

COPING WITH DRY EYES AND PHOTOPHOBIA

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I have no financial interests to disclose
and will not be discussing off label use

This talk is for information purposes and
is not medical advice, please talk to your
eye doctor about your particular
treatment plan



01

Dry Eye Basics

Learning the terminology of dry eye

02

Dry Eye and Blepharospasm

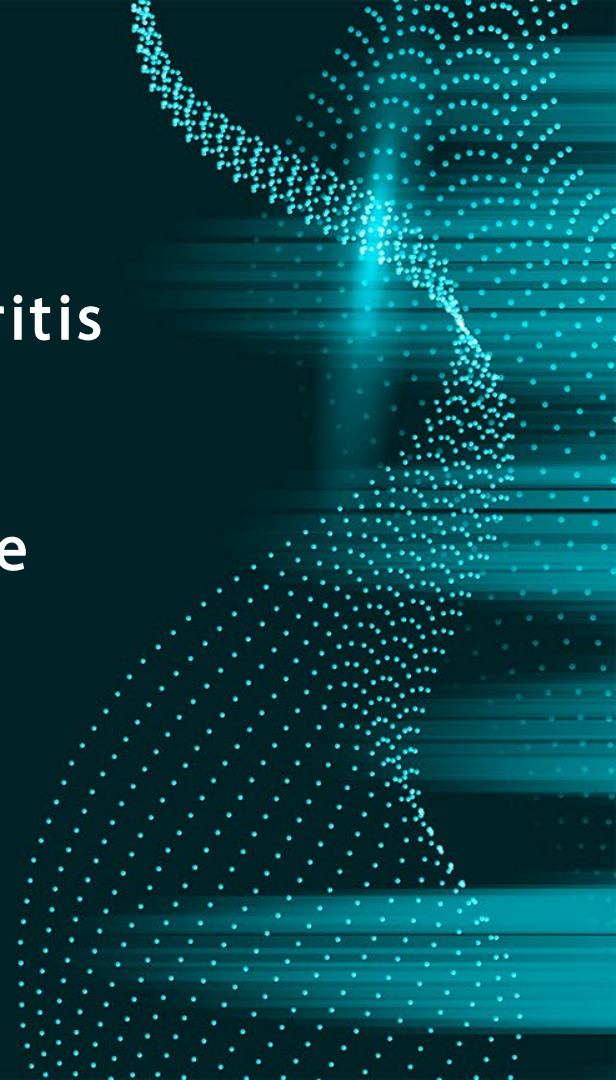
