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 Conference Advisory Board considers content and speakers for future meetings to provide you with the best education possible.

VISION EXPO

1

Justin Schweitzer, OD, FAAO has received honorarium from:

- Aerie – C/L
- Alcon – C/L
- Allergan – C/L
- Bausch + Lomb – C/L
- Ocular Therapeutix - C
- EyePoint - C
- Sight Sciences – C
- Dompe - C
- Chief Medical Editor: Modern Optometry
- Sun - C
- Equinox - I
- Reichert - C
- J&J – C/L
- Glaukos - L
- Horizon – C
- Quidel – C
- Zeiss – C
- MediPrint

2

Innovations in Glaucoma Drug Delivery: What the Future Holds

Justin Schweitzer, OD, FAAO
Vance Thompson Vision
Sioux Falls, South Dakota

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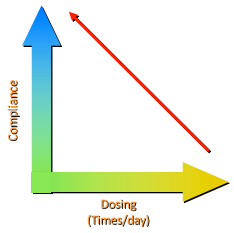

- Literature review of 76 studies show
  - Compliance increases with decreased dosage regimen and complexity[1]
  - 79% compliance with QD regimen vs 51% for QID regimens (p=0.001)[1]
  - Simpler, less-frequent dosing results in better compliance in a variety of therapeutic classes[1]

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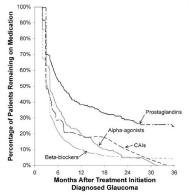


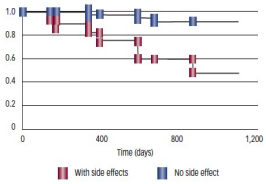
More than **90%** of patients are nonadherent to their ocular medication dosing regimens, and nearly **50%** discontinue taking their medications before 6 months[1]

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

Adherence with Topical Glaucoma Medication Monitored Electronically

The Travatan Dosing Aid Study

6



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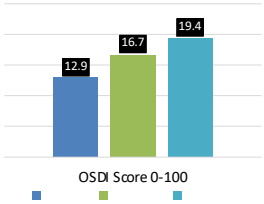
Ocular Surface Disease



Fechtner, R., Godfrey, D., Budenz, D., Stewart, J., & Stewart, W. (2010, June). Prevalence of Ocular Surface Complaints in Patients With Glaucoma Using Topical Intraocular Pressure-Lowering Medications. Cornea, 29(6), 618-621.

9

Challenges for Drug Delivery

11

The eye has many protective barriers, which efficiently clear foreign substances but restrict the bioavailability of applied topical agents.

Ghate D, Edelhauser HF. Ocular drug delivery. Expert Opin Drug Delivery. 2006;3(2): 275-287

12

Spillage or nasolacrimal drainage

Irritation and discomfort cause reflex tearing and blinking

↓

Ocular surface contact time < 5 minutes

Ghate D, Edelhauser HF. Ocular drug delivery. Expert Opin Drug Delivery. 2006;3(2): 275-287

13

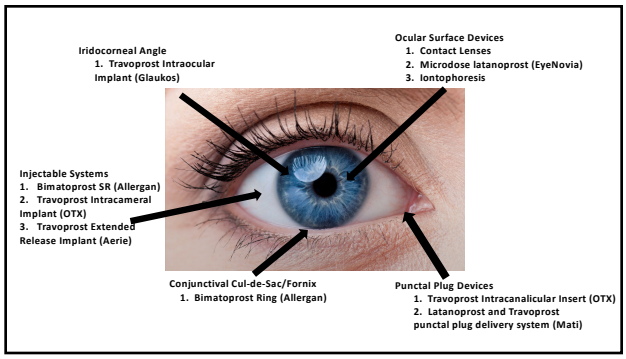
Conjunctival & Scleral Absorption
greater surface area than cornea

Corneal Absorption

5% of dose reaches target tissues

Gaudana R, Ananthula HK, Parenky A, Mitra AK. Ocular drug delivery. AAPS J. 2010;12(3):348-360
Ghate D, Edelhauser HF. Ocular drug delivery. Expert Opin Drug Delivery. 2006;3(2): 275-287

14



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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%

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

18

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, Weinreb 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.

19

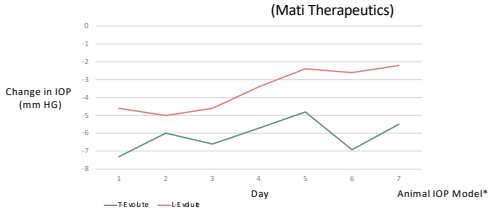
Punctal Plug Delivery System
(Mati Therapeutics)

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

20

Punctal Plug Delivery System
(Mati Therapeutics)



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

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Travoprost Intracanalicular Insert
(Ocular Therapeutix)

Bioresorbable sustained-release intracanalicular insert

Designed for continuous steady release of travoprost to the ocular surface for up to 90 days
- Preservative free
- Allows visualization

Low Ocular Adverse Events:
- Dacryocanalículitis – 8.3%
- Lacrimal structure disorder – 6.6%

23

Travoprost Intracanalicular Insert
(Ocular Therapeutix)

Reduction in IOP

	2 Week		6 Week		12 Week	
Diurnal Time Points	mm Hg		mmHg		mmHg	
	OTX-TP	Vehicle	OTX-TP	Vehicle	OTX-TP	Vehicle
8:00 AM	-5.72	-3.88	-4.81	-4.01	-3.91	-3.52
10:00 AM	-4.92	-3.16	-4.03	-3.23	-3.34	-2.63
4:00 PM	-5.22	-3.18	-4.16	-3.14	3.27	-2.60

n=334 OTX-TP n=211 Vehicle

24

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.

