



# 12 New Treatments in Eye Care

Mile Brujic, OD, FAO  
Premier Vision Group

## Disclosures

- I have received honoraria in the past 2 years for speaking, writing, participating in an advisory capacity, research or meeting support from: Apellis, ABB Optical, Alcon Laboratories, Aldeyra, Allergan, Art Optical, Avellino, Bausch + Lomb Health, Contamac, CooperVision, CSEye, Dompe, Horizon Therapeutics, Johnson & Johnson Vision Care, Kala, Lenstech, Notal Vision, Novartis, Oyster Point, Quidel, Radius XR, RVL, Sun Pharma, Tangible Science, Tarsus, Santen, Visus, Visionix, Walman Optical and Zea Vision.
- All relevant relationships have been mitigated



# #1- New Dry Eye Diagnostics


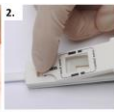


## InflammaDry

- Detects elevated levels of MMP-9 in tear fluid
- Rapid – 10 minute results
- Easy to use – can be performed by a nurse or technician
- In-office (point of care) test
- Low cost – no additional equipment required
- One time use – disposable
- Accurate – high sensitivity and specificity

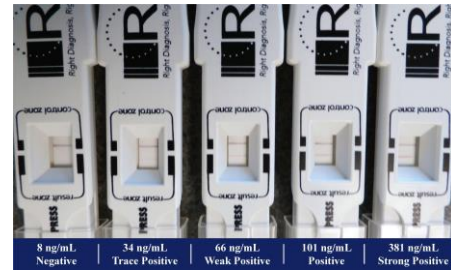
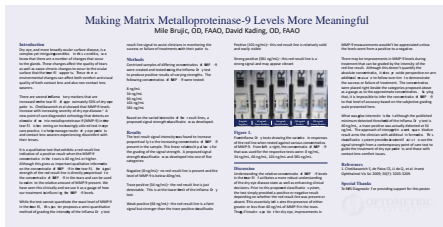


InflammaDry is CE Marked and commercially available in Europe. At this time InflammaDry is pending 510(k) review by FDA and is not commercially available in the U.S.

## How to Use InflammaDry: Four-step Process

-  1. Gently dab the Sample Collector in 6-8 locations on the palpebral conjunctiva (lower eyelid) to collect a tear sample. Do not use a dragging motion.
-  2. Snap the sample collector into the test cassette and press firmly where indicated.
-  3. Dip the test cassette into the provided buffer vial for 20 seconds. Replace the cap.
-  4. Read the results: 2 lines (1 red, 1 blue) = positive, 1 line (blue) = negative





Signal Strength →

### Osmolarity Digital Readout

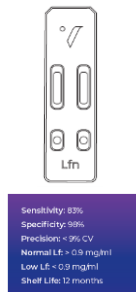


### Tear-Based Point-of-Care (T-POC) Quantitative Testing Platform

- Used to improve patient care in the areas of:
  - Dry eye disease (DED)
  - Ocular immunology,
  - Ocular allergy,
  - Ocular surgery, including LASIK
- With T-POC in your practice, patients can be diagnosed, treated, and monitored directly within your practice
  - Quantitative IgE and Lactoferrin results delivered within minutes
- Just a 1 microliter tear sample from each eye required
- Billable & reimbursable by Medicare and Private Insurance\*
  - CPT 83520 (Lactoferrin)
  - CPT 82785 (IgE)

### T-POC Lactoferrin Testing Is it Aqueous Deficient or Evaporative Disease?

- Benefits of testing Lactoferrin levels in the tear film:
  - Low Lactoferrin levels (<0.9 ug/ml) directly correlates to DED caused by aqueous deficiency
  - Severity of DED can be determined by the Lactoferrin level
  - Low Lactoferrin levels indicate DED and depressed ocular immunity, which may represent an increased surgical risk
  - Low Lactoferrin levels may indicate the cause of contact lens intolerance
  - Changes in Lactoferrin levels may show the efficacy of the prescribed treatment
  - Dry eye is a relative contraindication for LASIK and other surgical procedures



### T-POC IgE Testing: Is There An Allergic Component?

- Benefits of testing IgE levels in the tear film:
  - Presence of IgE indicates the diagnosis of allergic conjunctivitis
  - Levels of IgE increase with the severity of the allergic response
  - IgE testing can help differentiate allergic conjunctivitis from DED
  - Changes in IgE levels may show the efficacy of prescribed treatment
- IgE value is < 80 ng/mL (33 kIU), there is a 95.7% probability that the patient does not have an ocular allergy
- IgE value is > 80 ng/mL, there is a 92.9% probability that this elevated IgE is indicative of an ocular allergy



