



The Retina Society

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Management of Proliferative Vitreoretinopathy with Intravitreal Methotrexate using a Treat-and-Extend Protocol

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The treatment discussed represents an **off-label use** of methotrexate as an intravitreal pharmacotherapy.

All patients were informed and consented to the off-label use of methotrexate.

Disclosures and Affiliations



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No disclosures



Summary

Treat-and-Extend Study Results

- 50 consecutive patients with RD and grade C/B PVR were treated with postop methotrexate (MTX) injections q1-6wks
- The majority of patients received 6 or fewer injections
- The single operation success rate was 88%, with a final reattachment rate of 96%
- A significant improvement in visual acuity was observed
- The incidence of corneal toxicity was ~40%

Dosing Recommendation – *based on this study*

- Inject q1-2wks until retinectomy edge stable (~3-4 injections during PO month 1)
- Inject q3-6wks until SO removal (~2 injections during PO months 2-3)

Introduction

Intravitreal injection (IVI) of MTX has shown promise for the prevention of recurrent RD from PVR.

Dr. Elliott's Protocol involves 8 weekly injections followed by 1-4 bi-weekly injections. In a series of 26 eyes, there was a 92% reattachment rate.

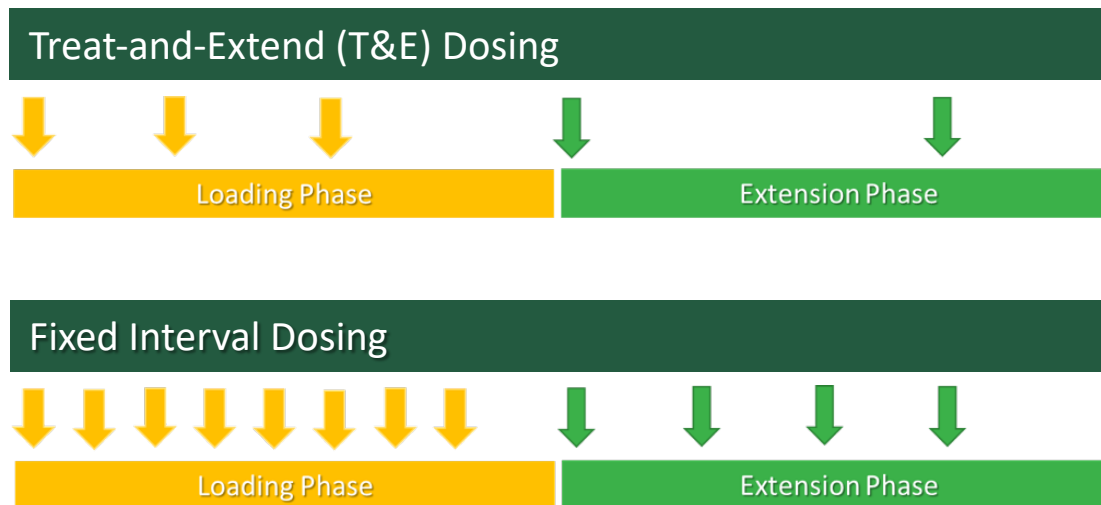


Elliott, Stryjewski, & Kim. *NEOS* 2018; meeting abstract.



Hypothesis

An individualized “treat-and-extend” protocol may also be effective in preventing recurrent RD from PVR.



Methods

Retrospective consecutive case series of patients receiving intraoperative and post-operative IVIs of MTX

Inclusion Criteria

- Retinal detachment
- Grade C or severe grade B PVR
- Age ≥ 18 years

Exclusion Criteria

- < 3 Months follow-up
- < 3 post-operative IVIs of MTX
- ≥ 12 IVIs of MTX

Surgical & Pharmacotherapeutic Methods

All patients underwent 25 gauge pars plana vitrectomy (PPV) with membrane peeling and/or relaxing retinectomy (RR)

Variables at Surgeon's Discretion

- Scleral Buckling (SB)
- Internal Limiting Membrane Peeling (ILMP)
- Degrees of RR
- Choice of Tamponade (SO, PFO, C3F8, SF6)

Intravitreal Dose: 400µg MTX/0.1mL, produced by a compounding pharmacy

Results

N = 50 eyes of 50 patients

- Median age = 63 years (range 18-82)
- 86% Grade C PVR (vs. 14% severe Grade B)

