

**This Webinar Will Begin Shortly!**

**WOO UNIVERSITY**  
**Dry Eye Disease**  
Current Eye Drop Management Options

Dr. Elise Kramer, OD, FAAO, FSLs  
Miami Contact Lens Institute



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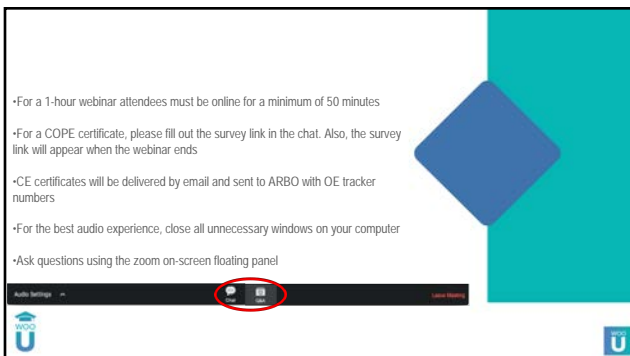
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- For a 1-hour webinar attendees must be online for a minimum of 50 minutes
- For a COPE certificate, please fill out the survey link in the chat. Also, the survey link will appear when the webinar ends
- CE certificates will be delivered by email and sent to ARBO with OE tracker numbers
- For the best audio experience, close all unnecessary windows on your computer
- Ask questions using the zoom on-screen floating panel



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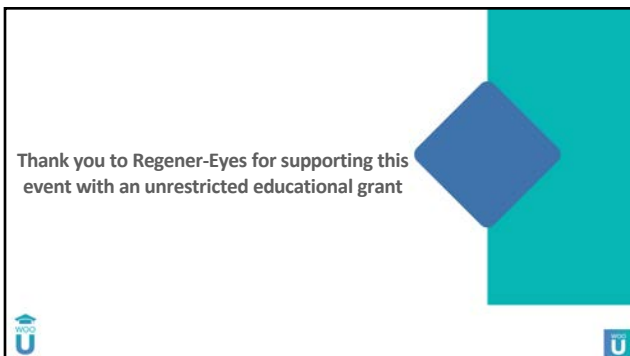
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Thank you to Regener-Eyes for supporting this event with an unrestricted educational grant



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## Financial Disclosures

- Avellino Labs
- Dompe
- Novartis
- Spectrum International




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## tfosDEWS II

“Dry eye is a multifactorial disease of the ocular surface characterized by a loss of homeostasis of the tear film, and accompanied by ocular symptoms, in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, and neurosensory abnormalities play etiological roles.”





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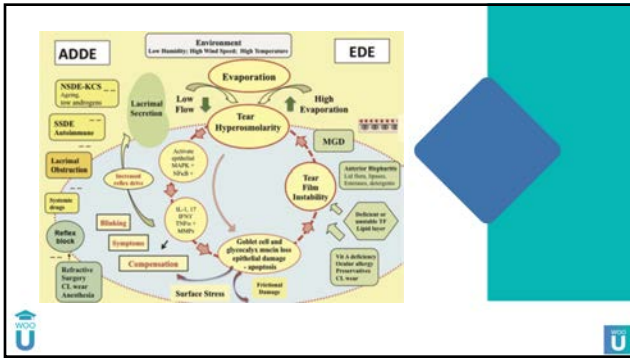
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### What is Evaporative DES?

Age-related

- 78% - 86% of all DED
- Ss/SAs: - MGD
- Itching
- Burning
- Watering
- Redness
- Thickened meibum
- Superficial punctate keratitis
- CL

↓ TFBUT  
 Meibum in MGD: ↓ terpenoids, ↓ proteins. → thicker secretions → plugging the gland

