Innovative Suprachoroidal Microneedle

Clinical Trial Results From Patients With Macular Edema Due to Noninfectious Uveitis

Treated with 4.0 mg of triamcinolone acetonide using a suprachoroidal injection

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Financial Disclosures

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  - Santen
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Key Take Home Points

- Novel microinjector syringe allows for office based delivery of therapy to the suprachoroidal space
- Injection of triamcinolone to suprachoroidal space was well tolerated and produced significant reductions in macular edema at 2 months
  - Significant improvements in BCVA
  - Reduction in other signs of uveitis
    - Anterior chamber cell
    - Vitreous haze
- Suggests that suprachoroidal injection of steroid provided efficacy in this study population

Suprachoroidal Injection in Development

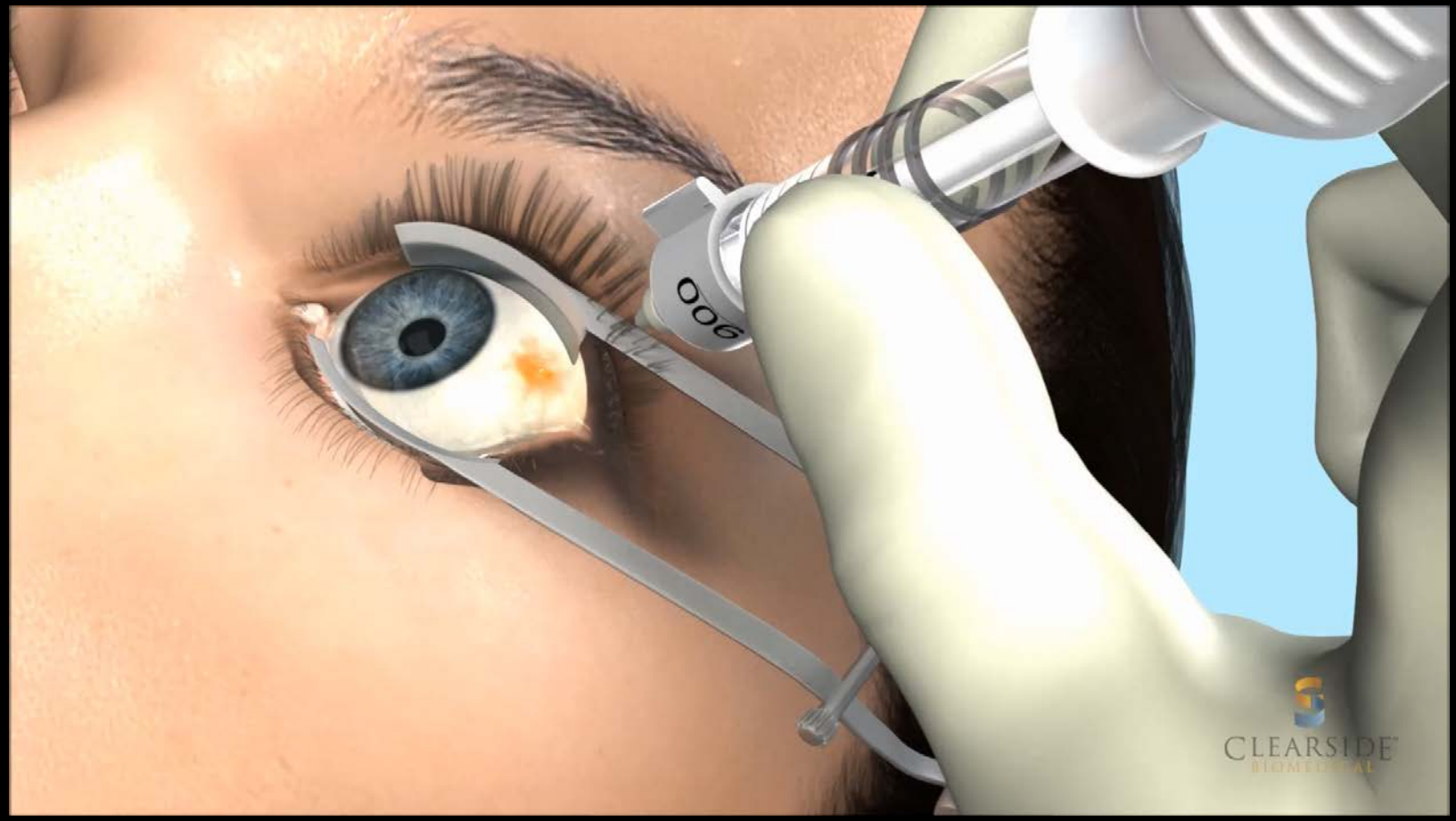
- Potentially useful approach for the treatment of ocular conditions affecting the posterior segment of the eye

