On behalf of Vision Expo, we sincerely thank you for being with us this year.

Reminder to Complete Your Session Evaluations!

Please be sure to complete your digital session evaluations for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.

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Speaker Financial Disclosure Statement

Jerry Robben, O.D. has no financial interests to disclose that are relevant to this course discussion.

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Practical Surgical
Co-Management – The OD's Role
Jerry Robben, O.D.
Chief Optometrist and Director of Clinical Research
Bowden Eye & Associates
Jacksonville, FL

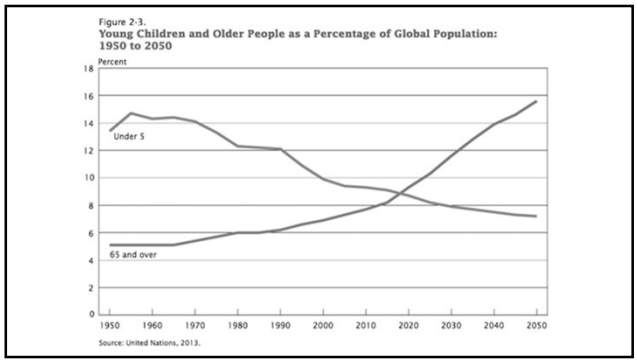
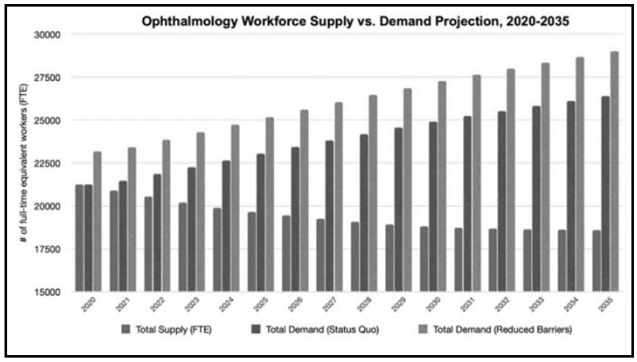


Figure 2-3.
Young Children and Older People as a Percentage of Global Population: 1950 to 2050
Percent
18
16
14
12
10
8
6
4
2
0
Under 5
65 and over
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
Source: United Nations, 2013.


Ophthalmology Workforce Supply vs. Demand Projection, 2020-2035
# of full-time equivalent workers (FTE)
30000
27500
25000
22500
20000
17500
15000
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
Total Supply (FTE)
Total Demand (Status Quo)
Total Demand (Reduced Barriers)

OPTOMETRY IS THERE TO MEET THE DEMAND (WE JUST NEED TO MAKE SURE THE OMDS KNOW THIS)

- Ophthalmology practices proactively are preparing to handle the "boom" in eye care needs -> Let them know you are ready
- Reduced availability of ophthalmologists means practices need to find ways to share care which, in essence, has each specialty working to the highest level of their care -> That needs to include Optometry too!
- Ophthalmic practices need and desire Optometrists to work with them -> This messaging is in the OMD community and is growing louder!
- Ophthalmic practices are researching adding Physician Assistants and Nurse Practitioners into their practice…-> WHY?? (recent anti-kickback statues and perceived issues with OD/MD comanagment)
- Optometry provides the best option for the OMDs to turn to aid in perioperative care and shared care, This works best when the entities work together-> Communicate

PARTNERSHIPS VS. CO-MANAGEMENT

Allison Shuren, JD, co-chairs the Life Sciences and Healthcare Regulator practice at Arnold & Porter in Washington DC. In Ophthalmology Management Dec. 2022
" Beware these regulatory landmines in comanagment"

"In recent years, this scrutiny has come from government enforcement officials such as the Office of Inspector General (OIG) of the U.S. Department of Health and Human Services, the Department of Justice and United States Attorney Offices as well as from whistleblowers who believe some of the relationships between ophthalmologists and optometrists raise significant fraud and abuse concerns under the federal Anti-Kickback Statute (AKS).

The AKS makes it a crime to knowingly offer, give, seek or receive something of value in return for or to induce referrals for items or services that are paid for by federal health-care programs.

With such serious consequences — the AKS carries criminal penalties — it is imperative clinicians understand what constitutes a kickback and the danger zones in their own specialty. Here is our attempt to provide some crucial clarity."

OFFICE OF INSPECTOR GENERAL (OIG)

- Issued specific guidelines on co-management
- Co-management is legal
- Case by Case Basis – Can't be considered routine
- Transfer of care occurs with medical stability and is in writing
- Patient must agree to being co-managed (informed consent)
- Patient agrees to return to the operating surgical facility if complications
- Fees must be disclosed to the patient

OFFICE OF INSPECTOR GENERAL (OIG)

- Must disclose the education of each provider along with the governing body for each profession ie State Board of Optometry and State Medical Board
- Payment is according to work performed
  - Percentage of the post-operative 90 days commencing with the written transfer of care

WE ARE BETTER TOGETHER

Shared Care

- Shared Care models allow for the patient to achieve the highest level of care in any situation
- In Shared Care models the provider of any care should set and collect fees
- There should be no money paid from one entity to another. Collect the fees you determine best for your overhead and services from the patient.
- Work together on standards of care to provide the best continuity in handoffs

COLLABORATIVE AREAS OF SHARED CARE/COMANAGMENT TO CONSIDER

- Management of
  - Dry Eye Disease
  - **Glaucoma**
  - Diabetes
  - **Cataracts**
  - **Refractive Sx**
  - Retina
  - Neuro
  - Essentially all pathologies if needed
  - Glasses and Contact Lenses
  - Myopia Control
  - VT
- Benefits to patient care
  - High quality eye care
  - Patient comfort
  - Patient convenience
  - Efficiency
  - Cost effective
- Utilize skills and expertise of each practitioner
- MD does Sx and we do the rest unless pathology dictates need for MD to treat

"To be on the cutting edge of optometry, you need to be on the cutting edge of science and technology."

Douglas K. Devries, OD

WHY IS THIS IMPORTANT FOR OPTOMETRY?