How dry and blepharospasm interact

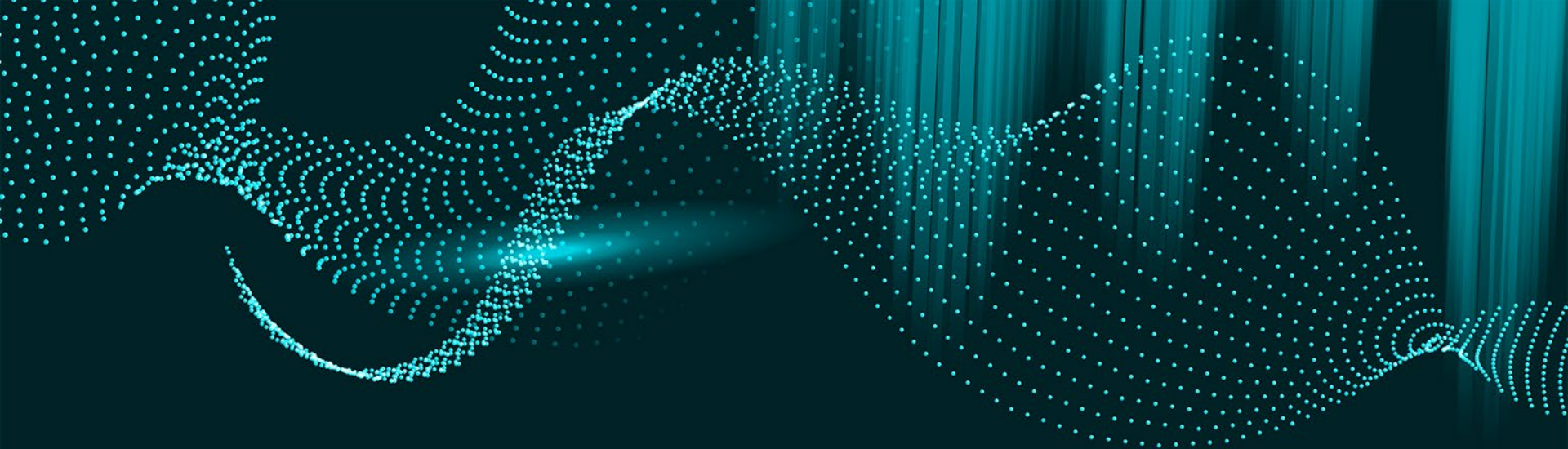
03

Treatment

What we can do about it

OUTLINE

- Basics of Dry Eye and Blepharitis
 - How Ocular Surface Disease Exacerbates Blepharospasm
 - Treatment Options for Dry Eye
 - How to Manage Temporary Lagophthalmos after Botox
 - Treating Photophobia
- 



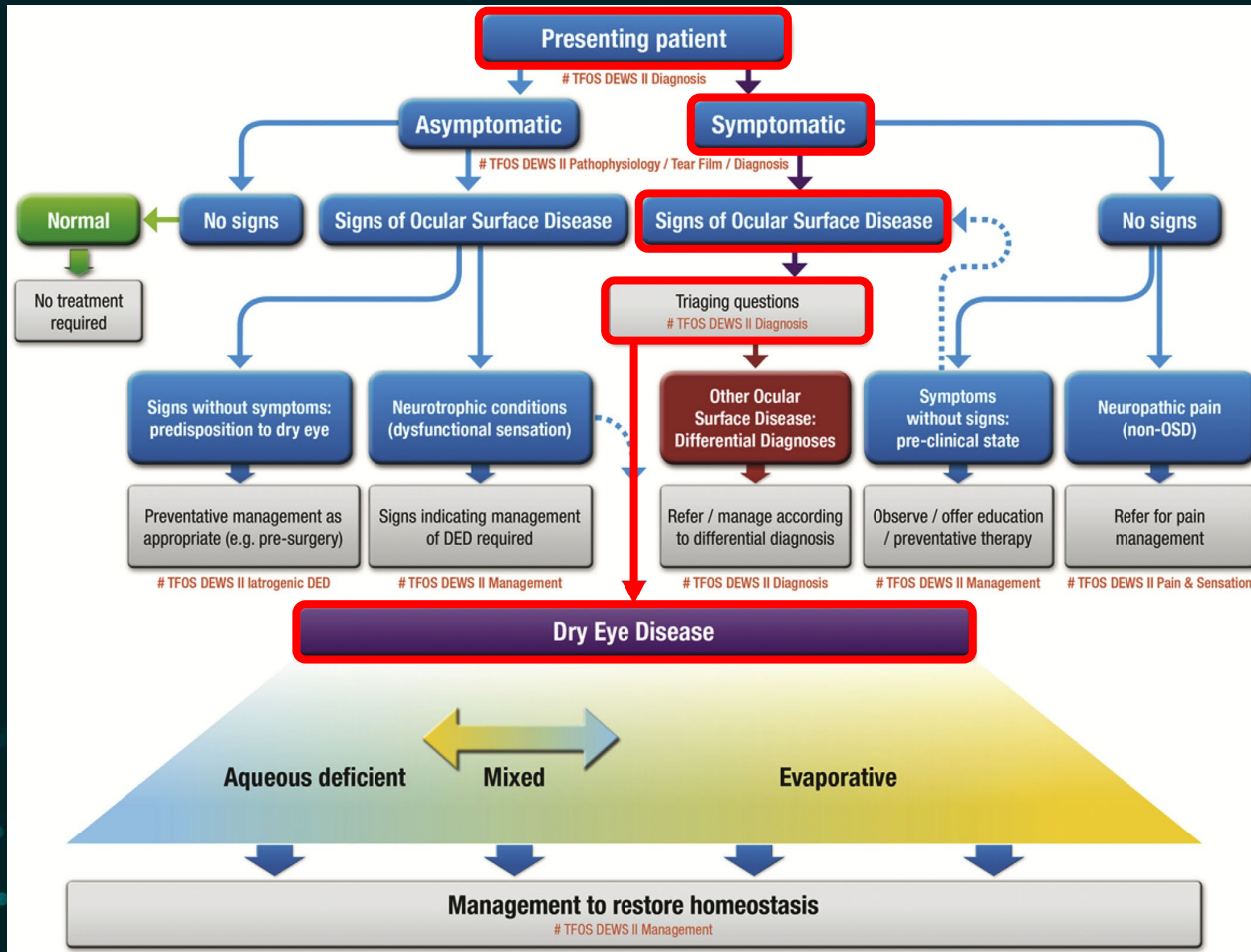
01 | Basics of Dry Eye

“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.”

