

**The DEWS & Don'ts
of
Dry Eye Disease Management**

Using Clinical Algorithms to Diagnose, Treat, and Manage Dry Eye Disease

Janelle Davison, OD

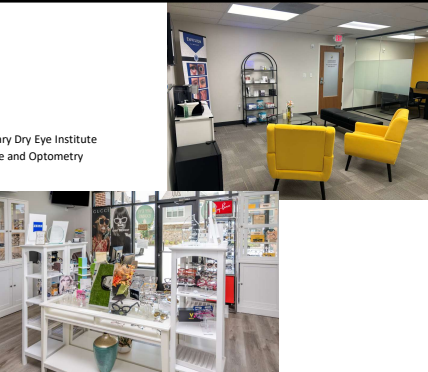
Financial Disclosures

- Alcon Pharmaceuticals Speaker/Consultant
- Tarsus Pharmaceuticals Speaker/Consultant
- Bausch & Lomb Pharmaceuticals Speaker/Consultant
- Viatris Consultant
- Orasis Pharmaceuticals Speaker/Consultant
- Hilco-Bruder Consultant
- AbbVie Pharmaceuticals Consultant

All conflicts have been mitigated.

Speaker About Me

- Graduated 2006 PCO at Drexel University
- Solo Private Practice at
 - Brilliant Eyes Vision Center & Visionary Dry Eye Institute
 - Specializing in Ocular Surface Disease and Optometry Aesthetics
- American Optometric Association
- National Optometric Association
- Intrepid Eye Society
- High School Internship Site



Learning Objectives

01

Master Clinical Algorithms

Understand key dry eye algorithms for diagnosis, treatment, and management including preoperative protocols for cataract and LASIK patients.

02

Explore Technologies & Strategies

Discover advanced diagnostic tools and establish sustainable, evidence-based treatment protocols for your practice.

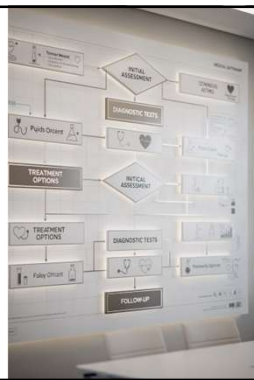
03

Apply Through Practice

Implement algorithms in real-world scenarios while identifying and avoiding common clinical pitfalls.

Understanding Clinical Algorithms

A clinical algorithm is a structured, step-by-step protocol that guides healthcare providers through evidence-based decision making for specific medical conditions.



Understanding the Scope of Dry Eye Disease

The Challenge

16.4 million Americans have been diagnosed with dry eye disease, with countless cases remaining undiagnosed in clinical practice.

Approach

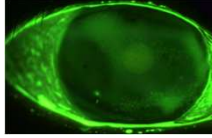
Master clinical algorithms and evidence-based protocols to systematically diagnose, treat, and manage dry eye disease effectively.

Strand M, Fridman M, Gillman GJ, Schwaberg DA. Prevalence of Diagnosed Dry Eye Disease in the United States Among Adults Aged 18 Years and Older. Am J Ophthalmol. 2017 Oct;162:90-96. doi: 10.1016/j.ajo.2017.04.013. Epub 2017 Jun 16. PMID: 28705665

Exam Findings

CC: eyes are very dry, watery and burn. OTC tears not working.

- DVAcc: 20/30- OU
- Ocular surface analysis:
 - 2-3+ fluorescein staining OD and 1-2+ OS
 - TBUT: 2-3 seconds OU
 - 1+ MGD OU
- Tear film analysis:
 - Tear osmolality: 315 OD, 316 OS



What Do I Treat First?

1. Tear volume
2. Inflammation
3. Lid margin
4. Tear quality/nutrition



Benefits of Algorithm-Driven Care



- **Enhanced Consistency** → **Improved Outcomes**
Standardized protocols ensure all patients receive evidence-based care regardless of provider variability. Systematic approaches reduce errors and optimize treatment effectiveness through proven pathways.
- **Efficient Decision Making**
Clear guidelines streamline clinical workflows and support confident therapeutic choices.



