

# Getting the Eye Ready for Specialty Lens Success




Getting the Eye Ready  
for Specialty Lens Success

**Paul M. Karpecki, OD, FAAO**

Director, Cornea & External Disease, Kentucky Eye Institute and Carmel IN Center for Sight

Associate Professor, UPIke Kentucky College of Optometry

Medical Director, KEPLR Vision



## Dry Eye Disease

- 42% of patients complain of symptoms that would indicate DED (60-80M people)
- 30-50 Million in the North America based on longitudinal studies
- 16 Million diagnosed with DED
- About 42% of all eye exams have a primary or secondary complaint that would indicate DED

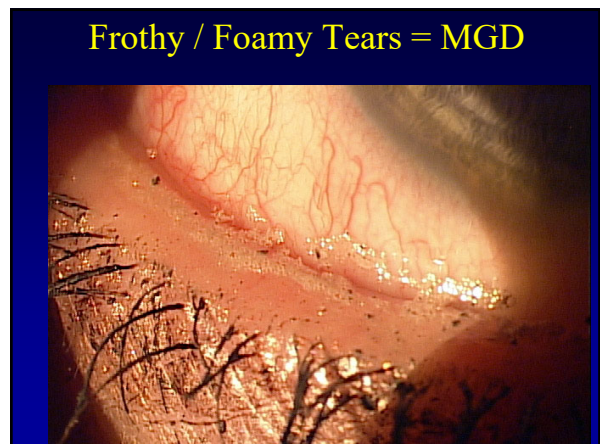
## Lacrimal Functional Unit (LFU)

- Tear film
- Lacrimal glands
- Corneal and conjunctival epithelia
- Meibomian glands
- Homeostasis controlled by nerve connections and systemic hormones

Barabino S et al. Prog Retin Eye Res. May 2012

## Begin with the Lid in Mind

6

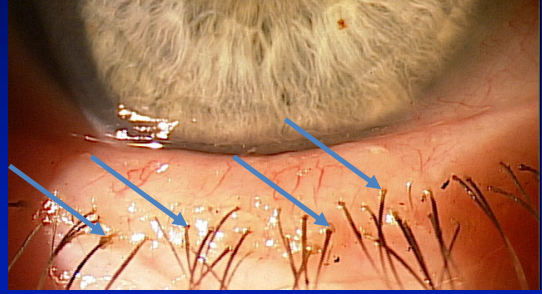


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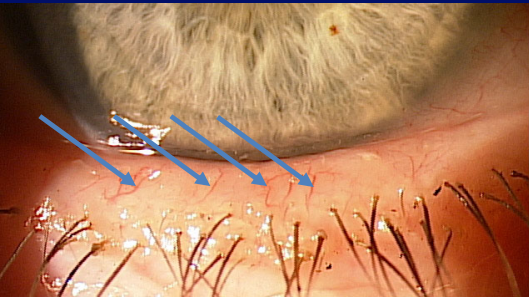
Significant Signs of Blepharitis



