Glaucoma

- A group of diseases that damage the eye's optic nerve and can result in vision loss and blindness
- 2nd leading cause of blindness in USA
  - PATIENTS DON'T EVEN KNOW THEY HAVE IT!!
- 3 million Americans have glc, but only half know they have it

Are patients good at taking eye drops?
How good are your patients at taking drops?

What's the problem?
- Education?
What’s happening in glaucoma?
- Over-production?
- Under-drainage?

What’s the problem?
- Education
- Number of gtts?
Conclusions: ...less frequent dosing regimens resulted in better compliance across a variety of therapeutic classes.

Persistence and adherence best with prostaglandins.

What’s the problem?
- Education?
- Number of gtt's?
- Cost?

Main Outcome and Measures: Nonpersistence was defined as the patient not refilling any topical glaucoma medication for more than 30 days. Patient characteristics, prescription-related clinical factors, and physician and hospital characteristics were identified and included in the analysis. The rate of persistence was estimated and risk factors for nonpersistence were investigated using Cox proportional regression model.

Conclusions: Medication persistence is an important factor for treatment effect in patients with glaucoma. Evaluating risk factors for refill discontinuation might be helpful for improving persistence and preventing blindness in patients with glaucoma.
Patients reported far higher medication use than their actual behavior. Nearly HALF pts used drops less than 75% of the time. The ability of the physician to identify which persons are poorly adherent is poor. And for those who actually do put in eye drops? In fact, up to 80% of patients contaminate their drops by touching their face, up to 61% do not instill exactly one drop and, most critically, up to 37% miss the eye with the drop. How can we help our patients?
Drug Delivery

- Rings (Bimatoprost Rings)
- Punctal plugs (travoprost punctum plug)
- Contact lenses (latoprost eluting contact lens)
- Intracameral injections

iDose Implant

iDose resides in the anterior chamber angle, anchored into the scleral tissue just behind the trabecular meshwork.

First iDose implant in the U.S. performed by Dr. John Berdahl M.D. in Sioux Falls SD, Vance Thompson Vision on March 29, 2016

Evolution of the Mobile Phone
Cataract Surgery

- Remove Cataract
- Correct Refractive Error
- MIGS
- Happier Patients

Areas of Aqueous Outflow

MIGS devices can be used to restore outflow through:

- Trabecular Meshwork
- Mild-to-Moderate Disease State
- Suprachoroidal Space
- Progressive Disease State
- Subconjunctival Space
- Refractory Disease State

Benefit-to-risk ratio is the ultimate criterion in determining MIGS treatment algorithm.
Schlemm’s Canal/TM

1. Bypass – iStent inject
2. Dilate – Omni
3. Cut/Ablate – KDB

iStent inject trabecular micro-bypass stent system
- Two trabecular bypass stents, ab interno implantation
- Multiple stent placement designed to increase access to more collector channels
- Multiple outlet lateral lumens provide exit route for aqueous from anterior chamber

IOP reduction

Primary endpoint
- 30% reduction in unmedicated IOP
- 75.8% reduction
- 81.5% reduction
- \( p = 0.003 \)
- 24 Months

Secondary endpoint
- Mean unmedicated IOP reduction
- 7.6 mmHg
- 4.4 mmHg
- \( p = 0.003 \)
- 24 Months

Medication burden

- 50% fewer Meds with iStent inject + Phaco at Month 23
- 84% of iStent inject subjects were medication-free at 23 months

Preop M23 (n=380)  No. of Meds  1.6
Preop M23 (n=109)  Phaco Alone  1.5
Stent inject + Phaco  0.4
Phaco Alone  0.4

75% reduction
67% reduction
75% reduction
### SAFETY OUTCOMES

Ocular Adverse Events of Interest Through 24 Months

<table>
<thead>
<tr>
<th>Event</th>
<th>n (%)</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stent obstruction</td>
<td>24 (6.2%)</td>
<td>NA</td>
</tr>
<tr>
<td>Intraocular inflammation</td>
<td>22 (5.5%)</td>
<td>5 (4.2%)</td>
</tr>
<tr>
<td>BCVA loss ≥ 2 lines at/after M1</td>
<td>8 (2.1%)</td>
<td>5 (4.2%)</td>
</tr>
<tr>
<td>IOP increase ≥ 10 mmHg at/after M1</td>
<td>8 (2.1%)</td>
<td>1 (0.8%)</td>
</tr>
<tr>
<td>Corneal abrasion</td>
<td>8 (2.1%)</td>
<td>4 (3.4%)</td>
</tr>
<tr>
<td>Goniosynechiae</td>
<td>7 (1.8%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>IOP increase requiring oral meds or SLT/Trabeculectomy/Express shunt</td>
<td>3 (0.8%)</td>
<td>3 (2.5%)</td>
</tr>
</tbody>
</table>

No reports of:
- Myopic shift
- Flat AC
- Choroidal hemorrhage/effusion
- Cyclodialysis
- Hypopyon lasting 2+ months
- Retinal detachment
- Significant hyphema
- Corneal decompensation

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### Aqueous Angiography Before and After Stenting

Don’t want patients to miss out on this

Alex Huang, MD, PhD

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### iStent inject Post-Op Images

[iStent inject Post-Op Images]

2-year post-op

Courtesy of Dr. Marc Toteberg

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### Long-term IOP Reduction at 3 Years

- **37%**
- 100% of patients with IOP ≤ 18 mmHg
Success rate: 68.8%
10% 1 week >10mmHg

Hydrus microstent

- Mild to Mod POAG
- Bypass and dilates SC

Benefit-to-risk ratio is the ultimate criterion in determining MIGS treatment algorithm.

MIGS devices can be used to restore outflow through:

1. Trabecular Meshwork
2. Suprachoroidal Space
3. Subconjunctival Space

Areas of Aqueous Outflow
**Xen gel shunt**

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**Blebitis**

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**Case 1: 60yo HM – cataract eval and OHTN**
- +3.00 sph 20/30 OU
- IOP OD 28 OS 27

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**iStent inject**
- Mild to moderate open angle glaucoma
- Need documentation (HVF and OCT) to prove to the insurance that the patient has glaucoma
- Needs to be on drop prior to surgery
Case 1: s/p CE OU and iStent inject

- IOP OD 17 OS 19
- IOP reduction 39.2% OD
- IOP reduction 29.7% OS

Do we need to add another drop?

Case 2: 72yo WM cataract eval

- OMD said IOP under control and has baby cataracts
- OD 31 mmHg OS 31 mmHg
  - Latanoprost qhs OU, Brimonidine TID OU, Cosopt BiD OU
- Gonio open
- Average pachs
- (+) Fam Hx
- BCVA 20/25 OU, BAT 20/50 OU

s/p LensAR toric IOL OU and iStent inject OU

- 1 day OS IOP: 32 mmHg
- 3 day OS IOP: 15 mmHg
- 1 week OS IOP: 16 mmHg
- 6 week OS IOP: 10 mmHg

Now what do we do?
Remember pt on Cosopt, Brimonidine, and Latanoprost

MIGS tips

- Be aware of MIGS
- Determine if patient has glaucoma before sending for cataract eval if possible
- Send to surgery group who does MIGS
- Don’t change drops til about 6 weeks post op
  - Be aware of IOP elevation at 1 day due to visco
  - Be aware of IOP elevation after due to steroid response

Oldest American celebrates 114th birthday

Role of ODs is only going to get bigger & bigger