

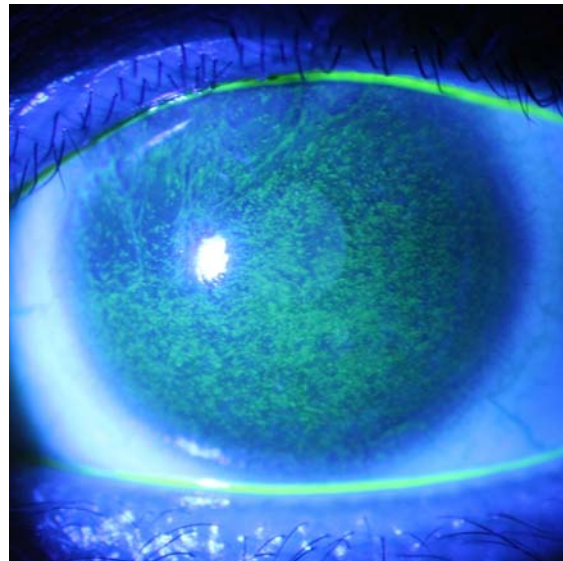
OH MY!!! DRY EYE!!!

No Conflict of Interest to Report

Charles Stockwell, O.D

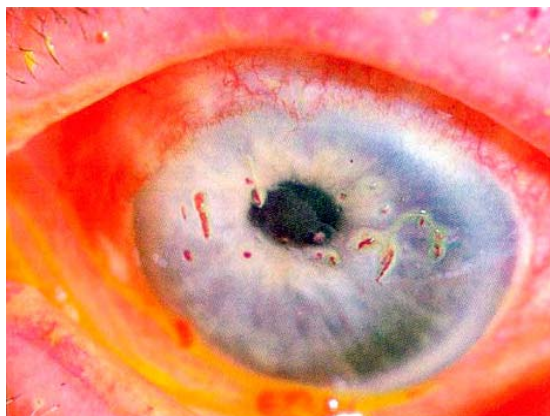
Charles.stockwell@ttuhsc.edu

The Problem



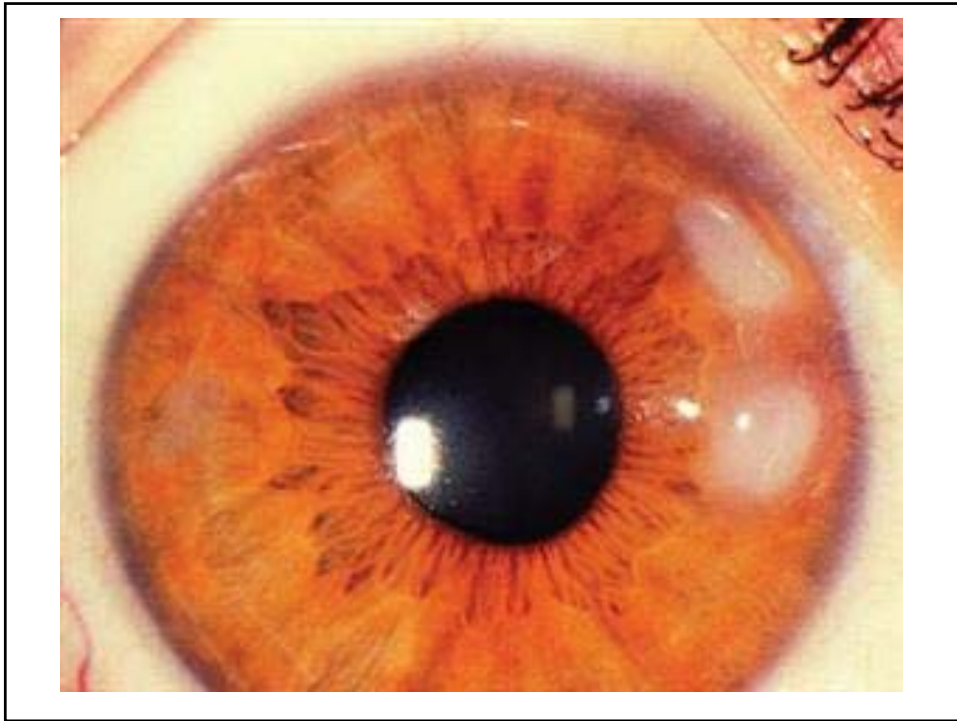
Filamentary Keratitis

- Keratoconjunctivitis sicca, or dry eye syndrome, is the most common issue with RA patients.

