D**

Who Should You Discuss Premium Lenses with?

- A. Patients with 6 figure income**
- B. Those who want a perfect result**
- C. Night drivers**
- D. Every patient**

“Selling” the lens

- You may not believe in it, but you had better offer it.....assuming your surgeon does!
- Ask patient about their goals and go from there
- Be upbeat, but don't overpromise

Extra work: yes, but you should be paid for your time

- Document extra tests
- Work with a surgeon who co-manages premium IOLs

Counseling IOL Patients

- Critical to be part of the education process if you want to be the “expert” in the eyes of your patients
- “He never told me I had astigmatism or that there was a lens to correct it” makes you look BAD
- Also send patients to where you believe they will get best care.....not closest, but best. They are coming to you for YOUR advice, not “here’s a list, pick 1”



The screenshot shows the website for Sight Selector. At the top is a navigation menu with links: HOME, CONTENT LICENSE, LVC COUNSELOR, IOL COUNSELOR, ABOUT US, CONTACT, ORDER INFO. Below the menu is a secondary navigation bar with links: Sight Selector, Websites/Social Media, Brochures, Counter Tips, Folders, Posters, Ads, Teaching Tools, Videos. The main content area features a large heading "Sight Selector™ FOR iPad™" and "Sight Selector™ for the iPad™ & iPhone™". Below this, it states "is Now Available for Purchase in the App Store!". There are images of an iPad and an iPhone displaying the app interface. Text describes the Premium version (49 topics, 3D images, narrated video) and the Lite version (Eye Anatomy topic at no cost). A "View Demo" button and a link to "Sight Selector™ FAQ's" are also visible.

Malpractice?

- “Will I be at risk if I tell the patient about the lens and they end up not doing well”
- ODs are at a higher risk from “failure to inform” suits than from misdiagnosis suits

Using the Right Terminology

- Premium lens
- Lifestyle lens
- High Technology Lens
- Multifocal lens

The Changing Face of Cataract Surgery

The Baby Boomer Generation

- Large, rapidly growing demographic
- Educated, financially secure
- Increased life expectancy
- Longer working careers
- Demand high quality vision (reading, distance, night vision)
- New requirement for near vision (computers)
- Unwilling to compromise active lifestyles

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The Future of Cataract Surgery and the O.D.'s role in Comanagement

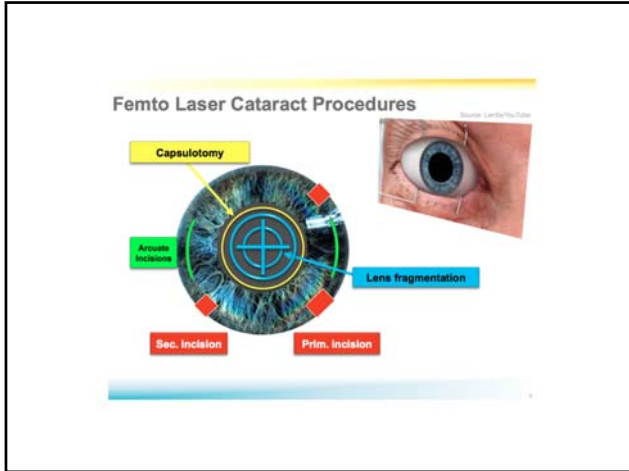
- Femtosecond Laser Cataract Surgery
- Image guided technology
- Intraoperative aberrometry

Traditional Cataract Surgery

- Corneal incisions via hand-held blade
- Manually created capsulorhexis via blunt needle or forceps
- Intraocular ultrasonic phacoemulsification for lens aspiration
- IOL Implantation

Do We Need FLACS?

- Cataract surgery already a "good" procedure?
- Only helps less experienced surgeons?
- Wait for technology to improve?
- Several lasers...wait to see which one is best?
- Laser too expensive to justify?
- Don't believe the hype?



Reproducible Primary and Secondary Incisions

Computer programmed incisions

- % depth
- Length & position
- Visualization of placement

Real time Corneal thickness

Customizable "planed" incisions (up to 3)

Manual Arcuate Incisions

- Manually executed by "tracing" corneal marks with handheld diamond knife
- Inconsistent depth control
- Unpredictable effect due to imprecise wound architecture and depth
- No image-guided surgical planning or visualization

LS01101.026

Laser Arcuate Incision

- Square edge
- Uniform depth (no ripples)
- Precise, reproducible
 - Arc shape
 - Arc length
 - Diameter

Shenker RF. Application of the Femtosecond Laser in Cataract Surgery for the Creation of Multi-Plane, Self-Sealing Incisions. ASCRS 2010, Boston

Laser Capsulotomy

Precise and reproducible

- Geometrically superior circle (vs. Manual Capsulorhexis)

Automatic Centration and Size

- Based on limbus and (dilated / undilated) pupil pupil

Capsular Edges

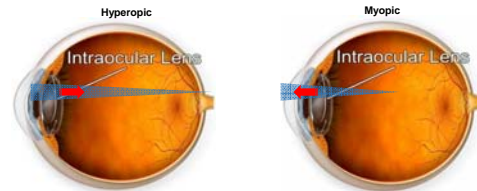
- Closest to manual capsulorhexis in terms of edge uniformity*

* Bala C, Meades K. SEM of femtosecond laser capsulotomy edge: An inter-platform comparison. Accepted for publication in Journal of Cataract and Refractive Surgery

Impact of ELP on IOL Predictability

If IOL is 0.5 mm posterior to the assumed plane, a 21 D lens will produce only 20 D of correction

If IOL is 0.5 mm anterior to the assumed plane, a 21 D lens will produce 22 D of correction



*Norlby S. Sources of error in intraocular lens power calculation. J Cataract Refract Surg. 2008;34:368-376.

