Are Eye Drops Dead?

The Future of Ophthalmic Drug Delivery

James D. Brandt, M.D.

Professor of Ophthalmology & Vision Science

Vice-Chair for International Programs and New Technology

Director, Glaucoma Service

Tschannen Eye Institute

University of California, Davis

Sackler Faculty of Medicine
Tel Aviv University

The Institute for International Scientific Exchanges in Medical Sciences
Tel Aviv, Israel
14 February 2020

Financial Disclosures

- Allergan
  - Consulting
    - Proposed PI of planned Phase 3 clinical trial of the bimatoprost sustained-release ring insert
  - Forsight Vision5 Laboratories (acquired by Allergan in 2016)
    - Research Support
      - PI of Phase 2 clinical trial of the bimatoprost sustained-release ring insert
    - Travel support
- Aerie Pharmaceuticals
  - Consulting
- Carl Zeiss Meditec
  - Consulting
- Glaukos
  - Stockholder
  - Former Advisory Board Member
- Graybug Vision
  - Consulting
- InnFocus (acquired by Santen in 2016)
  - Research Support, Phase 3 clinical trial - Site co-investigator
- Laboratoires Théa
  - Consulting
- National Eye Institute
  - PI of UC Davis Clinical Center for the Ocular Hypertension Treatment Study (OHTS) 20 year follow-up study

The Treatment Paradox

Highly effective treatments for glaucoma and ocular hypertension exist…

- Prostaglandin Analogues (PGAs) Reduce the Likelihood of Progression by 34 - 42% / year[1]
  - Approved by FDA in 1990s; Excellent Safety Profile
- PGAs are widely used as 1st line treatment[2]

1 NICE Guidelines: http://www.nice.org.uk/nicemedia/live/12145/43888/43888.pdf; Appendix F, p.246

2 Calculated as follows: IMS data shows 14.25MM Rx's in 2012 for PGAs in USA. Mean medication possession ratio = 0.64 (Friedman *et al.*, *Invest Ophthalmol Vis Sci* 2007;48:5052–5057). ((14.25MM)/12 months)/0.64 Rx/Pt/Month = 1.9MM patients

Non-Adherence in Glaucoma

…but our patients don't take their drops

- Non-adherent glaucoma patients represent a large unmet need: >50%* of patients
- Physicians are notoriously poor at identifying poorly-adherent patients†

* Newman-Casey *et al*.
Patterns of glaucoma medication adherence over four years of follow-up
Ophthalmology 2015;122:2010-2021

* Nordstrom *et al*.
Persistence and adherence with topical glaucoma therapy
Am J Ophthalmol 2005;140:598-606;

† Kass MA, Gordon M, Meltzer DW
Can ophthalmologists correctly identify patients defaulting from pilocarpine therapy?
Am J Ophthalmol 1986;101(5):524-30

Non-Adherence in Glaucoma

Sustained release (SR) delivery of glaucoma medications may help address this challenge

Why Sustained Release (SR)?

SR has the potential to provide long-term IOP lowering *without the need for daily dosing*

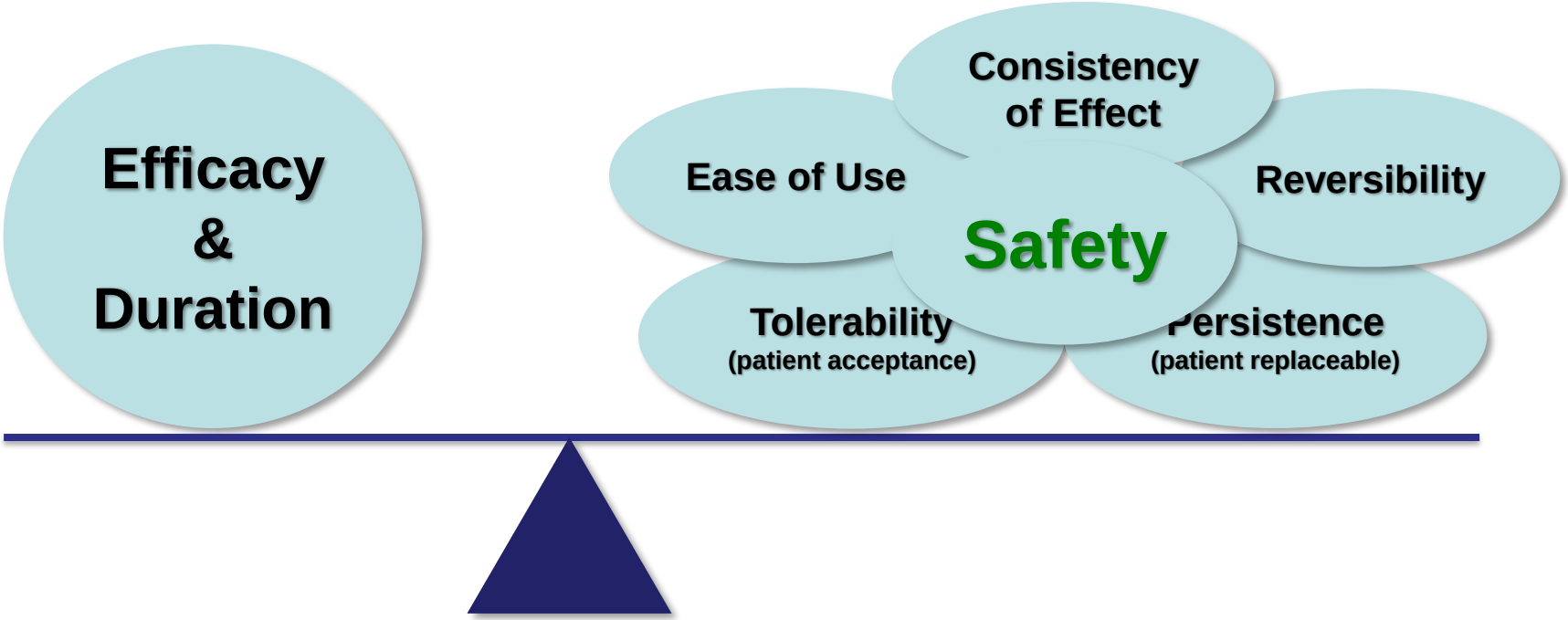
Why Sustained Release?

- May reduce several barriers to treatment adherence
  - Struggling to get drops into the eye

Why Sustained Release?

- May reduce several barriers to treatment adherence
  - Struggling to get drops into the eye
  - Remembering multiple daily doses
  - Adverse effects caused by preservative exposure to ocular surface or surrounding tissues

The SR Balancing Act



The SR Balancing Act

- Glaucoma is a slowly-progressive disease
  - For *early* disease (and ocular hypertension), ***safety must be the highest priority***
    - In the OHTS the NNT (number needed to treat) was **20**

The SR Balancing Act

- Glaucoma is a slowly-progressive disease
  - For *<u>early</u>* disease (and ocular hypertension), ***safety must be the highest priority***
    - In the OHTS the NNT (number needed to treat) was **20**
    - What is an acceptable NNH (number needed to harm)?

The SR Balancing Act

- Glaucoma is a slowly-progressive disease
  - For *early* disease (and ocular hypertension), ***safety must be the highest priority***
    - In the OHTS the NNT (number needed to treat) was **20**
    - What is an acceptable NNH (number needed to harm)?
  - For ***advanced*** disease, a modest safety penalty may be acceptable to achieve higher efficacy & duration of action

The SR Glaucoma Pipeline*

Implantable

Subconjunctival
- Erodible drug pellets
- Drug-containing microspheres
- Mechanical reservoir (device)

Intraocular
- Intravitreal
- Suprachoroidal
- Intracameral (erodible & device)

External

Cornea
- Contact lens

Punctal
- Drug-eluting punctal plug

Conjunctival (cul-de-sac)
- Drug-eluting ring
- Microsphere-containing polymer gel

* Based on publicly-available information as of late 2019

The SR Glaucoma Pipeline*

Implantable

Subconjunctival
- Erodible drug pellets
- Drug-containing microspheres
- Mechanical reservoir (device)

Intraocular
- Intravitreal
- Suprachoroidal
- Intracameral (erodible & device)

External

Cornea
- Contact lens

Punctal
- Drug-eluting punctal plug

Conjunctival (cul-de-sac)
- Drug-eluting ring
- Microsphere-containing polymer gel

* Based on publicly-available information as of late 2019

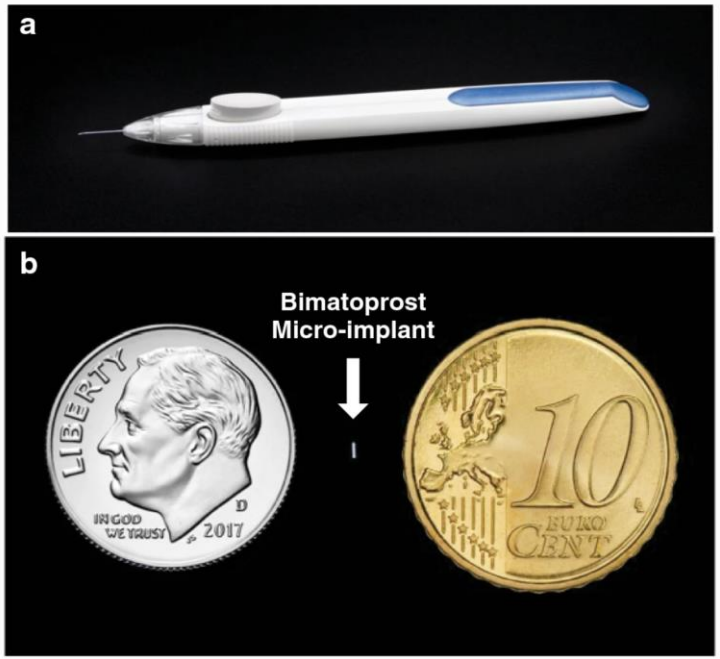
The Sustained Release Pipeline

Product (Company)	Description	Development Stage	Targeted Duration
Bimatoprost SR (Allergan)	Biodegradable Implant (anterior chamber)	NDA Submitted 7/17/2019	6 months
iDose (Glaukos)	Non-degradable Implant (anterior chamber)	Phase I/II	6 – 12 months
Bimatoprost Ring (Allergan)	Peri-ocular ring (conjunctival cul-de-sac)	Phase I/II	6 months
OTX-TP (Ocular Therapeutix)	Punctal Plug	Phase III underway	90 days
Evolute (Mati Therapeutics)	Punctal Plug	Phase II	90 days
Travoprost XR – ENV 515 (Envisia Therapeutics)	Biodegradable implant (anterior chamber)	Dose-Ranging Phase II	6 – 12 months