Tear-Based POC Quantitative Testing

- 1 Rapid
- 2 Repeatable
- 3 Reproducible
- 4 Reimbursable



**No AMD**  
 -No drusen or <10 small drusen (<63um) without pigment abnormalities

**Early AMD**  
 -Approximately >9 small drusen or <15 intermediate drusen (63-124um) or pigment abnormalities associated with AMD

**Intermediate AMD**  
 -Approximately >14 intermediate drusen or any large drusen (>124um)

**Advanced AMD**  
 -Geographic atrophy with involvement of the macular center or non-central GA atleast 350um in size

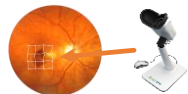
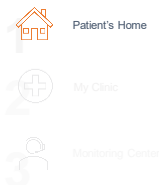
ForeseeHome

Uses Preferential Hyperacuity Perimetry (PHP)



Proven efficacy with level 1 evidence

Real-World Remote Patient Monitoring Model  
**Preferential Hyperacuity Perimetry** test for detecting visual abnormalities



**Preferential Hyperacuity Perimetry (PHP)** identifies visual distortions caused by, but not limited to, conversion from dry to wet AMD

ForeseeHome (Notal Vision) uses PHP test on a home-based device performed by the patient



**SYFOVRE** (pegcetacoplan injection) **APPROVED ON FEB 17, 2023**

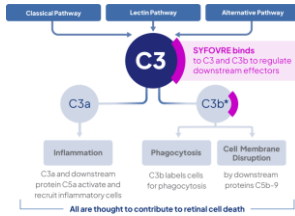
**INDICATION:** SYFOVRE™ (pegcetacoplan injection) is indicated for the treatment of geographic atrophy (GA) secondary to age-related macular degeneration (AMD).

**DID YOU KNOW?**

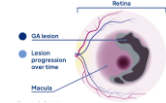
- ~1M people are affected by GA in the US
- Vision loss from GA can occur before lesions reach the fovea
- The median time to foveal encroachment in GA patients was just 2.5 years

**INTRAVITREAL INJECTION** given monthly or every other month (EoM); Based upon doctor's discretion

Mechanism of Action:  
Targeting C3 within the Complement Cascade



RESULTS:  
Monthly and EoM



Trial 1	Trial 2
After 2 years, compared to those who did not receive SYFOVRE, SYFOVRE slowed lesion growth by	After 2 years, compared to those who did not receive SYFOVRE, SYFOVRE slowed lesion growth by
▼ 22% when taken monthly (n=202)	▼ 18% when taken monthly (n=203)
▼ 18% when taken every other month (n=205)	▼ 17% when taken every other month (n=201)



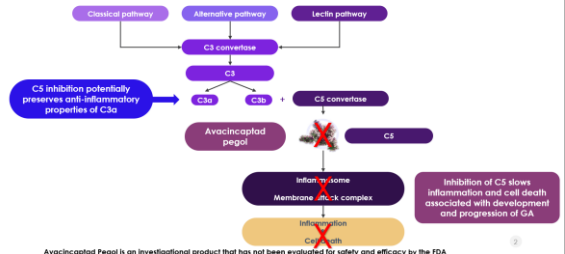
The Efficacy of Avacincaptad Pegol in Geographic Atrophy: GATHER1 and GATHER2 Results

Ashraf M Khanani, MD, MA<sup>1</sup>; Sunil S Patel, MD, PhD<sup>2</sup>; Giovanni Staurenghi, MD<sup>3</sup>; Ramin Tadayoni, MD, PhD<sup>4</sup>; Carl J Danzig, MD<sup>5</sup>; David R Lally, MD<sup>6</sup>; Anat Loewenstein, MD<sup>7</sup>; David S Boyer, MD<sup>8</sup>; Carl D Regillo, MD<sup>9</sup>; Tien P Wong, MD<sup>10</sup>; Glenn J Jaffe, MD<sup>11</sup>; Justin Tang, PhD<sup>12</sup>; Liansheng Zhu, PhD<sup>13</sup>; Hersh Patel, OD<sup>14</sup>; Julie Clark, MD<sup>15</sup>