Risk Factors

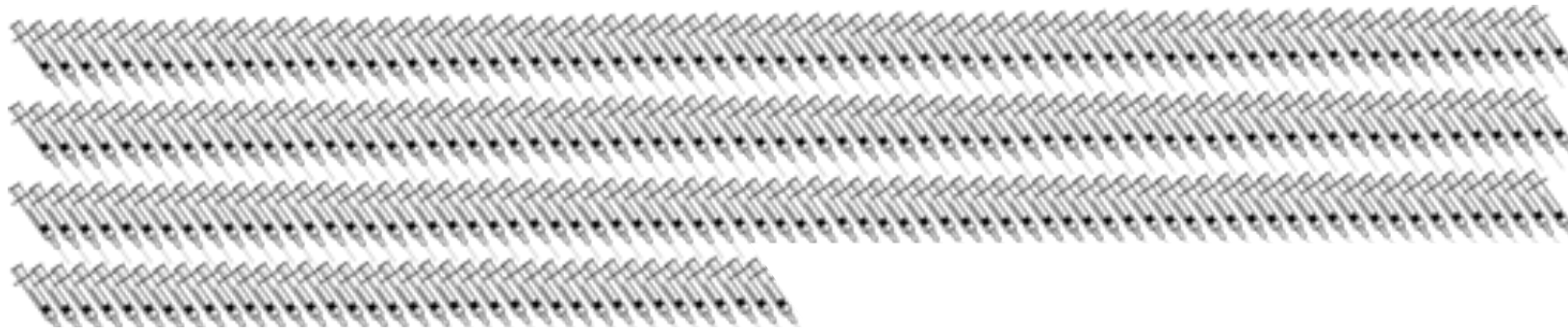
- Prior vitrectomy (70%; avg. 1.5; range 1-5)
- Hemorrhage (22%)
- Hypotony (18%)
- Giant retinal tear (14%)
- Severe trauma (14%)
- Endophthalmitis or uveitis (10%)

Comorbidities

- Full-thickness macular hole (18%)
- Retinal neovascularization (10%)
- Amblyopia (6%)
- Advanced glaucoma (4%)
- Choroidal neovascularization (4%)