The Sustained Release Pipeline

Product (Company)	Description	Development Stage	Targeted Duration
Bimatoprost SR (Allergan)	Biodegradable Implant (anterior chamber)	NDA Submitted 7/17/2019	6 months
iDose (Glaukos)	Non-degradable Implant (anterior chamber)	Phase I/II	6 – 12 months
Bimatoprost Ring (Allergan)	Peri-ocular ring (conjunctival cul-de-sac)	Phase I/II	6 months
OTX-TP (Ocular Therapeutix)	Punctal Plug	Phase III underway	90 days
Evolute (Mati Therapeutics)	Punctal Plug	Phase II	90 days
Travoprost XR – ENV 515 (Envisia Therapeutics)	Biodegradable implant (anterior chamber)	Dose-Ranging Phase II	6 – 12 months

Bimatoprost SR



Bimatoprost sustained-release (SR) single-use implant applicator (**a**) and photograph of implant next to a dime and Euro for size comparison (**b**)

Drugs
https://doi.org/10.1007/s40265-019-01248-0

ORIGINAL RESEARCH ARTICLE

24-Month Phase I/II Clinical Trial of Bimatoprost Sustained-Release Implant (Bimatoprost SR) in Glaucoma Patients

E. Randy Craven[1] · Thomas Walters[2] · William C. Christie[3] · Douglas G. Day[4] · Richard A. Lewis[5] · Margot L. Goodkin[6] · Michelle Chen[6] · Veronica Wangsadipura[6] · Michael R. Robinson[6] · Marina Bejanian[6] · for the Bimatoprost SR Study Group

Abstract

Objective The objective of this study was to evaluate the safety and intraocular pressure (IOP)-lowering effects over 24 months of biodegradable bimatoprost sustained-release implant (Bimatoprost SR) administration versus topical bimatoprost 0.03% in patients with open-angle glaucoma (OAG).

Methods This was a phase I/II, prospective, 24-month, dose-ranging, paired-eye controlled clinical trial. At baseline following washout, adult patients with OAG ($N = 75$) received Bimatoprost SR (6, 10, 15, or 20 µg) intracamerally in the study eye; the fellow eye received topical bimatoprost 0.03% once daily. Rescue topical IOP-lowering medication or single repeat administration with implant was permitted. The primary endpoint was IOP change from baseline. Safety measures included adverse events (AEs).

Results At month 24, mean IOP reduction from baseline was 7.5, 7.3, 7.3, and 8.9 mmHg in eyes treated with Bimatoprost SR 6, 10, 15, and 20 µg, respectively, versus 8.2 mmHg in pooled fellow eyes; 68, 40, and 28% of pooled study eyes had not been rescued/retreated at months 6, 12, and 24, respectively. AEs in study eyes that occurred ≤2 days post-procedure typically were transient. After 2 days post-procedure, overall AE incidence was similar between study and fellow eyes, with some events typically associated with topical prostaglandin analogs having lower incidence in study eyes.

Conclusions Bimatoprost SR showed favorable efficacy and safety profiles up to 24 months, with all evaluated dose strengths demonstrating overall IOP-reducing effects comparable to those of topical bimatoprost. Targeted and sustained delivery of bimatoprost resulted in protracted IOP lowering, suggesting that Bimatoprost SR may represent a transformational new approach to glaucoma therapy. Clinicaltrials.gov identifier: NCT01157364

Bimatoprost sustained-release pellet

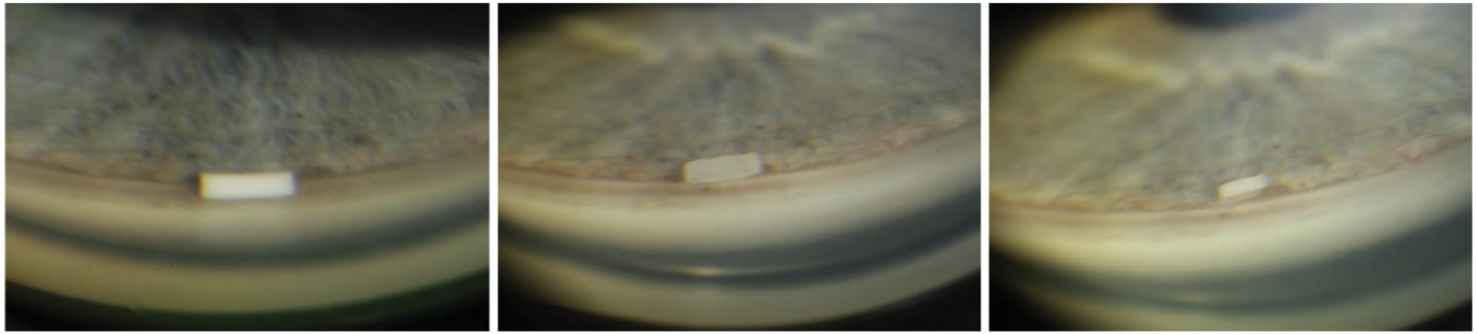
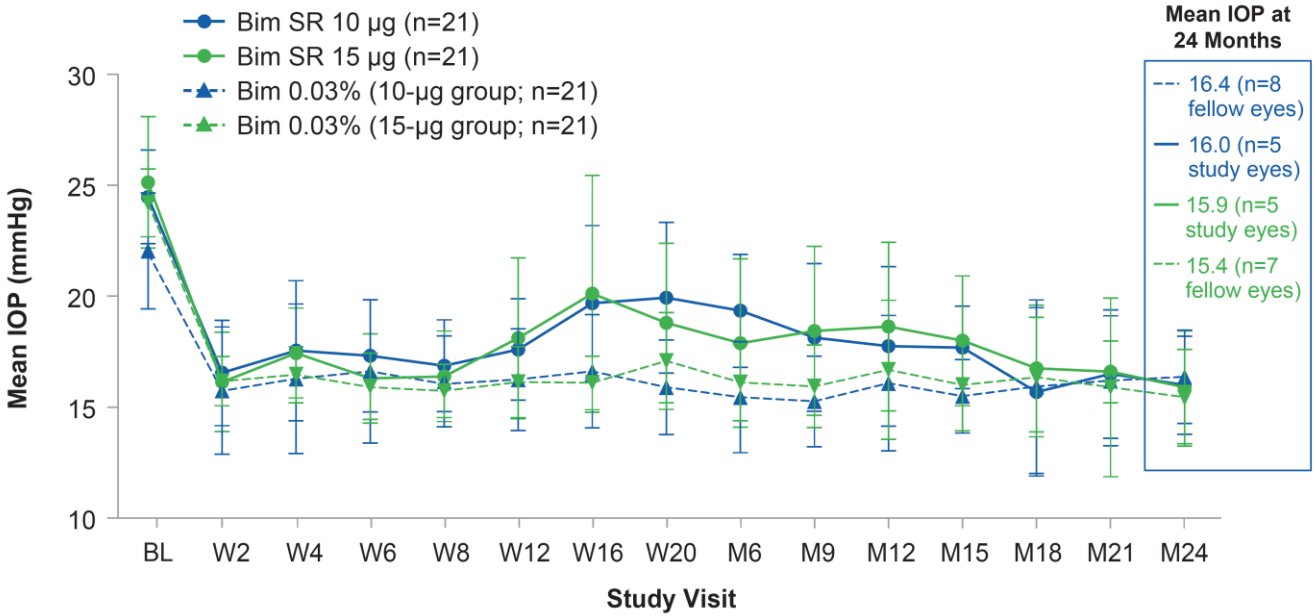


FIGURE 3. Gonioscopic photographs of bimatoprost sustained-release implant 10 μg in the anterior chamber of an eye of a representative patient diagnosed with open-angle glaucoma at (Left) 2 weeks, (Center) 9 months, and (Right) 12 months after injection.