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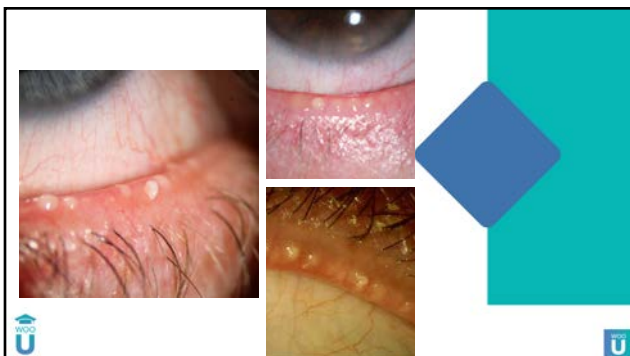
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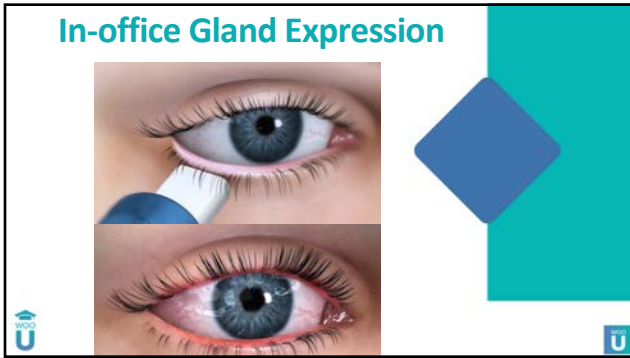
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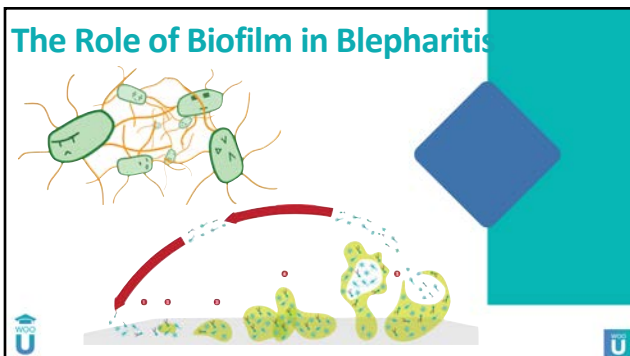
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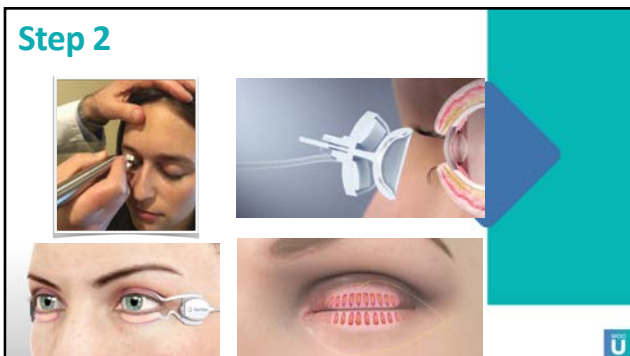
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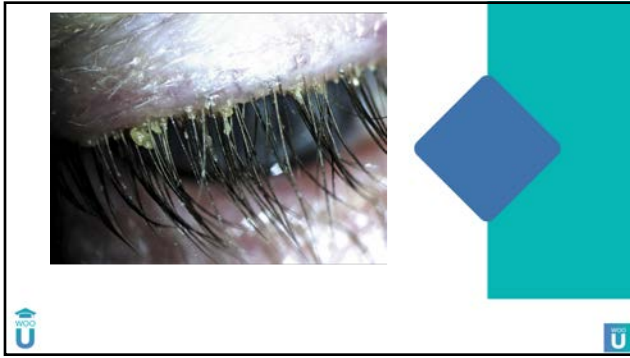
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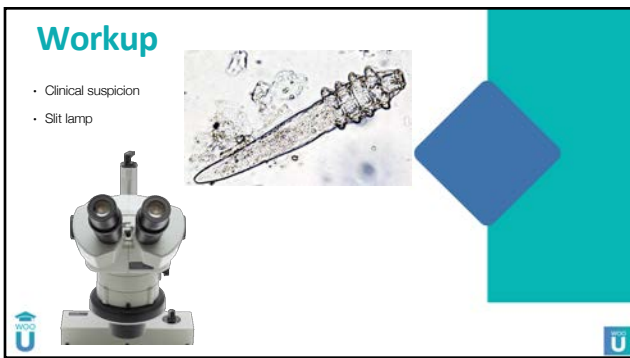
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## Artificial Tears

considered a first-line therapy for dry eye

Improve tear film lipid quality by managing MGD using lipid-based artificial tear supplements

- Mineral oils and phospholipids
- Designed to improve tear stability and reduce tear evaporation by supplementing deficiencies in the natural tear lipids

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## Artificial Tears

considered a first-line therapy for dry eye

Products are formulated as emulsions and include:

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<input type="checkbox"/> <b>LID HYGIENE</b> Help keep your glands open and functioning	<input type="checkbox"/> <b>WARM COMPRESSES</b>
<input type="checkbox"/> <b>ARTIFICIAL TEARS</b> (Available OTC)	<input type="checkbox"/> <b>PRESCRIPTION MEDICATIONS</b>
<input type="checkbox"/> <b>BLINKING EXERCISES</b> (See attached)	<input type="checkbox"/> <b>SLEEP MASK</b> Wear at night to minimize airflow around eyes.
<input type="checkbox"/> <b>SUPPLEMENTS</b>	<input type="checkbox"/> <b>PRACTICE THE 20/20/20 RULE</b> Every 20 minutes take a 20 second break and look at something 20 feet away. Follow the Blink Exercise Regimen.
<input type="checkbox"/> <b>CONTACT LENS INSTRUCTIONS</b> (If applicable)	<input type="checkbox"/> <b>OTHER THERAPIES</b>

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### BLINKING EXERCISE FORM

**BACKGROUND INFO ON BLINKING: WHY IT'S IMPORTANT AND ITS ROLE**

- Eyelids are part of the ocular surface system and protect eyes\*\*
- Blinking helps distribute the spread of multiple components of your tears\*\*
- Spreads tears across ocular surface\*\*
- In healthy individuals, 10-15% of blinks are typically complete blinks\*\*

**WHAT IS INCOMPLETE/NON-BLINKING AND WHY IT'S A PROBLEM**

Incomplete or partial blinks occur when the upper and lower lids don't fully close together. Incomplete blinking can cause problems with tear spreading across your eye and with tear evaporation. Studies show patients with incomplete blinking also have increased rates of their eye care providers prescribing drops to your eyes that provide key components of your tears\*\*

**CAUSES**

- Prolonged computer tasks that require significant focus such as reading, working in an online classroom\*
- Computer use reduces eye blink rate by at least 60-70% in healthy individuals\*\*

**WHY DOES THIS MATTER?**

- A high percentage of partial blinking is associated with 2x increase in dry eye disease\*\*
- Patients with a high percentage of incomplete blinks often have problems with the glands in their eyelids that secrete the oily layer of their production glands, leading to dry eye or evaporation dryness\*\*
- Patients that demonstrate a high percentage of partial blinking are likely to also demonstrate other ocular surface conditions such as OSD and dry eye disease\*\*

**BLINKING EXERCISE / SEQUENCE EXAMPLE**

**BLINKING EXERCISES**

1. CLOSE the lower lid to the touch
2. HOLD for a count of 2 to maintain lid-to-lid contact
3. SQUEEZE down lightly for a count of 2 to bring the eyelids and to spread the tear film evenly that coats the ocular surface for 10-15 seconds
4. OPEN for a count of 2 to complete the full blink sequence

Repeat the following sequence three times for a total of 30 repetitions three and count 1 and 2, repeat and count 3 and 4, and repeat and count 5 and 6.

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### What is Aqueous Deficient DES

Most common: inflammatory infiltration of the lacrimal gland

- Severe: Sjogren syndrome (SSDE)
- Less severe: Non-Sjogren syndrome (NSDE)
  - Inflammation causes both acinar and ductal epithelial cell dysfunction/destruction
  - Epithelial injury and defective glyco-calyx, loss of tear volume and of goblet cell mucin, lead to increased frictional damage and friction-related symptoms
  - Tear hyperosmolarity and epithelial injury caused by DED stimulates corneal nerve endings

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### Symptoms of ADDE

- Discomfort
- Increased blink rate
- Compensatory, reflex increase in lacrimal tear secretion

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### Ocular Surface Disease Index® (OSDI)<sup>2</sup>

Ask your patient the following 12 questions, and circle the number in the box that best represents each answer. Then, fill in boxes A, B, C, D, and E according to the instructions beside each.

#### Assessing Your Patient's Dry Eye Disease<sup>1,2</sup>

Use your answers D and E from Slide 1 to compare the sum of scores for all questions answered (D) and the number of questions answered (E) with the chart below.  
Find where your patient's score would fall. Match the corresponding shade of red to the key below to determine whether your patient's score indicates normal, mild, moderate, or severe dry eye disease.