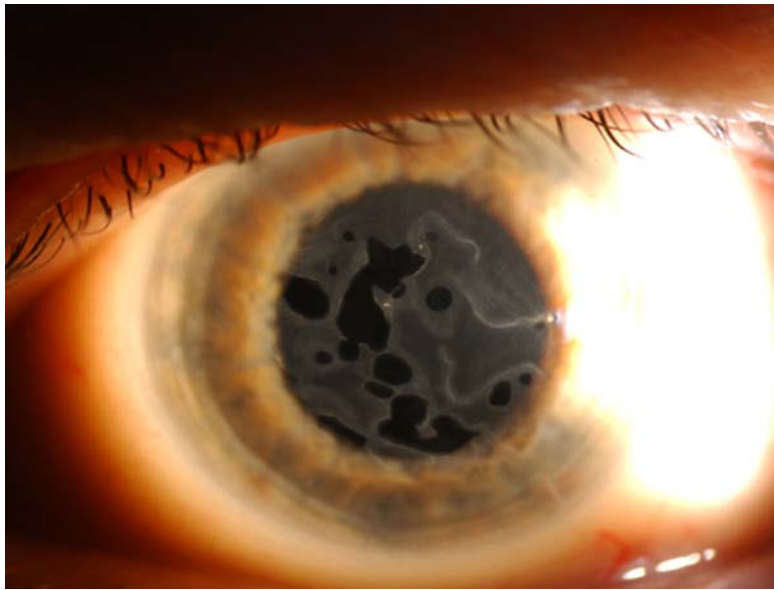


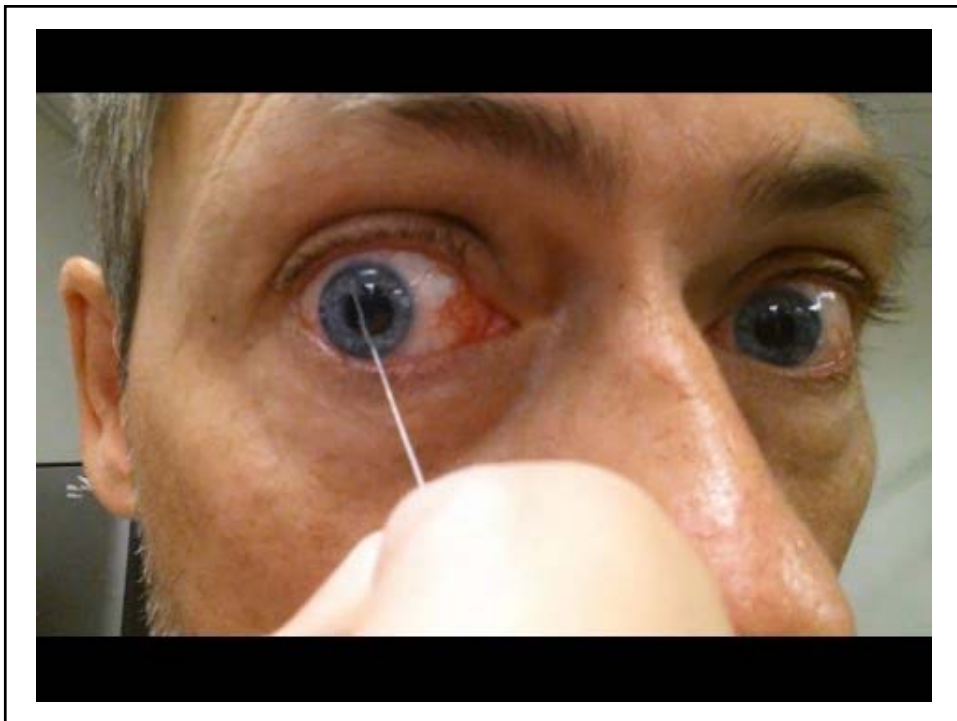
Masqueraders of Dry Eye

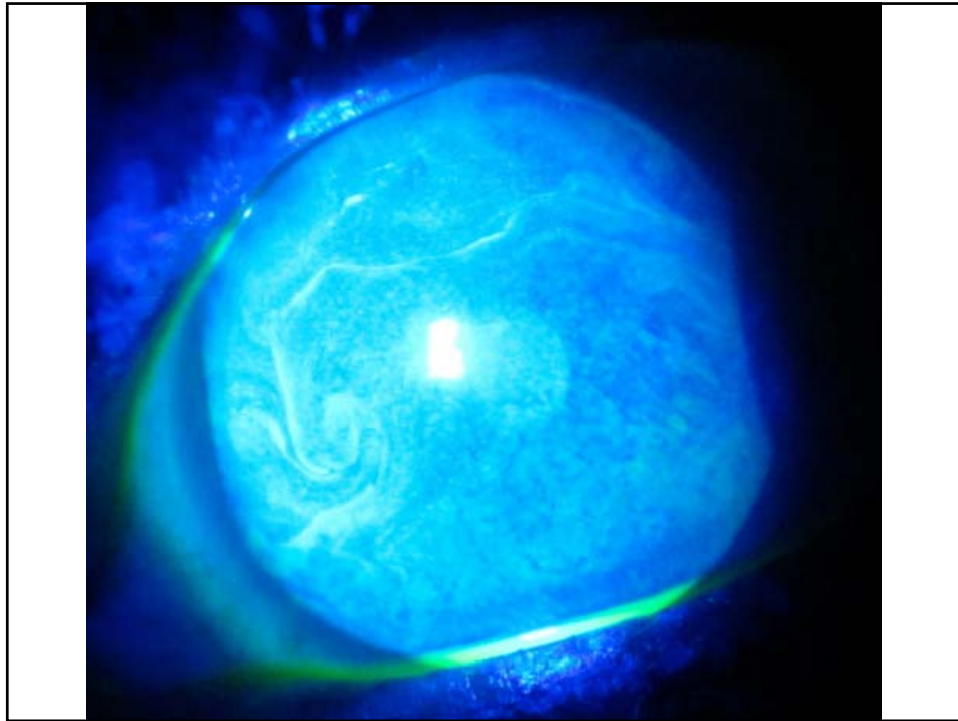
- Misalignment – Triggers Trigeminal Nerve
- Salzmann's
- Basement Membrane Dystrophy
- Allergic Conjunctivitis, GPC
- Mucous Fishing Syndrome
- Demodex
- Limbal Cell Deficiency



Map-Dot-Fingerprint - Basement







Where are We In the Nation?

- National Women's Health Resource Center named Lubbock as tied at number two for the top one hundred places in the USA for Dry Eyes.
- Women's Health Resource Center, the top 10 dry-eye hot spots are:
 1. Las Vegas
 2. Lubbock, Texas
El Paso
 4. Midland/Odessa, Texas
 5. Dallas/Fort Worth
 6. Atlanta
 7. Salt Lake City
 8. Phoenix
 9. Amarillo, Texas
 10. Honolulu



How Many of You Have Dry Eyes?

- Dry
- Gritty
- Burn
- Sting
- Tearing
- Vision Varies – Have to Blink to Clear
- Redness to the Eyes
- Use Artificial Tears

Lets Find Out - Try This

We will time this: Remember What Number You Put Your Hand Down On.

First of all Hold up your hands.

When I say now blink your eyes one time

Then hold them open as long as you can

When you have to blink put your hand down.

Pay attention to any of the sensation we just talked about and Look at this slide to see what happens to your Vision.

Reduced Blinking

Average Blink rate is 12 -16 Times a Minute
What would cause a decreased blink rate?

Reduced Blinking

Average Blink rate is 12 -16 Times a Minute
What would cause a decreased blink rate?