Key Dry Eye Algorithms

Why Preoperative Optimization Matters

American Society Cataract and Refractive Surgery

- Need for intervention:
 - 50% cataract patients had central corneal staining
 - 50% abnormal MMP-9 and Tear Osmolarity
 - Compromised Presurgical measurements
 - biometry, topography, keratometry reading

Screen
Asymptomatic NVS OSD
Visually symptomatic VS OSD

ASCRS PREOPERATIVE OSD ALGORITHM

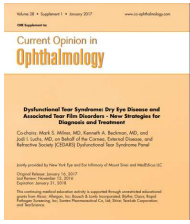
Important to measure Tear Osmolarity and/or MMP-9

Starr, Choudhury, & et al. "An algorithm for the preoperative diagnosis and treatment of ocular surface disorders." Journal of cataract and refractive surgery. vol. 41(5) 509-516. doi:10.1080/jcrs.2015.41.05.02

ASCRS Algorithm for Surgical Patients

- Definition**
The American Society of Cataract and Refractive Surgery (ASCRS) algorithm specifically addresses preoperative dry eye optimization.
- Clinical Introduction**
Established to improve biometry accuracy and postoperative outcomes by treating ocular surface disease before surgery.
- Decision Framework**
Guides practitioners through screening, diagnosis, and treatment protocols tailored to surgical candidates.
- Primary Goals**
Optimize tear film stability, reduce inflammation, and ensure accurate IOL calculations for superior refractive outcomes.

CEDARS Algorithm



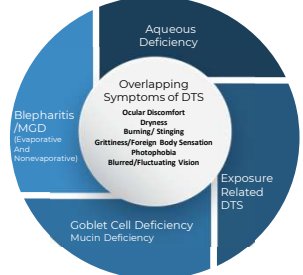
- 1 Definition**
The Clinical Evaluation of Dry eye And Related Symptoms (CEDARS) algorithm provides a **practical, office-based** approach to dry eye assessment.
- 2 Clinical Introduction**
Developed to **simplify** the diagnostic process while maintaining comprehensive evaluation standards for busy clinical settings.
- 3 Decision-Making Framework**
Combines patient-reported outcomes with objective clinical findings to guide **personalized treatment** plans.

CEDARS Algorithm Goals

Cornea, External Disease, and Refractive Society (CEDARS)

Dysfunctional Tear Syndrome described as having **overlapping symptoms** and subtypes.

- Streamline assessment
- Focuses on Diagnostic Categories
 - Aqueous Deficiency
 - Evaporative
 - Blepharitis/MGD
 - Goblet Cell Deficiency
 - Exposure
- *Co-conspirators



Milner MG, Beckman M, Luchs J, et al. Dysfunctional tear syndrome, dry eye disease and associated tear film disorders - new strategies for diagnosis and treatment. *Can Opin Ophthalmol*. 2017;27 Suppl 1(Suppl 1):S3-47. doi:10.1097/00000000-201701000-00004

DEWS II Algorithm Overview

- 1 Definition**
The Dry Eye Workshop II (DEWS II) algorithm provides a comprehensive, **evidence-based** framework for dry eye classification and management.
- 2 Introduction**
Published in **2017** by the Tear Film & Ocular Surface Society (TFOS), revolutionizing dry eye care worldwide.
- 3 Clinical Application**
Stratifies patients by **severity** and guides treatment escalation based on symptoms and clinical signs.
- 4 Primary Goal**
Standardize diagnosis and create treatment pathways that address both aqueous deficiency and evaporative dry eye.

DEWS III: The Evolution

What's New?

DEWS III updates incorporate breakthrough research on inflammation, neurosensory dysfunction, and the role of the ocular microbiome in dry eye pathophysiology.