TFOS DEWS II Report

“Dry eye can be caused by many factors which disrupt the normal balance of the tear film resulting in ocular discomfort.”

Plain English



Source: TFOS DEWS II Report

Spectrum of Dry Eye

Aqueous Deficient

Low production of tears

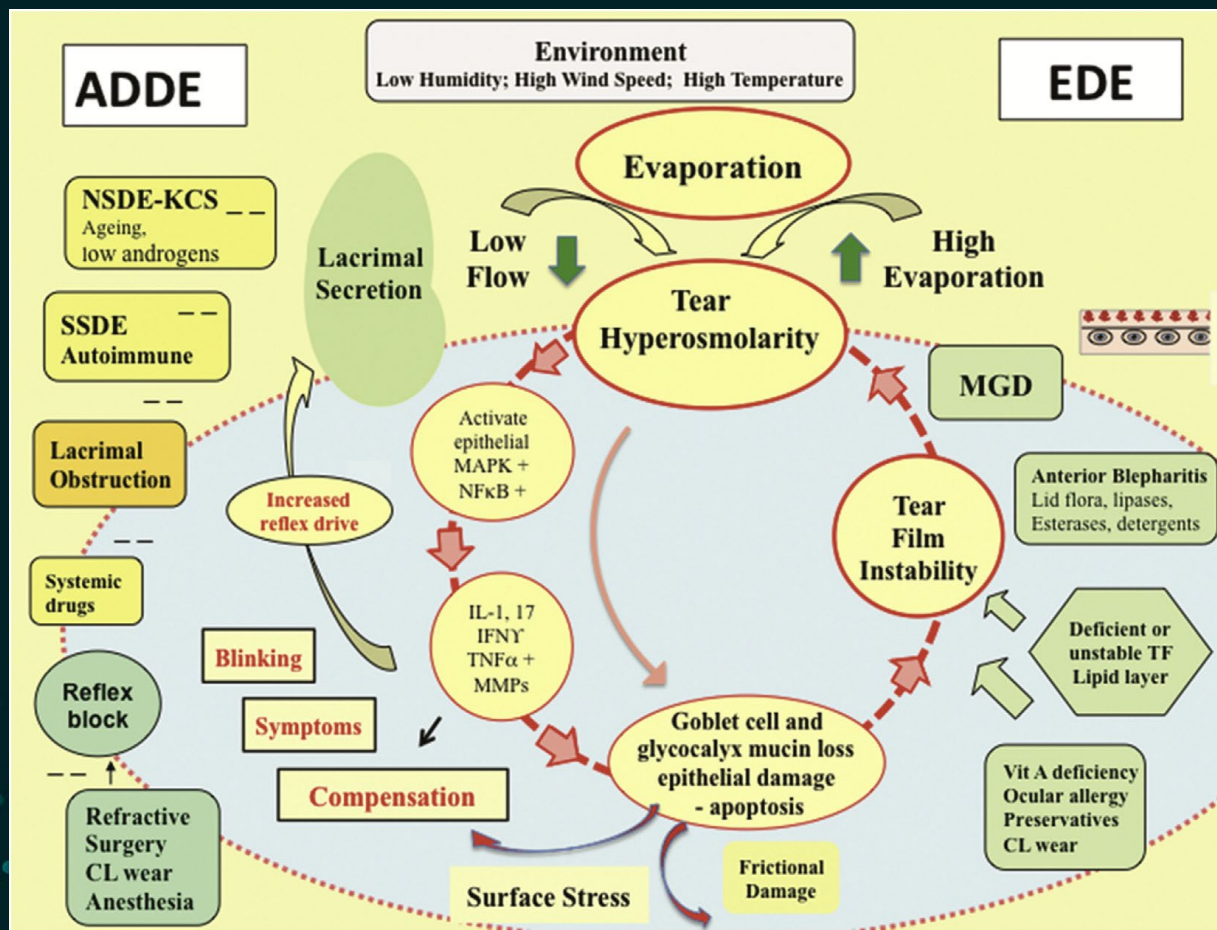
Evaporative

Early evaporation of tears

Spectrum of Dry Eye

Some definitions:

- **TBUT** (Tear Break Up Time) – The amount of time it takes the tears to evaporate between blinks. Normal is greater than 10 seconds
- **Tear Osmolarity** – A measure of how concentrated the tears are. Higher numbers mean there is less water in the tears
- **Tear Film** – The layer of tears which covers the eye surface. There is an oil layer and a combined water and mucous layer, both are important



Source: TFOS DEWS II Report

Autoimmune disease,
refractive surgery,
reflex block, some
medications

Aqueous Deficiency
(Low tear production)

Low humidity, high
wind or temperature,
Meibomian gland
disease

Evaporative
(Early evaporation)

Tear Hyperosmolarity
(Highly concentrated tears)

Inflammatory Cascade

Vicious
Cycle

Tear Film Instability

Surface Breakdown

How Do We Diagnose Dry Eye?

Symptoms

Tearing,
Burning, Itching
Light Sensitivity
Redness
Intermittent Blur
"Heavy" "Gritty"



How Do We Diagnose Dry Eye?

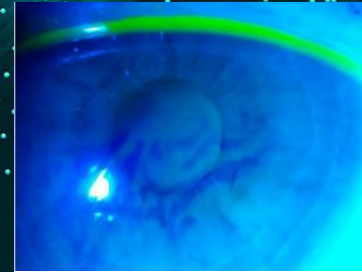
Screening

- **OSDI** (Ocular Surface Disease Index)
12 questions, from 0 to 4
- **SANDE** (Symptom Assessment iN Dry Eye)
Frequency and severity from 0 to 100
- **SPEED**
8 items within frequency/severity,
total score 0 to 28

How Do We Diagnose Dry Eye?

In the Clinic

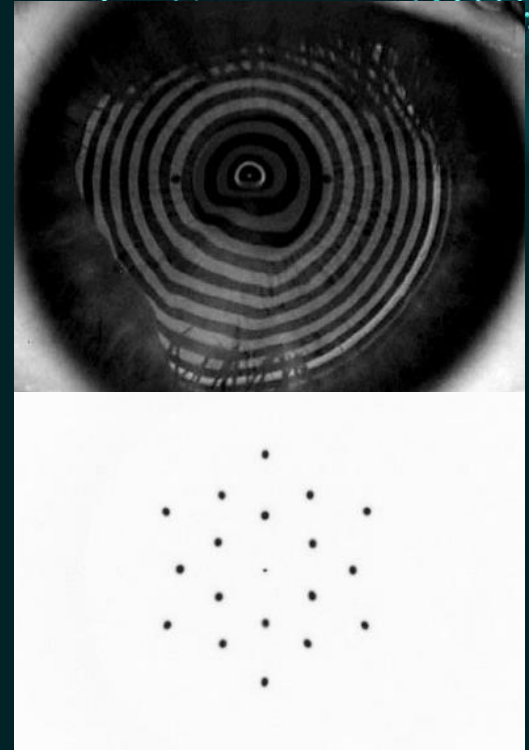
Dye Staining
Schirmer Testing
MMP-9 Testing
Tear Osmolarity

