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.

VISION EXPO

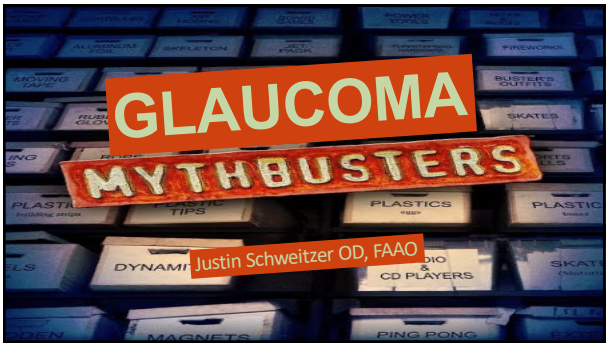
1

Financial Disclosure – Justin Schweitzer, OD, FAAO

- Alcon – C/L
- Aldeyra - C
- Allergan – C/L
- Bausch + Lomb – C/L
- Bruder - C
- Sight Sciences – C/L
- Dompe – C/L
- Zeiss – C/L
- Visus - C
- Science Based Health – C
- Tarsus – C/L
- Santen - C
- Sun – C/L
- Reichert - C
- Glaukos – C/L
- MediPrint – C
- LKC – C/L
- Avellino – C
- Iveric bio – C
- Ocuphire – C
- Viatris – C
- Thea – C
- Heru – C
- Eyenovia - C

All relevant relationships have been mitigated

2



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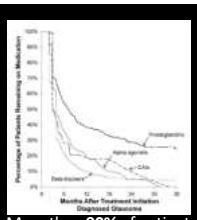


More than **90%** of patients are nonadherent to their ocular medication dosing regimens, and nearly **50%** discontinue taking their medications before 6 months[1]

Nordstrom BL. Persistence and adherence with topical glaucoma therapy. *Am J Ophthalmol.* 2005;140:598-596


Adherence with Topical Glaucoma Medication Monitored Electronically

5

Selective Laser Trabeculoplasty Versus Medical Therapy as Initial Treatment of Glaucoma: A Prospective, Randomized Trial

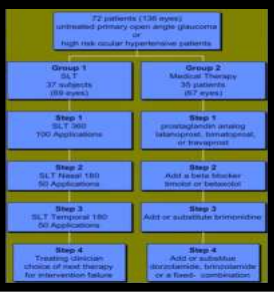
L. Jay Katz, MD, William C. Steinmann, MD,† Azad Kabir, MD,‡ Jeanne Molineaux, COA,* Sheryl S. Wizov, COA,* and George Marcellino, PhD§ the SLT Med Study Group*

J Glaucoma • Volume 21, Number 7, September 2012

- SLT Med Study (2012)
  - Dr. Katz @ Wills Eye in Philadelphia
    - J Glaucoma 2012;21:460-468
  - SLT (100 applications over 360 degrees of TM) vs. prostaglandin analog
  - Primary outcome -> IOP
  - Secondary outcome -> # of treatment steps

6

SLT Med Study Treatment Arms



7

SLT vs. Prostaglandins

- SLT Med Study (2012)

Results:

1. IOP reduction:
   - SLT – 25.7% IOP reduction
     - IOP reduced from 24.5 to 18.2 (6.3 mmHg reduction)
   - Prostaglandin – 28.3% IOP reduction
     - IOP reduced from 24.7 to 17.7 (7.0 mmHg reduction)
2. # of treatment steps:
   - SLT group - 11% of eyes required additional SLT
   - Prostaglandin group -> 27% of eyes required additional medication

8

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 Outome – 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

9

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
Medication Free Rates
1. ALT – 22.6%
2. Standard SLT -25.0%
3. Low-energy SLT – 58.3%

10-year Results
Median Times to Treatment
1. ALT – 2.8 years
2. Standard SLT -3.2 years
3. Low-energy SLT – 6.2 years

10

Automated Direct SLT

Automated Direct Selective Laser Trabeculoplasty: First Prospective Clinical Trial

Mordechai Goldenfeld[1], Michael Belkin[2], Masha Dobkin-Bekman[3], Zachary Sacks[3], Sharon Blum Meirovitch[3], Noa Geffen[4,5], Ari Leshno[1,4], and Alon Skaat[1,4]