<sup>1</sup>Glenn Eye Associates, Reno, NV, USA; <sup>2</sup>University of Nevada, Reno School of Medicine, Reno, NV, USA; <sup>3</sup>Retinal Veinoclinic Consultants, Atlanta, GA, USA; <sup>4</sup>Eye Clinic, Department of Biomedical and Clinical Sciences, Temple University, University of Medicine and Dentistry, Ophthalmology Department, A&P, Medical Citywide, Park, Fort-Lauderdale Eye Institute, Davieville Beach, FL, USA; <sup>5</sup>Florida Atlantic University, Charles E. Schmidt School of Medicine, Boca Raton, FL, USA; <sup>6</sup>West England Retinal Consultants, Bangor, MA, USA; <sup>7</sup>Division of Ophthalmology, Retina and Cornea Medical Center, Retina University, Salt Lake County, Retina Medical Associates Medical Group, Los Angeles, CA, USA; <sup>8</sup>Webb Eye Hospital, Philadelphia, PA, USA; <sup>9</sup>Retina Consultants of America, Danbury Eye Institute, Inouer Medical Hospital, Houston, TX, USA; <sup>10</sup>Department of Ophthalmology, Duke University, Durham, NC, USA; <sup>11</sup>Westcoast Retina, Mississippi, NJ, USA; <sup>12</sup>The Retinal Society 20th Annual Scientific Meeting, Pasadena, CA; <sup>13</sup>November 3-8, 2022

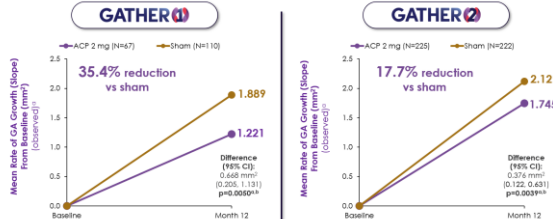
MED-2200207  
Avacincaptad Pegol is an investigational product that has not been evaluated for safety and efficacy by the FDA.  
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Avacincaptad pegol is a pegylated RNA aptamer designed to be a specific inhibitor of complement C5



Avacincaptad Pegol is an investigational product that has not been evaluated for safety and efficacy by the FDA.

Mean rate of observed GA growth (slope analysis) demonstrated consistent efficacy results between the two studies



Note: The primary analysis for GATHER1 (mean change in square root transformed GA area from baseline to month 12 [mm²]) is consistent with the slope analysis utilizing observed data. The estimates for the GATHER1 ACP 2 mg group is shown on the mainline model, drawing on all available data, including data from groups with different randomization ratios in Part 1 and Part 2 of the trial, and drawing on all available data, including observed data, mean square root transformed (square root of GA area) and observed data. Data on the 1:100 ratio.

Avacincaptad Pegol is an investigational product that has not been evaluated for safety and efficacy by the FDA.

Avacincaptad pegol (IZERVAY) is approved for the treatment of geographic atrophy secondary to age-related macular



- Efficacy and safety of IZERVAY were evaluated in 2 phase 3, randomized, multi-center, doublemasked, sham-controlled clinical trials
- Izervay safety profile was consistent, with a high rate of patient retention
- Izervay demonstrated significant reductions in ga growth in just 12 months

IZERVAY™ (avacincaptad pegol intravitreal solution) Prescribing Information, IVERV Inc., Parsippany, NJ 07054

## New Data on Zeaxanthin

Original Article  
 Published: 10/13/2023  
 ORIGINAL RESEARCH

### Prevention Surpasses Treatment: 5-year Follow-Up, Cost-Utility, and Cost-Benefit of Zeaxanthin Therapy for Neovascular Age-Related Macular Degeneration

Gary C. Brown, Melissa M. Brown, Dennis Gierhart, & Joseph G. J. J. J.

Received March 20, 2023 / Accepted May 22, 2023  
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#### ABSTRACT

**Introduction:** Oral administration of mesoribine (Zx) 20 mg daily in patients with unilateral neovascular age-related macular degeneration (nAMD) treated with triple therapy (photodynamic therapy/intravitreal bevacizumab/intravitreal

desamethasone) reduced follow-eye 2-year nAMD incidence from 23 to 6% ( $p = 0.02$ ) in a prior clinical trial. We questioned the long-term benefit and thus analyzed case-control 5-year patient data of trial participants and additional participants with 5-year follow-up, also performing cost-utility and cost-benefit analysis. **Methods:** Consecutive, unilateral nAMD

-Group randomized to 20mg of Zeaxanthin (ZX) per day + AREDS 2 vs just AREDS 2  
 -Patients developing nAMD in the non-affected eye in that time period  
 -22% of ZX  
 -48% of non-ZX



#3 - New IOP, VF and MPOD devices

## iCare HOME2 and HOME Available measurement positions

The new iCare HOME2 enables measurement freedom.

