

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

**Vision Expo Has Gone Green!**

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE letter 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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**Financial Disclosure – Justin Schweitzer, OD, FAAO**

- Aerie – C/L
- Alcon – C/L
- Allergan – C/L
- Bausch + Lomb – C/L
- Ocular Therapeutix - C
- EyePoint – C
- Sight Sciences – C/L
- Dompe – C/L
- Zeiss – C/L
- Visus - C
- Science Based Health – C
- Kala – C
- RVL – C
- Tarsus – C/L
- Sun – C/L
- Equinox - I
- Reichert - C
- IBI – C/L
- Glaukos – C/L
- Horizon – C
- Quidel – C
- MediPrint – C
- LKC – C/L
- Avellino – C
- Novartis – C
- Iveric bio – C
- Occuphire - C

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**Innovations in Glaucoma**

**Next Generation Technology, Medications, and Delivery**



Justin Schweitzer, OD, FAAO  
 Vance Thompson Vision  
 Optometric Externship Director  
 Associate Director Residency Program

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**Today's Optometrists**

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

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# Diagnosics

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The Correcting Applanation Tonometer Surface (CATS)





British Journal of Ophthalmology

Modified Goldmann prism intraocular pressure measurement accuracy and correlation to corneal biomechanical metrics: multicentre randomised clinical trial

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The Correcting Applanation Tonometer Surface (CATS)

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IOP "corneal-compensated" (IOPcc)

213 Eyes of 125 glaucomatous patients followed for 2.4 years

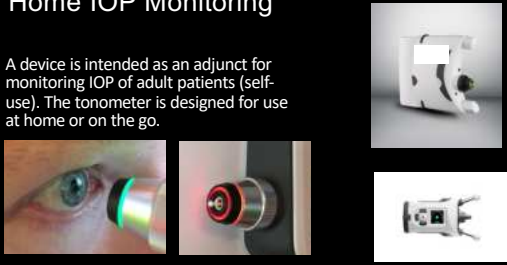
Tonometer	Rate of Visual Field Progression	Significance (p-value)
GAT	11.1%	(.11)
ORA	24.5%	(.24)
RBT	5.8%	(.05)

Susanna BN, Ogata, NG, Daga FB et al. Association between Rates of Visual Field Progression and Intraocular Pressure Measurements Obtained by Different Tonometer's. Ophthalmology. 2019 Jan;126(1): 49-54.

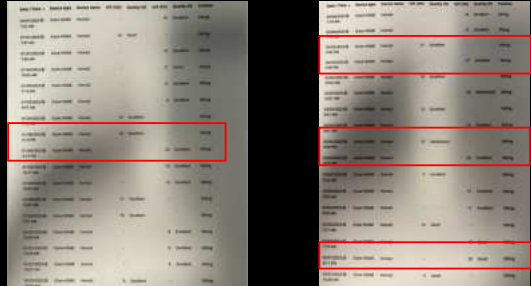
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### Home IOP Monitoring

A device is intended as an adjunct for monitoring IOP of adult patients (self-use). The tonometer is designed for use at home or on the go.



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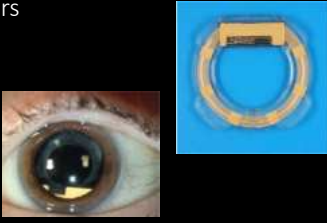


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### Continuous IOP Sensors

Implandata Eyemate


- Sulcus based IOP sensor
- 8 pressure-sensitive capacitors
- Diameter: 11.2 mm
- Thickness: 0.5 mm



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### Smart soft contact lens (BVS Sight)

- 24-hour IOP monitoring
- Lens power
- Wettable
- O2 Transmissibility
- Overnight wearability




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- AcuMEMS (Menlo Park, CA)
  - iSense System: implantable sensor
- Glaukos (San Clemente, CA)
  - DOSE Medical IOP sensor
- Implantsdata Ophthalmic Products GmbH
  - Suprachoroidal IOP sensor
- Injectsense Inc (Emeryville, CA)
  - Configurable on-demand sensor
- LaunchPoint Technologies (Goleta, CA)
  - Sensor attached to IOL or injected into vitreous
- Solx (Waltham, MA)
  - wireless intraocular sensor



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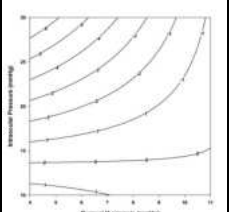
### Corneal Hysteresis, IOP, CCT



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### Corneal Hysteresis (CH)

Corneal Hysteresis reflects the ability of the corneal tissue to dissipate energy<sup>1</sup>  
Function of viscoelastic damping<sup>2</sup>



Medeiros FA et al. Ophthalmology. 2013;120:1533-1540.