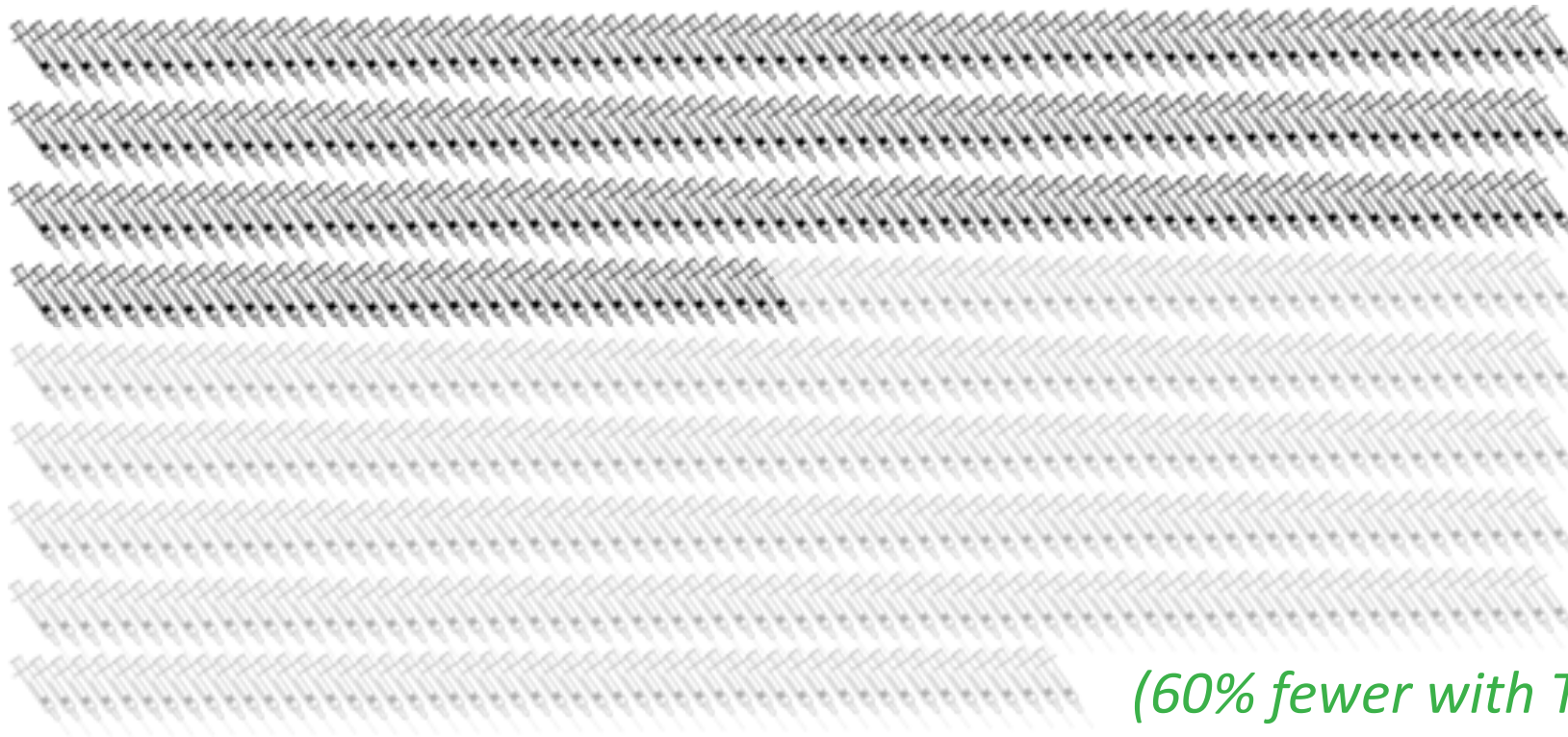
Results

Total number of post-operative IVIs = 264



Results

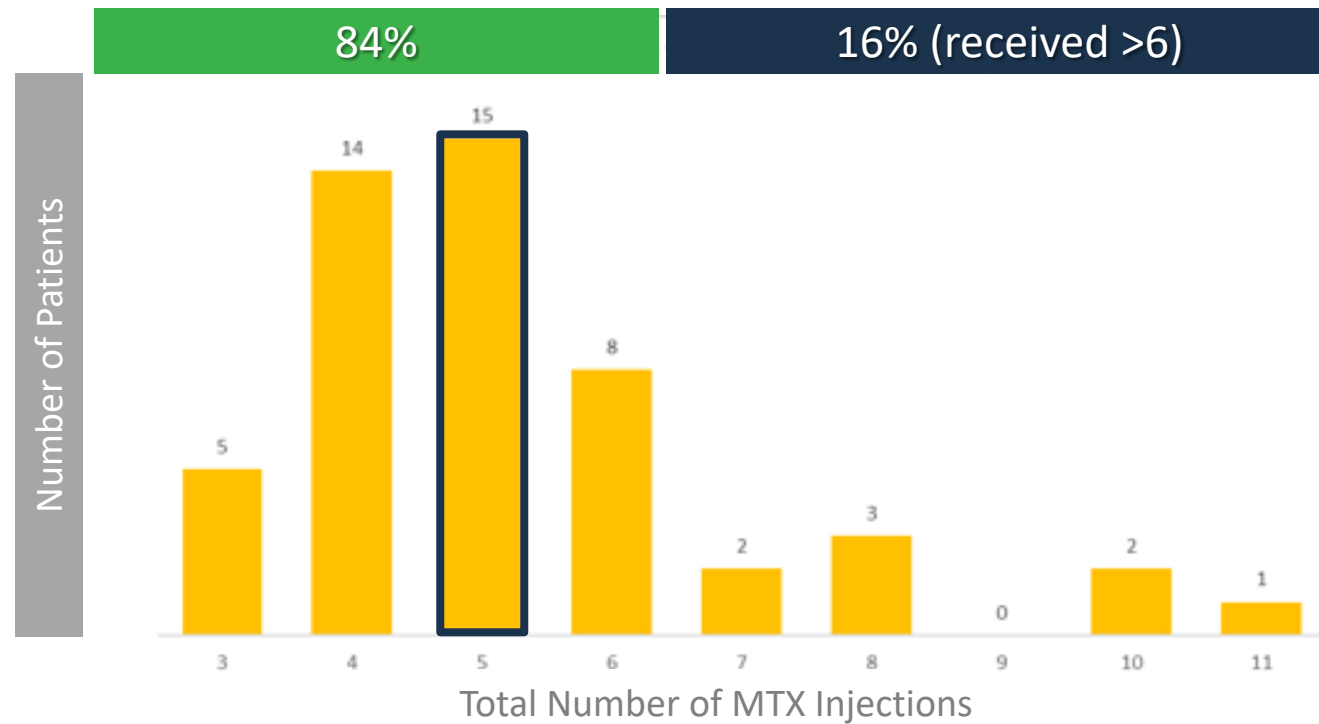
Versus 650 IVIs required with Dean Elliott's protocol