- Novel technique
  - 30G needle (1000 micron in length)
  - Proprietary microinjector syringe

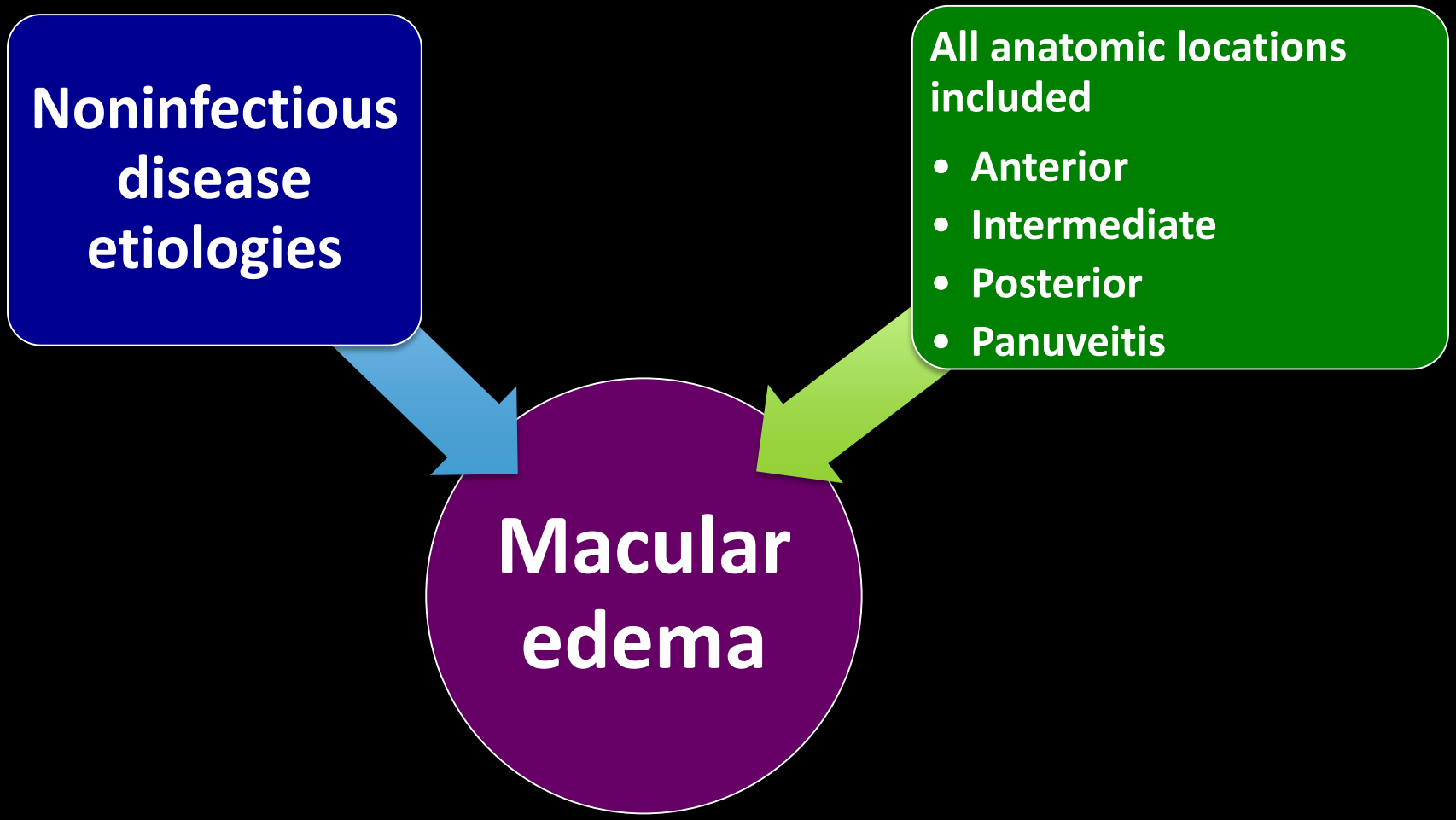
- Proposed benefits
  - High bio availability in target tissues[1]
  - Sparing anterior segment might result in fewer ocular side effects[2]
  - Potential for longer duration[2]

1. Gilger et al Invest Ophthalomol Vis Sci. 2013;54:173-178. Treatment of acute posterior uveitis in a porcine model by injection of triamcinolone acetonide into the suprachoroidal space using microneedles
2. Noronha G. Using suprachoroidal administration as an approach to treat noninfectious uveitis – from concept through clinical data. ISOPT 2015 Clinical Conference proceedings. Published March 2016

Novel Microinjector Provides Access Through the Suprachoroidal Space to the Choroid and Retina