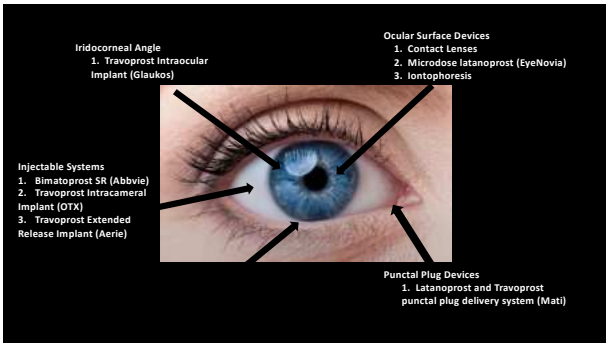
Purpose: Direct selective laser trabeculoplasty (DSLT) is a rapid, noncontact automated procedure performed directly through the limbus without gonioscopy. In this first nonrandomized clinical trial we assessed its safety and ability to reduce intraocular pressure (IOP).

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 DSLT by irradiation 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 (mm Hg) in all eyes was 26.7 ± 2.3. At 1, 3, and 6 months, this value was significantly reduced to 21.7 ± 4.2 (by 18.1%), to 20.8 ± 2.5 (by 21.4%), and to 21.5 ± 4.1 (by 18.8%), respectively. In six patients treated with 1.4 mJ/shot, 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 ± 0.7, $P = 0.03$). No serious adverse events occurred.

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

11



12

Bimatoprost SR (Abbvie)

(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

13

Bimatoprost SR (Abbvie)

(10-microgram bimatoprost sustained-release implant)

14

15

24 Month Phase I/II Clinical Trial

bimatoprost pellet
(6, 10, 15, or 20 micrograms)

24 months – IOP reduction
7.5, 7.3, 7.3, 8.9 mm Hg

topical bimatoprost 0.03%

24 months – IOP reduction
of 8.2 mm Hg

No Rescue or Retreatment
68% - 6 mos.
40% - 12 mos.
28% - 24 mos.

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.

16

Travoprost intraocular implant
(Glaukos)

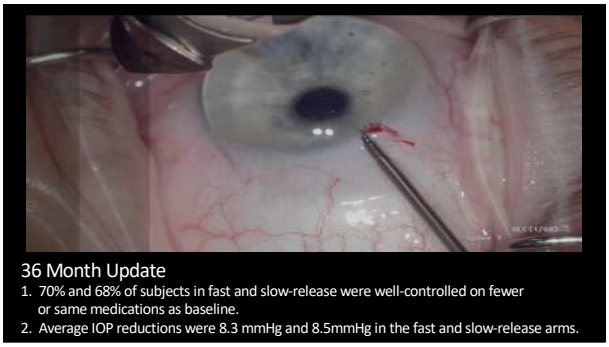
Resides in AC angle, anchored behind TM

- Length: 1.8 mm
- Diameter: 0.5 mm
- Titanium
- Non-ferrous

17

Travoprost intraocular implant
(Glaukos)

18

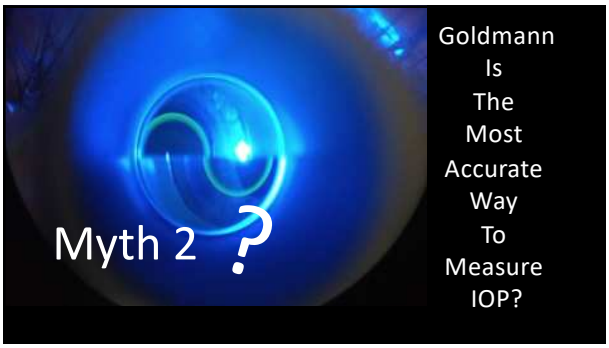


36 Month Update

1. 70% and 68% of subjects in fast and slow-release were well-controlled on fewer or same medications as baseline.
2. Average IOP reductions were 8.3 mmHg and 8.5mmHg in the fast and slow-release arms.

19

21



22

Limitations of GAT

1. Corneal curvature
2. Axial Length
3. Central corneal thickness
4. Tear film biomechanics
5. User error
6. Patient error

23

When gold standards change: time to move on from Goldmann tonometry?

Gus Gazzard,[1,2] Hari Jayaram,[2,3] Ana M Roldan,[4] David S Friedman[5]

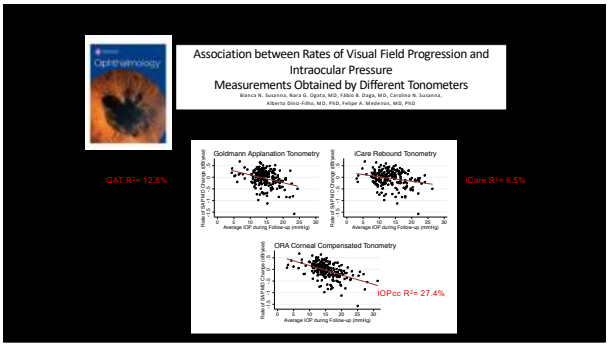
Br J Ophthalmol: 10.1136/bjophthalmol-2020-317112 24 September 2020

"Why are we persisting in using GAT clinically? The test itself is relatively time consuming, physicians often repeat the measurement because they cannot fully trust a technician, it slows down the clinic requiring technical staff to have slit lamps and place drops in patient's eyes and worse, it may be giving us a false sense of security.