Results

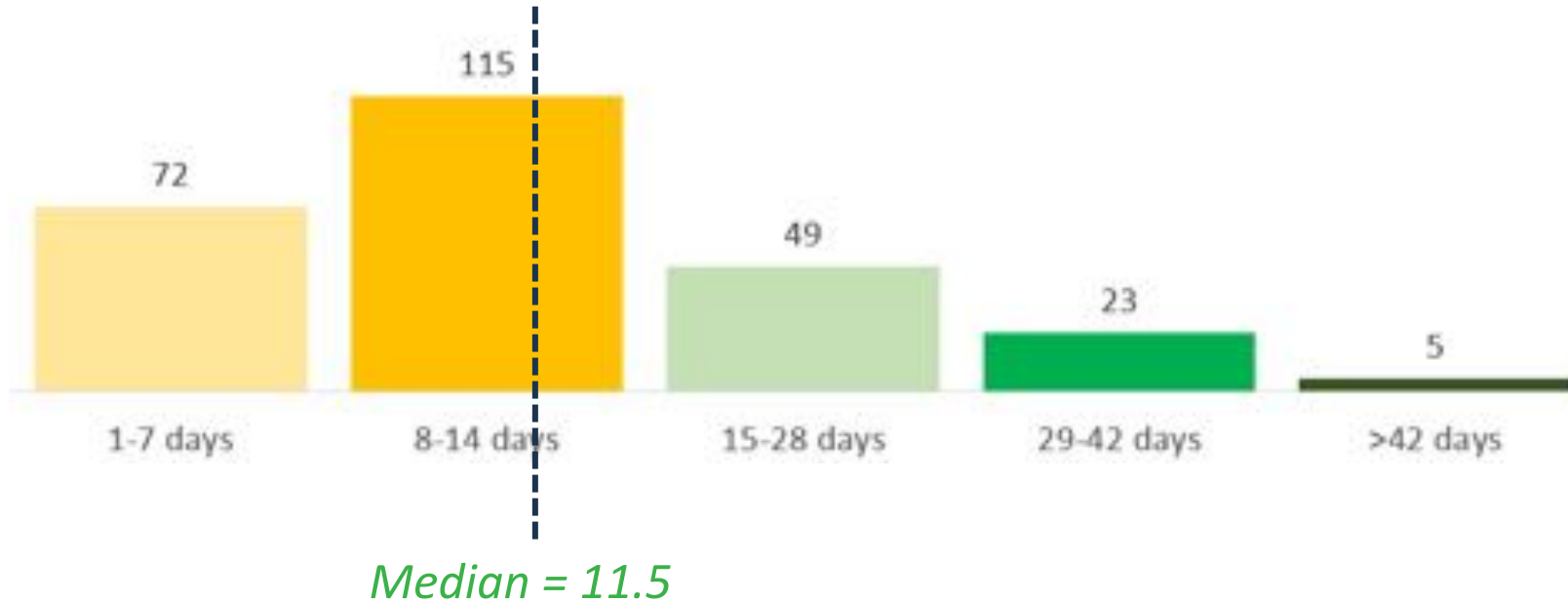
The majority of patients received 6 or fewer injections