27

Drug-Eluting Contact Lens

Comfort of Lens

Patient Compliance

Vision with Lens

Dry Eye/Ocular Surface Disease

Replacement Schedule

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Drug-Eluting Contact Lens

- Diopter Corporation
  - Uses an approved contact lens with approved drugs
  - Vitamin E Nano-barriers to extend drug release
- Phase I
  - Subject wore contact lens for 2 day dosing period
  - IOP reduction was observed over 9 days after the lens was removed
- Phase Ib and Phase 2 are planned for 2nd and 3rd quarter of 2021

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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 – Pase 2b dose-ranging clinical study is underway

30

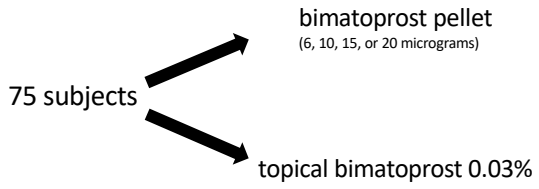
Bimatoprost SR (Allergan)

(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

31

24 Month Phase I/II Clinical Trial



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.

34

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.

35

2 x 20 Month Phase III (ARTEMIS)

- The device as implanted intracamerally at 4-month intervals for 1 year (Office-based procedure)
- 1,112 subjects
- Durysta vs 2 x topical timolol
- 30% IOP reduction from baseline over 12-week primary efficacy period

Conclusion: Noninferior to timolol administered as an eye drop twice a day.

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Phase III (ARTEMIS 3)

- The device as implanted intracamerally at 4-month intervals for 1 year (Office-based procedure)
- 742 subjects
- Durysta vs 2 x topical timolol
- Baseline IOP 24 mm Hg
- At 1 Year IOP maintained at 16-17 mm Hg

*80% - additional 12 months without retreatment

38

Phase III (ARTEMIS)

27% -conjunctival hyperemia
10% - post administration 2 days

5.4% - endothelial cell loss over 20 months

5% - iritis

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Travoprost Intracameral Implant

(Ocular Therapeutix)

Bioresorbable sustained-release implant injected into the AC

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

Preclinical Models (beagle dogs)
Steady state release
through 4 months

IOP lowering of 25-30%
through 4 months

40

Travoprost Intracameral Implant

(Ocular Therapeutix)

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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Travoprost intraocular implant

Resides in AC angle, anchored behind TM

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

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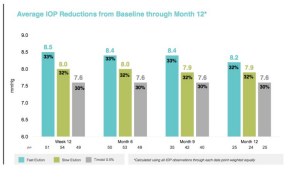
iDose Travoprost US Phase II: Preliminary Efficacy Results

Average IOP reductions through Month 12 ranging from 7.9 to 8.5 mmHg in the implant arms

Represents 32-33% reduction in the implant arms



Average IOP reductions from baseline = 7.9 mm Hg and 7.4 mm Hg in the fast and slow release arms.
Average IOP reductions from baseline = 29% and 28% in the fast and slow release arms.
Favorable safety profile with no ECC loss, no corneal adverse events, no adverse events of conjunctival hyperemia

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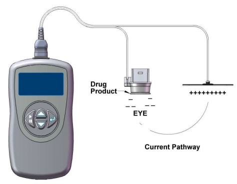
Iontophoresis

Electrical field generated by a low-level current to enhance the mobility of charged particles. Applicator placed on the conjunctiva at the limbus and a generator connected to an electrode attached to the patient's forehead. The generator creates an electric field inside the applicator and an opposite charge on the electrode.

Nanoparticles with ocular hypotensive agents delivered in a sustained-release strategy into the conjunctival tissue to produce once-monthly treatment for glaucoma



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Refractive Capsule

(Omega Ophthalmics)

- Drug delivery
- Biometric sensors
- Lens technology

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What is Considered First –Line Glaucoma Therapy

Lancet. 2019 Apr 13;393(10180):1505-1516. doi: 10.1016/S0140-6736(18)32213-X. Epub 2019 Mar 9.

Selective laser trabeculoplasty versus eye drops for first-line treatment of ocular hypertension and glaucoma (LiGHT): a multicentre randomised controlled trial.

Gazzard G[1], Konstantakopoulou E[2], Garway-Heath D[2], Garg A[2], Vickerstaff V[3], Hunter R[4], Ambler G[5], Bunce C[6], Wormald R[7], Nathwani N[8], Barton K[2], Rubin G[9], Buszewicz M[4]; LiGHT Trial Study Group.

Primary Outcome - Quality of Life at 3 years
Secondary Outome – Cost, cost-effectiveness, clinical effectiveness, and safety

Conclusions:
No significant difference in QOL
97% probability of SLT as 1st treatment being more cost-effective
SLT at target IOP 93% of visits vs 91.3% at target for meds

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In Conclusion...

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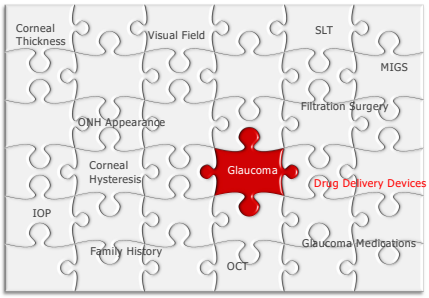

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Thank You!

justin.schweitzer@vancethompsonvision.com

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