24

The Correcting Applanation Tonometer Surface (CATS)

25


Ophthalmology
Association between Rates of Visual Field Progression and Intraocular Pressure Measurements Obtained by Different Tonometers
Goldmann Applanation Tonometry
iCare Rebound Tonometry
ORA Corneal Compensated Tonometry
GAT R²= 12.8%
iCare R²= 6.5%
IOPcc R²= 27.4%

26

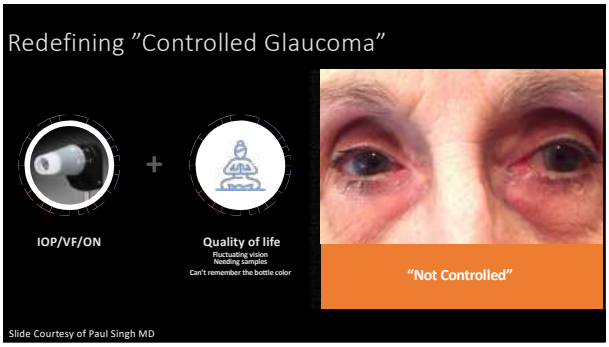

MYTH
BUSTED

27


MYTH
DENTED

28

29



30

The Burden of Caring for and Treating Glaucoma
The Patient Perspective

Quality-of-Life Consequences of Glaucoma Treatment Burden

1. Use of Time
2. Role and Activity Limitations
3. Financial Difficulties
4. Emotional Stress
5. Side Effects
6. Strain on Family and Friends

Stagg BC, Granger A, Guetterman TC, Hess R, Lee PP. The Burden of Caring for and Treating Glaucoma: The Patient Perspective. Ophthalmol Glaucoma. 2022 Jan-Feb;5(1):32-39. doi: 10.1016/j.ogla.2021.04.011. Epub 2021 May 10. PMID: 33984555.

31

Impact of Multiple Glaucoma Medications on Dry Eye Disease

Number of Drops	Incidence of DED among 61 glaucoma patients[1]	Incidence of DED among 19,665 glaucoma patients[2]
1	11%	51%
2	39%	55%
3+	40%	60%

OSDI®-Ocular surface disease index®
1. Fechtner RD et al. Cornea. 2010;29:618-621. 2. Erb C et al. Graefes Arch Clin Exp Ophthalmol. 2008;246:1593-1601. 3. Leung EW et al. J Glaucoma. 2008;17:350-355.

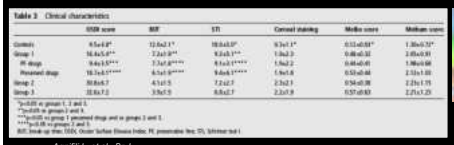
Slide Courtesy of Paul Singh MD

32

Effects on Meibomian Glands

Effect on lids/meibomian glands

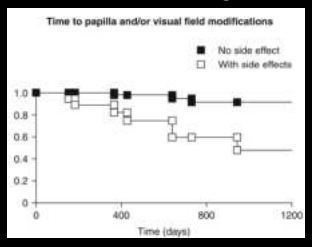
- Study on glaucoma patients 18mo stable treatment with different medications.
- Reduced number of meibomian glands
- Reduced numbers of acinae and increased dysfunction in patients
- Patients on multiple medications with preservatives = increased dysfunction and reduced number of acinae



Agnifili L., et al. Br J Ophthalmol 2013.

33

Side Effects Lead to Progression



• Denis, Philippe, et al. Medical outcomes of glaucoma therapy from a nationwide representative survey

34

Solutions?