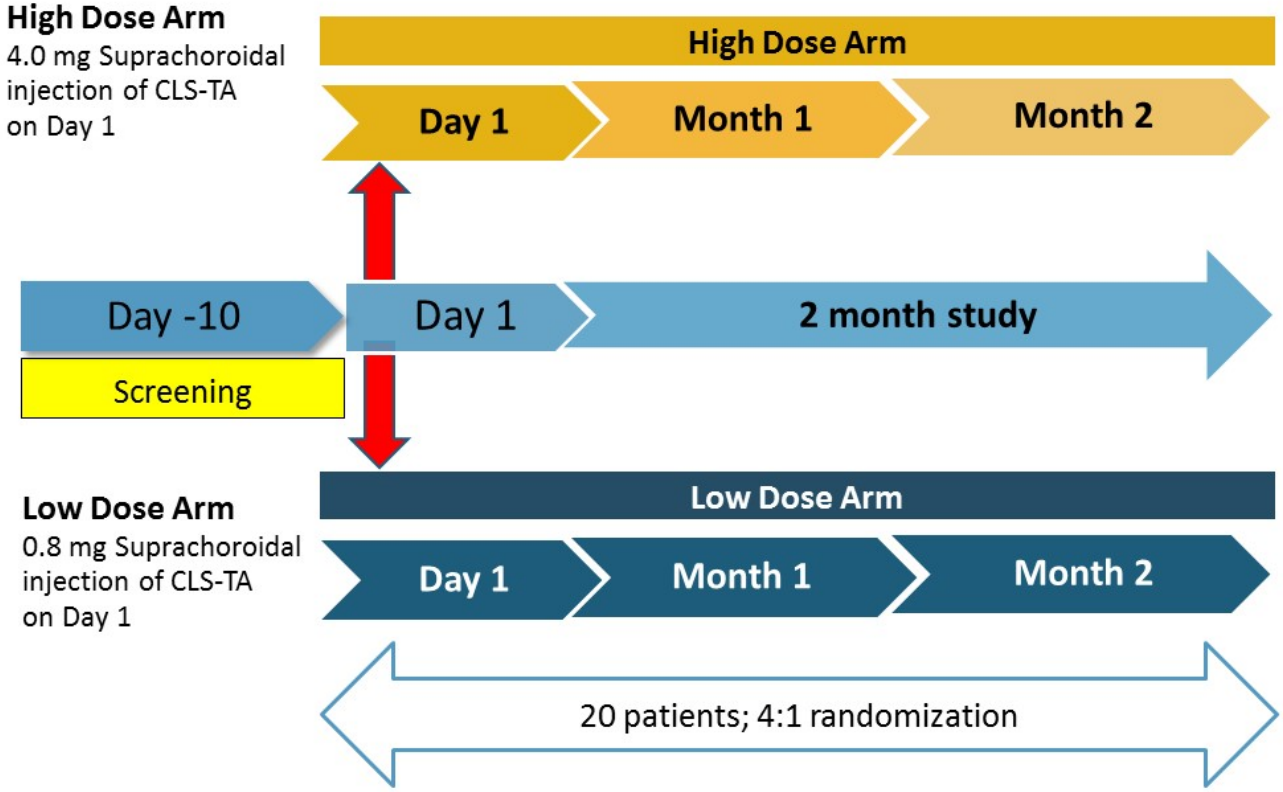
Phase 2 Clinical Study



Phase 2 Study Design

This study was powered only for the 4.0 mg dose

4.0 mg Suprachoroidal CLS-TA: 0.8 mg Suprachoroidal CLS-TA; 4:1



Primary Endpoint:
Mean change in central retinal thickness

Single suprachoroidal injection of triamcinolone to the study eye
Subjects were followed for 2 months