Additional Lens Fragmentation for Versatility

Customizable Lens Fragmentation based on lens characteristics or surgeon preference

Cylinder

Chop

Hybrid

Frag

FLACS Video- Narrow Angle

Benefits of Lowering CDE
(Cumulative Dispensed Energy)

- **Less ultrasound energy (CDE)**
- **Short term**
 - * decreased k edema 1 day post-op
 - * faster visual recovery
 - * decreases complications intra-op
- **Long term**
 - * decreased rate of endothelial cell loss
 - * pseudophakic bullous keratopathy less likely

Important to Explain

What's covered

- Cataract removal
- Monofocal lens resulting in good distance vision if no astigmatism
- Will need readers

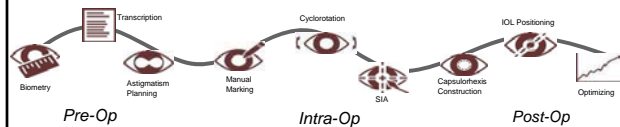
What's not covered

- Astigmatism Tx with laser
- Toric lenses
- Multifocal lenses
- Additional testing
- Intraoperative Aberrometry

Laser Cataract Surgery:
What Can You Expect Post-Op

- **Subconjunctival heme (“ring around limbus”)**
- **Less AC reaction**
- **Decreased astigmatism**
- **Early “wow” factor**
- **BUT....due to arcuate incisions, there may be temporary corneal surface irregularities**

Identifying Sources of Variability in our Current Process



The Verion™ Image Guided System

Designed to help consistently achieve the cataract refractive target.

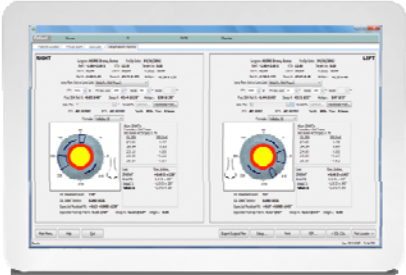
VERION™ Image Guided System

ACQUIRE IMAGE



VERION™ Image Guided System

TRANSFER TO PLANNER



OR Video- Toric Alignment

The ORA™ System with VerifEye® Technology

- The ORA™ System uses wavefront aberrometry data in the measurement and analysis of the refractive power of the eye (i.e. sphere, cylinder, and axis measurements)
- Real-time, intraoperative refractometer
- Measures anterior and posterior corneal astigmatism
- Minimizes post-op refractive surprises

Post Op Cataract Visits

- It took a long time to get where we are...don't relinquish post op care
- "I don't have time"
- "I am not set up for it"
- "I am not sure what to do"

Post Op Cataract Visits

- VA and pinhole at day one, with IOP and slit lamp check
- VA and quick refraction week one if not close to 20/20, with IOP and slit lamp
- VA and final refraction week four

- ***fundus exam at one or four week visit

Confusion is the Rule

- When it comes to pre/post op meds
- Be sure they never stop their glaucoma drops
- Rebound iritis often means steroids were stopped

Imprimis Dropless Therapy™

The modality of “Dropless” therapy involves the injection of an eye-compatible compound at the end of the cataract case as prophylaxis against inflammation and infection.

Currently, there are 2 combinations available only from Imprimis:

- **Tri-Moxi:** triamcinolone acetonide and moxifloxacin hydrochloride
- **Tri-Moxi-Vanc:** triamcinolone acetonide, moxifloxacin hydrochloride and vancomycin

Dropless Therapy™ Patient Benefits

- Physically/mentally challenged patients
- Eliminate compliance challenges of drops
- Lift burden from family members/caregivers
- Put patients with “Eye Drop Phobia” at ease
- Avoid pharmacy issues: refills, generics
- Help patients in nursing facilities
- Aid patients without insurance, money or access to sample drops



- Osteoarthritis
- Rheumatoid Arthritis
- Scoliosis
- Parkinson's
- Kyphosis
- Alzheimer's
- Dementia



➤ Drop Therapy with branded medications can cost over \$400

Tri-Moxi-Vanc Transzonular Injection

Post-Op Visits: Whats Different with LenSx/Premium IOL's?

- **Restor:** check reading vision and find the “sweet spot”
- Until second eye is done, vision may not be optimal
- **Toric:** do a refraction if VA not 20/20 or close

Post-Op Visits: Whats Different with LenSx/Premium IOL's?