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### Corneal Biomechanics and Visual Field Progression in Eyes with Seemingly Well-Controlled Intraocular Pressure

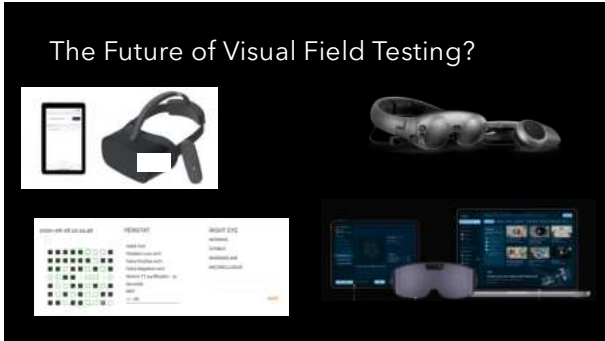
460 eyes of 334 glaucoma patients  
Follow-up – 4.3 years  
Well controlled if IOP < 18 mm HG

CH (8.6 vs 9.4)  
CCT (515 vs 531)

179 eyes well controlled  
42 (23.5%) of those eyes had VF progression

68% higher risk of progression

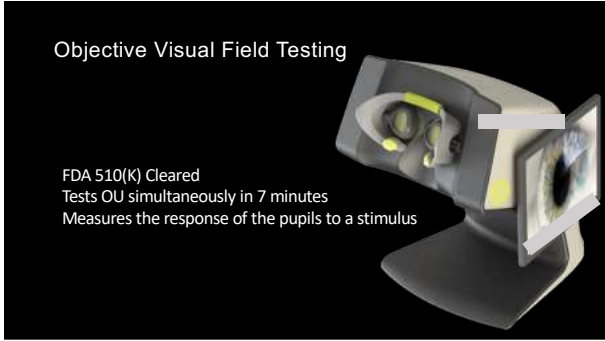
19



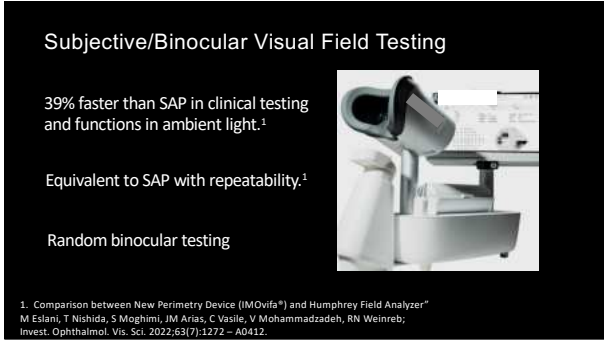
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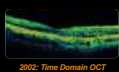
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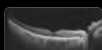
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## OCT Angiography: the Next Chapter

- Images retinal microvasculature without dye injection
- Displays structure and function from a single imaging system



2002: Time Domain OCT



2006: Spectral Domain OCT



2014: OCTA

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## OCT Angiography: the Next Chapter

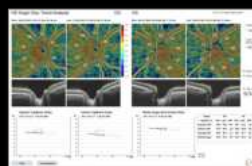


Image courtesy of Eric D. Hoffman, MD and Michael H. Galbraith, MD of Shiley Eye Institute, University of California at San Diego, La Jolla, CA

Correlates well with OCT Technology

Utilization:  
High Myopia  
Advanced Glaucoma

Rao HL, Pradhan ZS, Suh MH, Moghimi S, Mansouri K, Weinreb RN. Optical Coherence Tomography Angiography in Glaucoma. *J Glaucoma*. 2019 Aug;28(11):113-121. doi: 10.1097/IJG.0000000000001463. PMID: 32033551; PMCID: PMC67117982.

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## Artificial Intelligence and Glaucoma

1. Level of Suspicion of Disease
  - Non-ophthalmic or non-glaucoma settings
  - Guides referral's
  - Cybersight
2. Diagnosing Disease
  - OD or OMD clinics
  - Using OCT images
  - Challenging

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## Evaluation of an AI system for the automated detection of glaucoma from stereoscopic optic disc photographs: the European Optic Disc Assessment Study

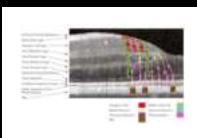

- Objectives - To evaluate the performance of a deep learning based Artificial Intelligence (AI) software for detection of glaucoma from stereoscopic optic disc photographs, and to compare this performance to the performance of a large cohort of ophthalmologists and optometrists.
- Results
  - Pegasus was able to detect glaucomatous optic neuropathy with an accuracy of 83.4% (95% CI: 77.5–89.2)
  - This is comparable to an average ophthalmologist / optometrist accuracy of 80.5% / 80% respectively (95% CI: 67.2–93.8) / (95% CI: 67–88) on the same images.
  - There was no statistically significant difference between the performance of the deep learning system and ophthalmologists or optometrists.

Rogers TW, Jaccard N, Carbonaro F, Lemij HG, Vermeer KA, Reus NJ, Trikha S. Evaluation of an AI system for the automated detection of glaucoma from stereoscopic optic disc photographs: the European Optic Disc Assessment Study Eye (Lond). 2019 Nov;33(11):1791-1797. doi: 10.1038/s41433-019-0510-3. Epub 2019 Jul 2. PMID: 31267086; PMCID: PMC67002599.

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### Electroretinography

Measures the electrical responses of various cell types in the retina, including the photoreceptors (rods and cones), inner retinal cells (bipolar and amacrine cells), and the ganglion cells in response to a stimulus.

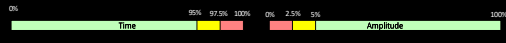



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### Interpretation

How should I think about yellow/red results?

Yellow and red results require closer attention and other tests to confirm disease.