Lewis RA, Christie WC, Day DG *et al.*
Bimatoprost Sustained-Release Implants for Glaucoma Therapy: 6-Month Results from a Phase I/II Clinical Trial
Am J Ophthalmol 2017;175(3):137-147

Bimatoprost SR – 24 month data

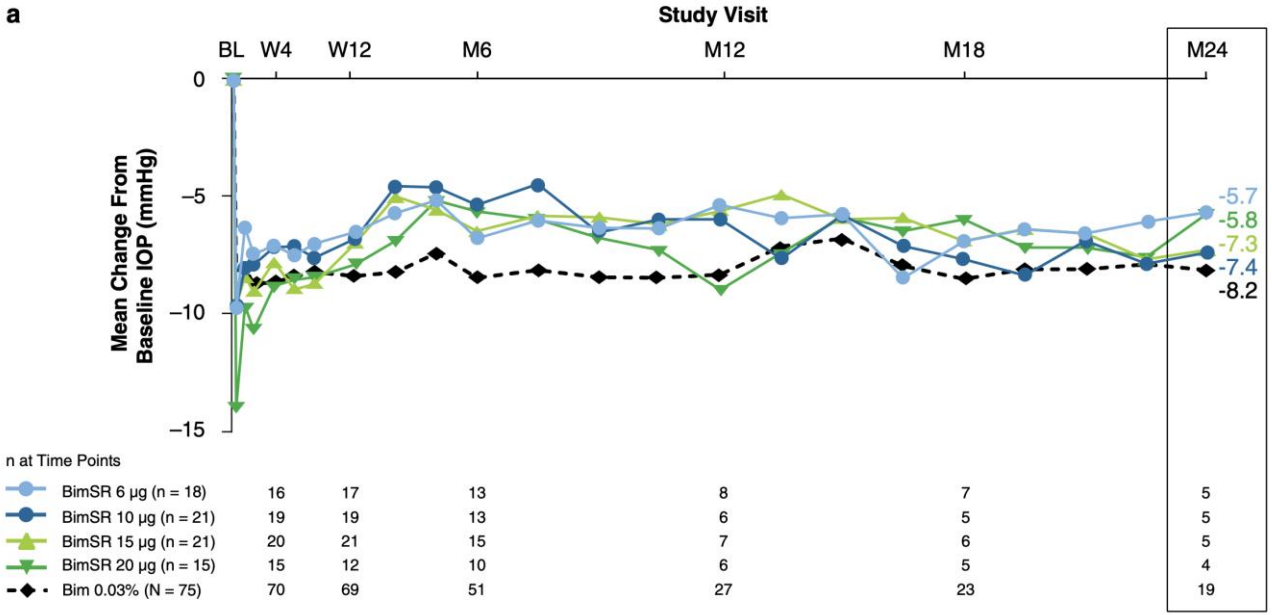
Mean IOP in Patients Receiving the Bim SR 10- or 15-µg Dose Strengths Without Rescue or Retreatment*



*Analysis based on observed values with data censored at rescue or retreatment

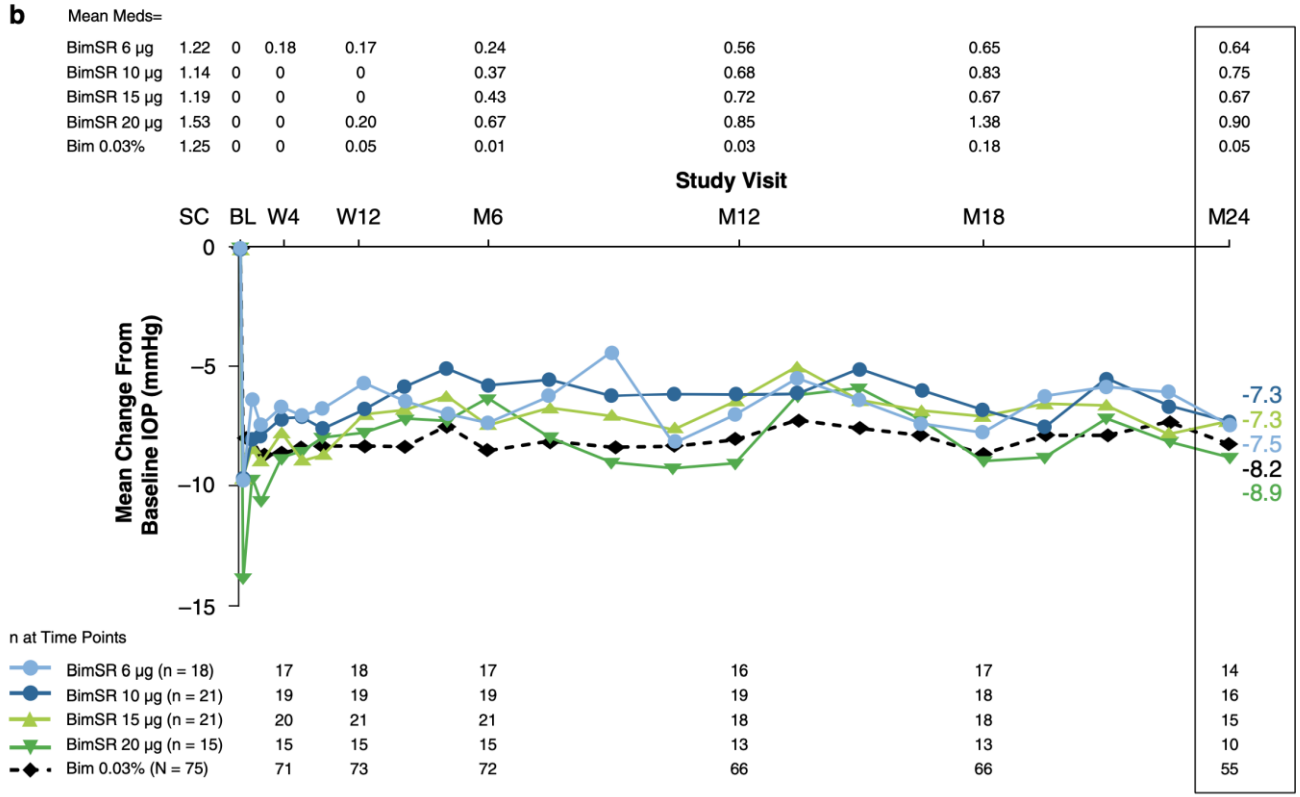
Craven ER, Coote M, Walters T *et al.*
Bimatoprost Sustained-Release Implant for Lowering Intraocular Pressure: Long-term Efficacy and Patient-Reported Outcomes.
World Glaucoma Congress, March 2019
Melbourne, Australia. Poster P-WT-138

Bimatoprost SR – 24 month data



Craven ER, Walters T, Christie WC *et al.*
24-Month Phase I/II Clinical Trial of Bimatoprost Sustained-Release Implant (Bimatoprost SR) in Glaucoma Patients
Drugs 2019; ePub ahead of print, 30 Dec 2019

Bimatoprost SR – 24 month data



Craven ER, Walters T, Christie WC *et al.*
24-Month Phase I/II Clinical Trial of Bimatoprost Sustained-Release Implant (Bimatoprost SR) in Glaucoma Patients
Drugs 2019; ePub ahead of print, 30 Dec 2019

NDA for Bimatoprost SR

- New Drug Application filed on 7/17/2019
- Detailed Phase 3 data not yet public, press statement only:

"In the two Phase 3 ARTEMIS studies, Bimatoprost SR reduced intraocular pressure (IOP) by 30% over the 12-week primary efficacy period, meeting the predefined criteria for non-inferiority to the study comparator. The ARTEMIS studies evaluated 1122 subjects on the efficacy & safety of Bimatoprost SR versus timolol, an FDA standard comparator for registrational clinical trials, in patients with open-angle glaucoma or ocular hypertension. After 3 treatments with Bimatoprost SR, greater than 80% of patients remained treatment free & did not need additional treatment to maintain IOP control for at least 12 months. Bimatoprost SR was well tolerated in the majority of patients."

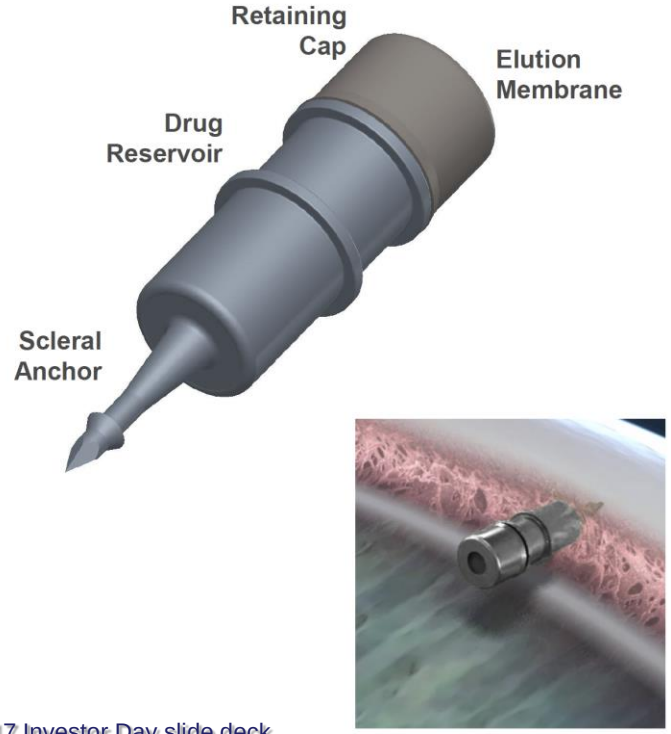
FDA = US Food and Drug Administration.

Press Release. https://www.allergan.com/news/news/thomson-reuters/u-s-fda-accepts-allergan-s-new-drug-application-fo. Accessed January 6, 2020.