Clinical Takeaways

- Enhanced focus on inflammatory biomarkers
- Integration of neuropathic pain assessment
- Updated diagnostic criteria and severity grading
- Expanded advanced therapy recommendations



Key Differences: DEWS II vs. DEWS III

Enhanced Diagnostic Criteria

DEWS III incorporates point-of-care testing (MMP-9, osmolarity), meibography, and tear film interferometry as standard diagnostic tools rather than optional assessments, enabling more precise disease classification.

Expanded Treatment Arsenal

The updated algorithm includes newer therapies such as intense pulsed light (IPL), thermal pulsation devices, biologics (serum tears, platelet-rich plasma), and neurostimulation as evidence-based options for moderate to severe disease.

Emphasis on Early Intervention

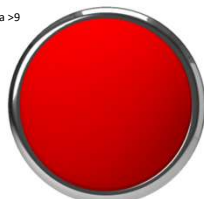
DEWS III advocates for earlier, more aggressive treatment of meibomian gland dysfunction before irreversible gland atrophy occurs, shifting the paradigm from reactive to proactive management.

Wuiffredo JE, Beecher Dal-Cinello JM, Lopez-Garcia D, Uvencia T, Yan G, Liang L, Park H, Salazar AL, Starr CE, Vithana E, Wang W, Chen W, Craig W, Dogru M, Perez VL, Spitznagel C, Sullivan DA, Green LJ. DEWS Collaborative Group. DEWS III: The Revised International Workshop on the Management of Dry Eye Disease. *Invest Ophthalmol Vis Sci*. 2021;62(12):3653-3665. doi:10.1167/iovs.62.12.3653

DEWS III: Management and Therapy. DEWS Collaborative Group et al. *American Journal of Ophthalmology*. Volume 270, 289-306

Easy As 1-2-3

- First, administer the OSDI-6 questionnaire (≥4 is significant for dry eye)
- Next, measure either noninvasive tear breakup time (cutoff: <10 sec) or osmolarity (cutoff: ≥308mOsm/L)
- Finally, assess ocular surface staining (cornea >5 punctate spots and/or conjunctiva >9 punctate spots and/or lid margin ≥2mm length and ≥25% width)

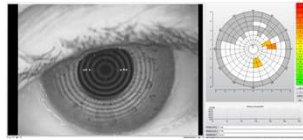
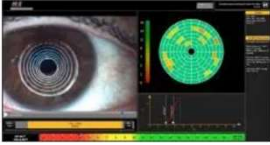


<https://www.researchgate.net/publication/350511111>

Non-Invasive Tear Breakup Time (NITBUT)

BOSA

Oculus Kerograph 5



My clinical experience

repeatable, delegable, & conversion assistant

Innovation in Diagnostics & Treatment

Focus on Etiology, Treatment and Management



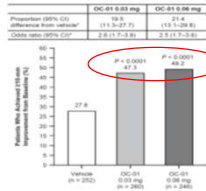
TFOS DEWS II Management and Therapy Algorithms



L. Jones, JF Craig, M. Moshfeghi, P. Karacak, EA Akinci, S. Bhatt, E. Bilton, W. Chen, DK Dhillon, M. Dogru, JAP Gentry, M. Koehn, S. Mehta, VA...
Original images ©2015 Tear Film and Ocular Surface Society. Modified from Jones, L, Craig JP, Moshfeghi M, Karacak P, Akinci EA, Bhatt S, Bilton E, Chen W, Dhillon DK, Dogru M, Gentry JAP, Koehn M, Mehta S, Mehta VA, ...
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ONSET-2: Efficacy and Safety

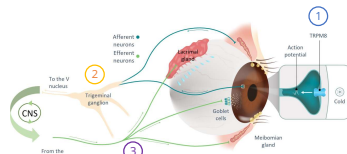
- Significantly greater percentage of patients achieved ≥ 10 -mm improvement in ST5 at week 4 in both varenicline treatment groups compared with the vehicle group
- Most TEAEs were mild and nonocular (sneezing, cough, throat irritation, and instillation site irritation)



Wills D et al. Ophthalmology 2022;129:379-387

TRPM8 Receptors Are Key Regulator of Basal Tear Production Through Activation of the Trigeminal Nerve