### iCare HOME2

- Measurements are possible in sitting, reclined and supine positions

### iCare HOME

- Measurements are possible in sitting position only



## iCare HOME2 and HOME Measurement guidance before the measurement

### iCare HOME2

- Smart light guide enables active positioning guidance for the patient. The light rings help find the correct measurement distance.
- Solid red light means the device is not level and cannot take a measurement
  - Visible blue light ring indicates that the probe is too far from the eye
  - When the patient sees a symmetrical green light ring, the device is positioned in correct angle



### iCare HOME

- Probe base light to help level the tonometer
- Solid red light means the device is not level and cannot take a measurement
  - When the patient sees a symmetrical green light ring, the device is level and centered



## iCare HOME2 and HOME Taking measurements

### iCare HOME2

- Patient is self-taught or has minimal assistance from technician on proper use of device
- A successful measurement is indicated with a check mark, shown on the display screen and single long beep
- A measurement sequence consists of six measurements
- Take the measurement sequence by
  - pressing Measure button 6 individual times or
  - pressing and holding the Measure button down

### iCare HOME

- A technician instructs patient on proper use of device
- A successful measurement is indicated with a small check mark and single long beep
- A measurement sequence consists of six measurements
- Take the measurement sequence by
  - pressing Measure button 6 individual times or
  - pressing and holding the Measure button down



## Wearable Devices for VF Radiusxr Olleyes Heru M&S Technologies



Hand Held  
MPOD



## Study on Effect of Nutrition on Computer Symptoms

- 360 participants
- Randomized to 4 groups that utilized 1 of four nutritional formulations for 90 days
- Measurements were taken at baseline, 45 days later and 90 days later
  - 1 - Placebo
  - 2 - 6 mg Lutein, 1.2mg Zeaxanthin, 75mg chrysanthemum extract, 75mg goji berry extract, 100mg black current extract
  - 3 - 10 mg Lutein, 2 mg Zeaxanthin, 125mg chrysanthemum extract, 125mg goji berry extract, 167mg black current extract
  - 4 - 14 mg Lutein, 2.8 mg Zeaxanthin, 175mg chrysanthemum extract, 175mg goji berry extract, 233mg black current extract

## Results

- 1 - Improved eye fatigue symptoms
- 2 - Improved visuognosis persistence
- 3 - Improved Schirmer test
- 4 - Improved macular pigment optical density (MPOD)

## 2. Improved visuognosis persistence

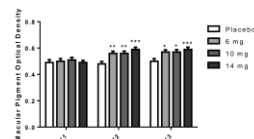
- Subject stares at an object for 3 minutes
- As subject stares at object, it will at some point blur
- The percentage “clear vision” time of the total gaze time is called visuognosis persistence, which is an index that reflects both visual and psychological functions
- After staring at the cubes for a while, the subjects would see inverted cubes, which was defined as “unclear vision.”
- $\text{Visuognosis persistence} = (\text{clear vision time} / \text{total time of gaze}) \times 100\%$
- All formulas improved visuognosis persistence

## 3. Improved Schirmer test

- Unanesthetized measurement over 5 minutes for each eye
- Measured the number of patients in each group with  $>9\text{mm}$
- The highest concentration nutrition test groups showed significant improvement after 90 days over placebo

## 4. Improved Macular Pigment Optical Density (MPOD)

- All baseline measurements for all groups were identical
- All treatment groups demonstrated significant increase in MPOD over placebo at second visit (45 days after beginning nutrition)







# Quality of Life

Acta Ophthalmologica

Review Article  
**Review of the impact of presbyopia on quality of life in the developing and developed world**  
 Ariana D. Goerzi,<sup>1</sup> William C. Stewart,<sup>1</sup> William R. Burns,<sup>2</sup> Jeanette A. Stewart<sup>1</sup> and Lindsay A. Nelson<sup>2</sup>

**ABSTRACT**  
 Purpose: To examine the public health impact of presbyopia regarding its effect on quality of life (QoL) and review its effect in the developed and developing worlds. Methods: A database was created from articles based on PubMed, the Cochrane Library and Science Direct using the following search terms: presbyopia, QoL, accommodation, depth of field, presbyopia, treatment and public health. Articles were screened for the inclusion of the following parameters: age, gender, location, ethnicity, 2010. Evidence recently developed presbyopia has implications for QoL. The major aim of this review is to explore the current state of the field in other areas including disease burden and medication. American Ophthalmic Association

Goerzi AD, Stewart WC, Burns WR, Stewart JA, Nelson LA. Review of the impact of presbyopia on quality of life in the developing and developed world. Acta Ophthalmol. 2014;56(2):160-169.