Number of Questions Answered	1	2	3	4	5	6	7	8	9	10	11	12
12	14.8	25.1	21.2	31.7	37.3	43.0	72.9	83.2	85.8	100.0		
11	11.6	22.7	21.1	31.3	36.8	42.5	71.9	82.2	84.8	100.0		
10	8.5	19.5	17.9	28.2	33.7	39.4	68.8	79.1	81.7	100.0		
9	5.4	16.3	14.7	25.0	30.5	36.2	65.6	75.9	78.5	100.0		
8	2.3	13.1	11.5	21.8	27.3	33.0	62.4	72.7	75.3	100.0		
7	0.0	10.0	8.4	19.1	24.6	30.3	59.2	69.5	72.1	100.0		
6	0.0	6.8	5.2	15.9	21.4	27.1	56.0	66.3	68.9	100.0		
5	0.0	3.6	2.0	12.7	18.2	23.9	52.8	63.1	65.7	100.0		
4	0.0	0.4	0.0	9.5	15.2	20.9	49.6	59.9	62.5	100.0		
3	0.0	0.0	0.0	6.3	12.0	17.7	46.4	56.7	59.3	100.0		
2	0.0	0.0	0.0	3.1	8.8	14.5	43.2	53.5	56.1	100.0		
1	0.0	0.0	0.0	0.0	0.0	0.0	40.0	50.3	52.9	100.0		

Sum of Scores for All Questions Answered (D from Slide 1)

Normal Mild Moderate Severe

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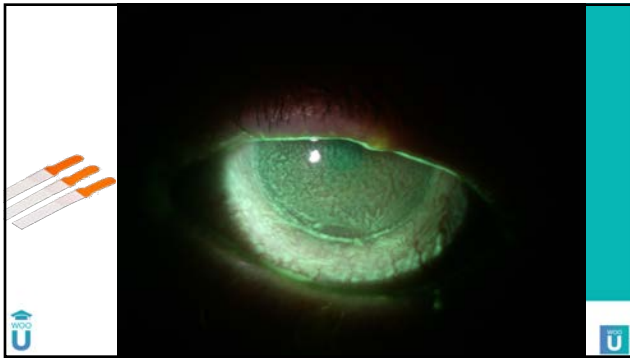
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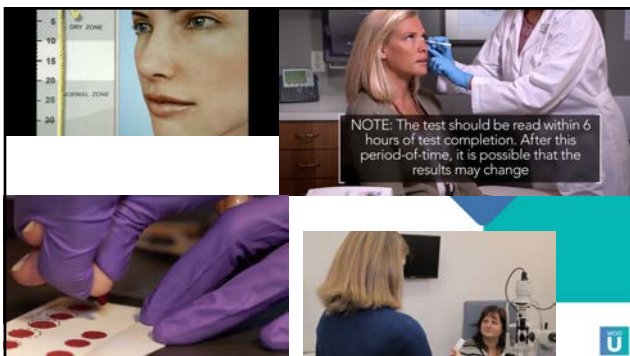
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### Artificial Tears

considered a first-line therapy for dry eye

- increase tear volume
- minimize desiccation
- lubricate the ocular surface
- increase viscosity, lubricity, retention time and adhesion to the ocular surface
- inorganic ions (0.9% NaCl)
- May contain electrolytes or found in normal tears

$$\text{HO}-\text{C}(=\text{O})-\text{O}^- \text{K}^+$$

A 'U' logo is in the bottom left and right corners.

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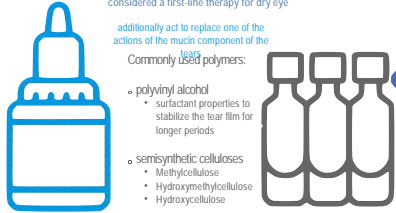


## Artificial Tears

considered a first-line therapy for dry eye

additionally act to replace one of the actions of the mucin component of the

Commonly used polymers:

- polyvinyl alcohol
  - surfactant properties to stabilize the tear film for longer periods
- semisynthetic celluloses
  - Methylcellulose
  - Hydroxymethylcellulose
  - Hydroxyethylcellulose
- Hyaluronic acid
  - greater retention times
  - improves tear film stability

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## Other Ingredients

**OPTASE®**

Put one or two drops in the affected eyes as needed to rehydrate and soothe dry, irritated eyes.

Use within three months from opening the bottle. Use by the expiry date, see warning on the bottle. Contact lens compatible.

**SCOPE**

Long-lasting relief from Irritable Dry Eye symptoms

**SCOPE**

Heat, Cold, Allergies, Dry Air, Wind, Smoke, Pollution, Screen Time, Contact Lenses

**OPTASE® DRY EYE INTENSE DROPS**

OPTASE® Dry Eye INTENSE Dry Eye Drops relieve symptoms of dry eyes such as itching and burning sensations. The OPTASE® formula products are designed to deliver moisture and soothing relief.