**SLOW IMPLICIT TIMES**

- Too Slow: Possibly indicative of cellular stress

**AMPLITUDES**

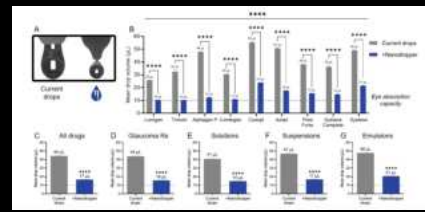

- Too Small: Possibly indicative of cell damage

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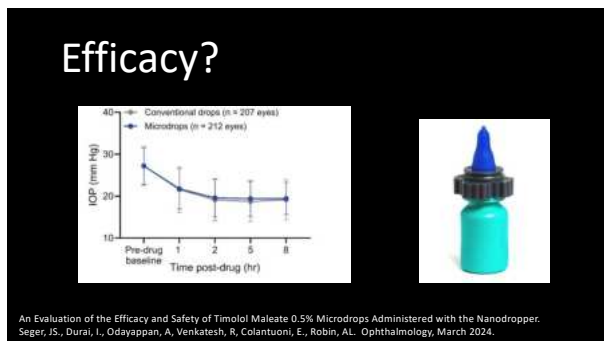
# Treatment

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### Delivering Treatment

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#### The effects of antioxidants on ocular blood flow in patients with glaucoma

*Acta Ophthalmologica*

#### The MIND Diet

Mediterranean-Diet-Associated Neurodegeneration (MIND)

**WHAT TO EAT**

- Vegetables: 3 servings of various greens, 1 serving of vegetables, 1 1/2 cups of beans, 6 cups
- Whole grains: 3 servings
- Fruit: 2-3 servings
- Other: 1 serving

**WHAT TO LIMIT**

- Butter and animal products: 2 servings
- Red meat: 1 serving
- Wheat bread: 1 serving
- Fast food: 1 serving
- Sweets: 1 serving
- Alcohol: 1 serving

In a case control study of participants from the large Rotterdam population Health study (matching those with OAG with age/sex matched controls), each 10% increase in adherence to the MIND diet was associated with a 20% reduced risk of OAG.

Vergoesen, Joëlle E., et al. "MIND diet lowers risk of open-angle glaucoma: the Rotterdam Study." *European Journal of Nutrition* 62.1 (2023): 477-487.

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### Preservative-Free Formulations

N=349, Significant improvement in both signs and symptoms of OSD with switch to PF meds

**Table 4. Frequency of symptoms and signs at visits 1 and 2 in PF group**

	Visit 1 (preserved)		Visit 2 (preservative free)		p-Value
	N <sup>a</sup>	(%)	N <sup>a</sup>	(%)	
<b>Painful symptoms</b>					
Dryness upon instillation	196/349	57.6%	40/343	11.7%	<0.001
Irritation persisting with or without eye symptoms between instillations	283/343	82.7%	123/344	35.8%	<0.001
<b>Ocular signs based on the clinical examination (patients presenting with at least one)</b>					
Puffy/red eyes (blepharitis)	123/342	35.7%	30/346	8.7%	<0.001
Conjunctival red	111/338	32.8%	26/338	7.7%	<0.001
Superficial punctate keratitis	83/334	24.8%	18/337	5.3%	<0.001

<sup>a</sup>Number of patients for which the variable had been recorded.

Reilly, P.J., P. Prud'homme, and C. Baudouin. Prevalence of ocular symptoms and signs with preserved and preservative free glaucoma medication.

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### Preservative-Free Solutions

#### PF-Latanoprost

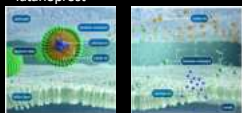
	Phase 3 (US) Trial (n=325)		Phase 3 (Europe) Trial (n=353)	
	PF-Latanoprost	Xalatan	PF-Latanoprost	Xalatan
Mean baseline IOP ± SD (mmHg)	18.8 ± 2.9	19.2 ± 3.1	24.1 ± 1.8	24.0 ± 1.7
Mean IOP reduction from baseline (mmHg) (range)	2.7 (2.2-3.0)	3.4 (2.9-3.8)	8.6 (8.3-8.8)	8.9 (8.8-9.0)

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### BAK-Free Latanoprost

- Following instillation, micelles mix with the tear film
- As the micelles migrate toward the ocular surface, they break apart, releasing latanoprost



### Preservative-Free


Drug	Concentration	Formulation	Preservative
LAT	0.005%	0.005% Latanoprost in 0.1% Hydroxypropylcellulose	None
BAK	0.005%	0.005% Latanoprost in 0.1% Hydroxypropylcellulose, 0.01% Benzalkonium Chloride	BAK
BAK	0.005%	0.005% Latanoprost in 0.1% Hydroxypropylcellulose, 0.01% Benzalkonium Chloride, 0.01% EDTA	BAK
BAK	0.005%	0.005% Latanoprost in 0.1% Hydroxypropylcellulose, 0.01% Benzalkonium Chloride, 0.01% EDTA, 0.01% Thimerosal	BAK
BAK	0.005%	0.005% Latanoprost in 0.1% Hydroxypropylcellulose, 0.01% Benzalkonium Chloride, 0.01% EDTA, 0.01% Thimerosal, 0.01% Polyoxyl 40	BAK
BAK	0.005%	0.005% Latanoprost in 0.1% Hydroxypropylcellulose, 0.01% Benzalkonium Chloride, 0.01% EDTA, 0.01% Thimerosal, 0.01% Polyoxyl 40, 0.01% Polyoxyl 18	BAK