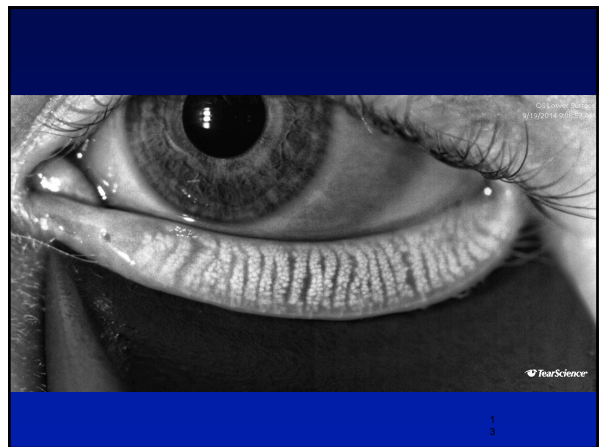
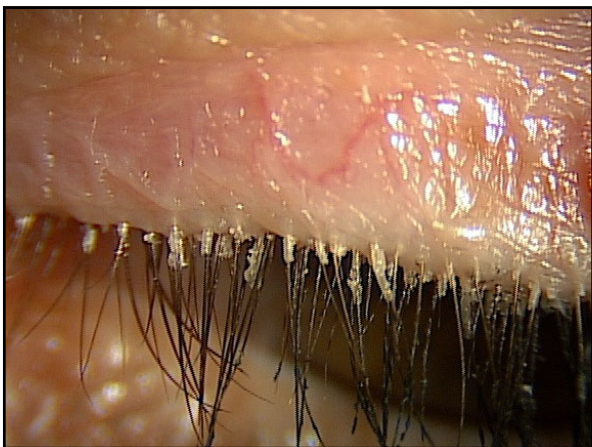
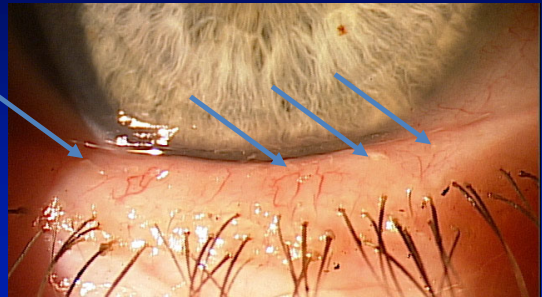
Collarettes/volcano sign



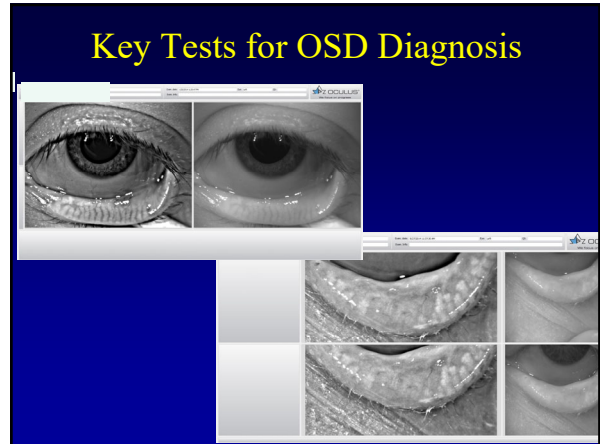
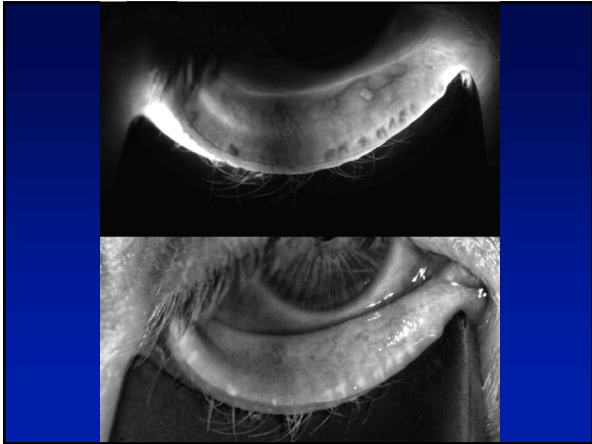
Telangiectatic vessels



Capped MG's



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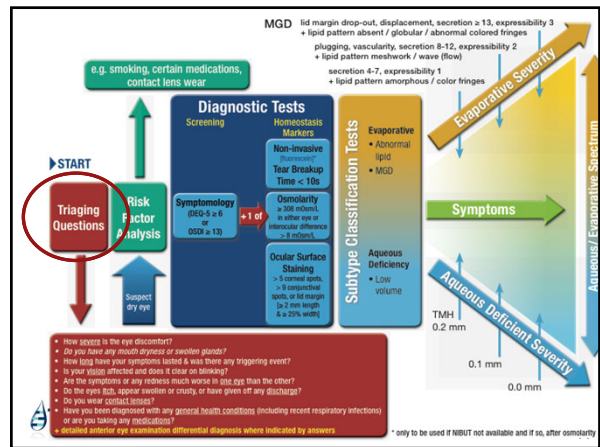
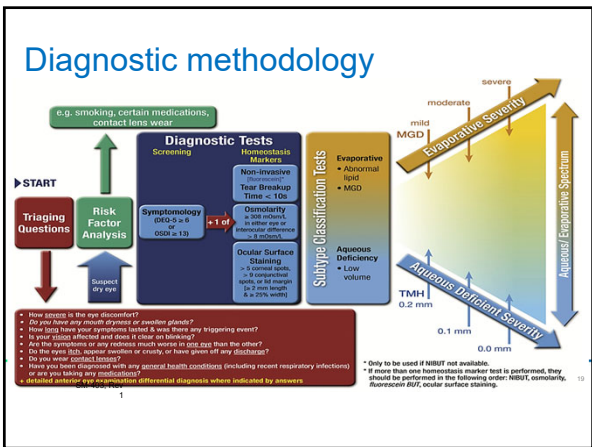