CONCENTRATION

**Computer work/Games,
Reading,
TV,
Driving
Contact Lenses**

**Average Blink rate is 6-9 Times a Minute while doing
the above.**

Reduced Blinking

Also, certain Diseases/Events-

Parkinson's

Bell's Palsy

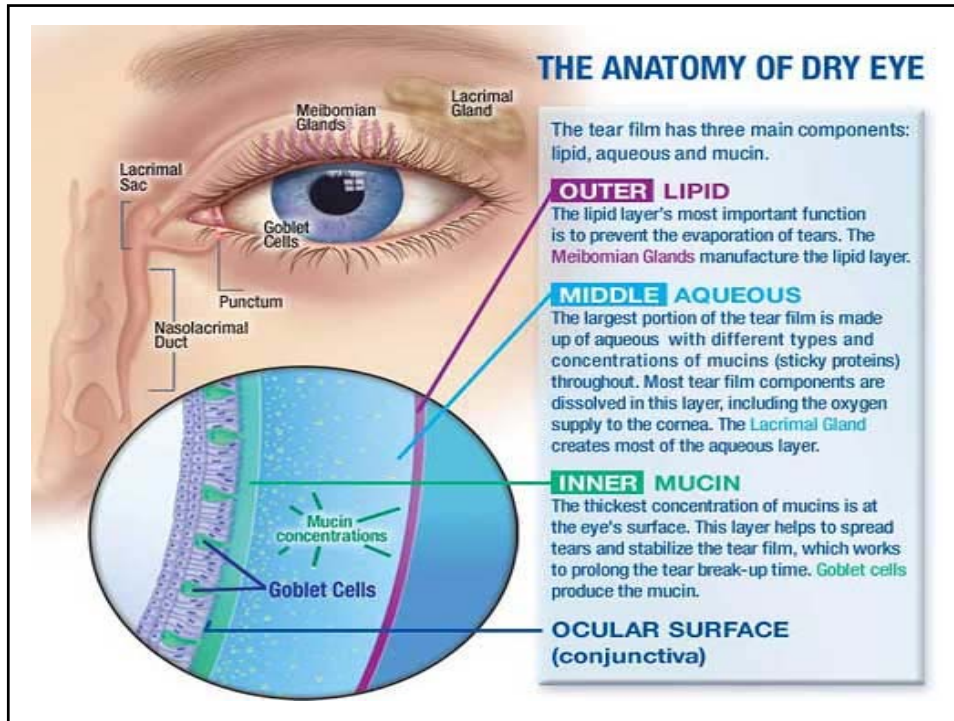
NEW DEFINITION OF DRY EYES

FROM

THE INTERNATIONAL DRY EYE WORKSHOP II IN 2017

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.

Dry eye is recognized as a disturbance of the **Lacrimal Functional Unit (LFU)**, and integrated system comprising the lacrimal glands, ocular surface (cornea, conjunctiva and meibomian glands) and lids, and the sensory and motor nerves that connect them. It's overall function is to preserve the integrity of the tear film, the transparency of the cornea and the quality of the image projected onto the retina.



Prevalence of Dry Eye Also Known As Keratoconjunctivitis Sicca (KCS)

Incidence and Classification

- Two to Three times more Women than Men
- Age is # 1 Factor

**Pre-Clinical/Marginal/
Enviromental/SAD** =

1. Mild/Episodic
2. Moderate or Chronic
3. Severe or Constant
4. Disabling and Constant

Dx: 16 M Tx: 1.5 M

Numbers of People

Aged 50+ = over 80M

ALMOST EVERYONE

30% = 30 Million

20% = 10 Million

10% = 5 million

5% = 2.5 million

The Key is History

Questions to Ask

Ocular Surface Disease Index OSDI

Standardized Patient Evaluation of Eye Dryness
SPEED

Questions to Ask

- Do your eyes tear, burn, feel dry, gritty or irritated?
- Are your eyes red or occasionally get red?
- Do you experience blurred or fluctuating Vision?
- Are you using or do you feel the urge to use Artificial Tears?

OSDI (Ocular Surface Disease Index)

Patient name: _____ Date of birth: _____ Patient ID: _____

Have you experienced any of the following during the last week?