- 4 out of 5 patients diagnosed with a cataract are done so by an optometrist
- Optometrists are the "gatekeepers" to cataract referrals and ATIOLs
- Referring O.D.'s must discuss all IOL options and educate patients about cataract and treatment options
- Same for Refractive Sx and Glaucoma or other pathologies…We are the primary ECP

MENU AHEAD

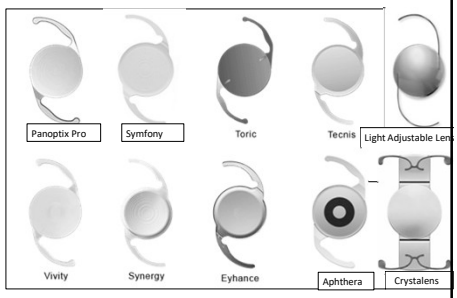
- Cataract Sx Pre and Post Op Considerations
- Refractive Sx Pre and Post Op Considerations
- Glaucoma Sx Pre and Post Op Considerations

TODAY'S PRESBYOPIA-CORRECTING IOL OPTIONS

- Enhanced Monofocal IOL
- Wavefront-Shaping EDOF IOL
- Hybrid Multifocal/EDOF IOL
- Small Aperture IOL
- Accommodative IOL (Crystalens)
- Light Adjustable Lens

- Monofocal*
- Monofocal plus*
- Accomodative*
- EDOF*
- Non-diffractive EDOF*
- Bifocal*
- Trifocal*
- Adjustable
- Small aperture

*also come in toric



IT IS IMPORTANT TO CHOOSE THE CORRECT IOL FOR THE INDIVIDUAL PATIENT.

Considerations:

- Visual needs
- Lifestyle
- Daily activities
- Concerns about dysphotopsia
- Comorbidities

PATIENTS WANT A BETTER UNDERSTANDING OF THEIR LENS OPTIONS AND RELY ON THEIR EYE DOCTOR FOR GUIDANCE

Patients want to know their options

82% of patients want to know all the lens options available to them

However, only 36% know what different types of lenses are available

Patients rely on their eye doctor for guidance

96% of past patients followed their eye doctor's recommendation if recommended ATIOL

However, only 33% of patients receive a recommendation

2021 Consumer Decision Making Research. % selecting top 3 box on 1-10 scale, n = 297

KNOW YOUR TOOLS ATIOL'

	Add Power	Astigmatism Correction	Range of Vision	UCVA quality	Nightime glare	Cost
Light Adjustable	None	0 - 3 D	Customizable	++++	_	+++
Accommodative	None		D/MR/N	+++	_	+++
Trifocal	+2.17/+3.25	1 - 3 D	D/MR/N	+++	++	++
Extended Focus	+2.00	0 - 3 D	D/MR	+++	+	++
Toric Monofocal	None	1 – 5 D	One distance	+++	_	++
Small Aperture	None-pinhole effect	1-2 D	D/MR	++	_	++

STUDIES ON CATARACT SURGERY OUTCOMES SHOW THAT

50-70% WITHIN 0.5 D

79-94% 1.0 D OF THE INTENDED TARGET

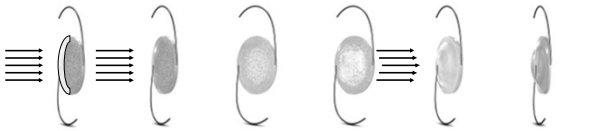
- A STUDY OF PATIENTS UNDERGOING PLACEMENT OF TORIC IOLS FOUND THAT 88% HAD LESS THAN 1.0 D OF ASTIGMATISM POSTOPERATIVELY.

LAGRASTA JM, ALLEMANN N,SCAPUCIN L, ET AL. CLINICAL RESULTS IN PHACOEMULSIFICATION USING THE SRK/T FORMULA. *ARQ BRAS OFTALMOL.* 2009;72(2):189-193.
COOKE DL, COOKE TL. COMPARISON OF 9 INTRAOCULAR LENS POWER CALCULATION FORMULAS. *J CATARACT REFRACT SURG.* 2016;42(8):1157-1164.
KANE JX, VAN HEERDEN A, ATIK A, PETSOGLOU C. ACCURACY OF 3 NEW METHODS FOR INTRAOCULAR LENS POWER SELECTION. *J CATARACT REFRACT SURG.* 2017;43(3):333-339.
ARISTODEMOU P, KNOX CARTWRIGHT NE, SPARROW JM, JOHNSTON RL. FORMULA CHOICE: HOFFER Q, HOLLADAY 1, OR SRK/T AND REFRACTIVE OUTCOMES IN 8108 EYES AFTER CATARACT SURGERY WITH BIOMETRY BY PARTIAL COHERENCE INTERFEROMETRY. *J CATARACT REFRACT SURG.* 2011;37(1):63-71.
HOLLAND E, LANE S, HORN JD, ERNEST P, ARLEO R, MILLER KM. THE ACRYSOF TORIC INTRAOCULAR LENS IN SUBJECTS WITH CATARACTS AND CORNEAL ASTIGMATISM: A RANDOMIZED, SUBJECT-MASKED, PARALLEL-GROUP, 1-YEAR STUDY. *OPHTHALMOLOGY.* 2010;117(11):2104-2111

Digital correction of vision

The Light Adjustable Lens:

Customized Vision through Light Adjustment after Implantation



ActivShield
Blocks UV except during LDD treatment

Adjustment Beam
Light from the RxSight LDD is directed by the surgeon to the Light Adjustable Lens

Photopolymerization
Macromers in the path of the light are photo-polymerized

Diffusion and Power Change
Unpolymerized macromers move into the exposed area, causing precise shape and power change

Lock-In Beam
The entire lens is exposed to light to polymerize all the remaining macromers

Final Result
The outcome is a precise change in the LAL power to match the patient's individual prescription

- LAL eyes achieved UCVA of **20/20 or better** at 6 months postoperatively at approximately **2x the rate** of patients receiving a monofocal lens
- **91.8% of LAL eyes achieved result within 0.50 D** of target MRSE (similar to LASIK results)
- **Superior Quality of Vision** at all measures compared to control lens:

LAL FDA CLINICAL TRIAL

U.S. FDA Clinical Study
Prospective Randomized Study
N=391 (eyes) RxLAL; N=193 (eyes) Control Monofocal
17 U.S. Sites
Phaco and Implantation of RxLAL -Correction of +/- 2 D sphere & 0.75-2.0 D cylinder
6 Month Outcomes

CONSOLIDATE THE OPTIONS:
AVOID DECISION PARALYSIS

- Non-femto/monofocal
- Non-femto/Toric $
- Non-femto Multifocal/EDOF $$
- Non-femto/LAL $$$
- Femto/Monofocal $$
- Femto/ATIOL $$$
- Femto/LAL
  $$$$

AH

GETTING TO KNOW YOUR PATIENT WILL HELP IN COUNSELING…

Refractive History
myope, hyperope, astigmatism, presbyope

Visual Demands
active lifestyle, wants best UCVA at N/MR/D, wants "perfect" vision

Reading Correction
bifocals, readers over contacts, monovision, under-corrected myope, peak over/under glasses