## Most Common Diagnostic Tests: 2014

- Pt history
- Tear film break-up
- Schirmer test - phenol thread test (mostly MDs')
- NaFl staining

## Diagnostic Testing: Today

1. Pt questionnaire- DEQ5, SPEED vs. directed questions
2. TearLab osmolarity
3. Meibography
4. Slit lamp examination
  1. CCH, bleph, incomplete closure, allergy
5. Non-tight lid seal test (KB Light Test)
6. MG Expression
  1. Tear meniscus height
  2. Corneal staining
  3. Conjunctival staining
4. Glance at TFBUT



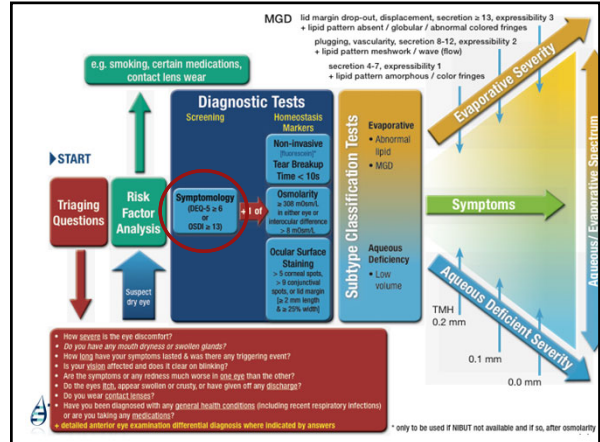


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## 5 Triaging Questions from OD Summit

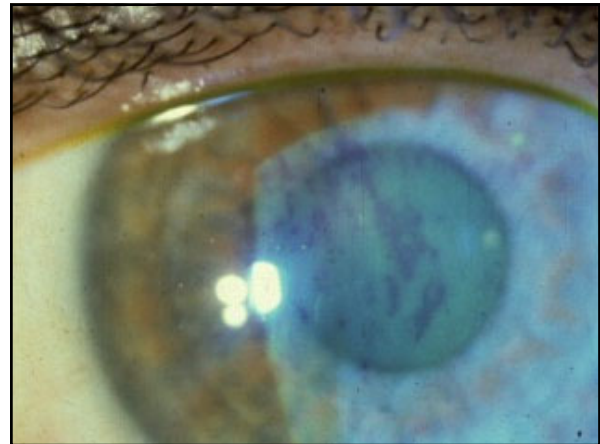
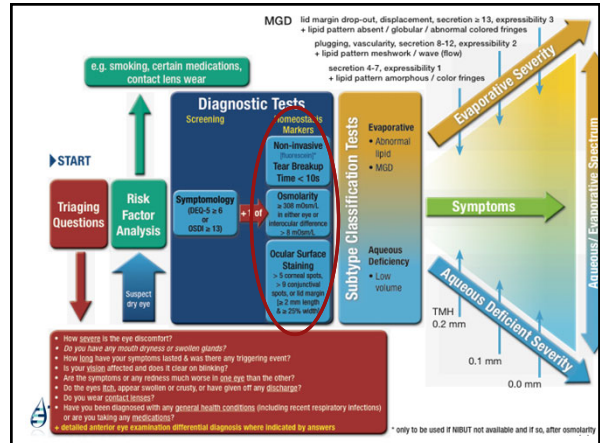
1. Do your eyes ever feel irritated, dry or burn?
2. Are your eyes red?
3. Do you experience blurred vision especially fluctuating vision?
4. Do you use or have the urge to use artificial tears?
5. How much time do you spend on digital devices per day?