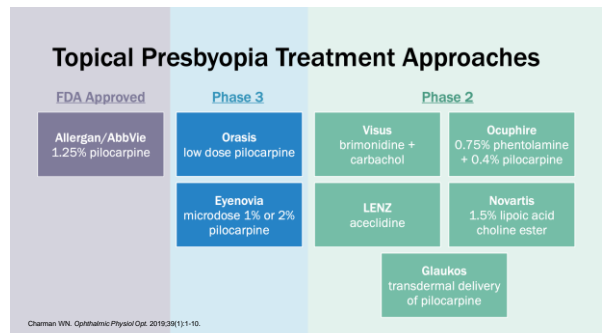
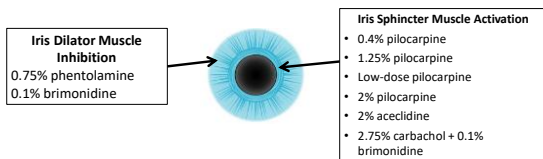
## Current Treatments (Non-surgical)

- Glasses
  - Reading glasses
    - Advantages – low cost, easily accessible, convenient
    - Disadvantages – inconvenient, are dependent on them
  - Bifocals
    - Advantages – have correction on all the time (both distance and near)
    - Disadvantages – sometimes current environment isn't conducive to this design; cosmetic component
  - Progressive addition glasses
    - Advantages – have correction on all the time (both distance and near)
    - Disadvantages - sometimes current environment isn't conducive to this design

## Current Treatments (Non-surgical)

- Contact Lenses
  - Single Vision Distance
    - Advantages – provides visual freedom from spectacles
    - Disadvantages – need optical correction for near vision
  - Monovision
    - Advantages - provides visual freedom from spectacles
    - Disadvantages – some visual compromise
  - Multifocals
    - Advantages - provides visual freedom from spectacles
    - Disadvantages – some cannot adapt to multifocal optics

## MOAs of Different Miotics In Development For Presbyopia







## Ocular Surface Inflammation

- Commercially available as Restasis
- 0.05% concentration
- Preservative free
  - Single vials
  - Multi-dose bottle
    - Patented non-preserved system that maintains its sterility
- Is an immunosuppressive agent
- Available as generic

### Restasis (Cyclosporine 0.05%)



### Cyclosporine 0.09%

- Commercially available as Cequa
- Unit dose vials
- Unique delivery mechanism
- N-cell technology

### Klarity-C Drops PF

- 0.1% cyclosporine
- Preservative free
- Imprimis Rx
- 5.5mL multidose bottle



### Verkazia

- 0.1% cyclosporine
- Approved for vernal keratoconjunctivitis
- Dosed four times/day



## Cyclosporine 0.1%

- Novaliq
- VEVEE
- FDA approved for the signs and symptoms of dry eye
- Water free

## Ocular Surface Inflammation

- Intercellular adhesion molecule-1 (ICAM-1) is found on surface cells of the conjunctiva and cornea
- ICAM-1 is overexpressed in dry eye disease
- LFA-1 and ICAM-1 binding is believed to be propagate inflammatory cascade on the ocular surface
  - Is believed to do so by T-cell activation and migration to target tissues

## Ocular Surface Inflammation

- Lifitegrast applied topically is believed to prevent the interaction between LFA-1 on T-cells and ICAM-1 on the ocular surface
- Has been shown to improve both signs and symptoms of dry eye within a 12 week time period
- Commercially available as Xiidra
  - 5% concentration
  - non-preserved sterile unit dose vials
- It is a lymphocyte functioning antigen-1 (LFA-1) antagonist

## Tyrvaya



## RASP Inhibitors

- [www.aldeyra.com](http://www.aldeyra.com)
- Aldehyde is a product of metabolism
- Normally rapidly broken down
- With inflammation, is produced in quantities that are difficult to breakdown efficiently
- RASP – Reactive aldehyde species
- Reproxalap – Is a RASP inhibitor



# Effectiveness of a Singular Ocular Rinse via Irrigating Eyelid Retractor to Reduce MMP-9 in Patients with Dry Eye Disease

Nandini Venkateswaran, MD ABO  
Natasha Mayer, BSc

ASCRS 2023

San Diego, California

## Objective

Eye rinsing has been an effective method to reduce Matrix Metalloproteinase-9 (MMP-9), a hallmark of surface inflammation

A **single** ocular rinse assisted via **irrigating eyelid retractor** effect on MMP-9

## Irrigating Eyelid Retractor

Fixed to a syringe, the retractor has 5 ports which aim fluid at the palpebral conjunctiva, bulbar conjunctiva and conjunctival fornix.