Sustained Release Pipeline

Product (Company)	Description	Development Stage	Targeted Duration
Bimatoprost SR (Allergan)	Biodegradable Implant (anterior chamber)	Phase III underway	6 months
iDose (Glaukos)	Non-degradable Implant (anterior chamber)	Phase I/II	6 – 12 months
Bimatoprost Ring (Allergan)	Peri-ocular ring (conjunctival cul-de-sac)	Phase I/II	6 months
OTX-TP (Ocular Therapeutix)	Punctal Plug	Phase III underway	90 days
Evolute (Mati Therapeutics)	Punctal Plug	Phase II	90 days
Travoprost XR – ENV 515 (Envisia Therapeutics)	Biodegradable implant (anterior chamber)	Dose-Ranging Phase II	6 – 12 months

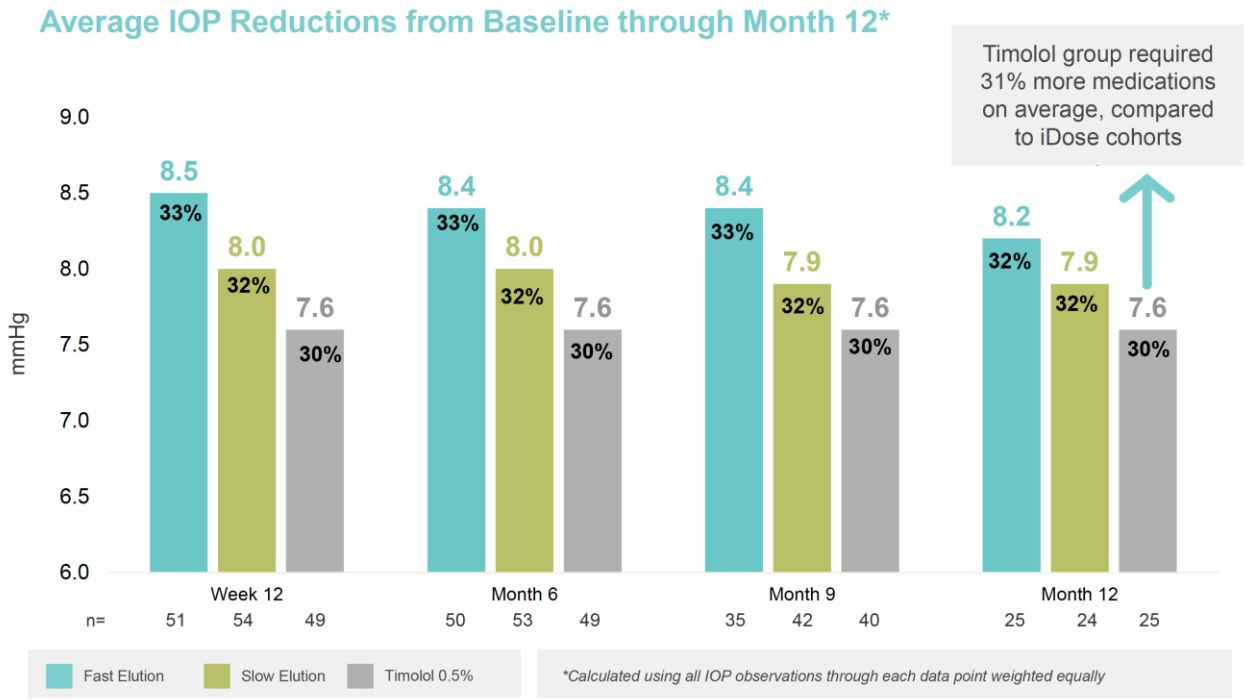
Glaukos Travoprost SR device



- Titanium implant containing 6+ month supply of travoprost
- Placed and re-placed surgically, anchors in the trabecular meshwork

Glaukos 2017 Investor Day slide deck
http://s21.q4cdn.com/471661912/files/doc_presentations/2017/09/Investor-Day-Deck-Master-Revised-09282017.pdf

Glaukos Travoprost SR device



ClinicalTrials.gov Data	
Study Design	Prospective multi-center RCT
Comparator	Timolol
Participants	1,000
Actual study start date	22 May 2018
Estimated Primary completion date	June 2021
Estimated Study completion date	June 2023

http://investors.glaukos.com/investors/events-and-presentations/presentations/PresentationDetails/2019/Glaukos-Investor-Presentation-br-May-2019/default.aspx

Travoprost XR (ENV515)

- Intracameral erodible platform delivering travoprost
- PRINT® technology permits production of <100 nm particles to >1 mm implants
- Early Phase 2 data (ARVO 2017*) demonstrated sustained IOP lowering out to 11 months (5 patients)

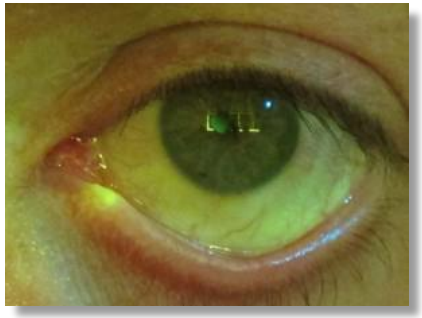
- Aerie Pharmaceuticals purchased the rights to PRINT® Technology for glaucoma and retinal applications (October 2017)

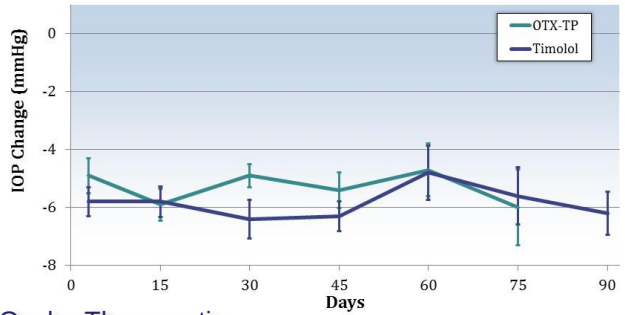
* Navratil T, Conley J, Verhoeven RS *et al.*
Extended PGA Delivery Results in Significant Drug Sparing Compared to Topical PGAs and Achieves Sustained IOP Lowering for 11 Months without Any Loss of Efficacy
ARVO 2017

Sustained Release Pipeline

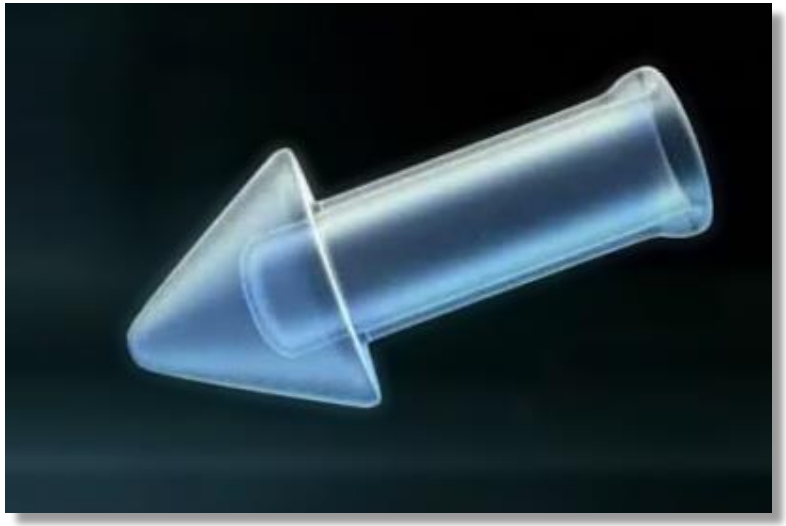
Product (Company)	Description	Development Stage	Targeted Duration
Bimatoprost SR (Allergan)	Biodegradable Implant (anterior chamber)	Phase III underway	6 months
iDose (Glaukos)	Non-degradable Implant (anterior chamber)	Phase I/II	6 – 12 months
Bimatoprost Ring (Allergan)	Peri-ocular ring (conjunctival cul-de-sac)	Phase I/II	6 months
OTX-TP (Ocular Therapeutix)	Punctal Plug	Phase III	90 days
Evolute (Mati Therapeutics)	Punctal Plug	Phase II	90 days
Travoprost XR – ENV 515 (Envisia Therapeutics)	Biodegradable implant (anterior chamber)	Dose-Ranging Phase II	6 – 12 months

Punctal Plug drug delivery





Source: Ocular Therapeutix
http://www.ocutx.com/pipeline/travoprost-punctum-plug



Source: http://www.matitherapeutics.com/pipeline

Punctal Plug Drug Delivery

Row	Saved	Status	Study Title	Conditions	Interventions	Study Start	Study Completion
1	☐	Completed	A Phase 2 Single-Masked, Randomized Study of **Latanoprost** PPDS in Ocular Hypertension or Open-Angle Glaucoma	• Ocular Hypertension • Open-Angle Glaucoma	• Drug: **Latanoprost Punctal Plug** Delivery System (L-PPDS)	December 2013	December 2016
2	☐	Completed	Study of the Effects of Artificial Tears on the Response to the **Latanoprost Punctal Plug** Delivery System in Subjects With Ocular Hypertension or Open-Angle Glaucoma	• Glaucoma • Ocular Hypertension	• Drug: **Latanoprost punctal plug** • Drug: artificial tears preserved with Benzalkonium Chloride	January 2009	December 2009
3	☐	Completed	A Study Evaluating the **Latanoprost Punctal Plug** Delivery System (L-PPDS) in Subjects With Ocular Hypertension or Open-Angle Glaucoma	• Ocular Hypertension • Open Angle Glaucoma	• Drug: **Latanoprost**-PPDS	October 2010	August 2011
4	☐	Completed	A Safety Study of the **Latanoprost Punctal Plug** Delivery System (L-PPDS) in Subjects With Ocular Hypertension or Open Angle Glaucoma	• Glaucoma • Ocular Hypertension	• Drug: **Latanoprost**-PPDS	January 2009	December 2009
5	☐	Withdrawn	A Phase 2 Study of the **Latanoprost Punctal Plug** Delivery System in Subjects With Ocular Hypertension or Open-Angle Glaucoma	• Glaucoma • Ocular Hypertension	• Drug: **Latanoprost**-PPDS	March 2009	July 2009
6	☐	Completed	A Study of the L-PPDS With Adjunctive Xalatan® Eye Drops in Subjects With OH or OAG	• Ocular Hypertension • Open-Angle Glaucoma	• Drug: **Latanoprost Punctal Plug** Delivery System • Drug: Xalatan	December 2009	July 2010
7	☐	Completed	A Dose Evaluation Study for the **Latanoprost Punctal Plug** Delivery System (L-PPDS) in Subjects With Ocular Hypertension or Open-Angle Glaucoma	• Glaucoma • Ocular Hypertension (OH)	• Drug: **Latanoprost**-PPDS	November 2011	September 2012
8	☐	Completed	A Dose Evaluation Study of the Effect of **Plug** Placement on the Efficacy and Safety of the **Latanoprost Punctal Plug** Delivery System (L-PPDS) in Subjects With Ocular Hypertension or Open-Angle Glaucoma	• Glaucoma • Ocular Hypertension (OH)	• Drug: **Latanoprost**-PPDS	November 2011	September 2012
9	☐	Completed	A Phase 2 Study of **Punctal** Placement of the **Latanoprost Punctal Plug** Delivery System (L-PPDS)	• Open-Angle Glaucoma • Ocular Hypertension	• Drug: **Latanoprost**	January 2009	November 2009
10	☐	Completed	A Study of Different Formulations of the L-PPDS in Subjects With OH or OAG	• Glaucoma • Ocular Hypertension	• Drug: Formulation E1 of L-PPDS • Drug: Formulation E2 of L-PPDS	August 2009	May 2010

ClinicalTrials.gov. https://clinicaltrials.gov/ct2/results?cond=&term=punctal+plug%2C+latanoprost&cntry=&state=&city=&dist= . Accessed January 6, 2020.