8  
Optometry Dry Eye Summit, Denver 2014

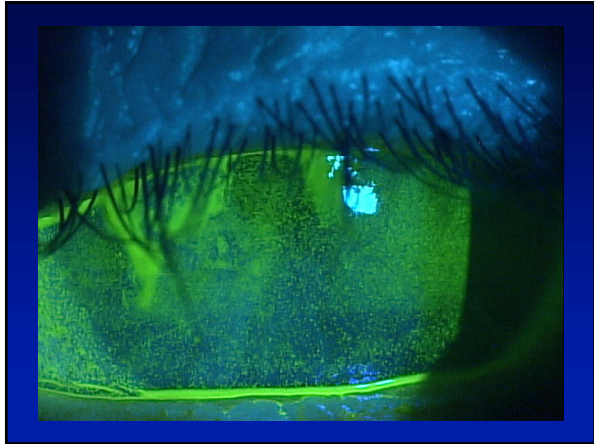


## Questionnaires

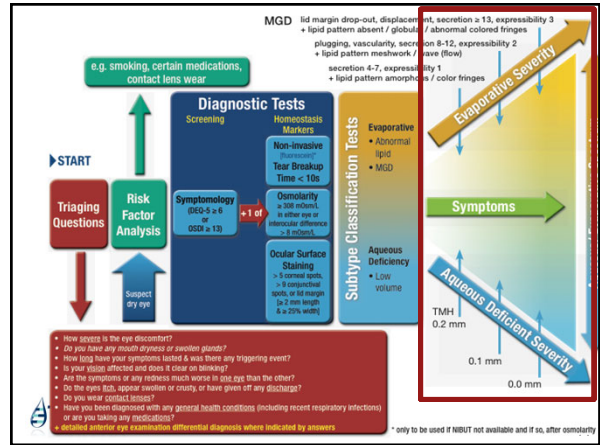
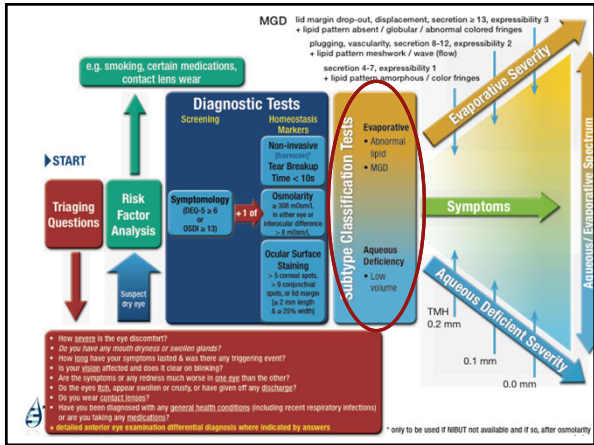
DEQ-5  
OSDI  
SPEED



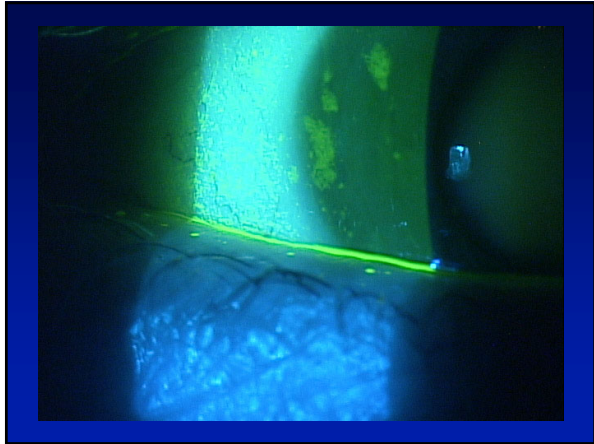
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## Identify the Sub-type of DED