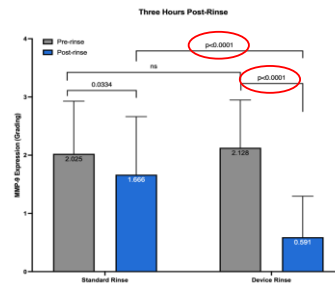
### scientific reports

**OPEN** Assessment of reliability and validity of the 5-scale grading system of the point-of-care immunoassay for tear matrix metalloproteinase-9

Standard photographs	Control zone	Control zone	Control zone	Control zone	Control zone
Interpretation	Negative	Trace	Weak positive	Positive	Strong positive
Grade	0	1	2	3	4

Figure 4. Standard photographs for 5-scale grades ranged from 0 to 4 along to the color density of the red band in the readout window of the point-of-care matrix metalloproteinase (MMP)-9 immunoassay.

## Results—Primary Endpoint



Paired t-test: decreased MMP-9 expression in both standard and device groups with greater attenuation in the device rinse group.

Two-way ANOVA: decreased MMP-9 expression in device group compared to standard (p<0.0001).

Conclusion

A novel irrigating eyelid retractor rinse of the ocular surface statistically reduces MMP-9 levels compared to baseline and is superior to a standard eye rinse.

Use of an irrigating eyelid retractor may be a therapeutic avenue for those patients with dry eye disease.

Further work on the durability of these findings is ongoing.



No AMD  
 -No drusen or <10 small drusen (<63um) without pigment abnormalities

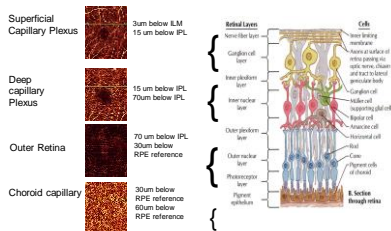
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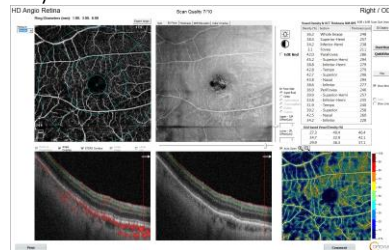
Advanced AMD  
 -Geographic atrophy with involvement of the macular center or non-central GA atleast 350um in size



Visualize Retinal Vasculature

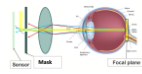


Unhealthy Diabetic





### TrueColor Confocality



Confocal systems employ a very thin beam of light to scan the retina, and a mask that blocks the light reflected by layers that are far from the focal plane.



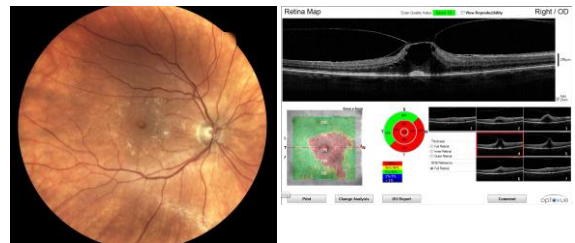
Differently from other Confocal systems that use monochromatic lasers, EIDON uses white LED illumination, thus providing TrueColor images.



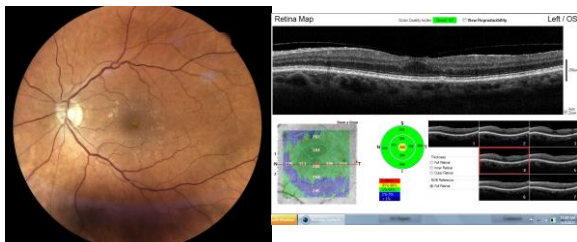
### New Standards for Detecting Change



### Macular findings



### Macular findings



**PERCEPT MiWear®**

MiWear is a unique **migraine therapy** that uses special lens filters in eyewear that only allows a very **narrow band of green light**. nbGL has been shown in research to provide **therapeutic effects** for the migraine sufferer. This is important because migraine can be debilitating and MiWear may improve their quality of life by allowing these sufferers to continue in their daily activities.