- **LenSx:** check if the under 1 D of astigmatism is reduced
- Check for corneal swelling due to dock, along with "ring around the limbus" sub conj hemorrhage

What can affect the results of cataract surgery and premium IOL's?

- Surface disease
- Chalazia
- Pterygia
- Corneal dystrophies and degenerations
- Undetected pre-op retinal conditions
- Post-op CME

Take off the Pterygium prior to the Cataract!

- 3 techniques
 - Bare sclera (60%)
 - Amniotic membrane (10%)
 - Conjunctival autograft (5%)
- Mitomycin C cuts recurrence rate in half
- Specimen for pathology

Pterygium Excision

- 69826
- 90 day global period
- 4 post op visits

Pterygium

- POD#1
 - History- Pain/discomfort- may require pain meds for a few days
 - Acuity- should be normal
 - External- Moderate conjunctival injection
 - S/L- be sure corneal epithelium intact

Sutures

- Rarely used unless the graft area is huge
- Fibrin glue better

Drops

- If any sign of recurrence or inflammation, up the steroids
- Even consider a steroid injection

IOP

- Check IOP.....
 - If elevated consider steroid response
 - If low, check carefully for wound leak

If in doubt.....

- Keep them on lubes and a steroid

Bumpy Corneas could mean Bumpy Post Op Refraction

- 55 y/o F c/o months of monocular f.b. sensation, contact lens intolerance, tearing, and mild decrease in vision

The most likely diagnosis is:

- A. Pellucid degeneration
- B. Salzmann's nodules
- C. Granular dystrophy
- D. Corneal scarring

Salzmann's Nodules

- Follows episodes of keratitis
- Collagen plaques with hyalinization
- Anterior to Bowman's
- Irregular epithelium
- F.B. sensation/photophobia
- Superficial keratectomy

Superficial Keratectomy

Salzman's Post Op Visits

- 1 day
- 3-5 days...remove BCL and stop NSAID, start hourly viscous artificial tears
- 1 month

- Progress will be monitored via acuity and corneal healing and topography
- Then set up the cataract surgery!

Microincisional Glaucoma Surgery with Cataract Surgery

MIGS – Micro-Invasive Glaucoma Surgery

- Ab-interno approach
 - Clear corneal micro-incision (<2.0mm)
 - Conjunctival sparing
- Minimally traumatic
 - Negligible disruption of normal anatomy/physiology
 - Excellent biocompatibility
- Efficacious
- Extremely high safety profile
- Rapid recovery



iStent® Specifications

iStent is the smallest medical device known to be implanted in the human body and weighs just 60 µg



- iStent dimensions are customized for a natural fit within the 270 µm canal space
- Made of surgical-grade nonferromagnetic titanium
- Heparin-coated to promote self-priming

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iStent® Therapeutic Objectives

iStent® is designed to be used in conjunction with cataract surgery to safely and effectively reduce IOP

- Lowers IOP and may reduce or eliminate medication burden¹
- Decrease risk of IOP fluctuations associated with non-adherence to prescription medication regimens
- Avoid serious complications associated with end-stage filtration and shunt procedures
- Spare the conjunctiva and safely preserve future treatment options
- Minimizes risks of hypotony and bleb related complications

¹ Elimination of medication following iStent implantation is at the discretion of the physician.

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MIGS Study Group

- Prospective study, 119 iStent® patients followed for 18 months
- Patients did not undergo cataract surgery (non-FDA approved)
- All patients on 1-3 glaucoma meds
- Compared IOP after 1, 2, and 3 iStents placed (without Phaco/IOL)
- IOP = 19.8, 20.1, and 20.4 respectively, before washout
- IOP = 25.0, 25.0, and 24.9 respectively, after washout
- IOP = 15.6, 13.9, and 12.3 respectively, 18 months post-op

iStent® Postop Management

- **iStent postop no different than standard cataract**
- **Maintain glaucoma meds**
- **“Final effect” on IOP not until 2-3 months postop**

Typical iStent Patient

- IOP 19-20 on 2 to 3 meds with questionable compliance
- s/p PC IOL with iStent day1
- Leave on all glaucoma meds for 30 days
- IOP drops to 12-14 range
- Start weaning meds, IOP often stays in the low teens!

iStent® Potential Complications

- Hyphema
 1. Minimal
 2. Self absorbing
- IOP spike
 1. Manage as normal postop spike
 2. Topical B blockers, alpha agonists, CAI's
- PAS to iStent
 1. YAG as necessary

iStent® Summary

- Effective in lowering IOP for many glaucoma patients
- Ideal for COAG patient having cataract surgery
- Decreases or eliminates need for glaucoma meds
- Well tolerated, good safety profile
- Minimally invasive

Finally.....

- Each surgeon has their own regimen for each procedure
- “Scrub in” with the surgeon and know their routine and preferences
- Communication is critical both ways
- Be accessible to your patients after hours, and be sure to have your surgeon’s cell number

AND.....

- SUPPORT THOSE THAT SUPPORT YOU AND OUR PROFESSION.....
- REGARDLESS OF LOCATION
- TAKE CHARGE AND SEND TO THOSE YOU TRUST