Punctal Plug Drug Delivery

- Only public-facing data from a Phase III pivotal trial for punctal plugs disappointing (diurnal data compared to vehicle):
  - -1.8 mmHg (2 weeks), -0.9 mmHg (6 weeks), -0.6 mmHg (12 weeks)

OTX-TP failed to meet primary endpoint but achieved statistically significant reduction of intraocular pressure versus placebo at eight of the nine pre-specified time points

The Company plans to discuss the data from the clinical trial with the FDA and determine next steps

May 20, 2019 04:05 PM Eastern Daylight Time

Table 1: Reduction in Intraocular Pressure (Change from Baseline)

	2 Week			6 Week			12 Week		
	mm Hg			mm Hg			mm Hg		
Diurnal Time points	OTX-TP	Vehicle	p-value	OTX-TP	Vehicle	p-value	OTX-TP	Vehicle	p-value
8:00 AM	-5.72	-3.88	<.0001	-4.81	-4.01	0.0181	-3.91	-3.52	0.2521
10:00 AM	-4.92	-3.16	<.0001	-4.03	-3.23	0.0077	-3.34	-2.63	0.0234
4:00 PM	-5.22	-3.18	<.0001	-4.16	-3.14	0.0004	-3.27	-2.60	0.0310

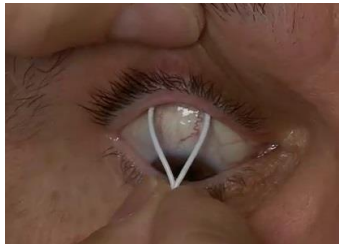
FAS Population (OTX-TP=343 subjects, Vehicle=211 subjects) ***Least Squares (LS) Means***

https://www.businesswire.com/news/home/20190520005742/en/Ocular-Therapeutix™-Announces-Topline-Results-Phase-3

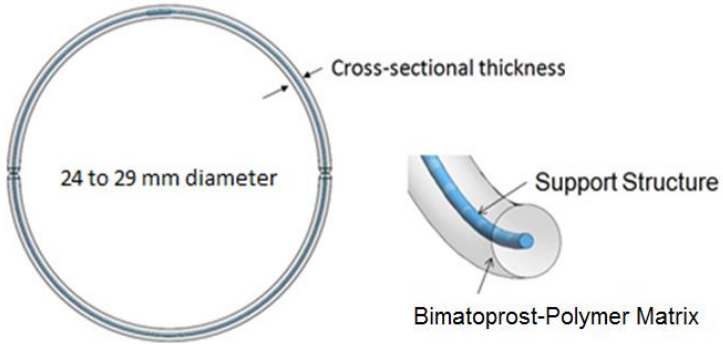
Sustained Release Pipeline

Product (Company)	Description	Development Stage	Targeted Duration
Bimatoprost SR (Allergan)	Biodegradable Implant (anterior chamber)	Phase III underway	6 months
iDose (Glaukos)	Non-degradable Implant (anterior chamber)	Phase I/II	6 – 12 months
Bimatoprost Ring (Allergan)	Peri-ocular ring (conjunctival cul-de-sac)	Phase I/II	6 months
OTX-TP (Ocular Therapeutix)	Punctal Plug	Phase III	90 days
Evolute (Mati Therapeutics)	Punctal Plug	Phase II	90 days
Travoprost XR – ENV 515 (Envisia Therapeutics)	Biodegradable implant (anterior chamber)	Dose-Ranging Phase II	6 – 12 months

Bimatoprost Ocular Insert

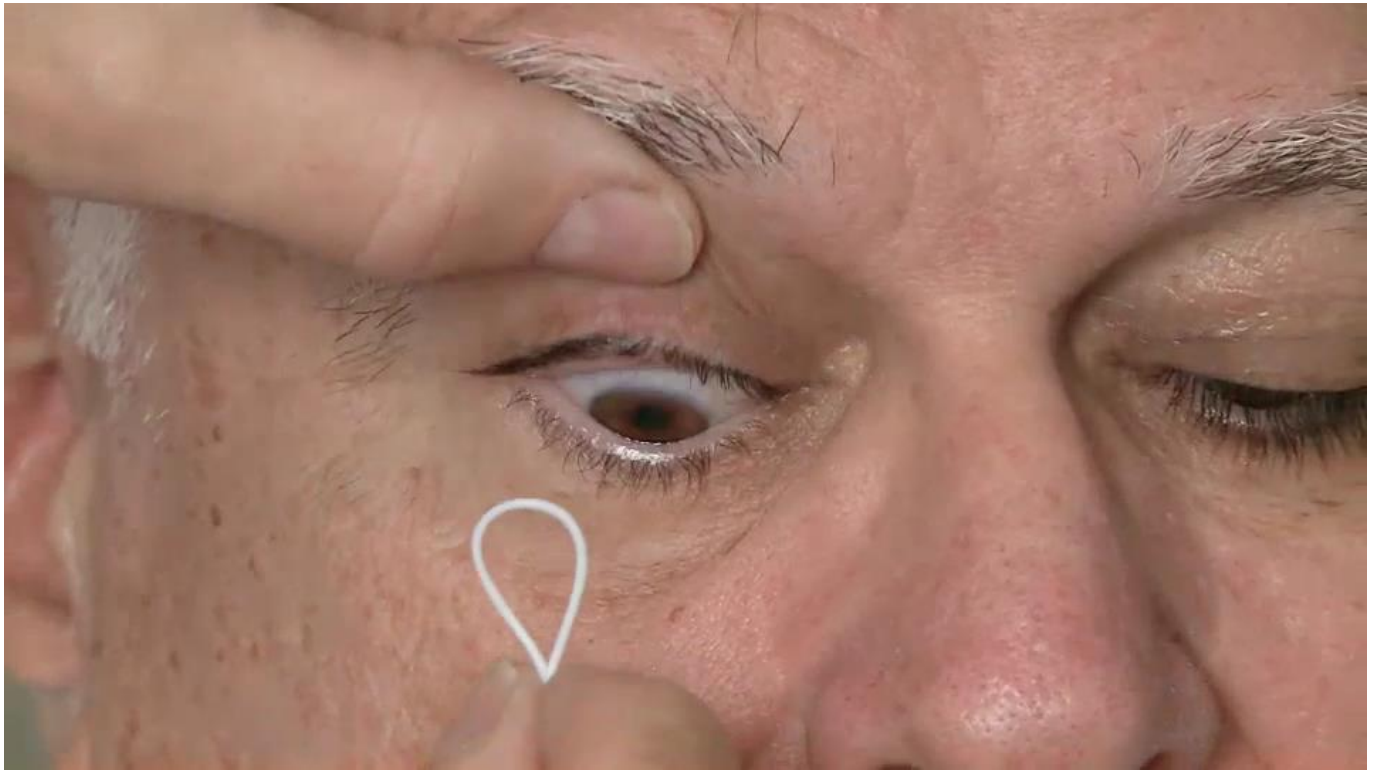

- Simple, non-invasive ocular insert – rests under eyelids
- Easily applied by the eye care provider
- Impregnated with bimatoprost; preservative-free
- *Not* bioabsorbable – replaced by physician q6 months
- Can be designed to carry more than 1 drug (bimatoprost + timolol ring recently completed Phase 1)



Brandt JD, Sall K, DuBiner H *et al*.
Six-Month IOP Reduction with a Topical Bimatoprost Ocular Insert: Results of a Phase II Randomized Controlled Study
Ophthalmology 2016;123(8):1685-1694

Brandt JD, Sall K, DuBiner H *et al*.
Long-term Safety and Efficacy of a Sustained-Release Bimatoporost Ocular Ring
Ophthalmology 2017;124(10):1565-1566