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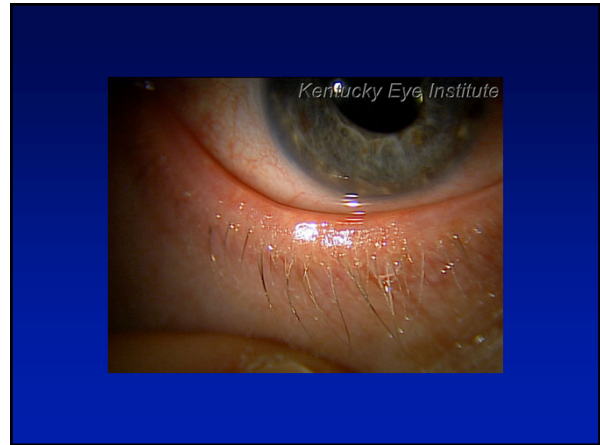


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- Lid debridement
- Thermal expression
- LLLT

**BIOFILM**

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- Hypochlorous acid
- Tea tree oil
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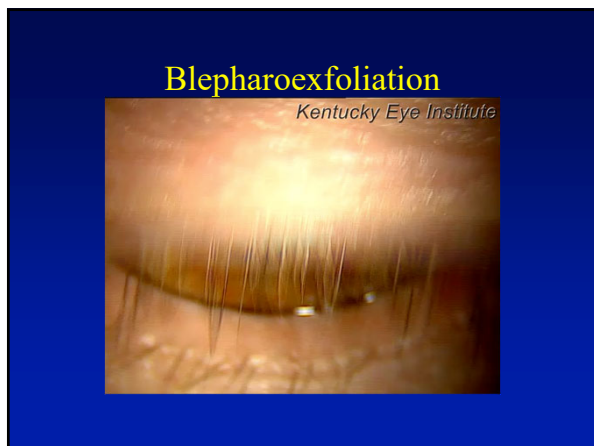
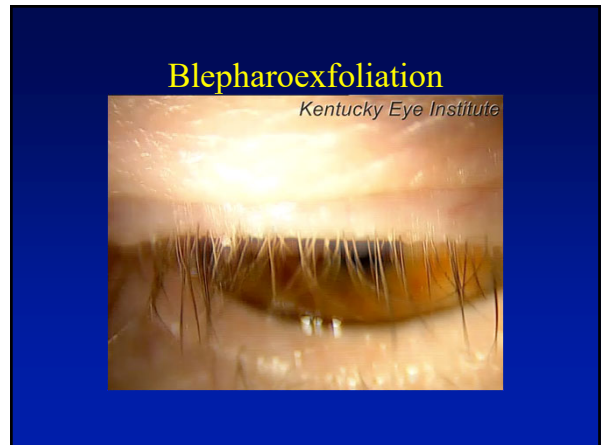
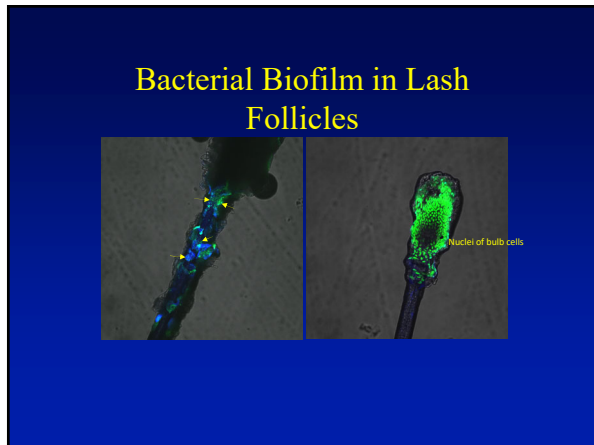
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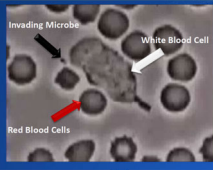
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### White Blood Cell in Action



**Hypochlorous Acid (HOCl)**  
Natural Compound  
NVC-101 – Stable Formulation  
Rapid Acting


**N-Chlorotaurine (NCT)**  
Natural Compound  
Rapid Acting  
Effective  
**BUT Unstable**

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### Omega fatty acids and Dry Eye