Median = 5
Average = 5.3
Range = 3-11



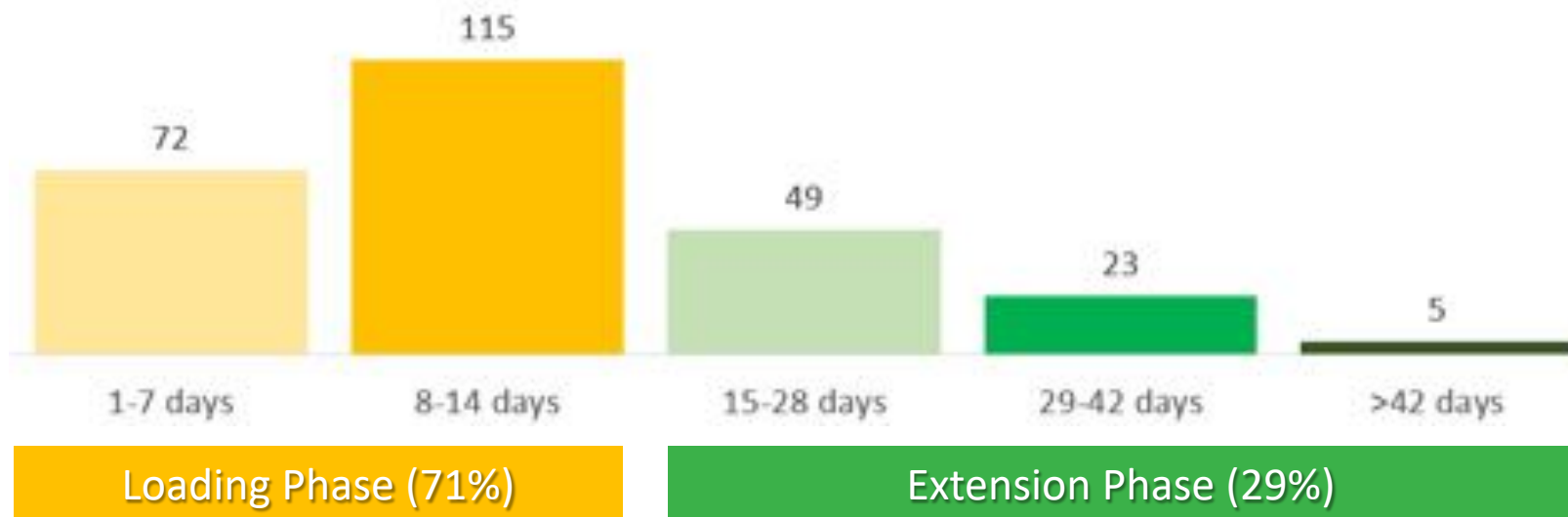
Results

How frequently were doses administered?



Results

Dosing was “front-loaded” with the majority of IVIs occurring during the initial “loading phase”



Results

How many IVIs occurred during the “loading phase”?

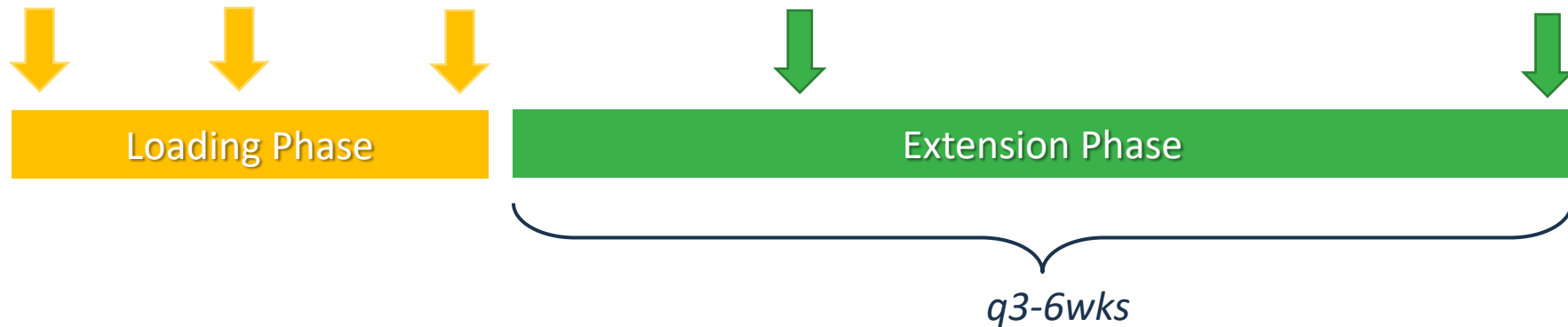
- Median = 3
- Average = 3.6
- Range = 1-11



Results

How many IVIs occurred during the “extension phase”?