Clear OPTASE® products

Preservative Free


100% Natural



Eye Eye Layer

Heat, Cold, Allergies, Dry Air, Wind, Smoke, Pollution, Screen Time, Contact Lenses

**SCOPE**

Heat, Cold, Allergies, Dry Air, Wind, Smoke, Pollution, Screen Time, Contact Lenses



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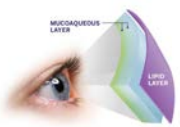
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## Combinations

The active ingredients in FRESHKOTE PF are a patented polymer blend with a unique ratio of polyvinyl alcohol and povidone.<sup>1,2</sup>

**MUCOAGGREGATIVE LAYER**  
Polyvinyl Alcohol (2.7%)<sup>1,2</sup>



- Mimics the mucin layer of the tear film by tightly adhering to dry hydrophobic spots, making them hydrophilic.
- Attracts the aqueous portion of the tear film to these areas, completely wetting the ocular surface.

**LIPID LAYER**  
Povidone (2.0%)<sup>1,2</sup>

- Integrates with the lipid layer, supplementing it and thereby reducing evaporation while lubricating and soothing the ocular surface.

**HIGH ONCOTIC PRESSURE**  
Unique Ratio Blend<sup>1,2</sup>

- FRESHKOTE PF was scientifically developed to result in high oncotic pressure when on the ocular surface.

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### Gels

More viscous  
Longer retention times

- Polyacrylic acid
- Petroleum – mineral oil-based ointments reserved for nocturnal use or lagophthalmos/blink paralysis
- blur vision and feel sticky

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### Useful tips on eye lubricants...

- ✓ Eye Doctors recommend using preservative free eye lubricants, particularly if using contact lenses or undergoing glaucoma treatment.<sup>1</sup>
- ✓ Once opened, many eye drops and gels should be thrown away after 28 days. Some newer eye drops can be kept for up to six months from first opening – please check when your eye drops should be discarded.
- ✓ Most eye drops will have a patient information leaflet inside the box. There is usually a lot of information in here including details on how to use the product.
- ✓ Don't share your eye drops with anyone else.

<sup>1</sup> Daniel Nelson, et al. TFOS DEWS II: New Dry Eye Report Updates Research. The Ocular Surface. 2017

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### Lacrimal Punctal Occlusion

AT + PO = Mainstay of treatment for ADDE

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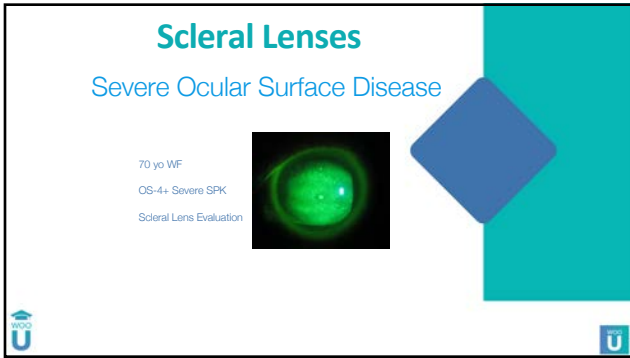
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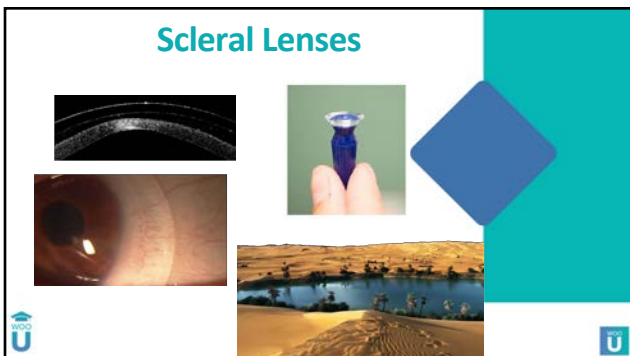
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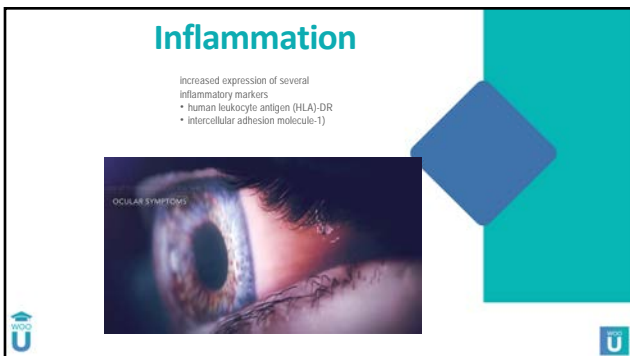
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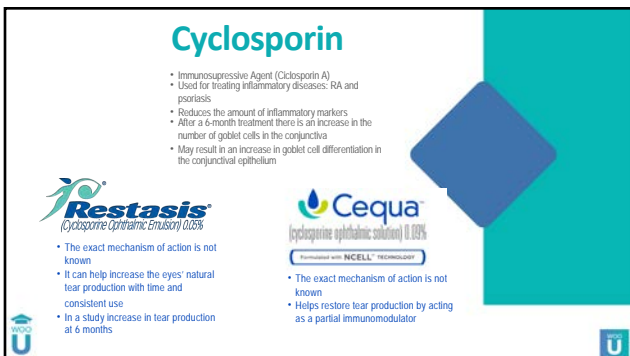
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### NCELL technology enhances delivery