- LA / GLA ( $\omega$ -6)
  - Increase "good" PG (PGE-1)
    - Against ocular surface inflammation
    - Increase tear production
- Positive action on lipid layer (Graham RH. There's nothing fishy about omega-3 fatty acids for Dry Eye Syndrome. [www.medscape.com/viewarticle/707984](http://www.medscape.com/viewarticle/707984). Sep 3, 2010.)
- Positive action on tear volume (Roncone M, Bartlett H, Eperjesi F. Essential fatty acids for dry eye: A review. *Cont Lens Anterior Eye* 2010; 33(2):49-54.)
- Help to maintain MG function (Maesai, 2008)



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### IPL and LLLT

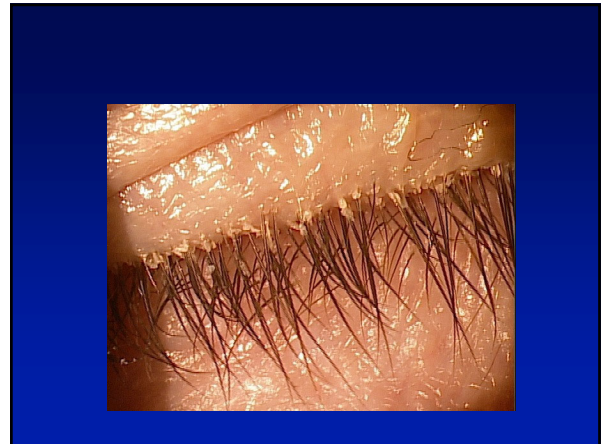
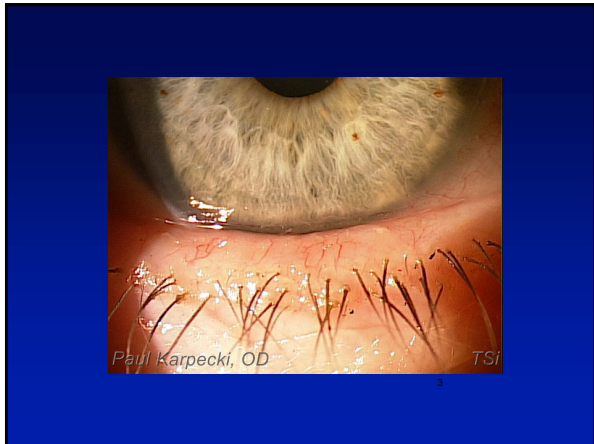
- Intense Pulsed Light Therapy and Low Level Light Therapy
- Clear association between DED and lid margin inflammatory disease
- Widely accepted as a treatment for dermatological rosacea
- More than 80% of patients with rosacea have MGD
- 20% have ocular signs first

### IPL and LLLT

- Telangiectatic vessels and skin erythema release inflammatory mediators
- IPL targets the abnormal erythematous blood vessels
- Affects mitochondrial activity
- Temperature effect on glands?
- Photomodulation affecting cytochrome C or activating fibroblasts and collagen synthesis



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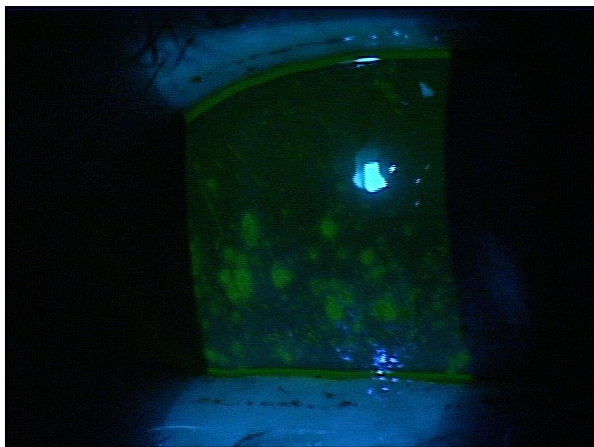
**TREATMENT: Demodex**

CONSISTS OF A PHASE 1 (WITH A SPECIFIC BLUE LIGHT MASK) AND A PHASE 2 (WITH THE STANDARD)


**PHASE 1 – BLUE MASK**  
Blue light stimulates porphyrins and creates an anti-bacterial action.

**PHASE 2 – RED MASK**  
Red light stimulates ATP by increasing and improving cellular activity, it reduces inflammation and oedema and works on Meibomian glands.