Phase 2 Study

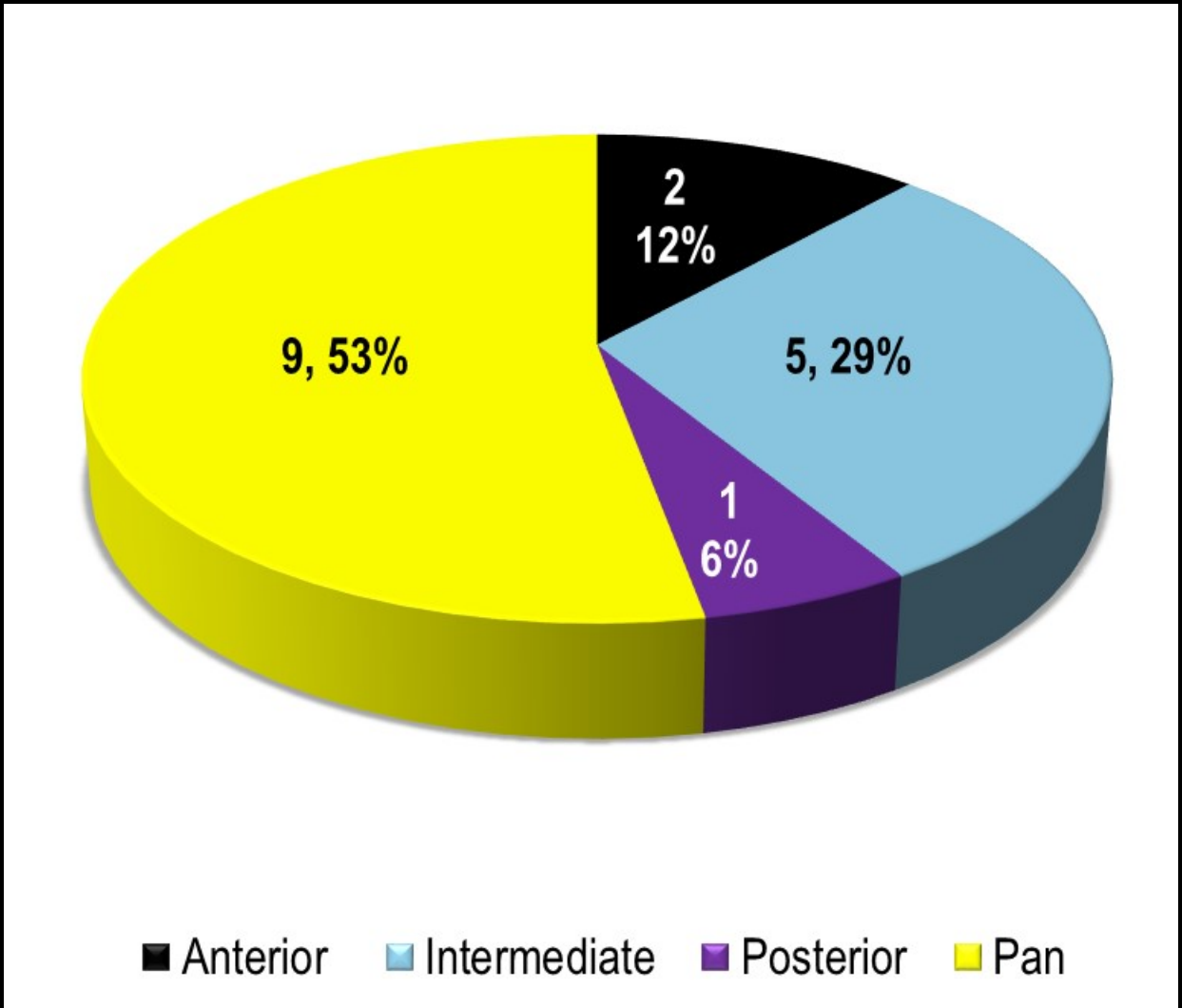
Protocol Design: Target 20 (16:4) subjects - Actually Randomized: 22 (17:5)

TOTAL NUMBER OF SUBJECTS	CLS-TA 4.0 mg N=17	CLS-TA 0.8 mg N=5	TOTAL
RANDOMIZED	**17**	**5**	**22**
COMPLETED	**17**	**5**	**22**
DISCONTINUED	**0**	**0**	**0**
SAFETY	**17**	**5**	**22**
INTENT-TO-TREAT	**17**	**5**	**22**

