

DEWS II

And the Continuing Evolution of the Dry Eye Algorithm

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Disclosures

CORE SPEAKER ALLERGAN PHARMACEUTICALS


DEWS I (2007)

- ▶ Widespread recognition DED
- ▶ Growing prevalence worldwide
- ▶ Impact on quality of life
- ▶ Develop initial definition and classification
- ▶ Future trials and studies



DEWS II (2017)

- ▶ 150 clinical/research experts, 23 countries
- ▶ 12 subcommittees
- ▶ Updates to definitions, classifications, diagnostic methodology
- ▶ Investigates causes, mechanisms, and global impact
- ▶ Aspect of neurosensory component/neuropathic pain
- ▶ Evidence-based consensus approach to treatment



DEWS II Subcommittee Highlights

- ▶ Definition and Classification
- ▶ Sex, Gender and Hormones
- ▶ Epidemiology
- ▶ Tear Film
- ▶ Pain and Sensation
- ▶ Pathophysiology
- ▶ Iatrogenic Dry Eye
- ▶ Diagnostic Methodology
- ▶ Management and Therapy

Definition and Classification

"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, hyperosmolarity, inflammation, and ocular surface damage, and neurosensory abnormalities play etiological roles."

Classification

Sex, Gender and Hormones

- ▶ Increased prevalence in women
- ▶ Androgen deficiency
- ▶ Anatomical differences in ocular surface structures
- ▶ Sex matters...except in MGD
- ▶ Need more understanding

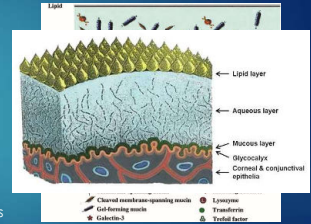
Epidemiology

- ▶ Difficult due to lack of standardizations
- ▶ Estimated between 5%-30% of pop
- ▶ Evaporative most common subtype
- ▶ Sex
- ▶ Race
- ▶ Age
- ▶ Risk Factors
- ▶ Economic burden



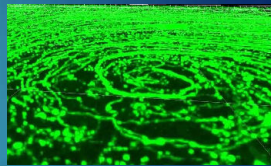
Tear Film

- ▶ 3 layer vs 2 layer system
- ▶ Mucoaqueous layer
- ▶ Overlying lipid layer
- ▶ ALL components maintain tear stability and ocular surface homeostasis
- ▶ Hyperosmolarity
 - >308 mOsm/L Early
 - >316 mOsm/L Moderate
 - >336 mOsm/L Severe
 - Difference >8 mOsm/L
- ▶ Proteins, growth factors, other mediators



Pain and Sensation

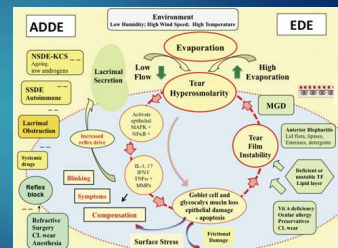
- ▶ Trigeminal ganglion
 - Nociceptors
 - Cold Thermoreceptors
- ▶ Nociceptive vs Neuropathic pain
- ▶ DED associated w changes in morphology of corneal nerves
- ▶ Damage can be variable
- ▶ Lack of correlation signs/symp's potential red flag for neuropathic etiology



Pathophysiology

The Vicious Circle of DED

- ▶ Core mechanism is Hyperosmolarity
- ▶ ADDE and EDE
- ▶ Vicious Circle of DED
 - Release of inflammatory mediators
 - Goblet and epithelial cell loss
 - Damage to epith glycocalyx
 - Activation of T-cells
 - Surface damage/tear film instability
- ▶ Mixed mechanism DED



Iatrogenic Dry Eye

- ▶ Definition
"Dry eye induced unintentionally by medical treatment..."
- ▶ Classification/Categories
 - Ophthalmic surgery
 - Pharmaceuticals
 - Contact lenses
 - Non-surgical Ophthalmic procedures