## Aqueous Deficient Dry Eye Disease Management

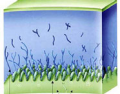


**Monitor for MGD**



**INFLAMMATION**

- Lifitegrast (Xiidra)
- Cyclosporine (Restasis, CEQUA or Klarity-C)
- Corticosteroids (Loteprednol, Eyesuvis)
- Omega fatty acids
- PO Doxycycline
- PO Azithromycin
- Amniotic membrane



**TEAR VOLUME**

- Artificial tears
- Environment changes
- Increase hydration
- Punctal occlusion
- Neurostimulation
- Cevimeline PO (Evoxac)
- Autologous serum q2h
- Scleral lenses

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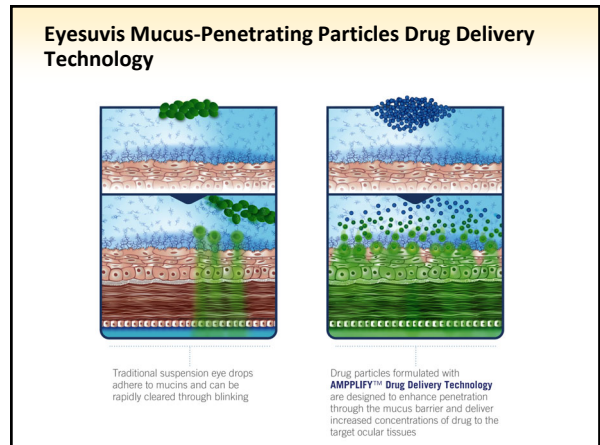
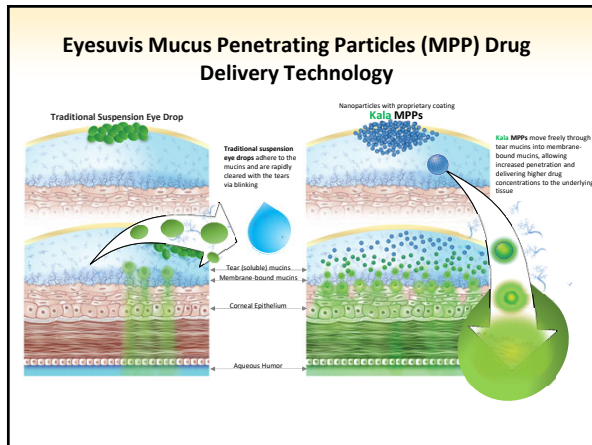
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Confidential

### EYSUVIS: For Dry Eye Flares- Most Recent FDA Approval

- Dry eye is a chronic inflammatory disease with flares that are characterized by acute exacerbations of signs and/or symptoms
- Loteprednol 0.25% approved for short term signs and symptoms of DED (QID for up to 2 weeks)
- Most dry eye disease patients with or without maintenance dry eye therapy, experience flares and desire rapid relief.
- Regardless of dry eye severity, flares typically occur 4-6 times per year

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## 180 Day Extended Duration Punctal Plugs

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A NOVEL NEUROSTIMULATION APPROACH WITH SONIC ENERGY

Drug free, home use, fast onset of action with sustained effect

Handheld, battery powered device with no disposable component

Externally applied

Doctor prescribed, 15s Training

75

**TAKEAWAYS FROM TRIALS**

- Array of positive endpoints reflects broad mechanism of action of neuromodulation
- Effective for aqueous tear deficiency and meibomian gland disease
- Acute, sub acute, and chronic benefits to the ocular surface
- Outstanding safety profile
- High value product for dry eye

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ACTIVATES CENTRAL REFLEX WHICH RESULTS IN ACTIVATION OF LACRIMAL FUNCTIONAL UNIT

77

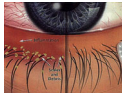


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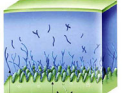
IMMEDIATE TEAR RESPONSE AND  
MEIBUM SECRETION