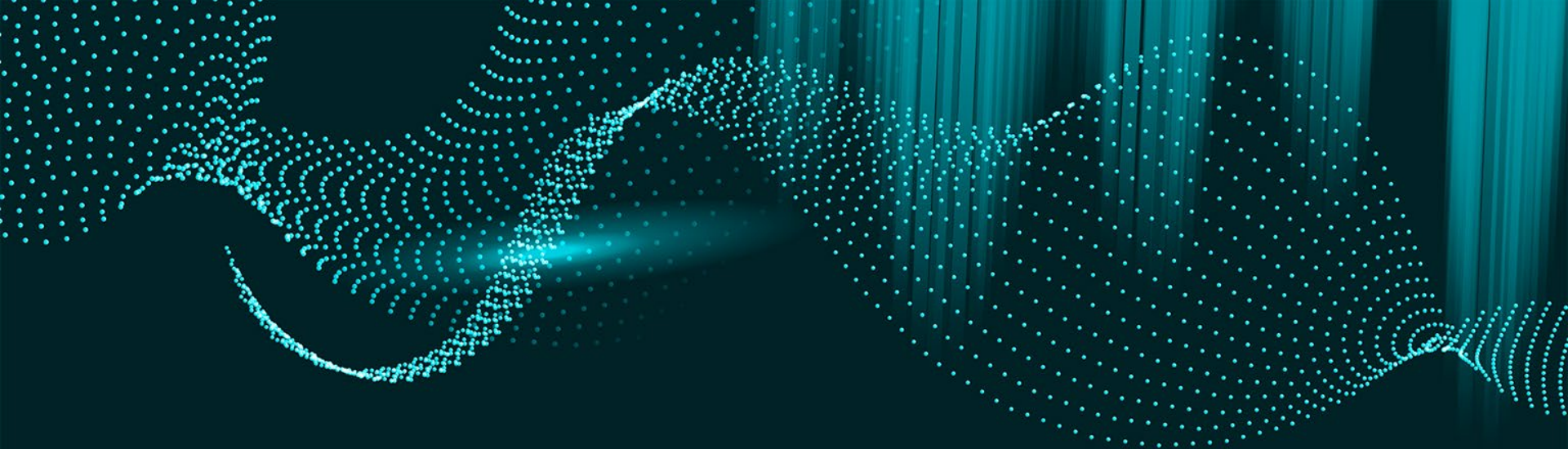


How Do We Diagnose Dry Eye?

Diagnostics

Topography
Epithelial Mapping
Meibomography





02

Dry Eye and
Blepharospasm

Dry Eye and Blepharospasm

The Influence of Benign Essential Blepharospasm on Dry
Eye Disease and Ocular Inflammation

RONG LU, RUI SHENG HUANG, KANG LI, XIN CHUN ZHANG, HUI YANG, YADAN QUAN, AND QIAN LI

Compared dry eye symptoms in blepharospasm
against patients with dry eye disease and
patients with neither disease

Dry Eye and Blepharospasm

40

Blepharospasm

40 patients were recruited with blepharospasm and dry eye disease to analyze cytokines

40

Dry Eye Disease

40 patients with dry eye disease were recruited to compare their baseline

40

Healthy controls

40 healthy controls were used to obtain averages for patients without either condition

Dry Eye and Blepharospasm

For all patients, they measured:

- OSDI Questionnaire
- Tear Break Up Time (TBUT)
- Schirmer I test
- Fluorescein Staining
- Impression Cytology
- Cytokine Assay

Dry Eye and Blepharospasm

- Patients with dry eye and blepharospasm had significantly higher inflammatory markers
- All patients improved with Botox injection
- After Botox injection, average OSDI scores and tear break up times improved
- It was felt that the microabrasive effects of blinking in blepharospasm contribute to the feedback of dry eye symptoms

Autoimmune disease,
refractive surgery,
reflex block, some
medications

Aqueous Deficiency
(Low tear production)

Low humidity, high
wind or temperature,
Meibomian gland
disease

Evaporative
(Low tear production)

Tear Hyperosmolarity
(Highly concentrated tears)