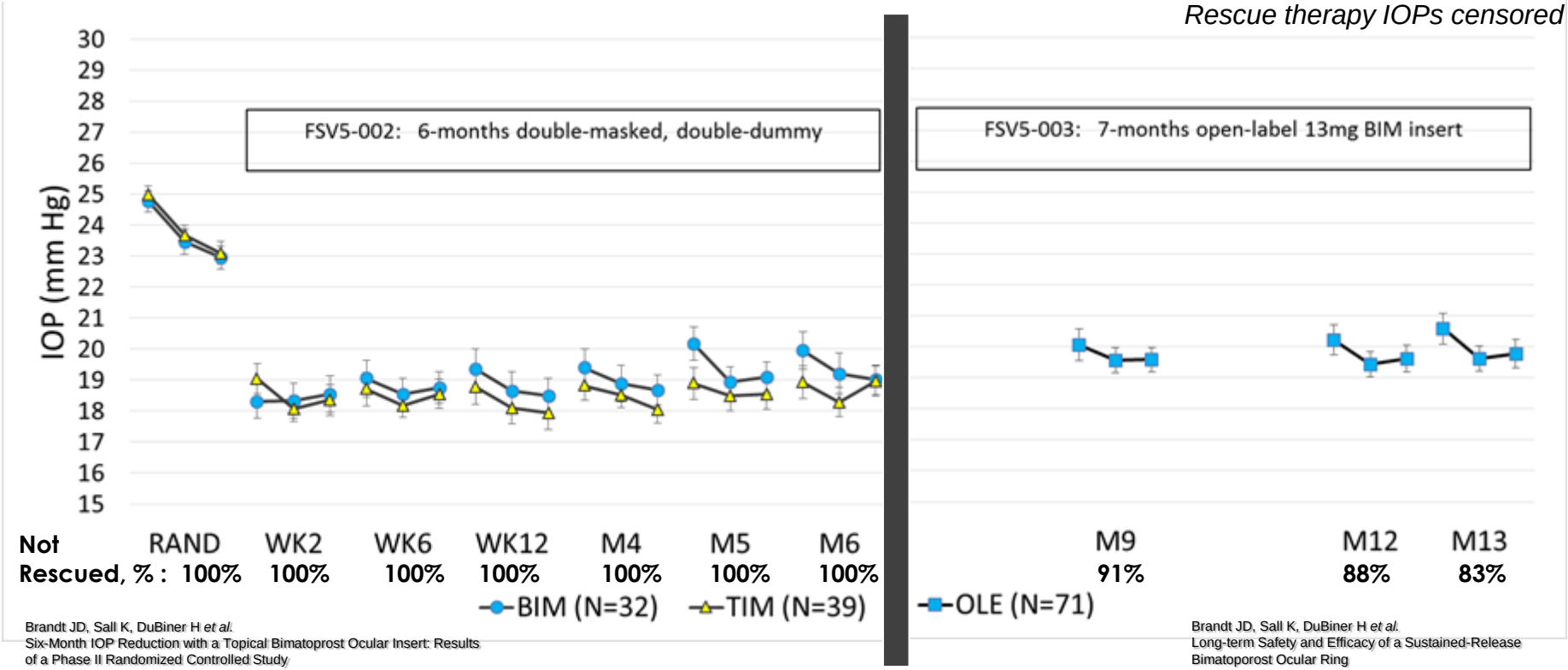
Placement Procedure



Filmed at the Sall Research Medical Center

Results (Diurnal IOP):
Observed Efficacy through 13 months

Rescue therapy IOPs censored



Brandt JD, Sall K, DuBiner H *et al.*
Six-Month IOP Reduction with a Topical Bimatoprost Ocular Insert: Results of a Phase II Randomized Controlled Study
Ophthalmology 2016;123(8):1685-1694

Brandt JD, Sall K, DuBiner H *et al.*
Long-term Safety and Efficacy of a Sustained-Release Bimatoporost Ocular Ring
Ophthalmology 2017;124(10):1565-1566

Reality Check

SR Platforms *will* arrive in the next 12 – 18 months

Questions to Ask about ALL Sustained Release Platforms in Development

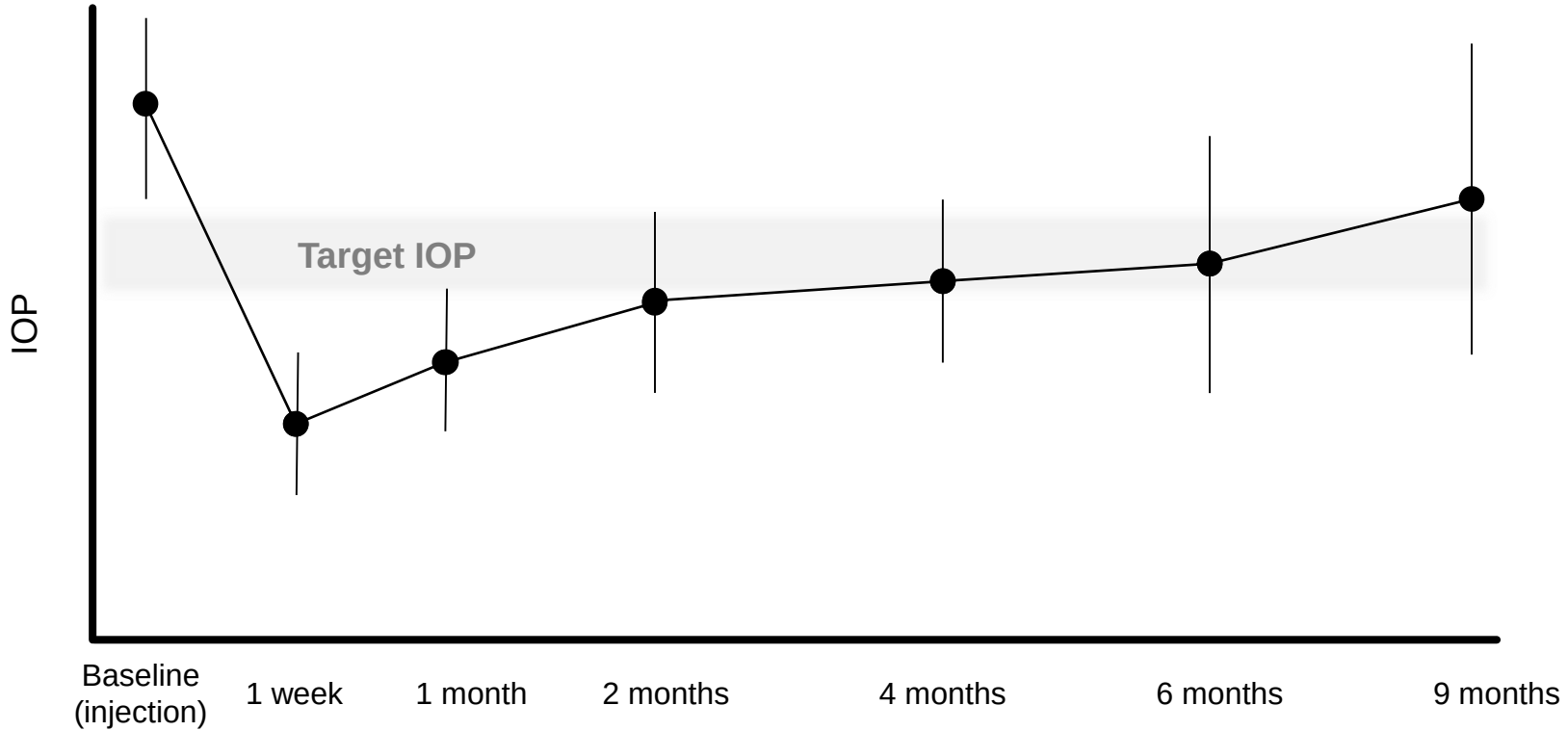
Considerations for all SR Platforms

How predictable is the duration of action?

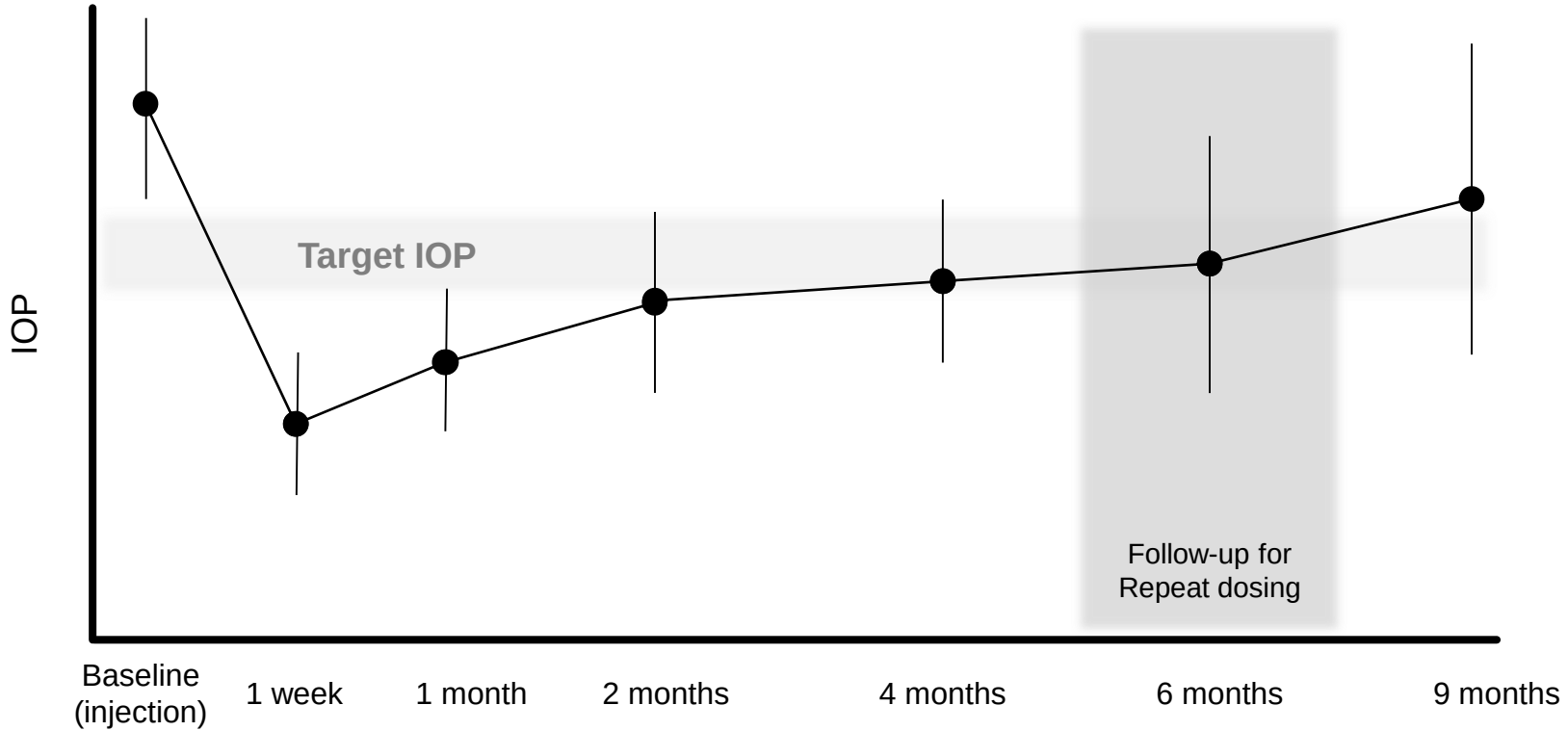
- If a sustained release drug is labeled for 6 months, when do you need to bring patients back for monitoring or re-dosing?