Prior Refractive Surgery
LASIK, PRK, RK

Other Comorbidities
dry eyes, AMD, glaucoma

IOL CHEATSHEET

PATIENT CONSIDERATIONS	IDEAL IOL	WHY?
POST REFRACTIVE SURGICAL PATIENT (POST LASIK/PRK/RK)	LIGHT ADJUSTABLE LENS (LAL) or ACCOMMODATIVE	Adjustability post implantation allows for the most precise fine tuning of vision and helps avoid refractive surprise.
MONOVISION PATIENT, not easy-going about final target	LAL or ACCOMMODATIVE	Monovision patients who are discerning demand most optimized distance in their dominant eye and are particular about the near distance most optimized for task, adjustability allows for such precision
MONOVISION PATIENT, more easy going	EDOF, TORIC, or MONOFOCAL (if doesn't want best option with LAL)	This is a patient who may not want to commit to the time and cost of the LAL, and is willing to accept slight suboptimal target
MYOPE, wants to maintain ability to read without glasses/contacts but wants uncorrected distance vision, never tried monovision in past	TRIFOCAL IOL	For a patient accustomed to reading without correction, it is an important consideration to maintain that ability while addressing their desire to gain distance vision too
HYPEROPE	TRIFOCAL IOL	These are often the easiest patients to make happy, they are dependent on glasses for all distances and trifocal delivers a great outcome
IRREGULAR CORNEA	SMALL APERTURE IOL	

AH/NS

Refractive surgical options

	PRK	LASIK	EVO ICL	SMILE	RLE
Type of procedure	Surface ablation	Ablation under the flap	Additive of an ICL	Lenticular extraction	Phakic lens removal and IOL implant
Myopia correction	Up to -6D	Up to -6 to -8	-3.0 to -16.0	Up to -6 to -8	In older patients, very high myopia
Astigmatism correction	Up to 3 D	Up to 3-4 D	Up to 4 D	Up to 4 D	Up to 4 D
Hyperopia correction	Up to +2 to +3 (not ideal)	Up to +2 to +3 (not ideal)	----	----	Very high correction
Dry eye risk?	Yes	Yes	Minimal	Yes	Minimal
Complications	Haze, delayed epi healing, regression, ectasia	Flap complications, epi ingrowth, infection, regression, ectasia	Sizing issues with related pigment dispersion, high IOP, cataract, ICL rotation	Retained lenticule, infection, epi ingrowth, ectasia	Residual refractive error, infection, persistent inflammation, RD, CME, ERM

NS

PATIENT PROFILE

25 YO WITH STABLE REFRACTIVE ERROR SEEKING REFRACTIVE SURGERY

- OD: -10.00 +1.00 x 90 → 20/20
- OS: -11.00 +1.50 x 85 → 20/20
- Pachymetry: 500, 490
- Mild d…
- …ble but with …rior steepening
- Tomography with minimal posterior elevation

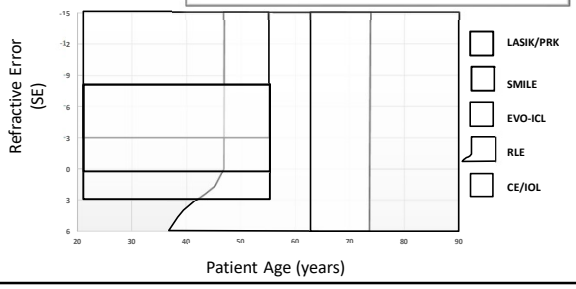
Definitely ICL!

- … + 1.00 x 90 → 20/20
- …/20
- Topography no…
- Tomography normal

LASIK/SMILE or ICL?

AH

REFRACTIVE SURGICAL TREATMENT: MENU OF OPTIONS



PATIENT IDENTIFICATION

- Patient wishes to improve vision and/or reduce need for glasses and or CLs
  - Not always a "perfect" candidate based on older stipulations-keep an open mind
  - This does not always mean correction of emmetropia – in some cases the surgical reduction of the magnitude of the refractive error can still positively change a patient's life
- Patient who is a good refractive candidate, but who may not be aware that they are.
  - You are the eye expert…let them know of their options
    - "Have you ever thought about corrective eye surgery?"
    - "Did you know you are a good candidate for refractive eye correction?"
    - "Your prescription is perfect for surgery to correct?"

PATIENT EDUCATION – SET EXPECTATIONS

- Educate about how a proposed refractive surgery may benefit their visual status
- Educate how that improvement may apply to their case and their visual complaints if applicable
- Balance the above with also setting proper visual expectations to not "make a promise that you can not keep" following surgery.
- Educate on cost and possible financing options
- Educate on proper time expectations to prepare their eyes and have the surgery.
- Educate on the need to prepare their eyes for the surgery

PATIENT PREPARATION

- After the patient has been identified and educated and they wish to proceed with a surgical evaluation with OMD
  - We need to make sure the patient is "ready" to see the surgeon (the basics)
    - Does patient need medical necessity to proceed if insurance coverage is being used?
    - Pretesting obtained?
      - Comprehensive Exam with DFE and dilated pupil size documented
      - BCVA
      - Corneal Topo, Aberometry, iTrace?
      - Glaucoma, Macular testing updated? Is the retina in good shape? ERM?
        - If retina pathology exists or may exist we need to assess and possibly have retina specialist opine on it prior to Sx.
      - Endothelial Dystrophy testing updated? Any corneal or other concerns? ABM Dystrophy, Salzmann's Nodules any irregularities, CCH, other?
      - Is the patient systemically healthy for Sx?
      - What else…?
  - We need to prepare their eyes, specifically their ocular surface, for best results
  - AKA-TREAT DRY EYE!
  - Also need to ensure all other loose ends are tied up

MANAGEMENT OF THE OCULAR SURFACE PRIOR TO SX

- Clinical science has demonstrated the importance of a healthy ocular surface for optimal outcomes in anterior segment surgery.
- The international TFOS-DEWS, DEWS ll, DEWS III and MGD Workshop have provided a comprehensive understanding of ocular surface disease.
- Recent studies on DED prevalence among ocular surgery patients have heightened awareness of the importance of preoperative DED recognition.

MANAGEMENT OF THE OCULAR SURFACE PRIOR TO SX

- **Cataract surgery patients frequently have unrecognized dry eye disease.**

PHACO study **143 cat pts who were scheduled for Sx**

77% had NaFl corneal staining, 50% had central corneal staining and 62.9% had a tear break-up time of less than 5 seconds, yet only 22% had DED diagnosis

Duke study **336 cat patients who were scheduled for Sx**

64% had abnormal OSDI and 80% had at least 1 abnormal tear test, yet only 16% had DED diagnosis.