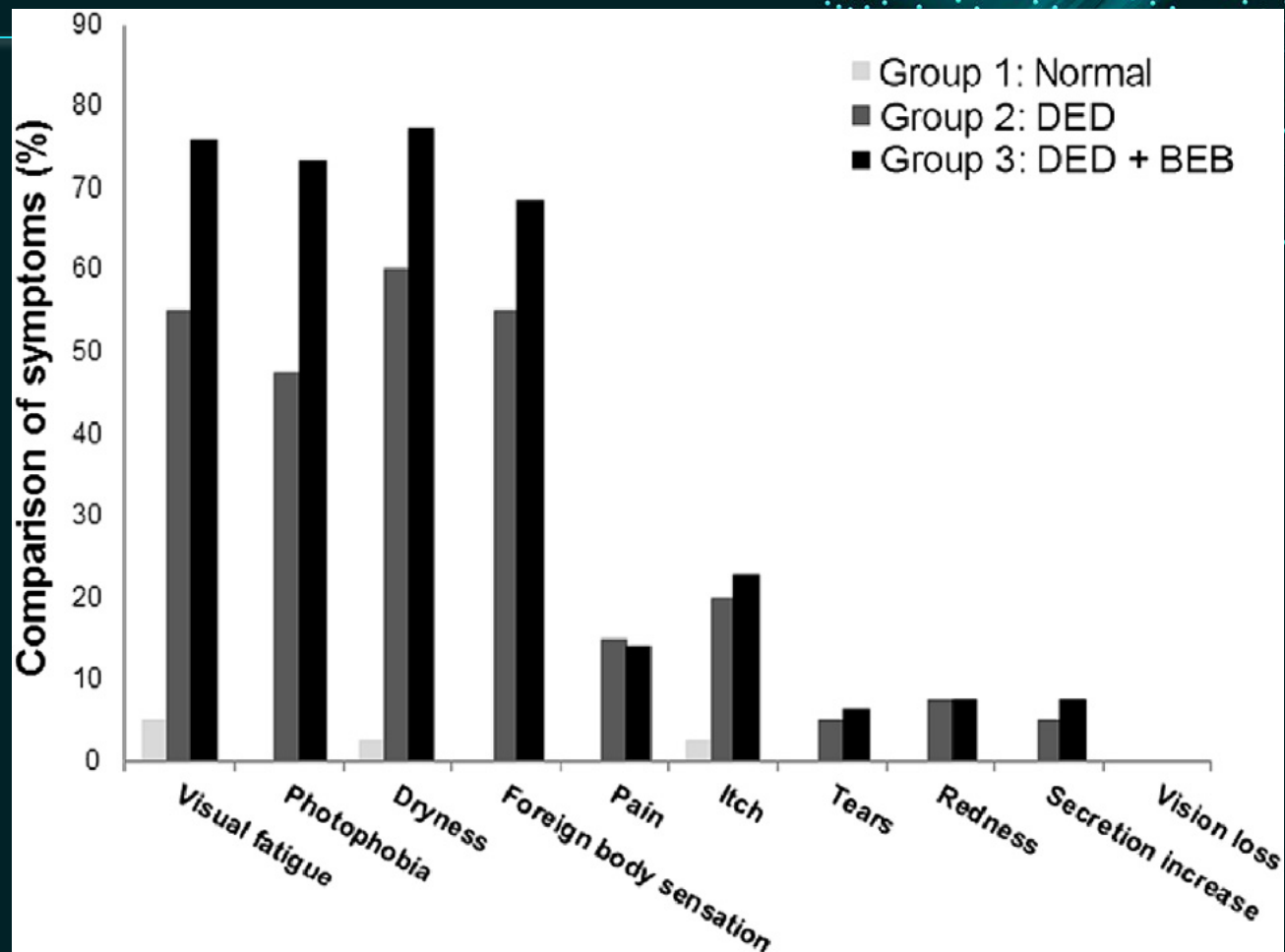
Inflammatory Cascade

Abnormal blink
In blepharospasm

Surface Breakdown

Tear Film Instability

Vicious
Cycle



Dry Eye and Blepharospasm

CLINICAL SCIENCE

Botulinum toxin A treatment in patients suffering from blepharospasm and dry eye

J Horwath-Winter, J Bergloeff, I Floegel, E-M Haller-Schober, O Schmut

Br J Ophthalmol 2003;**87**:54–56

- 16 patients with blepharospasm and dry eye
- Botox relieved blepharospasm in all patients
- 3 dry eye improved, 8 no difference, 5 worse