	All of the time	Most of the time	Half of the time	Some of the time	None of the time
1. Eyes that are sensitive to light?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Eyes that feel gritty?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Painful or sore eyes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Blurred vision?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Poor vision?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>


Have you problems with your eyes limited you in performance any of the following during the last week?

	All of the time	Most of the time	Half of the time	Some of the time	None of the time	No Answer
6. Reading?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Driving at night?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Working with a computer or bank machine (ATM)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Watching TV?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Have your eyes felt uncomfortable in any of the following situations during last week?

	All of the time	Most of the time	Half of the time	Some of the time	None of the time	No Answer
10. Windy conditions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Places or areas with low humidity (very dry)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Areas that are air conditioned?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

The SPEED Questionnaire for Rapid Screening


SPEED[®] DRY EYE QUESTIONNAIRE

Patient Name: _____
Date: _____

Please answer the following questions by checking the box that best represents your answer. Select only one answer per question.

1. Report the type of SYMPTOMS you experience and when they occur:

SYMPTOMS	AT THIS VISIT		WITHIN PAST 72 HOURS		WITHIN PAST 3 MONTHS	
	YES	NO	YES	NO	YES	NO
Dryness, Itchiness or Scratchiness						
Stinging or Irritation						
Blurring or Watering						
Eye Fatigue						

2. Report the FREQUENCY of your symptoms using the rating list

SYMPTOMS	0	1	2	3
Dryness, Itchiness or Scratchiness				
Stinging or Irritation				
Blurring or Watering				
Eye Fatigue				

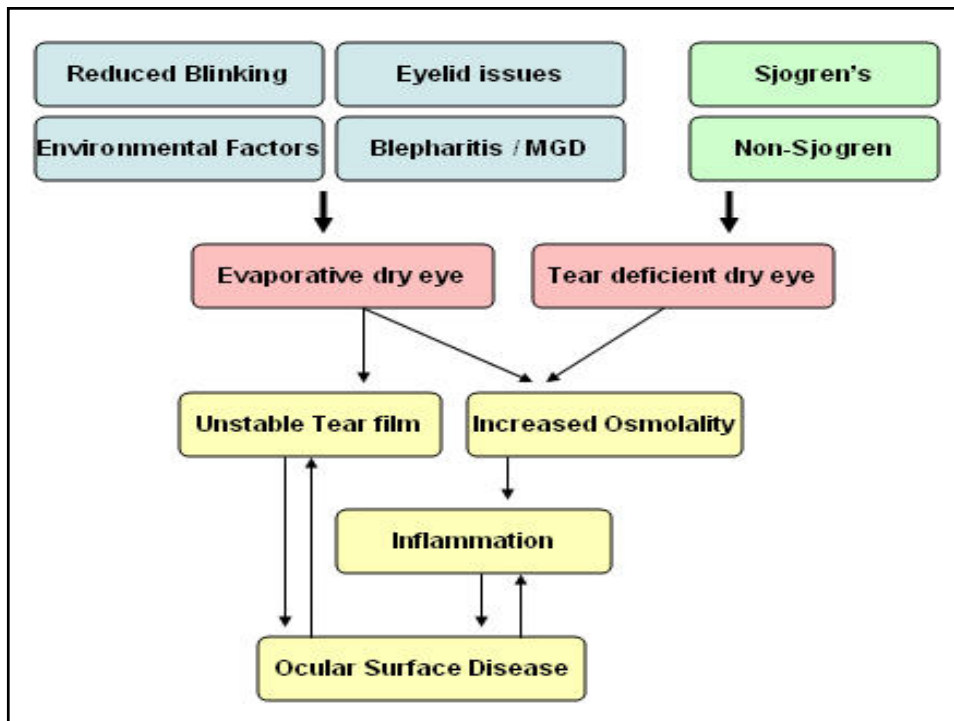
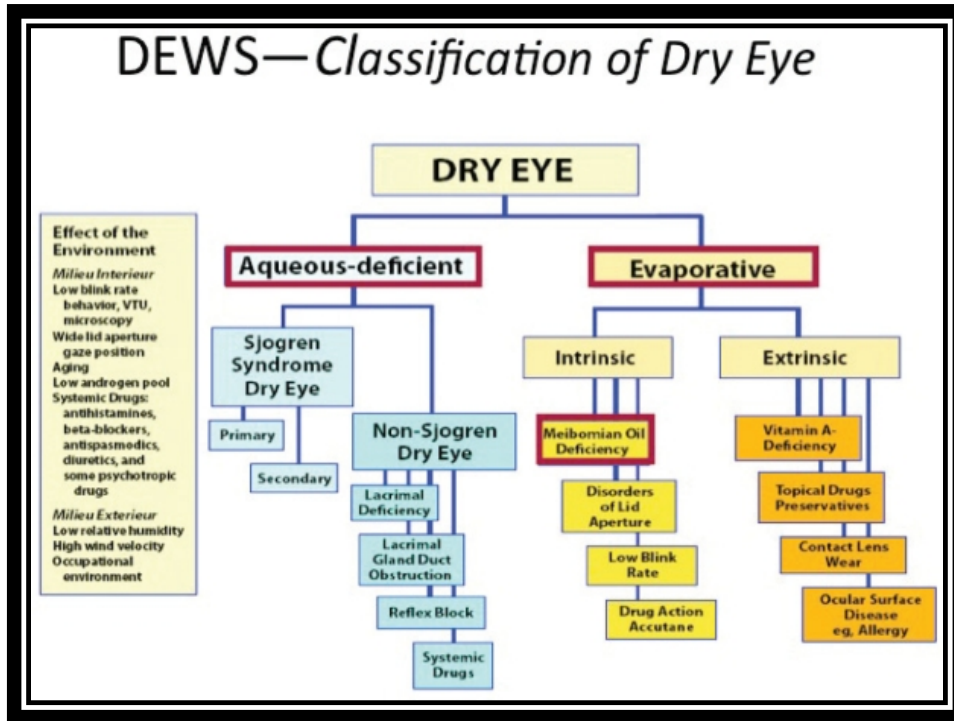
0 = Never 1 = Sometimes 2 = Often 3 = Constant