- TRPM8 receptors are expressed on cold thermosensory nerves innervating the cornea and upper eyelids
- TRPM8 receptors detect small temperature reductions and changes in osmolarity on the ocular surface associated with interblink tear evaporation
- Once stimulated TRPM8 receptors activate trigeminal nerve signaling
- Increased trigeminal nerve signaling coordinates secretion of basal tear components from lacrimal glands, meibomian glands and goblet cells



CNS, central nervous system; TRPM8, transient receptor potential melastatin 8.
 1. Wipflinger JC, Stein ME. Exp Eye Res. 2020;197:108111. 2. Cheng H, et al. Ocul Surf. 2017;15(2):276-283. 3. Belmonte C, et al. Ocul Surf. 2012;10(6):604-627.
 4. Wipflinger JC, et al. Ocul Surf. 2018;16(1):10-17. 5. Wang H, et al. Invest Ophthalmol Vis Sci. 2014;55(17):6141-6147. 6. Smith CL, Peng B, et al. Invest Ophthalmol Vis Sci. 2010;51(11):5511-5517.
 7. Wang H, et al. Invest Ophthalmol Vis Sci. 2012;53(10):3611-3617.

(Acotremon Ophthalmic Solution) 0.003%

Acotremon is a potent and selective TRPM8 agonist that activates the trigeminal nerve to stimulate tear production

Enrollment 931 dry eye subjects completed COMET-2 and -3 studies

Primary endpoint met in both phase 3 (COMET) trials

Primary Unanesthetized Schirmer Test

- Statistically significantly higher % of subjects with ≥ 10 mm increase in unanesthetized Schirmer Test scores on Day 14 with acotremon 0.003% (ACO) compared to vehicle
- Similar results seen on Day 1 and Day 90 (secondary endpoints)

Key Secondary SANDE Score

- Change from baseline in SANDE scores were statistically significantly greater with ACO on Day 28 in COMET-2 (P=0.0138); numerically greater with ACO in COMET-3 (P=0.1321)

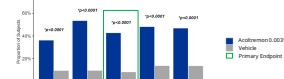
Exploratory Ocular Staining

- Change from baseline in total corneal and total conjunctival staining were observed at Day 7 through Day 90

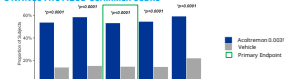
Adverse Events

- ACO was well-tolerated, and there were no reported serious ocular adverse events

COMET-2: PROPORTION WITH ≥ 10 mm INCREASE IN UNANESTHETIZED SCHIRMER SCORE



COMET-3: PROPORTION WITH ≥ 10 mm INCREASE IN UNANESTHETIZED SCHIRMER SCORE



Wills D, et al. Am Acad of Ophthalmol, 2024

1/1

Slide 32

- TY1**
1. MED-US-NP-2400068
 2. MED---2301092
 3. MED-US-NP-2400031
 4. MED--ACLT-2500002
 5. MED---2400756
 6. MED---2400325
 7. MED-US-NP-2400104


Yeh, Thao, 2025-06-09T04:49:55.680

Slide 33

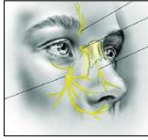
- TY1** MED--ACLT-2500015

Yeh, Thao, 2025-08-13T03:51:29.402

External Neurostimulation Device



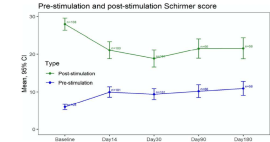
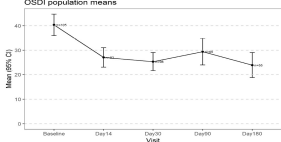
iTear 100 external nasal nerve stimulator; approved in 2020



Yu MD et al. Clin Ophthalmol. 2021;15(4):39-42. doi: 10.2165/000000009.202115040411

External Neurostimulation Device - Study

- Multicenter, open-label, single-arm clinical trial, included adult patients with DED with a Schirmer score of ≤ 10 mm in at least one eye.
- The primary efficacy endpoint was the Schirmer score at day 30. The major secondary endpoint was the change in DED symptoms at day 30 evaluated using the Ocular Surface Disease Index (OSDI).
- At day 30, patients had a mean Schirmer index of 9.4 mm (95% CI, 7.4-11.3), and improved baseline OSDI by an average of 14.4 (95% CI, 11.1-17.7) (both statistically significant).
- Two mild device-related AEs were reported.