Monitor for MGD



INFLAMMATION



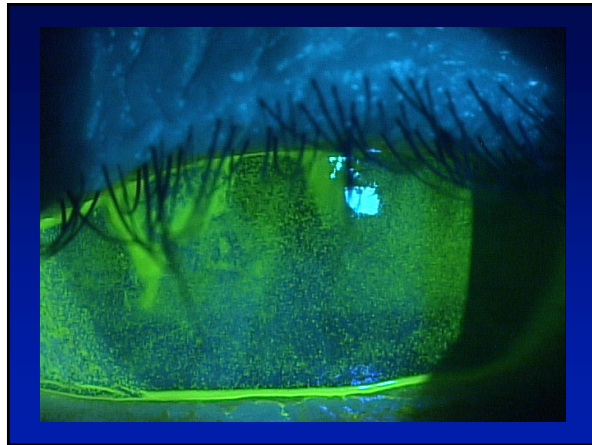
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### Ocular Surface Disorders

Diseases with Pre-existing Epithelial Defects <small>to promote wound healing and reduce complications (debridement is optional)</small>	Diseases without Epithelial Defects <small>to prevent further damage and promote regeneration (no debridement/PTK)</small>	Diseases with Unhealthy Epithelium or Basement Membrane <small>to promote regeneration (after debridement/PTK)</small>
<ul style="list-style-type: none"> <li>• neurotrophic persistent corneal epithelial defect</li> <li>• post-infectious recalcitrant corneal ulcers (e.g. herpetic, vernal, and bacterial)</li> <li>• non-healing epithelial defect after PRK/PTK</li> <li>• acute chemical/thermal burns</li> <li>• acute Stevens-Johnson syndrome/toxic epidermal necrolysis</li> </ul>	<ul style="list-style-type: none"> <li>• dry eye syndrome</li> <li>• superficial (punctate) keratitis</li> <li>• filamentary keratitis</li> <li>• radiation keratitis; whorl pattern indicative of limbal stem cell injury</li> <li>• exposure (Graves) keratopathy</li> </ul>	<ul style="list-style-type: none"> <li>• recurrent corneal erosion, EBMD</li> <li>• Salzmann's nodular degeneration</li> <li>• bullous keratopathy during/following DSEK</li> <li>• haze after PTK</li> <li>• partial limbal stem cell deficiency</li> <li>• corneal dystrophy (e.g., Reis-Bückler)</li> </ul>

Amniotic Membrane Insertion

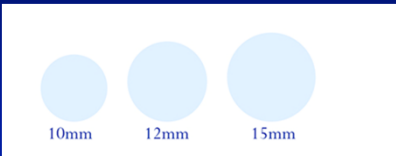


Removal




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## Cryopreserved vs. Dry Amniotic Membrane



10mm      12mm      15mm



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- Cyclosporine (Restasis, CEQUA or Klarity-C)
- Corticosteroids (Loteprednol, Eyesuvis)
- Omega fatty acids
- PO Doxycycline
- PO Azithromycin
- Amniotic membrane

**TEAR VOLUME**


- Artificial tears
- Environment changes
- Increase hydration
- Punctal occlusion
- Neurostimulation
- Cevimeline PO (Evoxac)
- Autologous serum q2h
- Scleral lenses

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Normal tears	Autologous Serum
• pH = 7.4	• pH = 7.4
• Osmolality = 298	• Osmolality = 296
• EGF (ng/ml) = 0.2-3.0	• EGF (ng/ml) = 0.5
• TGF-b (ng/ml) = 2-10	• TGF-b (ng/ml) = 6-33
• Vitamin A (mg/ml) = 0.02	• Vitamin A (mg/ml) = 46
• Lysozyme (mg/ml) = 1.4	• Lysozyme (mg/ml) = 6
• Fibronectin (ug/ml) = 21	• Fibronectin (ug/ml) = 205
	• Hepatocyte GF, NGF, IGF-1, substance p, Complement, Fibroblast GF, c GRP, other Ig, etc.

## VitalTears

- Present in almost every major city in the US
- Blood draw at patients home or work
- Processing
- Regular replacement
- Doctors must specify concentration
  - 20% for most patients
  - 40% for GVHD etc.



**Monitor for MGD**

**INFLAMMATION**


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## SCLERAL LENSES



## Getting the Eye Ready for Specialty Lens Success