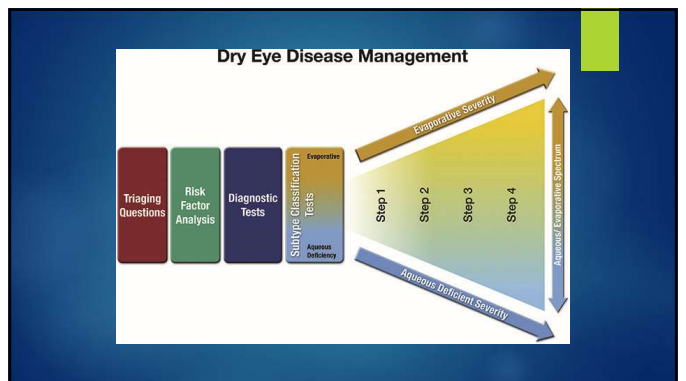
Iatrogenic Dry Eye

- ▶ Ophthalmic surgery
Refractive, Cataract, Lid, Penetrating Keratoplasty, Others
- ▶ Pharmaceuticals
Topical (glaucoma, BAK), Systemic (HBP, antihistamines, anxiety)
- ▶ Contact lens
Biophysical changes tear film, altered goblet cells, LWE, MG's
- ▶ Non-surgical ophthalmic procedures
Botox, corneal crosslinking, radiation, tattooing, piercing




Diagnostic Methodology

- ▶ Consistent criteria
- ▶ Battery of tests
- ▶ Triage questions
- ▶ Symptoms and signs
- ▶ ADDE vs EDE contribution

Triage Questions

- How **often** is the eye discomfort?
- Do you have any mouth dryness or swollen glands?
- How **long** have your symptoms lasted & was there any triggering event?
- Is your vision affected and does it clear on blinking?
- Are the symptoms in any respect much worse in one eye than the other?
- Do the eyes **feel**, appear swollen or crusty, or have given off any discharge?
- Do you wear contact lenses?
- Have you been diagnosed with any general health conditions (including recent respiratory infections) or are you taking any medications?

*Detailed anterior eye examination differential diagnosis where indicated by answers.

Suspect
dry eye

Risk Factor Analysis

1. Question about EYE DRYNESS

2. History of contact lens use in past month. How often did your eyes feel dryness?

3. How often do you have eye discomfort?

4. How long have your symptoms lasted & was there any triggering event?

5. Is your vision affected and does it clear on blinking?

6. Are the symptoms in any respect much worse in one eye than the other?

7. Do the eyes feel, appear swollen or crusty, or have given off any discharge?

8. Do you wear contact lenses?

9. Have you been diagnosed with any general health conditions (including recent respiratory infections) or are you taking any medications?

*Detailed anterior eye examination differential diagnosis where indicated by answers.



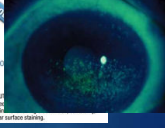
| Question | Answer | Points |
|--|--------|--------|
| 1. Question about EYE DRYNESS | Always | 3 |
| 2. History of contact lens use in past month. How often did your eyes feel dryness? | Always | 3 |
| 3. How often do you have eye discomfort? | Always | 3 |
| 4. How long have your symptoms lasted & was there any triggering event? | Always | 3 |
| 5. Is your vision affected and does it clear on blinking? | Always | 3 |
| 6. Are the symptoms in any respect much worse in one eye than the other? | Always | 3 |
| 7. Do the eyes feel, appear swollen or crusty, or have given off any discharge? | Always | 3 |
| 8. Do you wear contact lenses? | Always | 3 |
| 9. Have you been diagnosed with any general health conditions (including recent respiratory infections) or are you taking any medications? | Always | 3 |

Subtype Classification Tests

- Schirmer I Test
- Tear Breakup Time (TBUT)
- MGD
- TMR
- G2

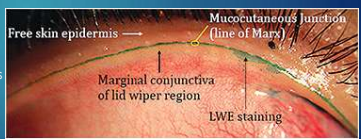
Subtype Classification

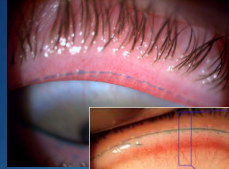
- Reproductive Abnormalities
- MGD
- Aqueous Deficiency
- Low Volume

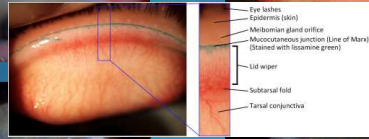





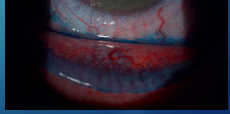
Lid Wiper Epitheliopathy (LWE)

- ▶ Observed as vital dye staining of the upper/lower lid margin regions that are in contact w the globe
- ▶ Caused by inc friction between palpebral lid and bulbar conj, cornea, or CL
- ▶ Associated with:
 - Unstable tear film
 - Decreased or altered mucins
 - CL wear
 - Incomplete blinking