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### ...Other Drop Options

- PDP-716 (0.35% brimonidine tartrate)
  - qd dosing, preservative free, seeking FDA approval
- NCX 470 (NO-donating bimatoprost)
  - Phase 3 trial = superior to latanoprost 0.005%
- CKLP1 (ATP-sensitive potassium channel opener)
  - lowers EVP 1:1 with IOP reduction
  - only tested in animal studies
- QLS-111 (ATP-sensitive potassium channel opener)
  - lowers EVP


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Innovations in Glaucoma Drug Delivery  
What the Future Holds

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Interventional Glaucoma  
Mindset



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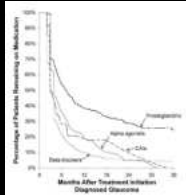


**The Long Time Glaucoma Patient**

"My eyes are red on a daily basis and my vision fluctuates."

"I do miss my drops off and on – and my eyes feel better when I do"

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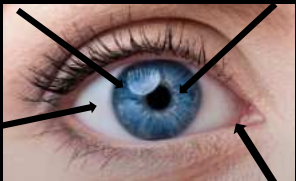


**Adherence with Topical Glaucoma Medication Monitored Electronically: The Tracoon Drug Ad Study**

More than **90%** of patients are nonadherent to their ocular medication dosing regimens, and nearly **50%** discontinue taking their medications before **6 months**!

Nordstrom BL. Persistence and adherence with topical glaucoma therapy. *Am J Ophthalmol.* 2003;140:98-106.

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**Iridocorneal Angle**

1. Travoprost Intraocular Implant (Glaukos)

**Ocular Surface Devices**

1. Contact Lenses
2. Microdose latanoprost (EyeNovia)
3. Iontophoresis

**Injectable Systems**

1. Bimatoprost SR (Abbvie)
2. Travoprost Intracameral Implant (OTX)
3. Travoprost Extended Release Implant (Aerie)

**Punctal Plug Devices**

1. Latanoprost and Travoprost punctal plug delivery system (Mati)

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**Patients Attitudes Towards Drug Delivery**

- Triple Combination Eye Drop – 85%
- Microdose Eye Spray – 54%
- Drug-eluting Contact Lens – 31%
- Drug-eluting Periocular Ring Insert – 43%
- Injectable Subconjunctival Drug Insert – 32%
- Injectable Anterior Chamber Implant – 30%

**attitude is everything**

Wang BB, Lin MM, Nguyen T, et al. Patient attitudes towards novel glaucoma drug delivery approaches. *Digit J Ophthalmol.* 2018; 24(3): 16-23

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**Bimatoprost SR** (Allergan)  
(10-microgram bimatoprost sustained-release implant)

- Biodegradable bimatoprost sustained-release implant
- FDA-approved and indicated to reduce IOP in patients with open angle glaucoma or OHT
- Single intracameral administration
- Phase I/II/III Studies



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**Bimatoprost SR** (Allergan)  
(10-microgram bimatoprost sustained-release implant)



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**24 Month Phase I/II Clinical Trial**

75 subjects

- bimatoprost pellet (6, 10, 15, or 20 micrograms)
- topical bimatoprost 0.03%

Craven ER, Walters T, Christie WC, Day DG, et al. 24-Month Phase I/II Clinical Trial of Bimatoprost Sustained-Release Implant (Bimatoprost SR) in Glaucoma Patients. Drugs. 2020 Feb;80(2): 167-179.

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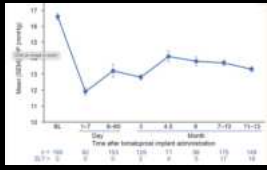
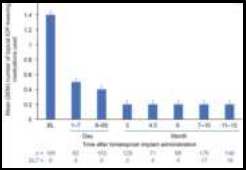
### 24 Month Phase I/II Clinical Trial

<p><b>bimatoprost pellet</b> (6, 10, 15, or 20 micrograms)</p> <p>↓</p> <p>24 months – IOP reduction 7.5, 7.3, 7.3, 8.9 mm Hg</p>	<p><b>topical bimatoprost 0.03%</b></p> <p>↓</p> <p>24 months – IOP reduction of 8.2 mm Hg</p>
<p><b>No Rescue or Retreatment</b></p> <p>68% - 6 mos. 40% - 12 mos. 28% - 24 mos.</p>	

Craven ER, Walters T, Christie WC, Day DG, et al. 24-Month Phase I/II Clinical Trial of Bimatoprost Sustained-Release Implant (Bimatoprost SR) in Glaucoma Patients. Drugs. 2020 Feb;80(2): 167-179.

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### Real-World Study of the Effectiveness and Safety of Intracameral Bimatoprost Implant

Teymourian S, Craven ER, Nguyen L, Werts E. Real-World Study of the Effectiveness and Safety of Intracameral Bimatoprost Implant in a Clinical Setting in the United States. Clin Ophthalmol. 2024 Jan 19;18:187-199. doi: 10.2147/OPTH.S44005. PMID: 38263954; PMCID: PMC10804876.