- Median = 3
- Average = 3.6
- Range = 1-11
- Median = 2
- Average = 1.8
- Range = 0-5



Results: Anatomic Outcomes

Single Operation Success = 88%

- Comparable to Dean Elliott's results (92%)

	Success	Failure
DE Cohort	24	2
SDW Cohort	44	6

No significant difference by χ^2 , $p=0.56$

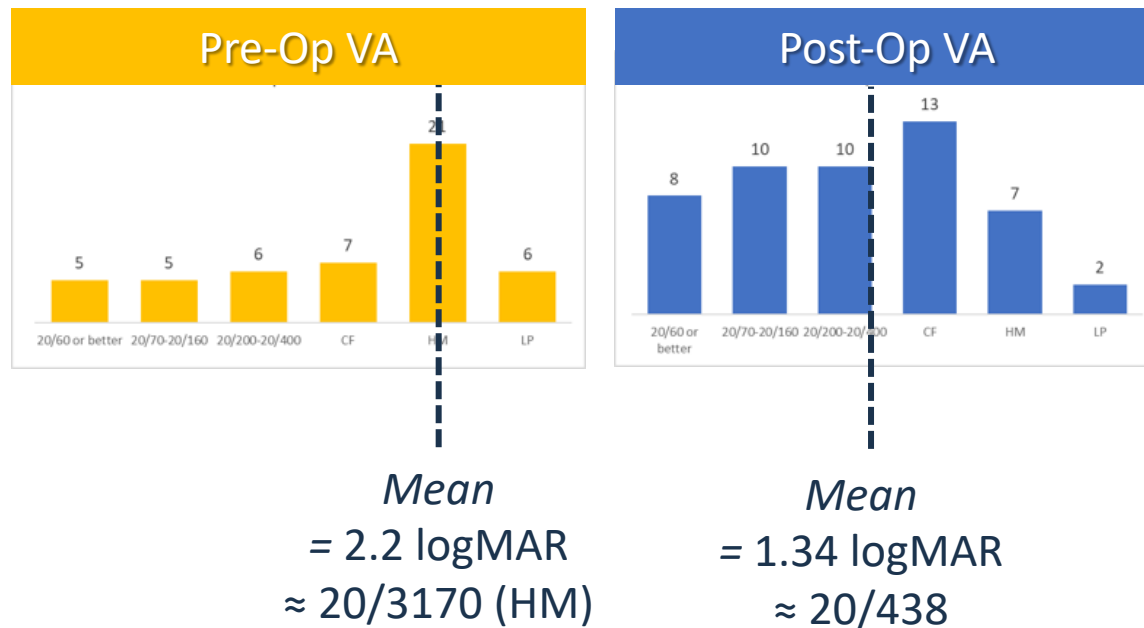
Results: Anatomic Outcomes

Final Reattachment = 96%

- 4 eyes (8%) required a single re-operation for recurrent RD with PVR
- 2 patients (4%) declined additional surgery