Study Demographics

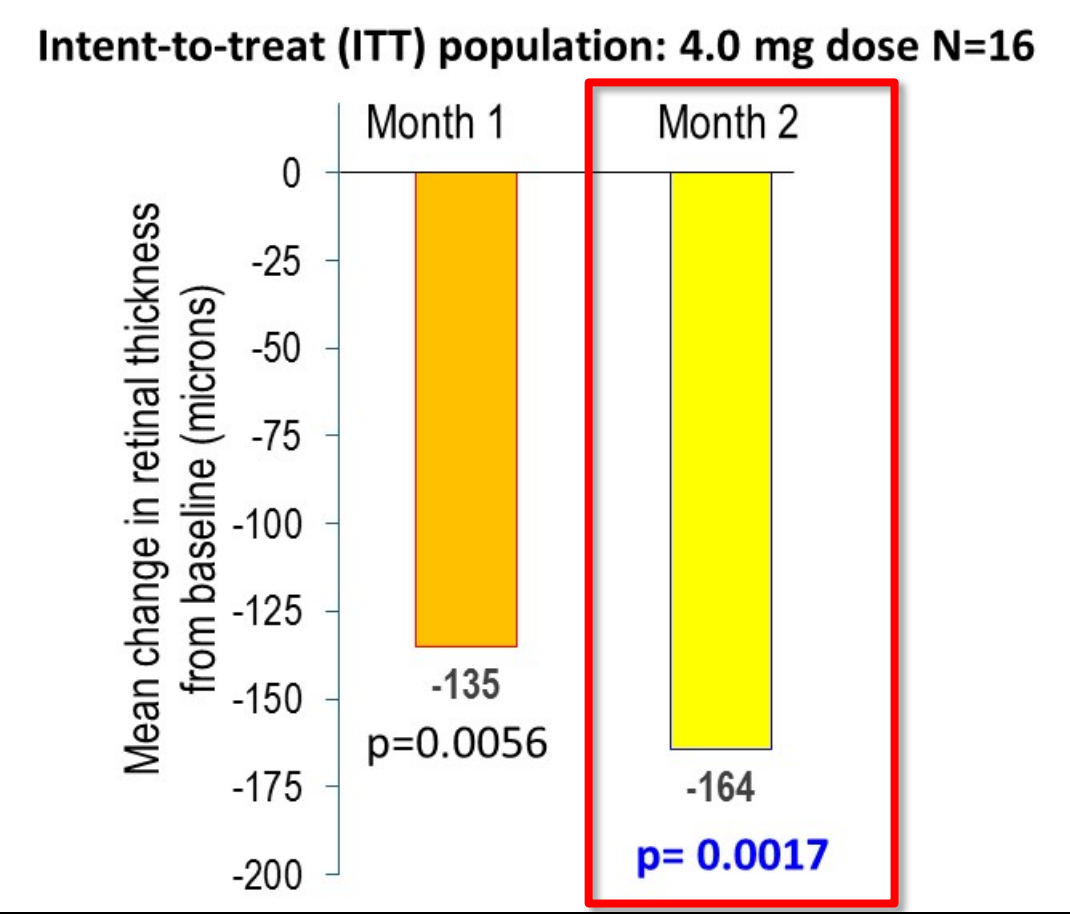
	CLS-TA 4.0 mg N=17	CLS-TA 0.8 mg N=5	TOTAL N=22
AGE (YEAR)			
MEAN	52.2	51.8	52.1
MEDIAN	50.0	53.0	53.0
MIN, MAX	20, 83	24, 69	20, 83
SEX n (%)			
MALE	9 (52.9)	1 (20.0)	10 (45.5)
FEMALE	8 (47.1)	4 (80.0)	12 (54.5)
RACE n (%)			
BLACK OR AFRICAN AMERICAN	2 (11.8)	2 (40.0)	4 (18.2)
WHITE	15 (88.2)	3 (60.0)	18 (81.8)

Geographic Location of Uveitis: 4.0 mg Triamcinolone Group



CLS1001-201 Table 16.2.4-2.3 16 Dec 2015

Primary Endpoint: Central Subfield Thickness



[1] CST is the central retinal thickness measured using optical coherence tomography (OCT)