3. Report the SEVERITY of your symptoms using the rating list below:

SYMPTOMS	0	1	2	3	4
Dryness, Itchiness or Scratchiness					
Stinging or Irritation					
Blurring or Watering					
Eye Fatigue					

0 = No Problems
1 = Tolerable - not perfect, but not uncomfortable
2 = Intolerable - irritating, but does not interfere with my day
3 = Bothersome - irritating and interferes with my day
4 = Intolerable - unable to perform my daily tasks

4. Do you use eye drops for lubrication? YES NO If yes, how often? _____



Types of Dry Eyes

- Evaporative - MGD – Rapid TBUT, Acne Rosacea
- External Eye Disease – Blepharitis, Staph, Demodex, Lid Wiper Epitheliopathy
- Aqueous Deficient – Sjorgren’s/Non-Sjorgren’s
 - Thyroid, RA, Autoimmune, GVHD
- Lid Closure Abnormalities – Eyelid Issues
- Topical and Systemic Medications
- Contact Lens Wear
- Refractive Surgery
- Corneal Irregularity or Scarring
- Allergies

WHY?

Evaporative Dry Eye

Missing the oily layer and the tears evaporate faster.

Tear BreakUp (TBU) time is less.

Superficial Punctate Keratitis (SPK) common.

Tear Meniscus is smaller.

Lid Wiper Epitheliopathy

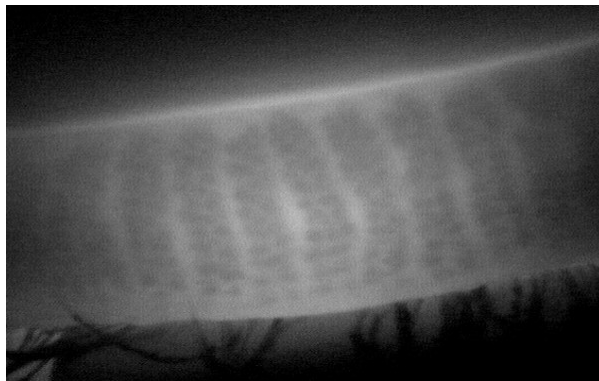
Fluorescein, Lissamine Green, Rose Bengal,