**Severe Headache & Migraine Sufferers: Breakthrough**  
*Burstein et al*


**BRAIN**  
*Journal of Neuroscience*

**Migraine photophobia originating in cone-driven retinal pathways**

Rodrigo Nisenda,<sup>1,2</sup> Carolyn A. Burstein,<sup>1,2</sup> Alicja J. Lee,<sup>4</sup> Anne S. Falzon,<sup>1,2</sup> Suzanne M. Bertisch,<sup>1,4</sup> Alexandra Horowitz,<sup>1,2</sup> Dean M. Cestari,<sup>2,4</sup> Rodrigo Saavedra-Walker,<sup>1</sup> David Borsook,<sup>1,2</sup> Bruce L. Doran,<sup>1,4</sup> Catherine Buettner<sup>1,4</sup> and Rami Burstein<sup>1,2</sup>

Migraine headaches is uniquely exacerbated by light. Using psychophysical assessments in patients with normal vision we found that green light exacerbates migraine headaches significantly less than white, blue, amber or red light. In addition, we used electroretinography and visual evoked potential recording in patients, and multi-unit recording of cone- and light-sensitive thalamic neurons in mice to show that green activates cone-driven retinal pathways to a lesser extent than white, blue and red, that thalamic neurons are more responsive to blue and least responsive to green, and that cortical responses to green are significantly smaller than those generated by blue, amber and red light. These findings suggest that patients' experiences with colour and migraine photophobia could originate in cone-driven retinal pathways, but travel to thalamic neurons outside the main visual pathway, and processed by the cortex. Additionally, the findings provide substrate for the soothing effects of **PERCEPT MiWear**.

**PERCEPT MiWear®**



- Migraine
- Estimated annual costs of \$17 billion (U.S.)
- Affects more than 40 million people (U.S.)
- Opportunity to help migraine sufferers live and function without optical noise

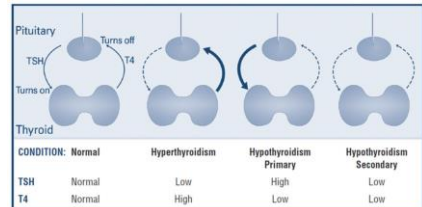
**#10 - New Thyroid Eye Disease Treatment**



**Thyroid Function**

- TSH is produced by pituitary gland
- Thyroid Gland Produces T4 which is converted to T3
- Alterations in hormonal balance can cause problems to arise

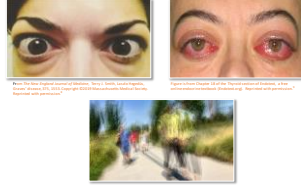
**Thyroid Gland Function**



<https://www.thyroid.org/thyroid-function-tests/>

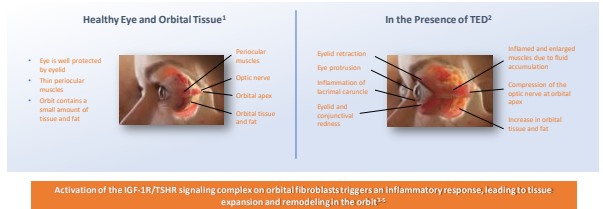
# TED Is a Debilitating, Progressive, and Vision-threatening Autoimmune Disease

- Patients may experience<sup>1,7</sup>:
  - Poor ophthalmic clinical outcomes
  - Disfigurement
  - Vision-threatening complications
  - Psychosocial distress
  - Restrictions in daily activities and ability to work



1. Hughes MD, et al. Thyroid Eye Disease. 2015. Reprinted with permission. 85

# Inflammation, Tissue Expansion, and Eye Muscle Changes May Lead to the Clinical Manifestations of TED



1. Hughes MD, et al. Thyroid Eye Disease. 2015. Reprinted with permission. 86

# Recognizing the Signs and Symptoms of TED

**Eyelid<sup>1-3</sup>**

- Upper eyelid retraction. 91% of patients affected
- Eyelid swelling
- Pain
- Lagophthalmos (incomplete closure of eyelid)

**Orbital Tissue<sup>1,3,4</sup>**

- Exophthalmos (proptosis). Occurs in 62% of patients
- Pain/deep ache
- Disfigurement