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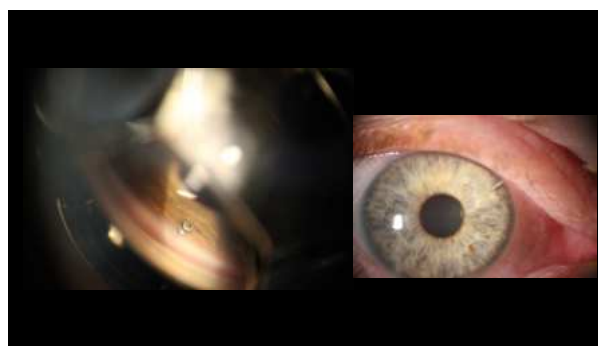
### Travoprost intraocular implant (Glaukos)

**36 Month Update**

- 70% and 68% of subjects in fast and slow-release were well-controlled on fewer or same medications as baseline.
- Average IOP reductions were 8.3 mmHg and 8.5mmHg in the fast and slow-release arms.

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### Microdose latanoprost (EyeNovia)

Delivers microdoses of latanoprost with Optejet delivery

Advantages: 75% less drug and preservative  
88% of the time got to target

Achieved 29% IOP lowering from baseline  
in Phase 2 study



Pasquale, LR, Shan L, Weisreb RN, et al. Latanoprost with high precision, Piezo-print microdose delivery for IOP lowering: clinical results of the PG21 study of 0.4 micrograms daily microdose.

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### Drug-Eluting Contact Lens

Attractive option secondary to large residence time in the eye and upward of 50% bioavailability in comparison with eye drop formulations.



Li, CC, Chauhan, A. Modeling ophthalmic drug delivery by soaked contact lenses. Ind Eng Chem Res 2006; 45: 3718–3734.

Pang, C-C, Kim, J, Chauhan, A. Extended delivery of hydrophilic drugs from silicone-hydrogel contact lenses containing Vitamin E diffusion barriers. Biomaterials 2010; 31: 4032–4047.

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### Drug-Eluting Contact Lens

- MediPrint Ophthalmics
  - LLT-BMT1 – drug eluting contact lens - bimatoprost
- Phase I – SIGHT-1
  - 5 Subjects wore the lens for 7 days continuously
  - Demonstrated 100% tolerability and no adverse events
  - IOP efficacy was noted
- SIGHT-2 – Phase 2b dose-ranging clinical study is underway

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### Punctal Plug Delivery System (Mati Therapeutics)

#### Latanoprost and Travoprost designs

U.S. Phase II Multi-center Trials (Lower Puncta)  
Glau 12 (n=92) – 96% retention rate  
Glau 13 (n=87) – 92% retention rate

Phase II Clinical Study  
L-Evolve - 5.5 mmHg IOP lowering over 12 weeks study




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### Travoprost Intracameral Implant (Ocular Therapeutic)

Bioresorbable sustained-release implant injected into the AC

Goal: Steady release of travoprost with target duration from 4 to 6 months




Preclinical Models (Basiglio dogs)  
Steady state release through 4 months  
IOP lowering of 25-30% through 4 months

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### Travoprost Intracameral Implant (Ocular Therapeutic)

Phase 1, prospective, multi-center, open label

Cohort 1 n=5 (15 micrograms)	→	Day 28 -9.1 mm Hg (n=5) Mo. 4 -7.6 mm Hg (n=4) Mo. 6 -7.5 mm Hg (n=3)  *Mo. 21 - -9.3 (n=1)
Cohort 2 n=4 (26 micrograms)	→	Day 28 -6.0 mm Hg (n=4) Mo. 4 -6.8 mm Hg (n=4) Mo. 6 -6.1 mm Hg (n=3)  *Mo. 9 - -5.9 (n=2)
Cohort 3 n=4 (15 micrograms Fast Degrading)	→	Day 28 -11.5 mm Hg (n=3) Mo. 4 -13.8 mm Hg (n=2)  *Mo. 6 -12.5 (n=1)



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### IOL-Haptic-Based Drug Delivery

Drug-eluting pads attached to haptics  
Goal is 3 years of drug delivery

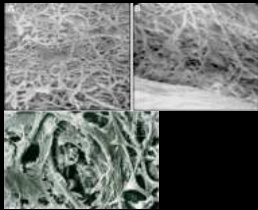


Feasibility Study – 23 patients  
45% mean IOP reduction  
100% of patients were 18 mmHG or below  
All were off topical medications  
No significant adverse events  
Visual outcomes similar to other IOLs

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### Selective Laser Trabeculoplasty

Selectively targets and laser burns pigmented TM cells



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LIGHT trial: 6-year results of primary selective laser trabeculoplasty versus eye drops for the treatment of glaucoma and ocular hypertension

Gus Gazzard, Evgenia Konstantakopoulou, David Garway-Heath, Mariam Adeleke, Victoria Vickerstaff, Gareth Ambler, Rachael Hunter, Catey Bunce, Neil Nathwani, Keith Barton, on behalf of the LIGHT Trial Study Group

Primary Outcome - Quality of Life at 6 years  
Secondary Outcome - clinical effectiveness and safety

Conclusions:  
No significant difference in QOL  
26.8% VS 19.6% progressed drops vs SLT  
Trab required in 32 eyes in drops arm compared to 13 eyes in the SLT arm  
69.8% of SLT Drop Free @ 6 Years

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Low-Energy SLT Repeated Annually: Rationale for the COAST Trial  
Tony Realini, MD, MPH, Gus Gazzard, MD, Mark Latina, MD, Michael Kass, MD

Newly diagnosed POAG treated with:

1. ALT 360 x 1
2. Standard SLT 360 as needed
3. Low-energy SLT 360 repeated annually

10-year Results	10-year Results
Medication Free Rates	Median Times to Treatment
1. ALT - 22.6%	1. ALT - 2.8 years
2. Standard SLT -25.0%	2. Standard SLT -3.2 years
3. Low-energy SLT - 58.3%	3. Low-energy SLT - 6.2 years

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Automated Direct SLT (BELKIN Laser Ltd.)