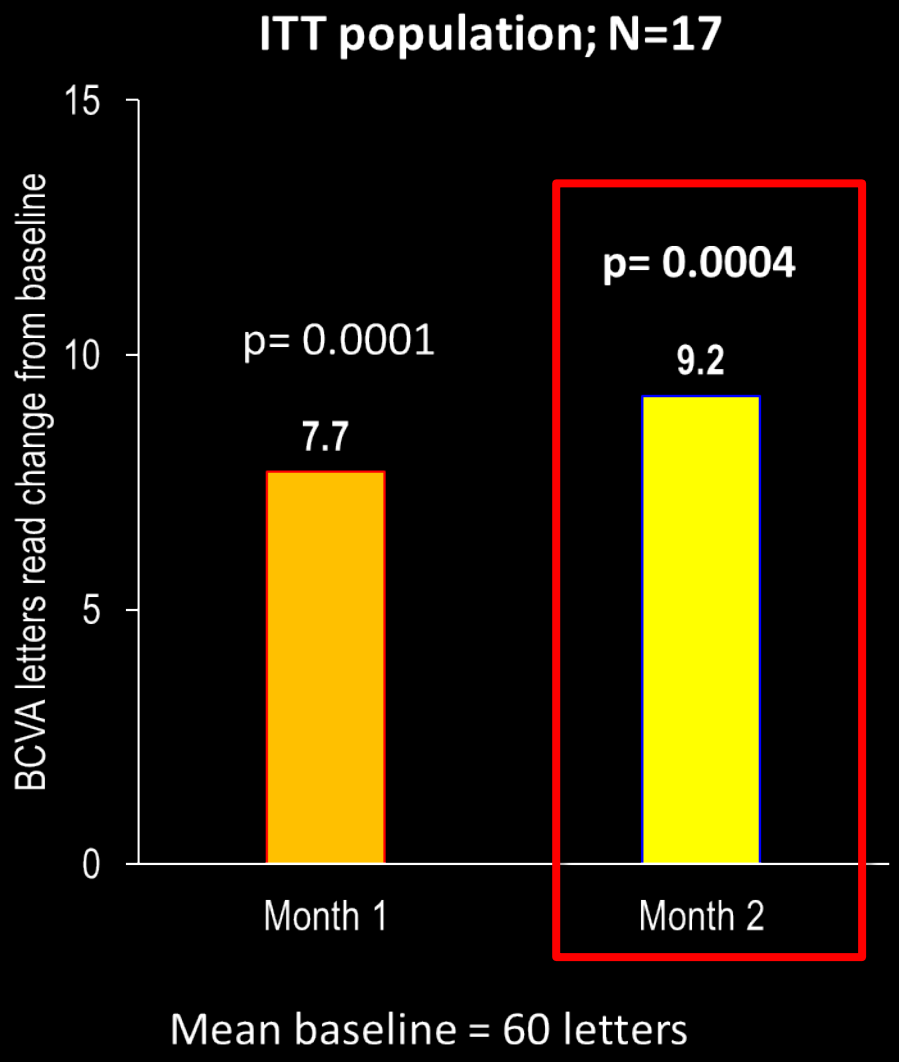
Mean baseline = 526 µm

Secondary End Points: Macular Edema Reduction

- Subjects with a ≥ 20% reduction in CST
- Subjects with CST <310 microns

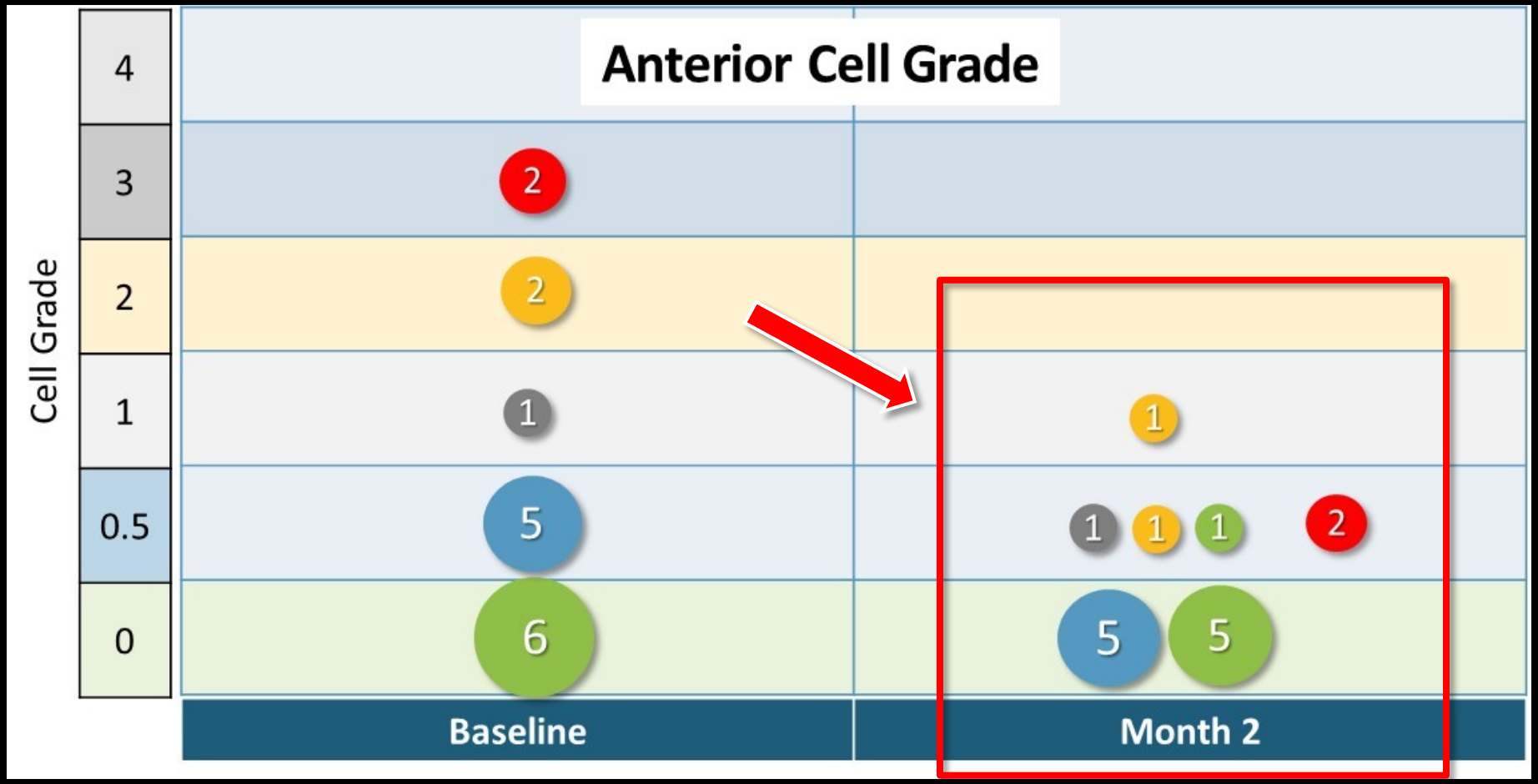
Visit	CST information	4.0 mg (N = 16)
Month 1	Subjects with ≥ 20% reduction in CST	9
	Subjects with CST <310 microns	9
Month 2	Subjects with ≥ 20% reduction in CST	11
	Subjects with CST <310 microns	9