1. Trattler WB, Majmudar PA, Donnenfeld ED, McDonald MB, Stonecipher KG, Goldberg DF; The PHACO Study Group. The Prospective Health Assessment of Cataract Patients' Ocular Surface (PHACO) study: the effect of dry eye *Clin Ophthalmol.* 2017;11:1423-1430.
2. Van Dusen KW, Gupta PM. The prevalence of dry eye syndrome in patients presenting for cataract surgery. *American Society of Cataract and Refractive Surgery Annual Meeting*; May 5-9, 2017; Los Angeles, CA.
3. Gupta PM, et al. Prevalence of ocular surface dysfunction in patients presenting for cataract surgery evaluation J Cataract Refract Surg. 2018 Sep

MANAGEMENT OF THE OCULAR SURFACE PRIOR TO SX

- **Corneal refractive patients frequently have symptomatic dry eye disease when screened.**

Refractive Surgery

PROWL studies 511 patients prior to LASIK

Avg age 30 yrs.

51% with abnormal baseline OSDI scores

mild 28%

mod 14%

severe 9%

1. Eydelman M, Hilmantel G, Tarver ME, et al. Symptoms and Satisfaction of Patients in the Patient-Reported Outcomes With Laser In Situ Keratomileusis (PROWL) Studies. *JAMA Ophthalmol.* 2017;135(1):13-22.

Management of the Ocular Surface Prior To Sx

Preop Ocular Surface Assessment

- The ophthalmic surgery evaluation should begin with an ocular surface assessment.
- The healthy ocular surface defines visual quality and refractive stability in the ophthalmic surgery patient.
- The prudent OD and OMD, <u>together</u>, must convey to the patient the importance of effective ocular surface preparation regardless of the procedure.

Management of the Ocular Surface Prior To Sx

Why Treat The Ocular Surface?

- **The refractive ocular surface is defined by the air-tear film interface and the corneal surface.**
- **This surface is responsible for 60-70% of the optical power of the human eye.**
- **Any tear film disturbance or cornea surface alteration associated with ocular surface disease may significantly degrade visual acuity and/or vision quality.**

Management of the Ocular Surface Prior To Sx

What are features of the healthy ocular surface?

- Normal lid closure dynamics
- Normal lid globe apposition
- Adequate tear volume
- Normal tear composition
- Stable tear film
- Intact and stable corneal epithelium
- Intact and stable conjunctival epithelium
- Absent ocular surface inflammation
- Clean lid margins
- Unobstructed meibomian glands

Management of the Ocular Surface Prior To Sx

Elements of preoperative ocular surface assessment

1	2	3	4
OSD Symptom Assessment	External exam Biomicroscopic examination	Diagnostic testing to detect the loss of ocular surface homeostasis	Imaging technology to define corneal surface injury and alterations of MG structure and function

Management of the Ocular Surface Prior To Sx

OSD Challenges

- The asymptomatic dry eye patient poses a major challenge to ECPs.
- We have talked about the importance of addressing the ocular surface prior to Sx for best post op results
- Eye surgery may destabilize an asymptomatic and barely compensated ocular surface creating symptoms and surgical complications.
- Preop patient education and management of OSD must be addressed prior to surgery.
- Patients are poorly receptive to OSD explanations for unmet expectations following ocular surgery.

Management of the Ocular Surface Prior To Sx

Ophthalmic surgery may expose the ocular surface to the following disruptive factors:

- topical anesthetics and antiseptics
- limbal corneal incisions
- arcuate corneal incisions
- intraoperative ocular desiccation
- excessive ocular surface irrigation
- topical eyedrop preservative exposure
- NSAIDS
- altered lid/globe apposition
- sutured surface wounds

Management of the Ocular Surface Prior To Sx

Patient Education on OSD Prior to Surgery

- Abnormal OSD findings must be presented effectively to the patient to obtain compliance with recommended preop measures.
- Patients are often unreceptive to needed ocular surface optimization due to:
  - asymptomatic OSD
  - absent insurance coverage for tests and procedures
  - impatience to proceed with surgery
- Recommendations for preop OSD treatment must be memorialized in the record as patients will likely forget postoperatively when unanticipated symptoms or problems arise.

Management of the Ocular Surface Prior To Sx

Conclusion

Ocular surface disease in the ophthalmic surgery patient:

- has greater prevalence than appreciated
- may be symptomatic or asymptomatic
- may adversely affect surgical outcomes
- may impact patient satisfaction

Asymptomatic ocular surface disease usually becomes symptomatic following ocular surgery.

Detection of OSD and effective optimization of the ocular surface prior to surgery are critical for the best surgical outcomes and patient satisfaction.

5 PEARLS (“P’S”) FOR SUCCESS

1. **P**lano Outcome
2. **P**roactive Tx of Ocular Surface Disease
3. **P**re Op Counseling – Setting Realistic Expectations
4. **P**roperly Screen Candidates
5. **P**ick the Right IOL

Other: 6. **P**ick the Right Surgeon
7. **P**osterior Capsular Opacification
8. **P**oor IOL Centration

POSTOPERATIVE COMPLICATIONS

- 1 day – High or low IOP
- 3-7 days – Endophthalmitis
- 2-3 weeks – Steroid Responder
- 3-4 weeks – Iritis/Uveitis
- 3-6 weeks – CME
- 1-3 months – Posterior capsule opacification

NEUROADAPTATION OF MULTIFOCAL IOLS

- Patients' expectations of time frame needed to adapt needs to be managed
  - These patients require more counseling post-op
  - Neuroadaptation can take as long as 6-12 months
  - About 10% never neuroadapt (will need IOL exchange)
  - No way of testing before surgery which patients will be able to adapt vs not
- Multifocal IOLs will induce more aberrations than monofocal IOLs

Take away: no YLC to be performed until rule out that IOL exchange is necessary

MANAGING THE UNEXPECTED OUTCOME: HAVE AN ALGORITHM TO IDENTIFY THE ISSUE

- Develop communication with your staff regarding dissatisfied patients
  - Encourage clinic techs to communicate patient satisfaction to you
  - Have work-up done before you see the patient
    - **MRx BCVA/Topo/OCT/Ocular surface testing**
  - Have a plan to fix the problem before you enter the room!