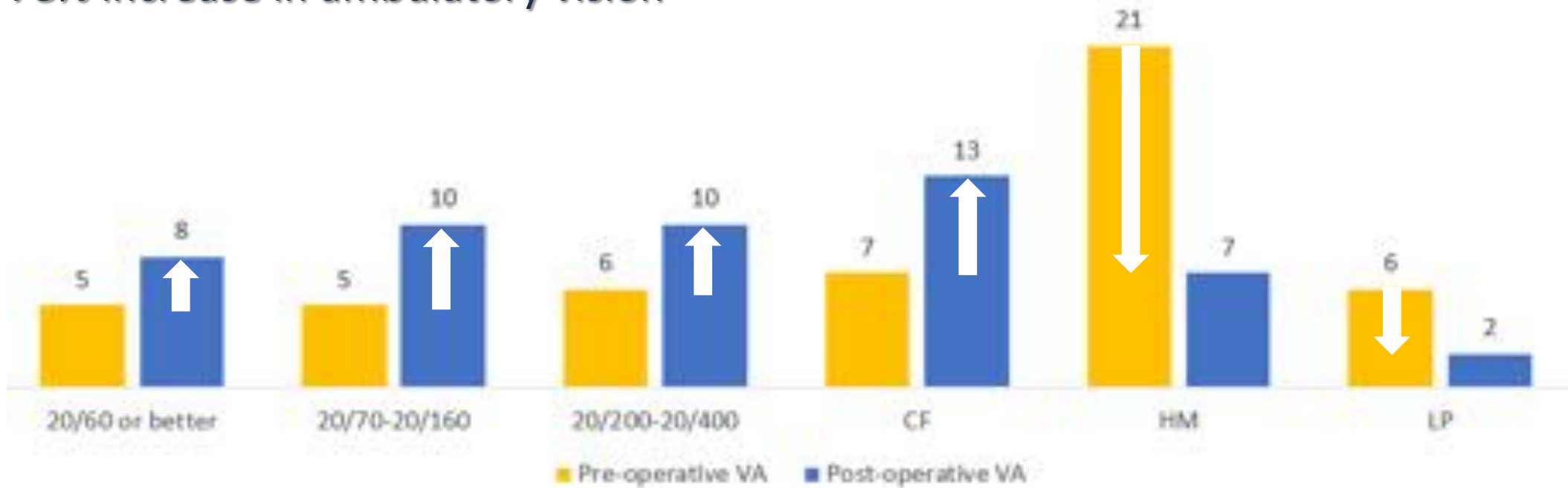
Results: Visual Acuity

There was a significant improvement in mean visual acuity ($p < 0.0005$)



Results: Visual Acuity

78% increase in ambulatory vision



Ambulatory Vision

Non-Ambulatory Vision

Results: Adverse Events

Is there any potential toxicity associated with IVI of MTX?

38% developed some form of keratopathy during the loading phase

- Non-healing corneal epithelial defect (22%)
- Vortex-like keratopathy (20%)
- Generally keratopathy improved with lubrication, BCL, extended MTX dosing intervals

Conclusions

A comparable rate of single operation success was achieved using 60% fewer MTX injections than in the previously described treatment protocol.



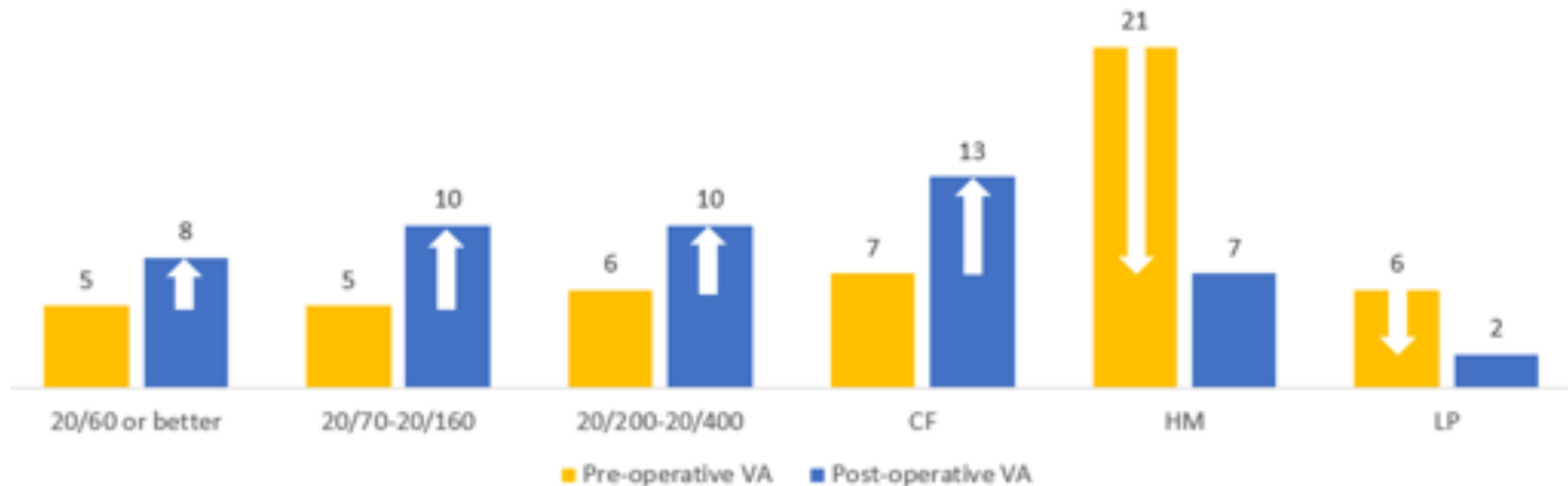
Success	Failure
44	6



24	2
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Conclusions

A significant improvement in visual acuity was observed among eyes included in the study.



Dosing Recommendation – *based on my experience*

- Inject q1-2wks until RR edge stable (~3-4 injections during PO month 1)
- Inject q3-6wks until SO removal (~2 injections during PO months 2-3)

Further study is needed to clarify the optimal MTX dosing frequency to prevent recurrent RD from PVR.