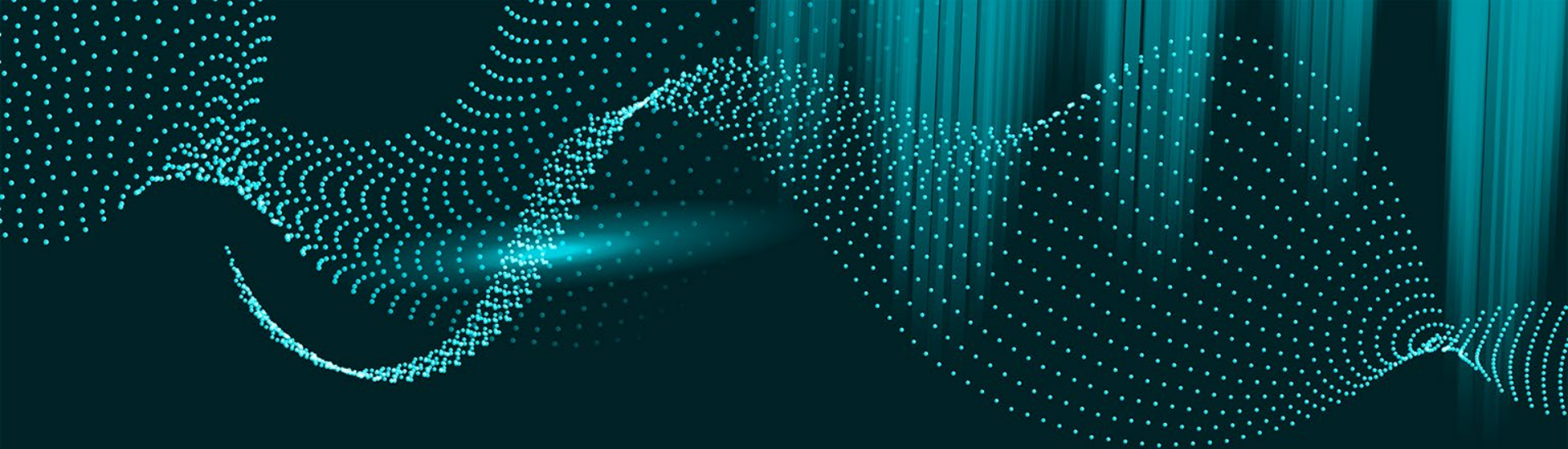
Dry Eye and Blepharospasm

Changes in ocular higher-order aberrations following botulinum toxin treatment in patients with blepharospasm

BTX improves dry eye in patients with BEB

Yoshihiko Isshiki^{1,2} · Hiroto Ishikawa¹ · Osamu Mimura¹

- Better Schirmer and TBUT after Botox
- Higher order aberrations, an objective measurement of visual blur, improved also



03

Dry Eye
Treatment

How Do We Treat Dry Eye?

Initial Treatment

- Artificial Tears
- Warm Compresses
- Eyelid Scrubs
- Artificial Tear Ointment
- Environmental Modification

How Do We Treat Dry Eye?

Moderate Dry Eye Treatment

- Preservative free artificial tears
- Anti-inflammatories (Restasis, Xiidra, Cequa)
- Topical steroid pulse
- Punctal plugs
- Omega-3 supplementation
- Doxycycline/Azithromycin

How Do We Treat Dry Eye?

Severe Dry Eye Treatment

- Eyelid Thermal Pulsation (Lipiflow, etc)
- Punctal cautery
- Autologous Serum Tears
- Amniotic Membrane
- Scleral/PROSE lenses
- Targeted surgical treatments

How Do We Treat Dry Eye?