CO-MANAGEMENT PEARL

- Opportunity to provide cutting edge technology
- Importance of your recommendation
- Patient education is critical!
- Patient preparation is critical! (treat the ocular surface)

CO-MANAGEMENT PEARL

- Identify potential causes of surgical complications
- Educate your patients your role within medical eye care – Again, at least, address the ocular surface
- *We are all judged by the visual outcomes our patients. Comfort and quality of vision is the key!*

PRK (photorefractive keratectomy)

- Follow-up visits: POD1, POW1, POM1, POM3, POM6/POY1
- POD1:
  - Subjective feedback from patient
  - VA, AR
  - SLE:
    - Are the BCLs in place?
    - Any sign of infection?
- POW1:
  - Subjective feedback from the patient
  - VA, AR
  - SLE:
    - Has the epithelium fully healed? If so, remove BCL.
- POM1/3/6/12:
  - VA, AR, MR, IOP. Is there residual refractive error? Is the patient happy?

Recovery
- Mild discomfort days 2-4
- BCL out at POW1 visit (usually)
- Functional vision after one week, sharp vision in 3-6 weeks, can/will fluctuate until stable.

LASIK (laser assisted in-situ keratomileusis)

Follow-up visits: POD1, POW1, POM1, POM3, POM6/POY1

POD1:
- Subjective feedback from patient
- VA, AR
- SLE:
  - Is the LASIK flap flat, smooth, and with symmetric gutters? Any macro- or micro-striae?
  - Any signs of epithelial defects? Any signs of DLK or epithelial ingrowth? Is there meibum underneath the LASIK flap? Any foreign bodies underneath the LASIK flap?
  - Is the ocular surface dry?

POW1:
- Subjective feedback from the patient
- VA, AR, MRx, IOP
  - SLE:
    - Same as above
    - Any signs of DLK, epithelial ingrowth, or infection? Any signs of flap movement?

POM1/3/6/12:
- Any changes to the above? Is there residual refractive error? Is the patient happy?

Recovery
- Mild discomfort days 1-4
- NO BCL(usually)
- Functional vision after 1-2 days, sharp vision in 1-2 weeks with much less fluctuations compared to PRK

MALONEY-SHAMIE-HURA VISION INSTITUTE

SMILE (small incision lenticule extraction)

Follow-up visits: POD1, POW1, POM1, POM3, POM6/POY1

POD1:
- Subjective feedback from patient
- VA, AR
- SLE:
  - Is the SMILE pocket flat and smooth? Any macro- or micro-striae?
  - Any signs of epithelial defects? Any signs of DLK or epithelial ingrowth? Is there meibum in the pocket? Any foreign bodies in the pocket? Any stromal edema?
  - Is the ocular surface dry?

POW1:
- Subjective feedback from the patient
- VA, AR, MRx, IOP
  - SLE:
    - Same as above
    - Any signs of DLK, epithelial ingrowth, or infection?

POM1/3/6/12:
- Any changes to the above? Is there residual refractive error? Is the patient happy?

Recovery
- Mild discomfort days 1-4
- NO BCL(usually)
- Functional vision after 1-2 days, sharp vision in 1-2 weeks with much less fluctuations compared to PRK

NS

EVO-ICL IS A SAFE AND HIGHLY EFFECTIVE SUGICAL OPTION TO CORRECT MYOPIA

Consider EVO ICL for your patients who have:

- Moderate to high myopia with or without astigmatism
- Dry eyes and seeking freedom from glasses or contacts
- Seeking a refractive surgical option other than LASIK/PRK/SMILE
- Desire a “reversible” surgical option

Long term management of EVO ICL patients:
- Routine follow-up checking for:
  - Vault
  - Anterior subcapsular cataract (extremely rare!)
  - Glaucoma (extremely rare!)

MALONEY-SHAMIE-HURA VISION INSTITUTE

PHACO IOL/ICL Sx

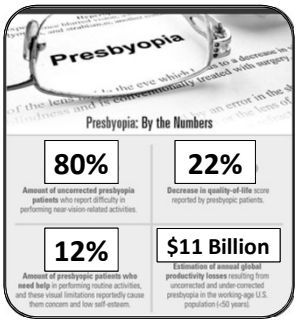
Follow-up visits: POD1, POW1/2, POM1-6w, POM3, POM6/POY1

POD1:
- Subjective feedback from patient
- VA, AR, IOP
- SLE:
  - Is the eye reasonably quiet? Any corneal edema? excessive A/C reaction? is the IOL stable and centered. Is the ocular surface dry? Any complications you need to send back to MD for?

POW1/2:
- Subjective feedback from the patient
- VA, AR, MRx, IOP, DFE
  - SLE:
    - Same as above
    - Any signs of DLK, epithelial ingrowth, or infection? Any signs of flap movement?

POM1/3/6/12:
- Any changes to the above? Is there residual refractive error? Any signs of Cloudy Lens Capsule? Is Pt off post op meds? Any complications that need ongoing Tx and or PT educations? Is the patient happy?

The Rising Tide of Symptomatic Presbyopia: RLE as the Lifeboat



DROPS ON TOP?

EMERGING MEDICAL PRESBYOPIA OPTIONS AND THEIR POSSIBLE INTERACTIONS WITH THESE PATIENT POPULATIONS?

- MAY IMPROVE NVA
- MAY IMPOROVE AE'S

MENU AHEAD

- Cataract Sx Pre and Post Op Considerations ✓
- Refractive Sx Pre and Post Op Considerations ✓
- Glaucoma Sx Pre and Post Op Considerations

WHY CONSIDER GLAUCOMA SX?

- Patient is getting worse and more meds won't work
- Patient is on MAX topical Meds and cant tolerate/afford or keep up
- Patient doesn't want more IOP meds but need better control
- Patient is unable to consistently use the IOP meds
- Cost of Meds is a barrier
- Intolerant to Meds needed, even if it is just 1 med
- Type of Glaucoma will require/respond better to Sx than meds
- Dry Eye/Ocular Surface Dz

GLAUCOMA SURGERIES TO EXPLORE

- **SLT**
- **Bimatoprost Implant (Durysta)**
- **iStent (various versions)**
- **Goniotomy/Trabeculotomy**
- **Canaloplasty/ViscoCanaloplasty**
- **Endoscopic Cyclophotocoagulation (ECP)**
- **Xen Gel Drainage Stent**
- **Hydrus**
- **Trabeculectomy**
- **Tube Shunts**

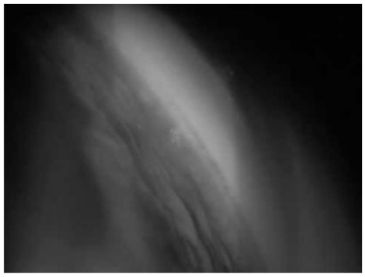
SELECTIVE LASTER TRABECULOPLASTY (SLT)