Preservative-Free Formulations
SLT
Glaucoma Drug Delivery
Minimally Invasive Glaucoma Surgery

35

Preservative-Free Formulations

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

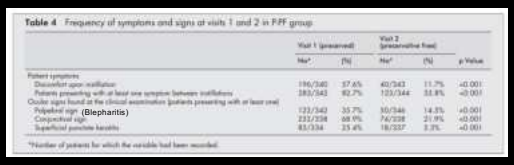


Table 4 Frequency of symptoms and signs at visits 1 and 2 in PFF group

	Visit 1 (preserved)		Visit 2 (preservative free)		
	No*	(%)	No*	(%)	p Value
Patient symptoms					
Discomfort upon instillation	196/340	57.6%	40/343	11.7%	<0.001
Patients presenting with at least one symptom between instillations	283/343	82.7%	123/344	35.8%	<0.001
Ocular signs found at the clinical examination (patients presenting with at least one)					
Palpebral sign (Blepharitis)	123/343	35.7%	50/346	14.5%	<0.001
Conjunctival sign	231/334	69.1%	74/338	21.9%	<0.001
Superficial punctate keratitis	83/334	25.4%	18/337	5.3%	<0.001

*Number of patients for which the variable had been recorded.

Pisella, P. J., P. Pouliquen, and C. Baudouin. Prevalence of ocular symptoms and signs with preserved and preservative free glaucoma medication

36

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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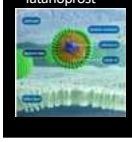
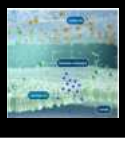
BAK-Free Latanoprost

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





Preservative-Free

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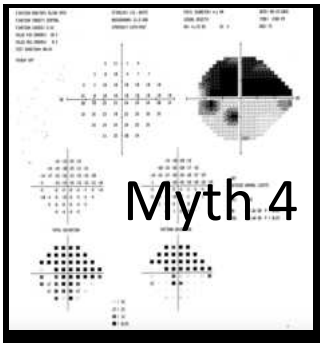


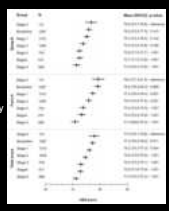
Myth 4 ?

Surgical Intervention Should Be Delayed For As Long As Possible?

40

Visual Field Damage and QOL[1,2]

"At worse levels of VF damage, glaucoma patients demonstrate shorter, more fragmented bouts of physical activity throughout the day and lower activity levels during typical waking hours, reflecting low physiologic functioning1"



1. Jian-Yu E, Jennifer A. Schrack, Aleksandra Mihailovic, Amal A. Wanigatunga, Sheila K. West, David S. Friedman, Laura N. Gitlin, Tianjing Li, Pradeep Y. Ramulu. Patterns of Daily Physical Activity across the Spectrum of Visual Field Damage in Glaucoma Patients. Ophthalmology. Volume 128, Issue 1, 2021,Pages 70-77,ISSN 0161-6420,https://doi.org/10.1016/j.ophtha.2020.06.053.
2. Rulli, E., Quaranta, L., Riva, I. *et al.* Visual field loss and vision-related quality of life in the Italian Primary Open Angle Glaucoma Study. *Sci Rep* **8**, 619 (2018). https://doi.org/10.1038/s41598-017-19113-z

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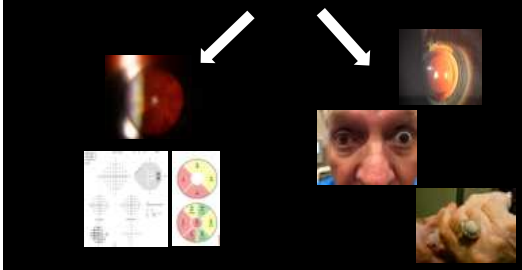
Interventional Glaucoma



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Safety Profile of MIGS

	iStent	iStent Inject	Hydrus	KDB	Trabectome	GATT	TRAB360	VISCO360	OMNI System	ABiC
IOP spike	1.9–22.2	1.06–16.8	1.9–8.45	1.0–18.2	2.06–28.9	0–16.7	1.2	0.9–1.1	3.7	0–22.2
Hyphaema	1.85–11.4	0–5	1.92–6.45	0–34.9	4.72–95	0.97–58	50.6	1–13.1	3.7	1.9–20
Corneal oedema	2.1–8.97	0–10	0–3.23	1.0–15.5	0	0	8.2	0	4.9	0
Bleb needling	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Device obstruction	0–13.2	0–6.2	0–6.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SCH	1.9–2.27	0	0	0	1.47	0	0	1	0	0

1. Vinod K, Gedde SJ. Safety profile of minimally invasive glaucoma surgery. Curr Opin Ophthalmol. 2021 Mar 1;32(2):160-168. doi: 10.1097/ICU.0000000000000731. PMID: 33315726.
2. Rowson, A.C.; Hogarty, D.T.; Maher, D.; Liu, L. Minimally Invasive Glaucoma Surgery: Safety of Individual Devices. *J. Clin. Med.* **2022**, *11*, 6833. https://doi.org/10.3390/jcm11226833