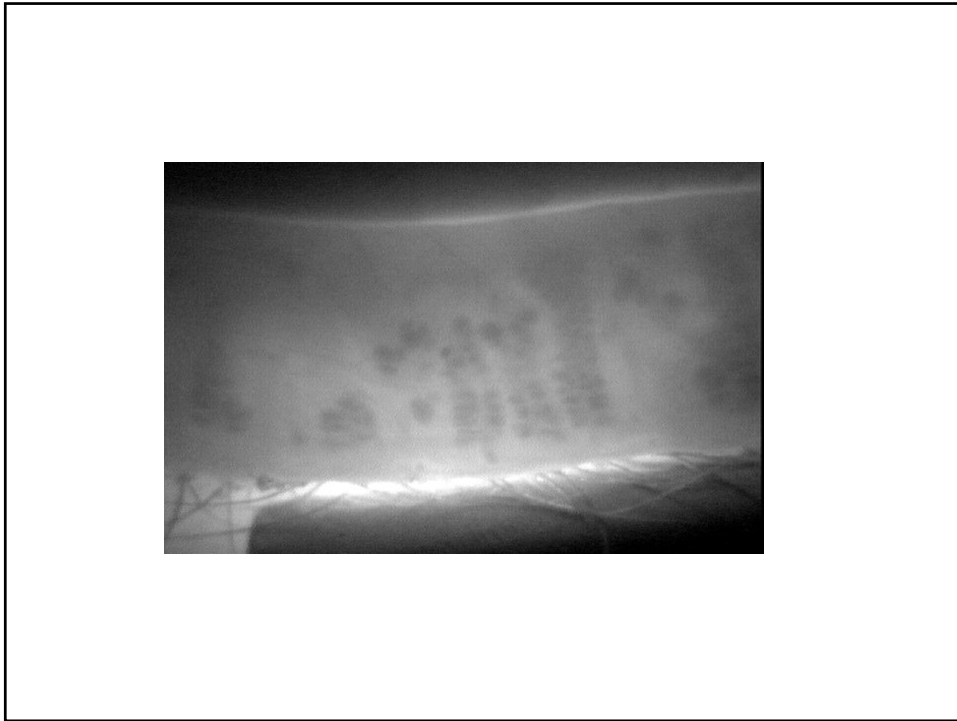
Fluramene

The Meibomian Glands Signs and Symptoms to Watch for

There are only 25 to 30 glands per eyelid.

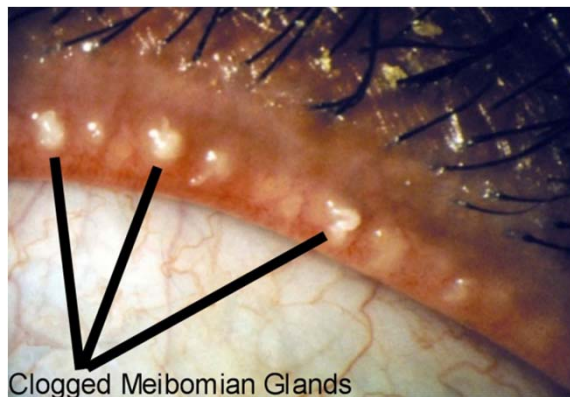
Patients suffering from MGD most commonly complain of burning, tearing, and a foreign body sensation.





Meibomianitis

- Inflammation of the eyelid; can be bacterial or due to dysfunctional oil glands.