Automated Direct Selective Laser Trabeculoplasty: First Prospective Clinical Trial


Mordechai Goldenfeld<sup>1</sup>, Michael Bulbin<sup>2</sup>, Masha Dobáin-Bekman<sup>3</sup>, Zachary Sacko<sup>1</sup>, Sharon Blum Meirovitch<sup>4</sup>, Noa Geffen<sup>5,6</sup>, Ari Leshno<sup>7,8</sup>, and Alon Skazat<sup>1,4</sup>

**Purpose:** Direct selective laser trabeculoplasty (DST) is a rapid, noncontact automated procedure performed directly through the limbus without gonioscopy. In this first nonrandomized clinical trial we assessed its safety and ability to reduce intraocular pressure (IOP).

**Methods:** Fifteen patients (15 eyes; 10 with open-angle glaucoma (OAG), 4 with ocular hypertension, and 1 with pseudoexfoliation glaucoma), naive or after medication washout, with an IOP >22 mm Hg, underwent DST for iridation with 100 or 120 sequential noncontact 532-nm, Q-switched laser shots (0.8–1.4 mJ) automatically applied during 1.5 or 2.3 seconds on the limbus, guided by image analysis and eye tracking. Results were assessed at 1 and 3 hours, 1 day, 1 week, and 1, 3, and 6 months.

**Results:** The mean ± standard deviation baseline IOP (mean Hg) in all eyes was 26.7 ± 2.3, 26.5 ± 3, and 6 months. This value was significantly reduced to 21.7 ± 4.2 (by 18.1%), to 20.8 ± 2.3 (by 21.4%), and to 21.5 ± 4.1 (by 18.8%), respectively. In six patients treated with 1.4 mJ shots, the mean IOP at 6 months decreased from 26.7 ± 3.2 to 19.3 ± 2.0 (27.1%, P = 0.03). There was a significant reduction in hypotensive medications (from 1.6 ± 1.0 to 0.4 ± 0.2, P = 0.03). No serious adverse events occurred.

**Conclusions:** Automated DST appears to be an effective and safe noncontact, rapid modality for reducing IOP in patients with OAG. Higher energy usage led to better results.



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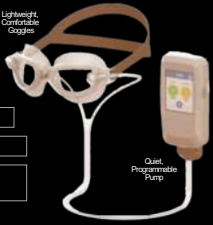
Innovations for NTG

FYSX O-PAP (Ocular Pressure Adjusting Pump)

- Only nonsurgical, non-pharma way to lower IOP
- Lowers IOP in every eye, every time
- Lowers IOP safely
- Can be used in combination with existing therapies
- Titrate IOP to target pressure level
- Lowers IOP during the vulnerable period at Night
- Ability to monitor usage, encourage compliance, and obtain data


Lightweight, Comfortable Oxygen

Quiet, Programmable Pump




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### THE SOLUTION IS BASED ON PHYSICS




The atmosphere pressurizes the entire body




By lowering the pressure only over the eye, it lowers the IOP relative to the rest of the body



It's just physics, and physics works every time



IOP can be dialed into the specific target



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### 2 Multi-Center Randomized Controlled Trials

**Apollo – Open-Angle Glaucoma**

- N = 128 eyes of 64 Subjects
- Contralateral Eye Served as Control
- IOP Inclusion - 13-32 mmHg
- POAG, NTG, OHTG, and Glaucoma Suspects**
- 89.7% had IOP Reduction of >20%
- 100% of eyes had IOP Reduction
- IOP decreased from 19.4 to 12.9 mmHG (34%)**
- IOP Decreased in addition to existing therapy
- IOP Decrease regardless of Baseline IOP
- No SAEs
- ~20% of eyes had temporary lid edema

**Artemis – Normal Tension Glaucoma**

- N = 182 eyes of 91 Subjects
- Contralateral Eye Served as Control
- IOP Inclusion - ≤ 21 mmHg
- NTG Only – IOP Measure Overnight in Sleep Lab**
- 98.2% had IOP Reduction of >20% at night
- 100% of eyes had IOP Reduction
- IOP decreased from 20.2 to 12.2 mmHG (39%)**
- IOP Decreased in addition to existing therapy
- IOP Decrease regardless of Baseline IOP
- No SAEs
- ~17% of eyes had temporary lid edema

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## What About MIGS



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### Schlemm's Canal/TM Procedures