43

Schlemm's Canal/TM Procedures

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

44

Trabecular Microbypass Stent (iStent Inject W)

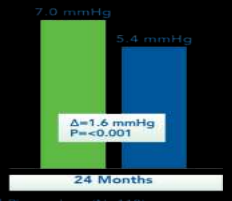
Schlemm Canal Microstent (Hydrus)

45

Trabecular MicroBypass X 2 PIVOTAL TRIAL

PRIMARY ENDPOINT:
≥ 20% Reduction in Unmedicated DIOP

SECONDARY ENDPOINT:
Mean Unmedicated DIOP Reduction



iStent inject + Phaco (N=380) Phaco alone (N=118)

Samuelson TW, Sarkisian SR Jr, Lubeck DM, Stiles MC, Duh YJ, Kerns KA, Giamporcaro JE, Hornbeak DM, Katz LJ, iStent inject Study Group. Prospective, Randomized, Controlled Pivotal Trial of an Ab Interno Implanted Trabecular Micro-Bypass in Primary Open-Angle Glaucoma and Cataract: Two-Year Results. Ophthalmology. 2019 Jun;126(6):811-821. doi: 10.1016/j.ophtha.2019.03.006. Epub 2019 Mar 14. PMID: 30880158.

46

HORIZON Trial – 5 Year

	Stent + Cataract (n=369)	Cataract Only (n=187)
Change in diurnal IOP (mean)	-8.3 mm HG (+/-3.8)	-6.5 mm HG (+/-4.0)
60 months medication free	66%	46%
60 months mean IOP (mm Hg)	16.6 (+/-3.2)	17.6 (+/-3.6)
1 preoperative med 2 to 4 preoperative med	52.6% 47.4%	54% 46%

Ahmed IIK, De Francesco T, Rhee D, McCabe C, Flowers B, Gazzard G, Samuelson TW, Singh K; HORIZON Investigators. Long-term outcomes from the HORIZON randomized trial for a Schlemm's canal microstent in combination cataract and glaucoma surgery. Ophthalmology. 2022 Feb 23:S0161-6420(22)00060-9.

47

Trabecular MicroBypass X 2 PIVOTAL TRIAL[1]

Conclusions: The overall safety profile of the treatment group was favorable and similar to that in the control group throughout the 2-year follow-up.

HORIZON Trial – 5 Year[2]

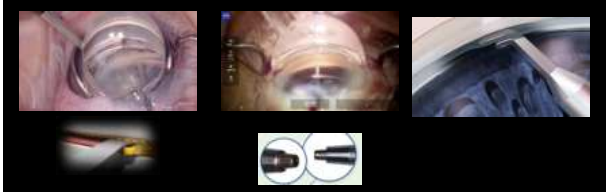
Conclusions: The addition of a Schlemm's canal microstent in conjunction with CS was safe, resulted in lowered IOP and medication use, and reduced the need for postoperative incisional glaucoma filtration surgery compared with CS after 5 years. Long-term presence of the implant did not affect the corneal endothelium adversely.

1. Samuelson TW, Sarkisian SR Jr, Lubeck DM, Stiles MC, Duh YJ, Ruiz-Ramos GA, Giamporcaro JE, Hornbeak DM, Katz LJ; iStent inject Study Group. Prospective, Randomized, Controlled Pivotal Trial of an Ab Interno Implanted Trabecular Micro-Bypass in Primary Open-Angle Glaucoma and Cataract: Two-Year Results. Ophthalmology. 2019 Jun;126(6):811-821. doi: 10.1016/j.ophtha.2019.03.046. Epub 2019 Mar 14. PMID: 30880108

2. Ahmed IIK, De Francesco T, Rhee D, McCabe C, Flowers B, Gazzard G, Samuelson TW, Singh K; HORIZON Investigators. Long-term outcomes from the HORIZON randomized trial for a Schlemm's canal microstent in combination cataract and glaucoma surgery. Ophthalmology. 2022 Feb 23:S0161-6420(22)00060-9.

48

Excisional Goniotomy (Kahook Dual Blade) | **Goniotomy (iAccess)** | **Goniotomy (SION)**



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Ab-interno Trabeculotomy + Canaloplasty
(OMNI)

50

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

Justin.Schweitzer@vancethompsonvision.com

lighthiz@nsuok.edu

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