Eyelid Scrubs



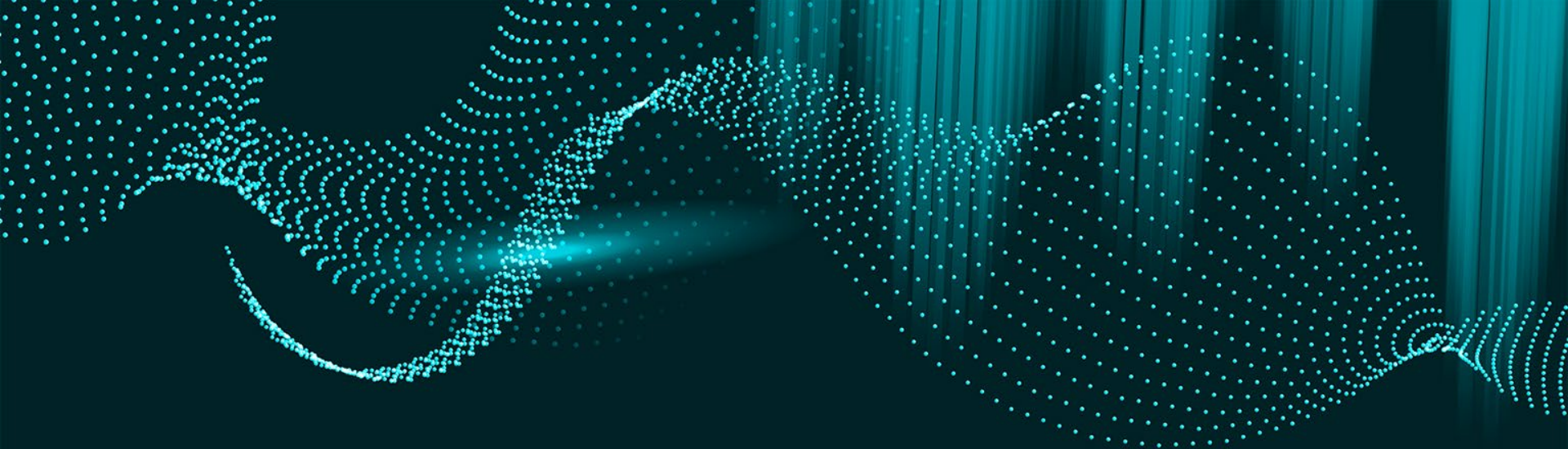
OcuSoft Plus



Avenova



SteriLid



04

Treating Lagophthalmos
After Botox

Treating Lagophthalmos After Botox



Source: Eyerounds.org

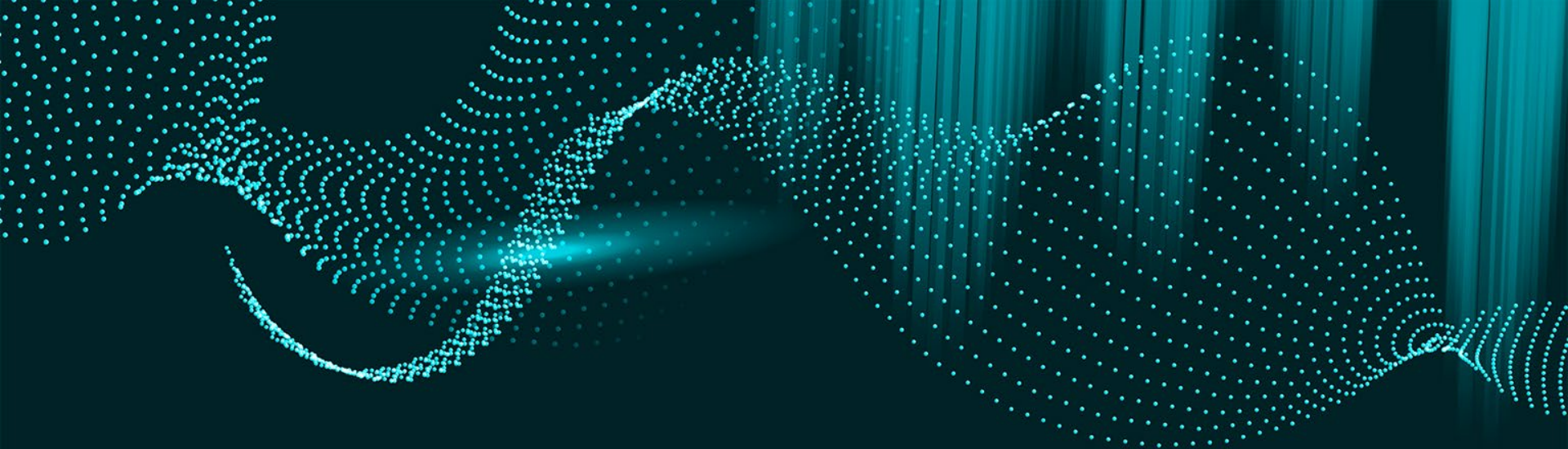
Treating Lagophthalmos After Botox

- Preservative free artificial tears
- Topical ophthalmic ointments
- Tape Tarsorrhaphy
- Moisture chamber
- Glue or Suture Tarsorrhaphy

Treating Lagophthalmos After Botox



Source: Eyeeco.com



05

Treatments for
Photophobia

Treating Photophobia In Blepharospasm

Effect of light on blinking in patients with idiopathic isolated blepharospasm

Yiwen Wu^{a,b,c,**}, Hyun Joo Cho^c, Pattamon Panyakaew^{c,d}, Charulata Sankhla Savant^{c,e}, Tianxia Wu^f, Nguyet Dang^c, Mark Hallett^{c,*}

- Blocking 480 and 590nm wavelengths helpful
 - FL-41 tint shown to help in these cases

Treating Photophobia In Blepharospasm

FL-41 Tint Improves Blink Frequency, Light Sensitivity, and Functional Limitations in Patients with Benign Essential Blepharospasm

Marcus K. Blackburn, MD¹, Randy D. Lamb, MD¹, Kathleen B. Digre, MD^{1,2}, A. Gordon Smith, MD², Judith E.A. Warner, MD^{1,2}, Robert W McClane, MS³, Sanjeev D. Nandedkar, PhD⁴, Wendy J. Langeberg, MPH⁵, Richard Holubkov, PhD⁶, and Bradley J. Katz, MD, PhD^{1,2}

- FL-41 tint showed significant benefit over standard gray or rose-tinted lenses
- Less fluorescent sensitivity, tearing, blinking

Summary

- There is overlap between dry eye disease and blepharospasm, with evidence of two-way exacerbation of either disease
- Botox significantly improves blepharospasm and can improve signs of dry eye
- Combined treatment can improve quality of life and restore function

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THANKS!

Any questions?

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