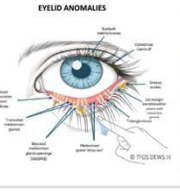



El M et al. Front Med Sci Technol. 2020;6(1):23. Peer Review. Oculoplastic Ophthalmology. 2020.

Eyelid Anomalies

Algorithm#2

ETIOLOGIC DRIVER TESTS	EVIDENCE-BASED INTERVENTIONS
Blepharitis / lid disease	Blepharitis / lid hygiene
Incomplete blinking	Blink exercises
Severe dry eye disease	Artificial tears
Eyelid homeostasis - gritty (orboshect) or flaky (blepharocyst)	Topical lid hygiene
Eyelash base - cylindrical dandruff, Demodex	Oral antibiotics
Mesenchymal gland dysfunction	Mesenchymal gland dysfunction
Truncal, meibomian, displaced gland orifices	Oral nutrition (vitamin D3)
Mesenchymal gland regression	Tear supplementation / replacement (lipid-based, endogenous)
Meibography - fractured, dilated glands, "plug-out", telangiectasia	Tear supplementation / replacement (lipid-based, endogenous) / restoration (topical alpha-tocopherol, selenium, sulfur)
Lid margin keratinization	Pharmacological tear stimulation / restoration (internal and external lid heating: PL, LLLT, QWR, radio-frequency)
	Device tear stimulation / restoration (internal and external lid heating: PL, LLLT, QWR, radio-frequency)
	Lid margin debridement for significant keratinization
	Oral antibiotics



Original image: Q2205. Tear Film and Ocular Surface Society. Modified from: Jones L, Craig JP, Markoull M, et al. TFOU DEWS II management and therapy report. Am J Ophthalmol. June 2, 2020. In: Jones L, et al. Ocular Surface Disease: A Practical Approach. Oxford: Oxford University Press; 2020. p. 100-110. doi: 10.1093/acprof:oso/9780198800000.003.0005

Common Clinical Pitfalls to Avoid

Symptom-Sign Mismatch

Don't dismiss significant symptoms with mild signs or vice versa. Consider neuropathic pain and treat both components appropriately.

Undertreating Inflammation

Chronic inflammation drives disease progression. Address underlying inflammation early with prescription anti-inflammatory therapy.

Inadequate Follow-Up

Dry eye requires monitoring and adjustment. Establish clear follow-up schedules and track patient progress systematically.

Missing MGD

Meibomian gland dysfunction underlies 86% of dry eye cases. Always assess gland structure and function as part of evaluation.

Follow-Up Schedule Recommendations

Initial Visit

Comprehensive evaluation, diagnostic testing, classification, and treatment initiation with patient education.

4-6 Week Follow-Up

Assess treatment response, review compliance, adjust therapy as needed, and reinforce self-care strategies.

3-Month Check

Re-evaluate severity classification, repeat objective testing, optimize long-term maintenance protocol.

Ongoing Monitoring

Schedule regular 3-6 month evaluations based on severity, with annual comprehensive reassessment for all patients.

Key Takeaways for Clinical Practice



Algorithms Standardize Care

DEWS, CEDARS, and ASCRS frameworks provide evidence-based pathways that improve consistency and outcomes across patient populations.



Technology Enables Precision

Objective diagnostic testing guides phenotype-specific treatment decisions and monitors therapeutic response over time.



Protocols Ensure Success

Systematic screening, classification, treatment, and follow-up protocols create sustainable, high-quality dry eye programs.

Thank you
SM platforms @Drjanelle OD



Connect, Engage, and Message Me On Social