1. Hughes MD, et al. Thyroid Eye Disease. 2015. Reprinted with permission. 87

# Ongoing Inflammation and Expansion of Orbital Tissues Leads to Changes in Physical Appearance

**Conjunctiva and Cornea<sup>1-3</sup>**

- Chemosis (swelling of the conjunctiva)
- Conjunctival hyperemia (redness)
- Photophobia (light sensitivity)
- Pain
- Foreign body sensation (gritiness)
- Exposure keratopathy
- Swollen lacrimal caruncle
- Dry eye and tearing

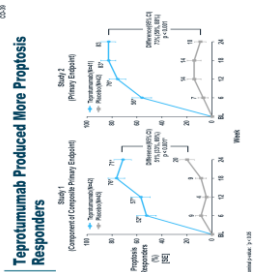
**Extraocular Muscle<sup>1,5</sup>**

- Restricted ocular motility. Occurs in ~40% of patients
- Strabismus (misalignment of eye)
- Diplopia (double vision)
- Pain
- Retro-orbital ache
- Decreased vision and depth perception

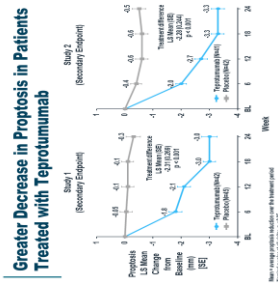
1. Hughes MD, et al. Thyroid Eye Disease. 2015. Reprinted with permission. 88

# Treatment – Teprotumumab (Tepessa)

8 infusions - Treat

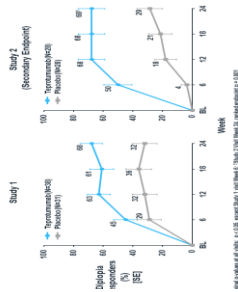


# Treatment – T<sub>0</sub>ED



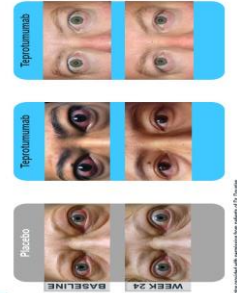
Treatment – <sup>COE</sup>

**Teprotumab Improved Diplopia**



Treatment – <sup>COE</sup>

**Examples of Patients in Clinical Program**

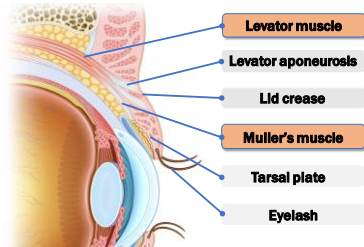


GlobalNewsWire

**Osmotica Pharmaceuticals plc Receives FDA Approval for Upneeq™ (oxymetazoline hydrochloride ophthalmic solution), 0.1% for Acquired Blepharoptosis (Droopy Eyelid) in Adults**

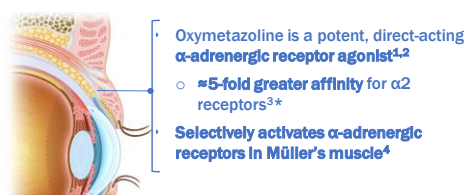
July 19, 2023 09:01 ET | Boston, Osotica Holdings US LLC

**Lid Anatomy: Two Muscles Lift the Eyelid**



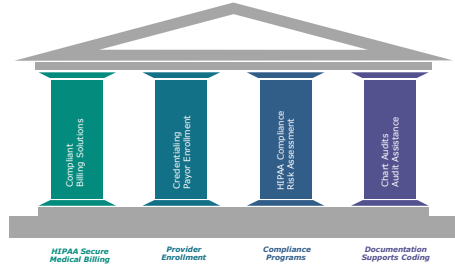
Frederick et al. Arch Plast Surg 2003; 27:193-204.

**Oxymetazoline Acts at Müller's Muscle to Lift the Upper Eyelid**



\*Receptor binding affinity is defined via in vitro binding assays  
 1. Havelich R, et al. Fundam Clin Pharmacol. 2010;24(6):729-733. 2. Suggen D, et al. Br J Pharmacol. 1996;118(5):1240-1252. 3. Neuman LO, et al. Clin Ocul. 2021;12:29-35. 4. Upneeq™ (oxymetazoline hydrochloride ophthalmic solution), 0.1% (Prescribing Information). PRA Pharmaceuticals, Inc. 2020.





### HOW IT WORKS



## Cost Effective Staffing

For Optometry

What Can We Do?

- Inbound Calls
- Outbound Calls
- Insurance Verification