SLT

- Primary or adjunctive Tx option for OAG/OHT
- Laser wavelength applied to TM to expand TM to increase outflow
- Expect 30% IOP reduction if primary Tx
- Effect can:
  - Work for years
  - Wear off in months
  - Have no measurable effect
- Post Op Concerns (normal F/U at 1W (DFE) then 1 MO)
  - Post op inflammation (usually mild and generally use NSAID for 5-10 days S/P to limit)
  - IOP spike right after Sx (5% incidence rate, responds to IOP meds as expected)
  - HIGH IOP spike 1 week S/P SX (rare and may be associated with uveitic glaucoma cases, likely need anti-inflammatory and aggressive IOP Tx)

1. Kent, C. (2017, June 9). *Treating with SLT First: The Pros and Cons.* Review of Ophthalmology. Retrieved January 27, 2024, from https://www.reviewofophthalmology.com/article/treating-with-slt-first-the-pros-and-cons
2. Frances, B. Glaucoma Research Foundation. Retrieved January 27, 2024, from https://glaucoma.org/selective-laser-trabeculoplasty-10-commonly-asked-questions/
3. The Glaucoma Laser Trial (GLT) and glaucoma laser trial follow-up study: 7. Results. Glaucoma Laser Trial Research Group. [No authors listed] Am J Ophthalmol 1995;120:6:718-31.

SLT



E. L. M. (2013). *SLT Clinical Footage: Treatment Protocol*. Youtube. Retrieved January 27, 2024, from https://www.youtube.com/watch?v=mXvOWH0D_qI

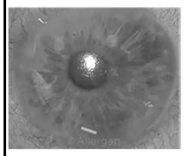
BIMATOPROST IMPLANT (DURYSTA)

BIMATOPROST IMPLANT

- Adjunctive Tx option for OAG/OHT
- Implanted into A/C, pellet slowly dissolves releasing PGA Bimatoprost and is proposed to use same mech. of action as topical Bimatoprost
- Expect 30-35% IOP reduction if primary Tx
- Designed to release drug for 6 months, cases have demonstrated lasting effect up to 12 months and beyond.
- Repeat Tx can be done but coverage can be a concern – this is evolving and looks to improve
- Contraindicated
  - Ocular or Periocular Infections
  - Corneal Endothelial Cell Dystrophy/Prior Corneal Transplantation
  - Absent or Ruptured Posterior Lens Capsule
  - Hypersensitivity to Bimatoprost or any other PGA contraindication (inflammatory conditions)
- Post Op Concerns (normal F/U at 1W (DFE) then 1 MO)
  - Post op inflammation (usually mild and generally use NSAID/Steroid for S/P to limit)
  - Endophthalmitis
  - Later Corneal complications (endocell dystrophy – edema), Macular edema
  - Anything similar to topical PGA

1. Stuart, A. (2020, December 1). *Bimatoprost Implant: What Role Will it Play in Glaucoma Management?* Retrieved January 27, 2024, from https://www.aao.org/eyenet/article/
2. Abbvie. Retrieved January 27, 2024, from https://www.rxabbvie.com/pdf/durysta_pi.pdf

DURYSTA



Implant can be done at slit lamp or under surgical microscope

Ahmed, I. (2023, December 1). *Glaucoma Drug Delivery into the Eye: Durysta Bioerodible Implant*. Youtube. Retrieved January 27, 2024, from https://youtu.be/ZnvSehN7mcI?si=015U7mDTzShjoeMp

ISTENT

ISTENT

- Adjunctive Tx option for OAG/OHT
- World's smallest medical implant – placed into TM to Schlem's Canal to increase outflow
- Generally done at time of cataract Sx but can be done independently (studies show similar response)
- Modest IOP reduction: Clinical Trial - 68% of glaucoma patients who received iStent remained medication-free at 12 months while sustaining a target IOP of ≤ 21 mm Hg vs. only 50% of patients who underwent cataract surgery alone
- Robust IOP Reduction: Phase 4 trial showed nearly 10mmHg IOP reduction or 2 med withdrawal sustained over 5 years (with or without cataract Sx)
- Contraindicated
  - Angle Closure Glaucoma or A/C anomalies
  - Active Uveitic Glaucoma
  - Active Neovascular Glaucoma
- Post Op Concerns (normal F/U at 1D then 2week (DFE) then 4-6 week final post op if clear)
  - corneal edema (8%), BCVA loss of ≥ 1 line at or after the 3-month visit (7%), posterior capsular opacification (6%), stent obstruction (4%) early post-operative anterior chamber cells (3%), and early postoperative corneal abrasion (3%) – **if becomes obstructed, can YAG it open (sometimes)**
  - Normal post op Tx following Cataract Sx

1. Cleveland Eye Clinic. *iStent Glaucoma Technology*. Retrieved January 29, 2024, from https://www.clevelandeyeclinic.com/glaucoma/istent/
2. Hengerer, F. H. (2022, March). *iStent Inject Trabecular Micro-Bypass with or Without Cataract Surgery Yields Sustained 5-Year Glaucoma Control*. Retrieved January 29, 2024, from https://pubmed.ncbi.nlm.nih.gov/35113323/

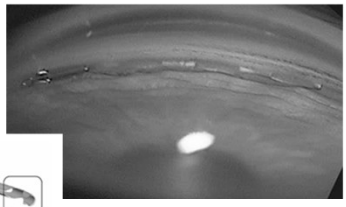
HYDRUS MICROSTENT

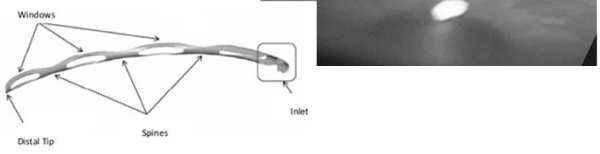
HYDRUS MICROSTENT

- Indicated to lower IOP to be placed at time of Cataract Sx for Mild to Moderate POAG
  - Pigmentary
  - PXE
- 8 mm long, implantable stent that occupies Schlemm's made of a nickel-titanium alloy that possesses super-elastic properties, allowing for return to its original shape after deformation.
- Can dilate Schlemm's canal by four to five times the natural width of the canal, countering the collapse of Schlemm's canal induced by elevated IOP to increase outflow from baseline
- Studies show reasonable expectation of 20% reduction of IOP when compared to Cataract Sx alone sustained for 2-5 years based on various studies
  - Hydrus vs Canaloplasty are equal in effect in head to head trials
  - Hydrus vs iStent, Hydrus slightly superior in mean reduced IOP and/or reduction in IOP meds
  - Hydrus vs SLT, Equal in mean reduction in IOP but Hydrus has statistically significant reduction in IOP Meds
- Contraindicated: Any other than POAG (basically)
- Post Op Concerns (normal F/U at 1D then 1-2week (DFE) then 4-6 week final post op if clear)
  - Any normal intraocular/cataract Sx post op complications
  - Hyphema (1%-1.2%) usually resolved in a week
  - IOP spike early in Post op (26%) treat with meds and usually resolves as espected and med can be D/C'd in a few days to a week
  - Periph. Anterior Synech (PAS) (10%-20%) around device but generally no effect to device
  - Endothelial Cell Loss slightly more than Cat Sx alone (14% vs 10%)