Predominant Identifying Subtype

- ▶ Primary contributor to evaporative process
- ▶ Tailor therapeutic treatments
- ▶ ADDE diagnostic testing
- ▶ EDE diagnostic testing

The diagram illustrates the 'Subtype Classification Tests' for Dry Eye Disease. It features a vertical color gradient from yellow at the top to blue at the bottom. On the left, 'Evaporative Deficiency' is associated with 'MGD' (Meibomian Gland Dysfunction) and 'Low volume'. On the right, 'Aqueous Deficient' is associated with 'TMH' (Tear Meniscus Height) and 'Low volume'. The TMH values are listed as 0.2 mm, 0.1 mm, and 0.0 mm. A diagonal arrow labeled 'Evaporative Severity' points from the bottom-left towards the top-right, with levels 'mild', 'moderate', and 'severe' marked along it. A vertical arrow on the right is labeled 'Aqueous/Evaporative Spectrum'.

Management and Therapy

- ▶ Evidence-based approach
- ▶ Organizational tool
- ▶ Start with primary subtype
- ▶ Severity-based treatment

The flowchart titled 'Dry-eye Disease Management Process (TFOS DEWS II)' is divided into 'Diagnosis' and 'Treatment'. The diagnosis phase includes 'Triage Questions', 'Risk Factor Analysis', 'Diagnostic Tests', and 'Subtype Classification Tests: Evaporative/Aqueous Deficient'. The treatment phase consists of 'Step 1', 'Step 2', 'Step 3', and 'Step 4'. A red arrow at the bottom points to the right, labeled 'INCREASING SEVERITY'.

Management and Treatment Stage 1

- ▶ Education
- ▶ Topical lubricants (targeted)
- ▶ Lid hygiene/compresses
- ▶ Dietary modifications
- ▶ Environmental modifications
- ▶ Identification and potential modification of systemic/topical meds

A red location pin icon with a white circle in the center containing the text 'START HERE' in black capital letters.

Management and Therapy Stage 2




- ▶ Treatment of inflammation
 - Topical antibiotics/steroids
 - Cyclosporine/Lifitegrast
 - Oral macrolides (Doxo/Azith)
 - Topical secretagogues
- ▶ Non-preserved lubricants
- ▶ Tea-tree oil
- ▶ Tear conservation
- ▶ In office heating and expression of MG's
- ▶ Intense pulsed light therapy

A close-up photograph of a human eye. The skin around the eyelids is severely dry, cracked, and peeling, illustrating the clinical presentation of severe dry eye disease.

Management and Therapy


Stage 3

- ▶ More interventional
- ▶ Punctal plugs
- ▶ Oral secretagogues
- ▶ Topical autologous serum
- ▶ Therapeutic contact lenses

Stage 4

- ▶ Topical steroids (longer duration)
- ▶ Amniotic membranes
- ▶ Surgical punctal occlusion
- ▶ Tarsorrhaphy



| THERMAL/HEAT | HYGIENE | TOPICAL/SUPPLEMENTAL | ORAL |
|------------------------------|---|--|--|
| Compresses/Washcloth | Diluted Baby Shampoo XXX | Targeted Artificial Tears | Omega-3 Supplements (Concentrated) |
| Heat Mask (Bruder) | Detergent-based Products (Ocusoft, Steri-lid) | Topical Antibiotics (ointments/gels) | Oral Tetracycline Derivatives (short-term) |
| MiBo Thermaflow | Hypochlorous Acid (Avenova) | Steroid/Combo | Oral Tetracycline Derivatives (chronic) |
| Thermal Pulsation (LIPiFlow) | 4-Terpineol, Tea Tree Oil (Cliradex) | Cyclosporine/Lifitegrast | Oral Secretagogues |
| | Microblepharoexfoliation (BlephEx) | Punctal Plugs Autologous Serum Amniotic Membrane Nasalacrimal Neurostim | |

DEWS II Summary

- ▶ Not rigid recommendation
- ▶ List of treatment options
- ▶ Movement away from grading to step approach
- ▶ Aggressiveness is risk-based/time-based
- ▶ Ophthalmic subspecialty?

Take home

1. Ask the right questions
2. Use screening tests
3. Determine predominant subtype
4. Target your management plan
5. Manage expectations