Duration of action

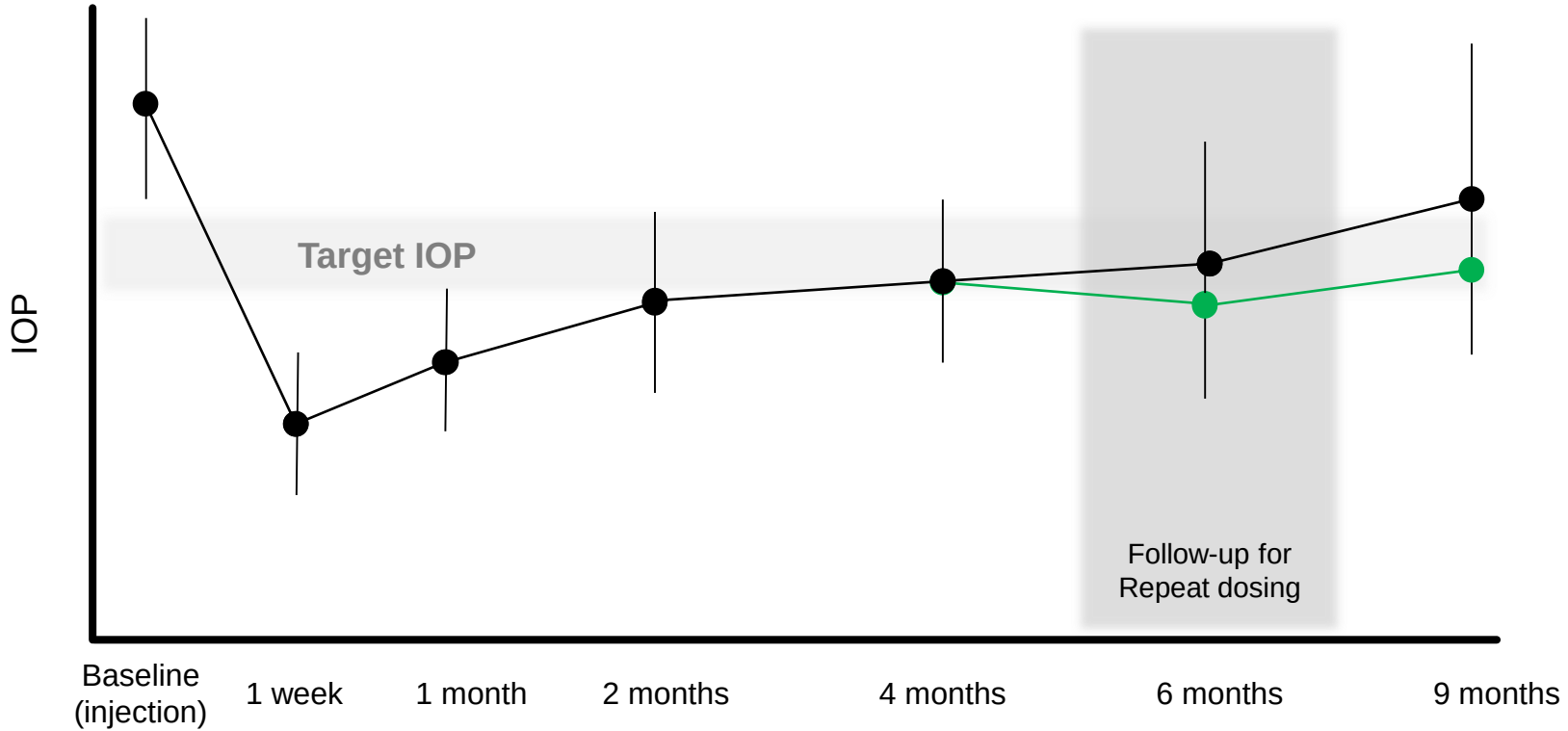
Duration of action



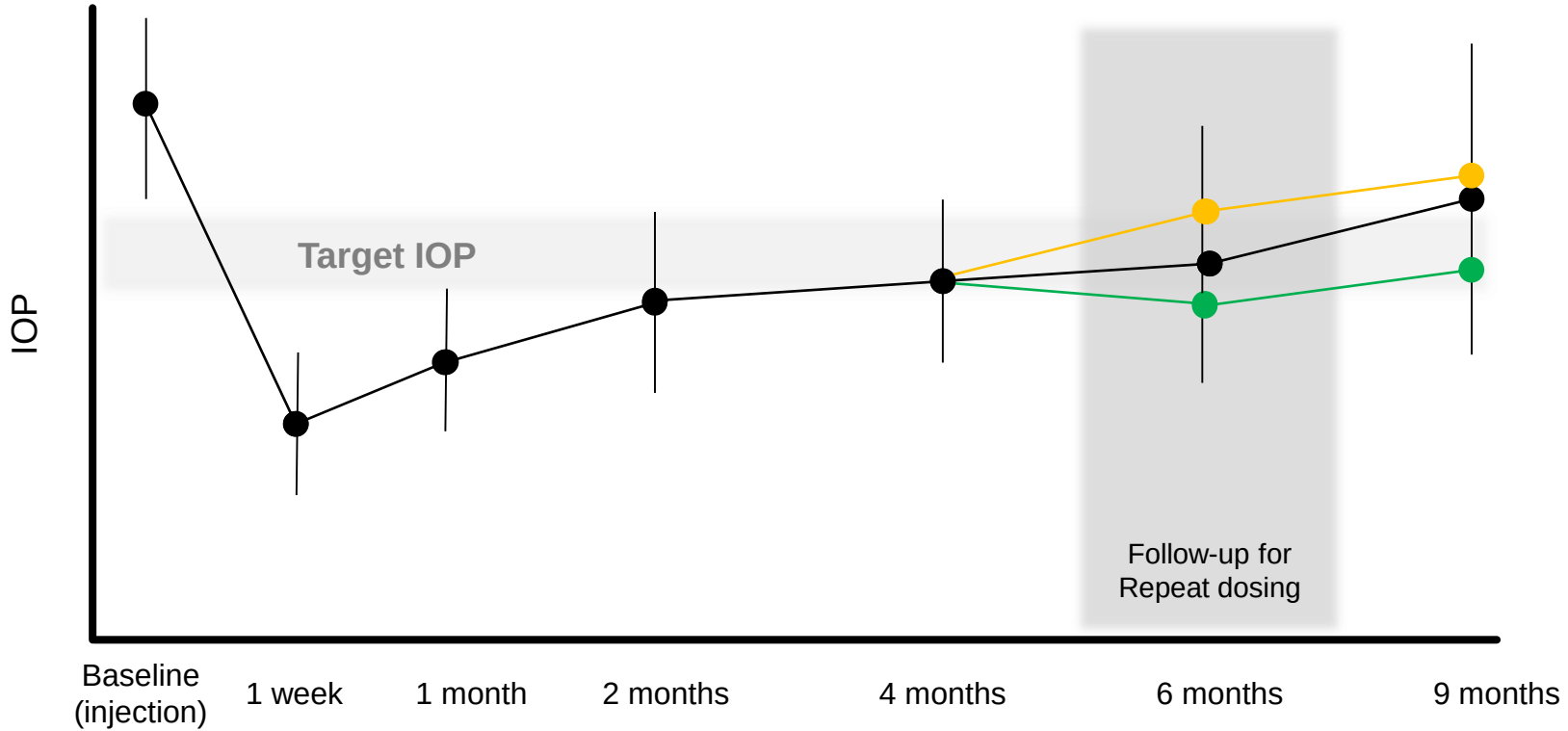
Duration of action



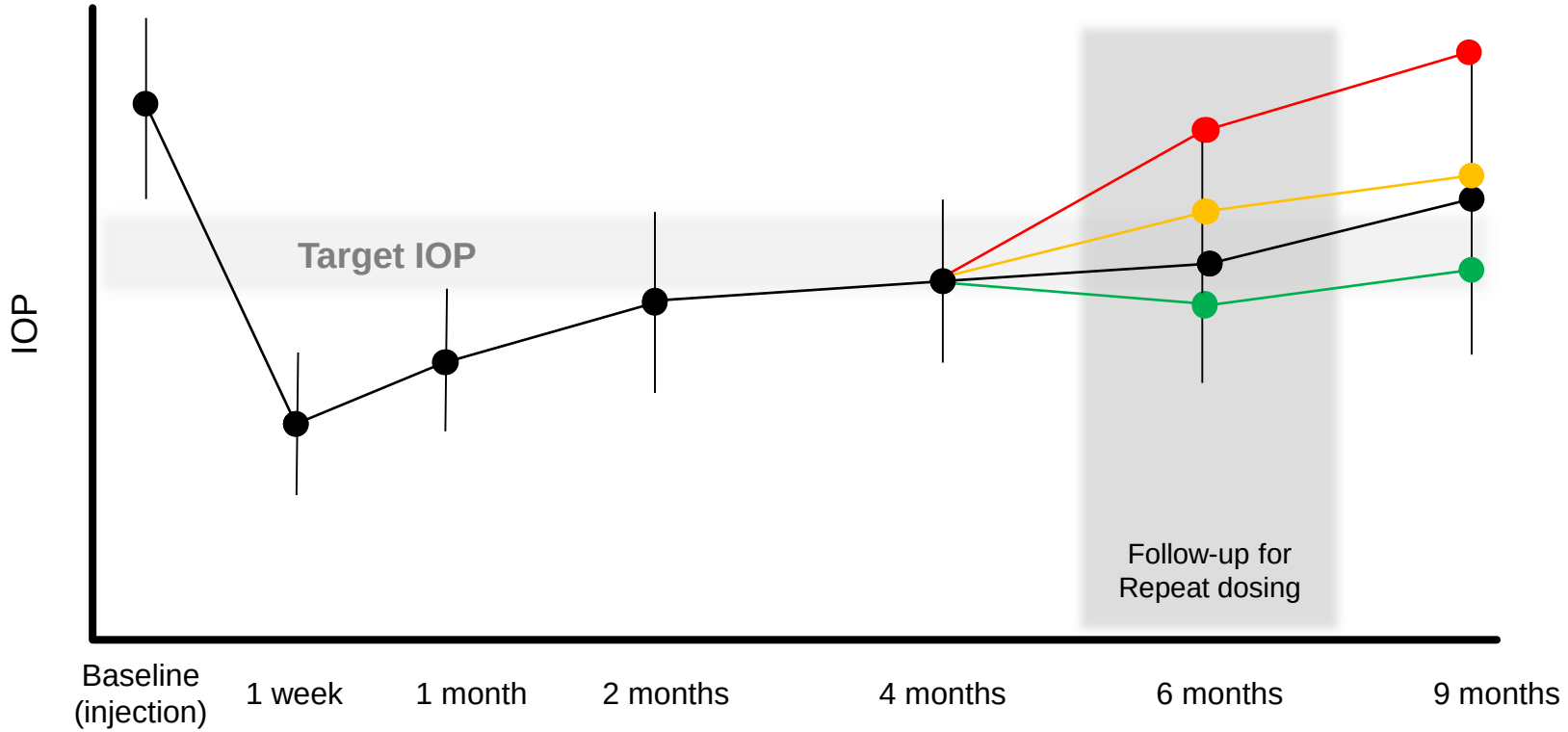
Duration of action



Duration of action



Duration of action



Considerations for all SR Platforms

Glaucoma ≠ AMD or DME

- "Treat & Extend" paradigm won't work in glaucoma
  - Patients do fall through the cracks & fail to return on time
  - Even poorly-compliant AMD or DME patients will usually initiate a return visit when their vision starts to drop

Considerations for all SR Platforms

Glaucoma ≠ AMD or DME

- Our patients don't know when their IOP is rising
  - Home tonometry may help with this part of the challenge

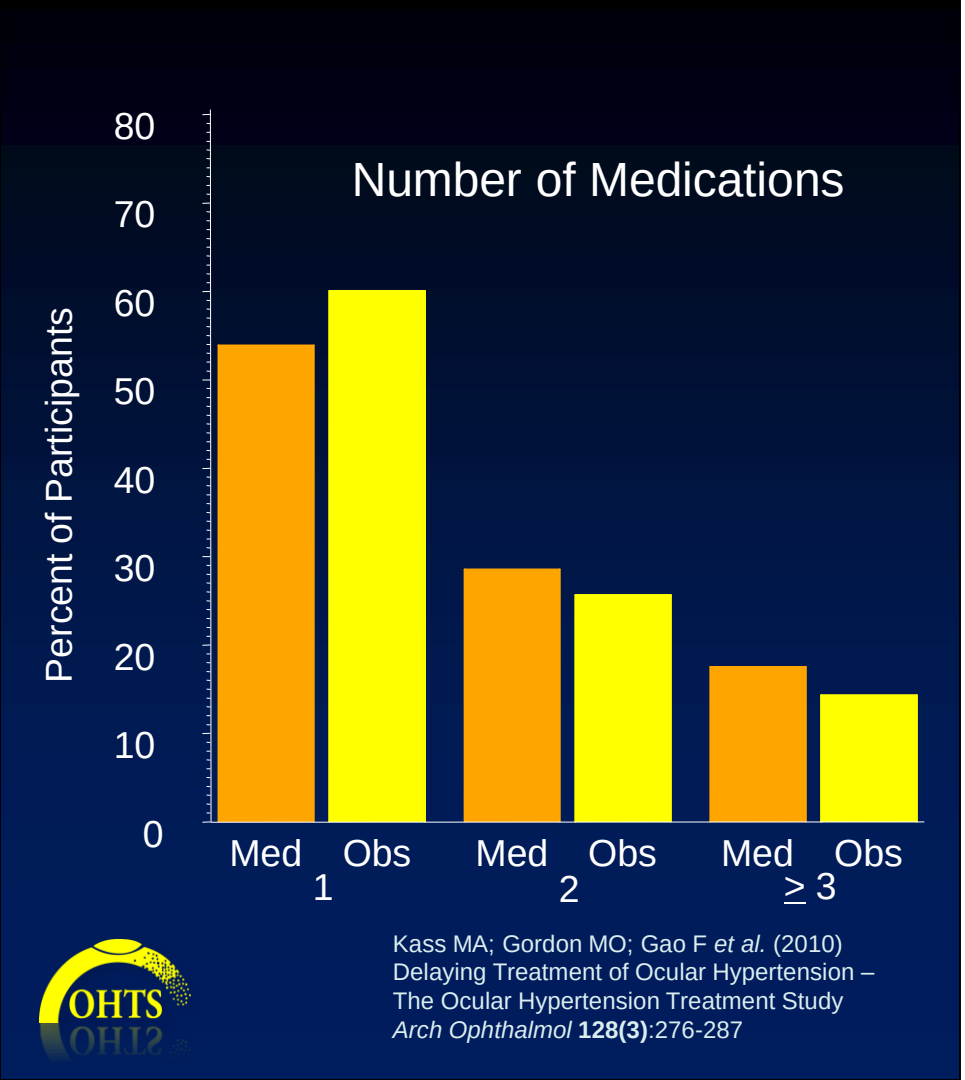
Considerations for all SR Platforms

What if the patient has a drug side-effect?

- All SR platforms in the pipeline use one of the three major PGAs
- Eyes at risk of CME were excluded from pivotal trials

Considerations for all SR Platforms

What if the patient needs more than one drug?



Kass MA; Gordon MO; Gao F *et al.* (2010) Delaying Treatment of Ocular Hypertension – The Ocular Hypertension Treatment Study *Arch Ophthalmol* **128(3)**:276-287

OHTS

- Despite its modest (20%) IOP target, ~ 50% of OHTS subjects required 2 or more medications to reach target
- This was true even for those originally in the observation group, who were started on PGAs half way through the study

Considerations for Injectables

Workflow concerns

- Glaucoma is usually bilateral
  - Each patient will typically need 2 injections
  - Will you inject both eyes on the same day?
- What about patients requiring multiple drugs?

Safety Concerns

- How many injections can a cornea take?