1. Aref, A. A. (2023, December 23). *Hydrus Microstent*. American Academy of Ophthalmology. Retrieved February 3, 2024, from https://eyewiki.aao.org/Hydrus_Microstent
2. Richter GM, Coleman AL. Minimally invasive glaucoma surgery: current status and future prospects. Clinical Ophthalmology 2016; 10: 189-206.
3. Samuelson TW, Chang DF, Marquis R, et al. A Schlemm canal microstent for intraocular pressure reduction in primary open-angle glaucoma and cataract: the HORIZON study. Ophthalmology 2019; https://doi.org/10.1016/j.ophtha.2018.06.012

HYDRUS





1. FDA Summary of Safety and Effectiveness Data (SSED) – Hydrus microstent.
2. Aref, A. A. *Hydrus Microstent*. American Academy of Ophthalmology. Retrieved February 3, 2024, from https://eyewiki.aao.org/Hydrus_Microstent

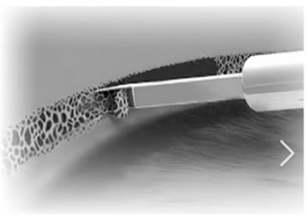
GONIOTOMY

GONIOTOMY/TRABECULOTOMY

- Adjunctive Tx option for OAG/OHT
- Intraocular surgical procedure where first layer of TM or more is cut/removed to increase outflow , done with multiple techniques
  - Traditionally done with MVR blade - – more prone to leave TM leaflets that can then scar
  - Trabectome electrocautery – more prone to leave TM leaflets that can then scar
  - Kahook Dual Blade (2015)* - dual blade is thought to remove more TM material and scar less
  - 27 gauge needle
- Can be done 360°, but usually done in quadrants
- Expect 80% or more Pt's reach 20% IOP reduction from baseline with same Med Tx or at least 1 medication reduction
- Good Candidates
  - OAG
  - Secondary Glaucoma
- Poor Candidates
  - Narrow Angles
  - Active Neovascular Glaucoma
- Post Op Concerns (normal F/U at 1D then 1-2week (DFE) then 4-6 week final post op if clear)
  - Any normal intraocular post op complications
  - Usual intraocular post op medications and F/U, some surgeons may use pilo. 1% to create tension on scleral spur to increase patency
  - Hyphema

1. Seibold, L. (2020, October 23). *Getting Started with Goniotomy and the Kahook Dual Blade*. Retrieved January 27, 2024, from https://eyesoneyecare.com/resources/getting-started-goniotomy-kahook-dual-blade/
2. Hillman, L. (2023, July 7). *Navigating the world of goniotomy/trabeculotomy and canaloplasty*. Retrieved January 27, 2024, from https://www.eyeworld.org/2023/navigating-the-world-of-goniotomy-trabeculotomy-and-canaloplasty/

GONIOTOMY



1. University Eye Specialists, Retrieved February 3, 2024, from https://universityeyespecialists.com/services/migs.html

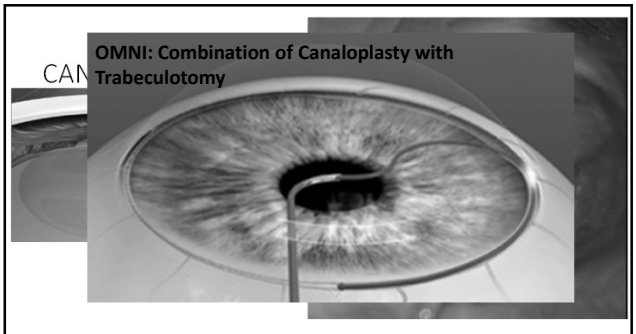
CANALOPLASTY/ VISCOCANALOPLASTY

CANALOPLASTY/VISCOCANALOPLASTY

- Adjunctive Tx option for OAG/OHT
- Viscocanaloplasty – using viscoelastic injected through Schlemm's Canal to expand it/clean it out and increase outflow
- Canaloplasty – uses a microcatheter to course through Schlemm's 360 and then removed and then visco is inserted as above.
- Up to 30% reduced IOP from baseline and a 60% reduction in need for medication (CP better results than VCP)
- Good Candidates
  - OAG
  - Pigmentary glaucoma
  - Pseudoexfoliative glaucoma
- Contraindicated
  - Angle Closure
  - Active Neovascular Glaucoma
  - Angle Recession
- Post Op Concerns (normal F/U at 1D then 1-2week (DFE) then 4-6 week final post op if clear)
  - Any normal intraocular post op complications
  - Microhyphema (6.1% - 85.2%), a good sign of patency and generally resolves within days to a few weeks
  - IOP spikes within 1st week post op (30%) likely due to remnants of visco can treat PRN

1. Riva, I. (2019, January 7). *Canaloplasty in the Treatment of Open-Angle Glaucoma: A Review of Patient Selection and Outcomes*. Retrieved January 29, 2024, from https://pubmed.ncbi.nlm.nih.gov/30488337
2. Wagdy, F. M. (2017, January 25). *Canaloplasty versus Viscocanalostomy in Primary Open Angle Glaucoma*. Retrieved January 29, 2024, from https://pubmed.ncbi.nlm.nih.gov/28243422/
3. Koerber, N. J. (2012, February 21). *Canaloplasty in one eye compared with viscocanalostomy in the contralateral eye in patients with bilateral open-angle glaucoma*. Journal of Glaucoma. Retrieved January 29, 2024, from https://pubmed.ncbi.nlm.nih.gov/21378587/

CAN



Web Eye Clinic. Retrieved February 3, 2024, from https://www.webeyeclinic.com/glaucoma/canaloplasty

ENDOSCOPIC CYCLOPHOTOCOAGULATION (ECP)

ENDOSCOPIC CYCLOPHOTOCOAGULATION (ECP)