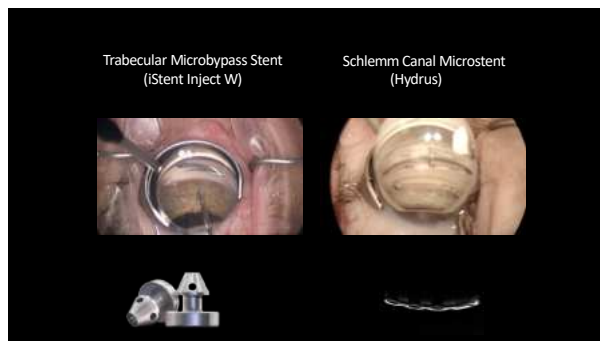
	Stents	SC Dilation	TM Cutting
Fibrosis Risk	(-)	(+)/(-)	(+)(+)
Hyphema	(-)	(+)/(-)	(+)(+)
PAS Risk	(-)	(-)	(+)
IOP Lowering	(+)	(+)	(+)(+)
Data	(+)(+)(+)	(+)/(-)	(+)(+)

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### HORIZON Trial

	CS (mm)	CS (mm)	Difference
Baseline (SD)	26.73 (26.43, 27.02)	26.74 (26.30, 27.18)	0.01 (-0.52, 0.54)
Main selection			
Rate (dR/year)	-0.36 (-0.36, -0.16)	-0.45 (-0.63, -0.34)	-0.23 (-0.40, -0.05)

Microstent lowers the rate of visual field loss per year:

**47%**

vs cataract surgery alone

Gazzard G, Montessano G, Omietto G. Five-year Visual Field Outcomes from the Multi-center, Randomized, HORIZON trial. AmJournalsOph. Feb 20, 2023.

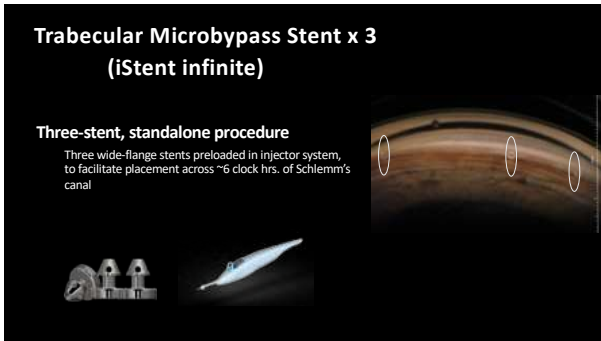
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### OSD IMPROVEMENT IN IMPLANTED EYES<sup>1</sup>

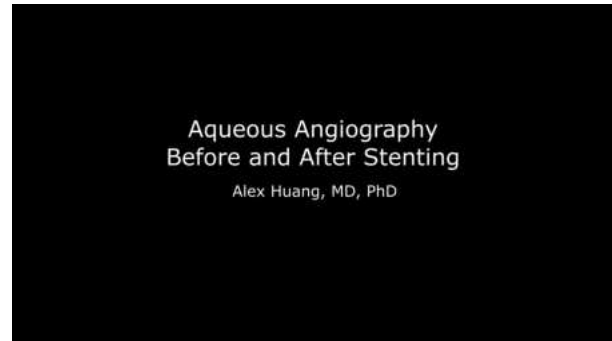
- Prospective, multicenter trial evaluating four ocular surface metrics 3 months post-stent implantation.
- n=47 eyes
- Other ocular health metrics improved as well:
  - 49% longer time to tear break-up (FTBUT) (p<0.0001)
  - Significantly reduced corneal/conjunctival staining (Oxford Schema) (p<0.0001)
  - Trend toward less hyperemia (Efron Score)

Schwartz JA, Hauser WH, Bash M, Baartman B, Gollan SD, Cotter AJ, Luo J, Bostad JP. Prospective Interferential Coherence Tomography of Ocular Surface Disease Changes in Eyes After Trabecular Micro-Bypass Stent(s) Implantation (Stent or Stent Inject) with Phacemulsification. Ophthalmol. 2020;127:11.

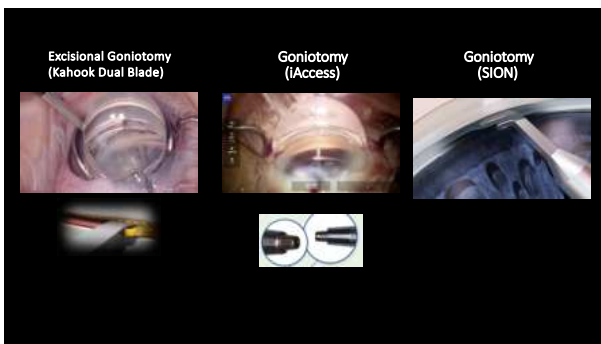
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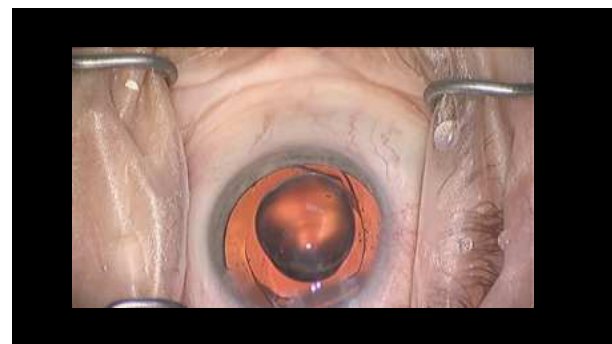
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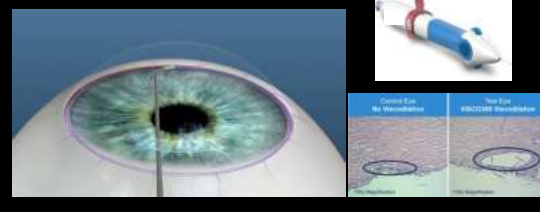


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### Ab-interno Trabeculotomy + Canaloplasty (OMNI)



The diagram illustrates the OMNI procedure on the eye's drainage angle. A 3D model shows the device being inserted. Below, two side-by-side images compare the 'Control Eye' and the 'New Eye' after the procedure, showing the placement of the device in the drainage angle.