Change in Best Corrected Visual Acuity Secondary Endpoint



Mean baseline = 60 letters

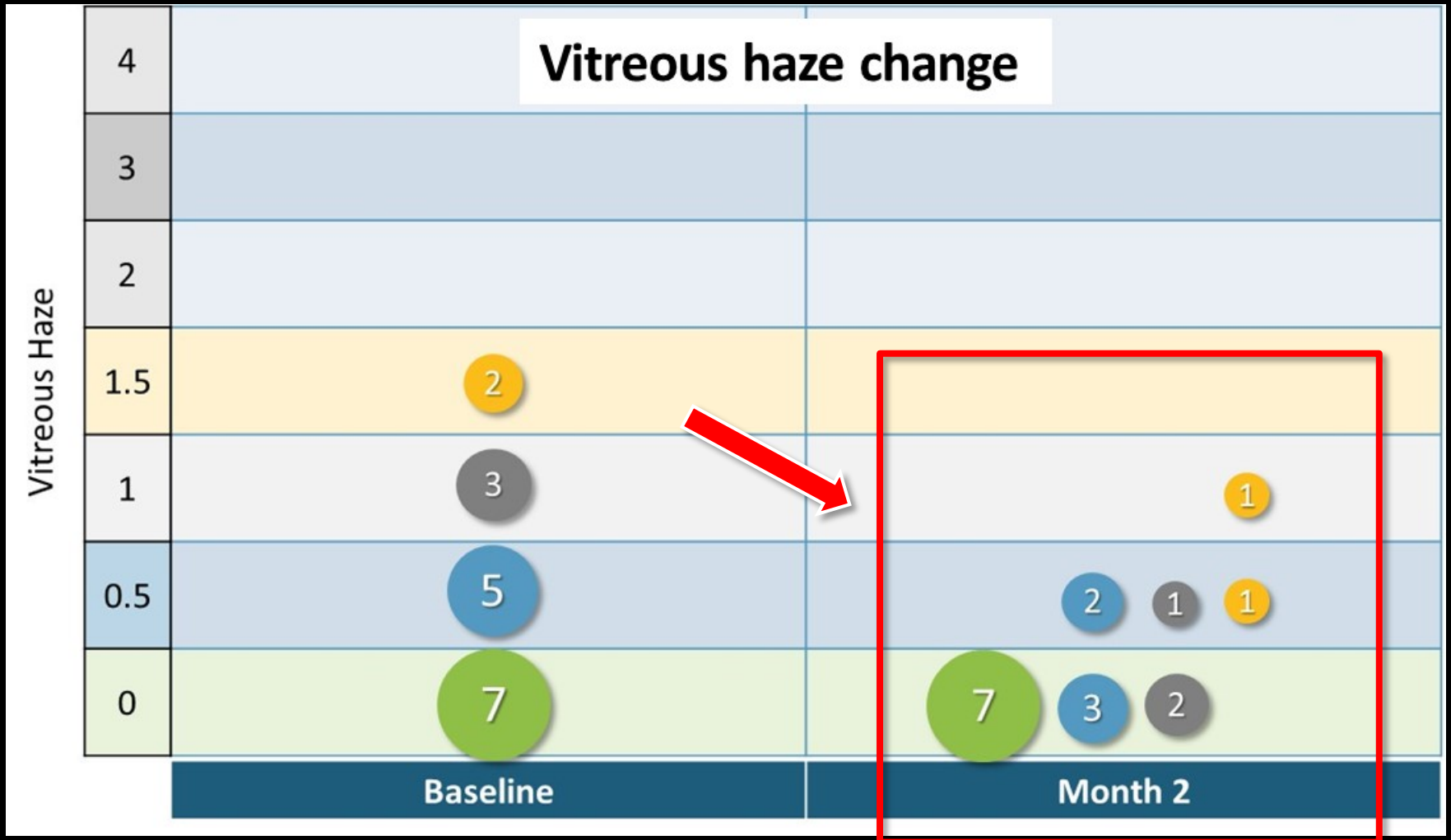
Anterior Cell Grade Change: Baseline to Month 2