- Adjunctive Tx option for OAG/OHT
- Cyclodestructive procedure developed in 1992 to ablate the ciliary body epithelium to decrease aqueous production resulting in lower IOP
- Uses an endoscope that serve 3 functions
  - Image guide – with light source provided direct view of the Tx area of the CB
  - Light source
  - Laser to deliver Tx energy target area and minimize "collateral damage" to deeper CB tor surrounding tissue
- Limited long term studies…Positive anecdotal evidence supports
- Studies suggest 4 – 10 mmHg IOP reduction with up to 70% success rate that does reduce effect year to year
- Good Candidates – up for debate
  - OAG and CAG
  - Pigmentary glaucoma and Pseudoexfoliative
  - Neovascular, Traumatic and Pediatric glaucoma among others
- Controversial – improved technology, techniques and more Tx numbers have increased acceptance
- Becoming more popular to be done at time of cataract Sx but can be done in a phacic patient
- Post Op Concerns (normal F/U at 1D then 1-2week (DFE) then 4-6 week final post op if clear)
  - Any normal intraocular post op complications – course is very similar to post op cataract Sx
  - Inflammation, CME, anterior/posterior synechiae, PCO, Hypotony if too aggressive

1. Siegel, M. J. (2023, November 6). *Endoscopic Cyclophotocoagulation (ECP)*. Eyewiki. Retrieved February 3, 2024, from https://eyewiki.aao.org/Endoscopic_Cyclophotocoagulation_(ECP)
2. Seibold, L. K. (2015, January 6). *Endoscopic cyclophotocoagulation*. National Library of Medicine. Retrieved February 3, 2024, from https://pubmed.ncbi.nlm.nih.gov/25624669/
3. *Endoscopic cyclophotocoagulation (ECP)*. Wills Eye Hospital. Retrieved February 3, 2024, from https://www.willseye.org/endoscopic-cyclophotocoagulation-ecp/

ECP

1. Northern Sydney Cataract. Retrieved February 3, 2024, from https://www.northernsydneycataract.com.au/endoscopic-cyclophotocoagulation-ecp/

XEN GEL DRAINAGE STENT

XEN GEL

- Adjunctive Tx option for OAG/OHT
- Flexible implanted tube that is 6mm long with a 45 micron lumen that creates a permanent drainage site between the A/C to the subconjunctival space through a trans scleral channel
- Material is designed to limit fibrotic/scar formation to reduce post operative conjunctival scaring seen with other drainage devices
- Studies suggest 29%+ IOP reduction from baseline and significant reduced need of IOP meds at 1-2 years
- Fluid dynamics allow for less likely cause of hypotony than other tubes/trabs
- Good Candidates
  - OAG, Pigmentary glaucoma and Pseudoexfoliative
- Contraindicated
  - CAG where angle has not been surgically opened
  - Active iris neovascularization
  - Previous tube or conj. scaring at target site
  - ACIOL, A/C silicone oil or vitreous in A/C
  - Hx of keloid scaring
- Post Op Concerns (normal F/U at 1D then 1-2week (DFE) then 4-6 week final post op if clear)
  - Any normal intraocular post op complications – course is very similar to post op tube but much less invasive
  - Need to monitor formation of bleb and ensure fibtrosis/scaring does not set in which will require timely intervention with needling bleb revision, consider staring ocular massage at 2 week post op if IIOP is >12mmHg.

1. Rooney, D. M. (2023, July 7). *Xen Glaucoma Treatment System*. Retrieved February 3, 2024, from https://eyewiki.aao.org/Xen_Glaucoma_Treatment_System
2. (2023) Abbvie. *What is the Xen Gel Stent*. Retrieved February 3, 2024, from https://www.wngelstent.com/XENGelStent
3. Hillman, L. (2017, July). *XEN Gel Stent: When to use and how to implant*. ASCRS EyeWorld. Retrieved February 3, 2024, From XEN Gel Stent: When to use and how to implant

XEN GEL

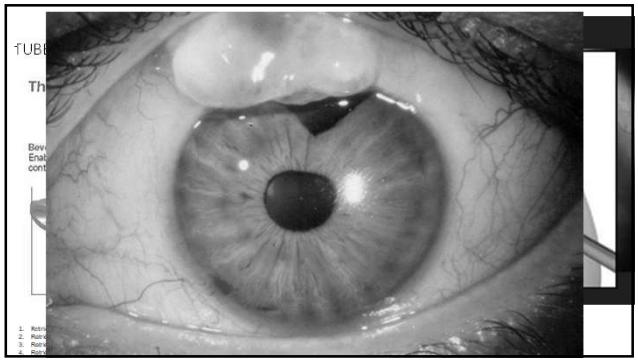
1. Millennial Eye. Retrieved February 3, 2024, from https://millennialeye.com/articles/staging/the-xen-gel-stent-in-pseudophakic-refractory-glaucoma-patients/
2. North Wales Eye Specialist. Retrieved February 3, 2024, from tps://northwaleseyespecialist.co.uk/glaucoma-surgery/

TUBES AND TRABS

TUBES AND TRABS

- Adjunctive or Primary Tx option for OAG or CAG
- Number of Trabs being done is going down due to less complications associated with Tubes
- Number of Tubes being done is going down due to effective, less invasive and less complicated MIGS
- Generally Tubes and Trabs can be expected to reduce IOP more than MIGS
  - Case by case
  - Risks vs benefits
  - Tube vs Trab Study indicates that Trab may lower IOP more but Tubes have less devastating complications
- More complications (usually more serious) associated with Tubes/Trabs than MIGS
  - Hypotony
  - IOP spikes (tubes more than Trabs)
  - Endo Cell Loss
  - Endophthalmitis
  - Aqueous Misdirection Syndrome
- Post Op Concerns (usually longer post op period than MIGS) (normal F/U at 1D then 1-2week (DFE) then as needed based on IOP and course)
  - Any normal intraocular post op complications – course is very similar to post op tube but much less invasive
  - Conj. Scarring Need to have injections of 5FU (multiple) to possible bleb revision, consider starting ocular massage at 2 weeks post op if IOP is >12mmHg
  - Failure over time resulting in need for additional Sx

1. Sarkisian, Jr., S. R. (2009, November 18). *Going With the Flow: Managing Tube Shunts*. Retrieved February 3, 2024, from https://www.reviewofophthalmology.com/article/going-with-the-flow-managing-tube-shunts#:~:text=For%20one%20thing%2C%20it%20clearly%20demonstrated%20that%20tube,of%20a%20traditional%20filtering%20bleb%20at%20the%20limbus.
2. Kent, C. (2010, June 11). *Which Glaucoma Surgery for Which Patient?* Retrieved February 3, 2024, from https://www.reviewofophthalmology.com/article/which-glaucoma-surgery-for-which-patient
3. Geddie, S. J. J. (2012, July 21). *The Tube Versus Trabeculotomy (TVT) Study*. Retrieved February 3, 2024, from https://www.aao.org/education/annual-meeting-video/tube-versus-trabeculectomy-tvt-study



Q & A

THANK YOU!