  - Platform(s) may remain months after drug is gone
- Effect on endothelial counts?
- Cumulative risk of endophthalmitis

Considerations for Injectables

What if a pellet migrates?

- Patients with open capsules or unstable IOLs were excluded from the pivotal trials

Considerations for Injectables

What if a pellet migrates?

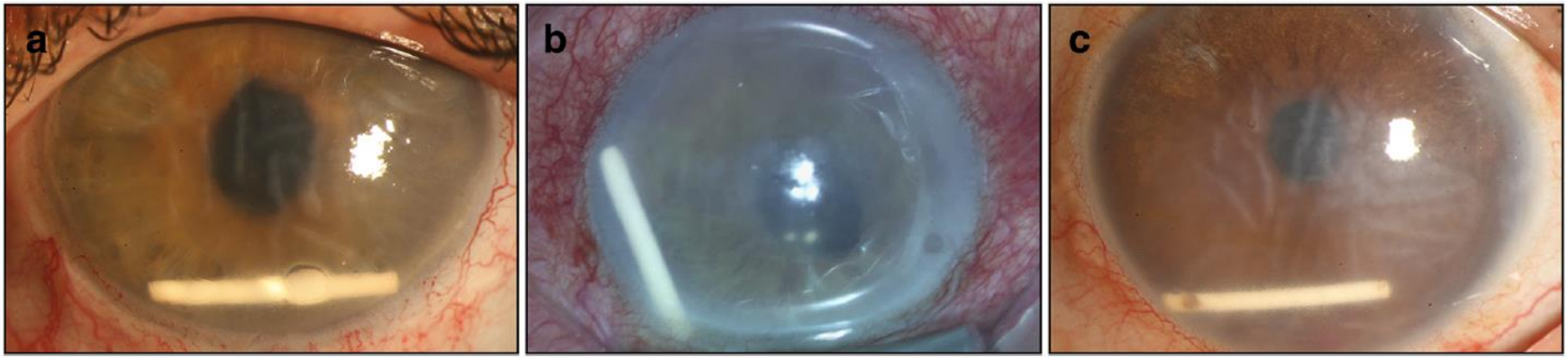


Fig. 1 Slit-lamp photography showing the dexamethasone implant dislocated to the inferior angle of the anterior chamber, touching the corneal endothelium, in three different patients (**a–c**). Diffuse corneal edema and Descemet membrane folds can be seen

Röck D, Bartz-Schmidt KU & Röck T
Risk factors for and management of anterior chamber intravitreal dexamethasone implant migration
BMC Ophthalmol 2019;19:120 [open access]

Considerations for Injectables

What if a pellet migrates?

- Will it be safe to do a Nd:YAG capsulotomy in a patient with a pellet in place?
- Will you go to the OR to remove a pellet or implant from a patient developing CME?

Conclusions

Are Eyedrops Dead?

Are Eyedrops Dead?

- Serious hurdles to adoption will have to be sorted out, *e.g.*
  - Safety
  - Frequency & timing of office visits
  - Clinic flow & logistics
  - Reimbursement models

Are Eyedrops Dead?

Eyedrops aren't going away soon…

… but today's pace of innovation suggests that by 2030, eyedrops will *not* be the primary method of glaucoma treatment, supplanted by:

- SR platforms
- Primary SLT*
- Better stand-alone MIGS

* Gazzard G, Konstantakopoulou E, Garway-Heath D *et al*. Selective laser trabeculoplasty versus eye drops for first-line treatment of ocular hypertension and glaucoma (LiGHT): a multicenter randomized controlled trial
Lancet 2019; 393:1505-1516

UCDAVIS

TSCHANNEN EYE INSTITUTE