**HYDROPHOBIC CORE**  
prevents the encapsulated cytosporine, which has poor aqueous solubility, from being released until after penetration through the aqueous layer of the tear film<sup>1,4,8</sup>

**HYDROPHILIC SHELL**  
allows for transport through the tear film onto the ocular surface<sup>1,4,8</sup>

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### xiidra (lifitegrast ophthalmic solution) 5%

### Lifitegrast

- Blocks LFA-1 on T cells from binding with ICAM-1 that may be overexpressed on the ocular surface in DED
- May prevent formation of an immunologic synapse which, based on in vitro studies, may inhibit T-cell activation, migration of activated T cells to the ocular surface, and reduce cytokine release

Based on in vitro data. The exact mechanism of action of lifitegrast in DED is not known.

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### Steroids

- Reportedly have a positive influence on DED
- More efficacious than NSAIDs
- Decrease in HLA-DR-positive cells and symptom severity

### EYSUVIS (loteprednol etabonate ophthalmic suspension) 0.25%

**~80%** OF PATIENTS WHO SUFFER FLARES

**45%** OF PATIENTS WHO DON'T SUFFER FLARES (INSTEAD OF CONTINUOUS SYMPTOMS)

Approved for SHORT-TERM (up to two weeks) treatment for DED

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**Regener-Eyes<sup>®</sup>**  
OPHTHALMIC SOLUTION

- derived-Multiple Allogeneic Proteins Paracrine Signaling (d-MAPP5)
- Contains a large number of immunoregulatory molecules as well as trophic & growth factors

STERILE MOISTURIZING EYE DROPS

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**Regener-Eyes<sup>®</sup>**  
OPHTHALMIC SOLUTION

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### Autologous Serum Tears



- 20-50% have been used safely and effectively contain albumin, epidermal growth factor, fibronectin, vitamin A, neurotrophic growth factor, and hepatocyte growth factor
- Protein and mRNA levels of MUCs 1, 4, and 16 in cultured human conjunctival epithelial cells are upregulated by serum
- Treatment may be related to upregulation of MAMs
- Vitamin A is essential for maintenance of a healthy, differentiated ocular surface
- Assist in maintaining a healthy and stable tear film
- Preliminary studies suggest acts to suppress apoptosis in both corneal and conjunctival epithelium
- A potential concern is risk of contamination, leading to infection

SERUM TEARS

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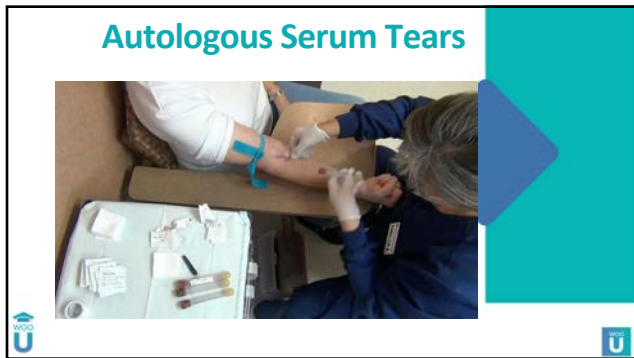
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Join Us For The Next Webinar  
Tuesday, May 18, 2021, 5:00 PM Pacific Time  
Genetic Testing in Eye Care



Melissa Barnett, OD, FAAO, FSLs, FBCLA    John Gelles OD, FIAO, FCLSA, FSLs, FBCLA



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QUESTIONS?

- This formally concludes the CE portion of the event
- We invite you to remain online for a short message from our supporter of the event, Regener-Eyes



UNIVERSITY

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