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### Xen 45 Gel Stent US Pivotal Clinical Trial

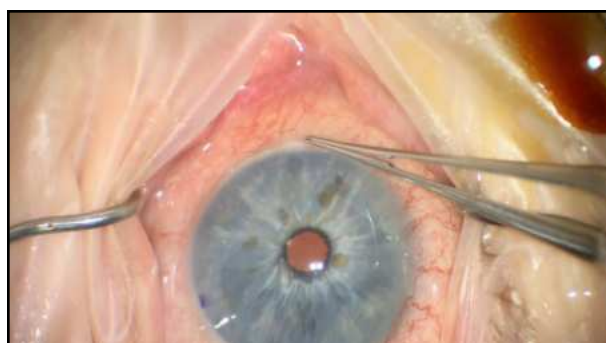


The diagram shows a cross-section of the eye with a subconjunctival stent (Xen) implanted between the sclera and the conjunctiva to facilitate aqueous outflow.

	Baseline	12 month
Medicated IOP	25.1 (3.7)	15.9 (5.2)
Glaucoma Meds	3.5 (1.0)	1.7 (1.5)
Hypotony	16 (24.6%)	
Bleb Needling	21 (32.3%)	

Subconjunctival Stent (Xen)

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### A Peak into The Future...

**Elios**  
Excimer Laser Technology  
10 Microchannels in the TM  
Combo with CEX



**Vialase**  
Femtosecond laser  
Micron-accurate gonio imaging  
Non-invasive  
Customized drainage channels



Camera




Femtosecond Laser


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### A Peak into The Future...

**MINject**  
 5-mm-long uveoscleral device  
 2-year outcomes of 25 patients  
 have shown a 40% reduction of  
 IOP.



**Minimally invasive micro-sclerostomy (MIMS)**  
 Stent-less  
 90-micron diameter cylinder of scleral tissue  
 Ab interno approach



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### Post-operative Considerations with MIGS

1. Stopping GLC Meds
2. IOP Spikes
3. Hyphema
4. Hypotony
5. Establish New Baselines

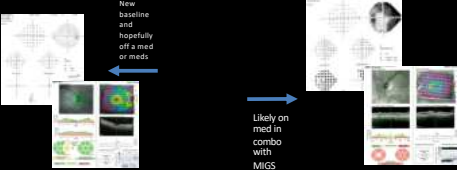


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### Stopping Glaucoma Medications

Severity of the Glaucoma

Preoperative IOP vs Postoperative IOP  
 IOP progression was occurring




New baseline and hopefully off a med or meds

Likely on med in combo with MIGS

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### PAS to Stents

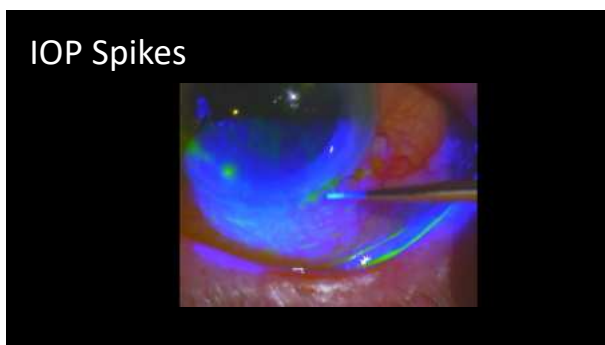


YAG laser considered to open stent

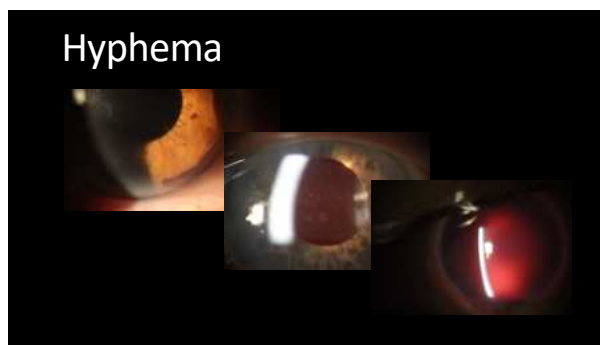
US Pivotal iStent Inject Trial  
 1.8% @ 24 months

HORIZON Trial  
 13% @ 48 months

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### Ocular Hypotony – Is it a Concern with MIGS?

Hypotony – An IOP below which the eye does not maintain its normal shape and may subsequently lose vision.  
Definitions vary slightly – IOP < 5 or 6

Episcleral Venous Pressure and its role

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### Establish New Baselines

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## Technology is nothing.

What's important is that you have a faith in people, that they're basically good and smart, and if you give them tools, they'll do wonderful things with them.

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