Trend towards less ocular inflammation

Numbers indicate number of patients

Vitreous Haze Score Change: Baseline to Month 2



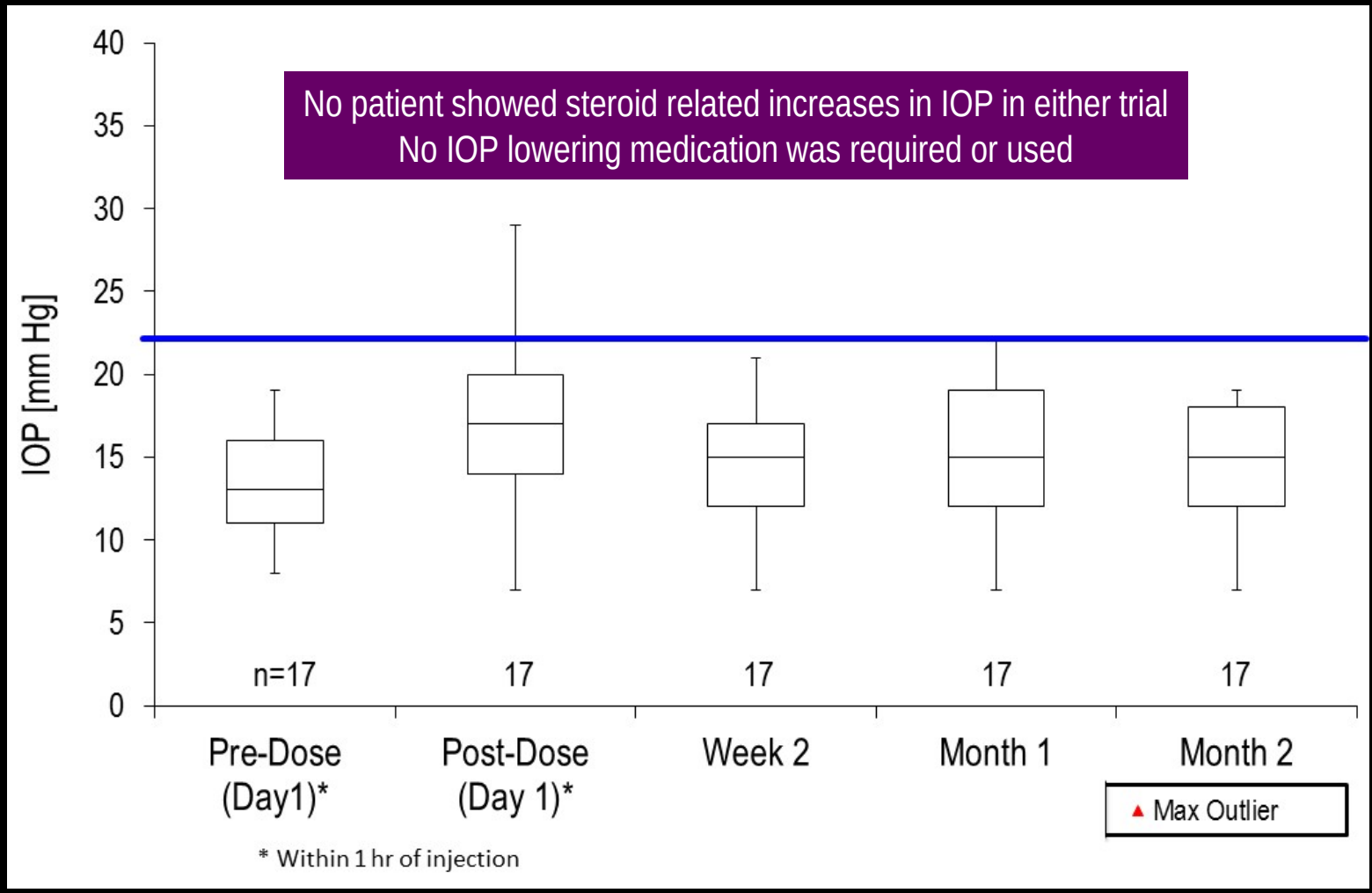
Trend towards less ocular inflammation

Numbers indicate number of patients

Safety

- 1 Serious systemic adverse event in the study: atrial fibrillation
  - Occurred in the 4.0 mg group
  - Not related to study treatment
- No adverse events (AEs) that led to discontinuation
- 4 subjects received additional treatment (2 on 4 mg, 2 on 0.8 mg)
- No serious ocular adverse events
- No corticosteroid related increases in intraocular pressure (IOP)

4 mg Triamcinolone: Intraocular Pressure Changes



Summary

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- Phase 3 clinical trial is ongoing

Acknowledgments

Phase 2 Study Investigators

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