MGD MEIBOMIAN GLAND DYSFUNCTION



Types of Blepharitis

Staphylococcal	Seborrheic	Meibomian Gland Dysfunction (MGD)	Rosacea
<ul style="list-style-type: none"> - younger, F (80%) - short duration - dry eyes - purulent discharge - collarettes, scales - ulcers at base of lashes - absent, thin, broken, misdirected, or white lashes - papilla - marginal ulcers 	<ul style="list-style-type: none"> - older patients - more chronic - dry eyes - crusting - oily margins - papilla, follicles - dermatitis 	<ul style="list-style-type: none"> - patients with acne rosacea - more burning - conjunctival injection - bulbar injection - SPK, Rose Bengal stain 	<ul style="list-style-type: none"> - females age 30-50 - seen in 60% of cases of MGD - rhinophyma, telangiectasia, pustules - erythema - marginal keratitis - inferior corneal pannus with subepithelial infiltrates

Blepharitis

- Blepharitis – inflammation of the eyelid; can be bacterial, dysfunctional oil glands, Staphylococcus, or Demodex Mite



Staph Blepharitis



Same lid prior to and after staining

- **No evidence of LWE**
- Minimal evidence of inflammation

Lid Wiper Epitheliopathy



- **Severe LWE**
- 100% of width
- Over 15 mm in length
- Severe staining

(Vertical linear fluorescein staining is evidence of inflammation)

Sjogrens Syndrome

- Sjogrens syndrome – Attacks the glands of the body and reduces production of tears in the eyes, and thus, keratoconjunctivitis sicca (DES) is the most common ocular manifestation.



GVHD

- After stem cell transplantation for treatment of malignancies and hematologic and immunogenic and metabolic disorder.
- Begins Rejection with ocular complications in 60 to 90% of patients.
- High mortality and morbidity rate.
- Affected are eyelids, lacrimal gland, conjunctiva, ocular surface, cornea, vitreous, uveal tract and optic nerve.

EyeLid Issues

Exophthalmos -Thyroid (Graves Disease),
Structural/Deformity - Ectropion, Injury, Burns
Lagophthalmous
Floppy Eyelid
Demodex
Mechanical (Surgical or Burns)

Graves Disease

- Graves Disease – 50% of patients with graves disease have manifestations of exophthalmos, a condition which causes bulging of the eye.







Demodex





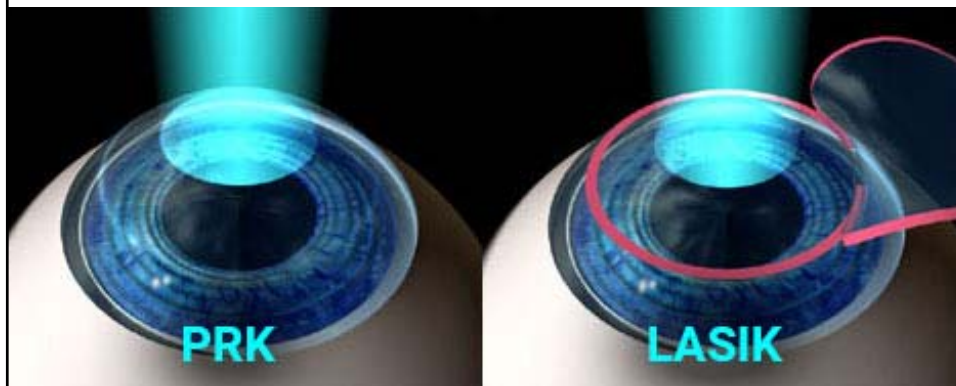
Topical and Systemic Medications

- Glaucoma Drops
- Allergy Medications
- Selective Serotonin Uptake Inhibitors

Contact Lens Wear



Refractive Surgery

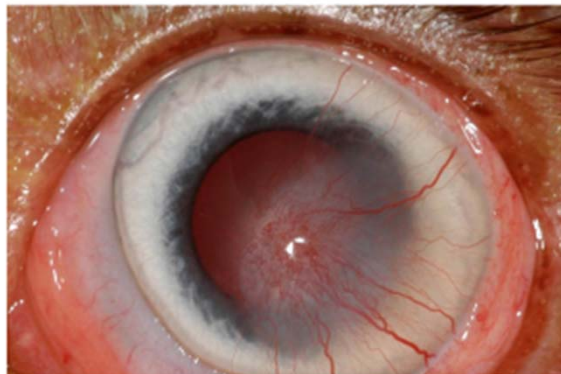


Corneal Irregularity or Scarring



Keratitis

- Keratitis – Inflammation of the cornea that may be caused by injury or infection.



Allergic Causes of Eye Inflammation/Dryness

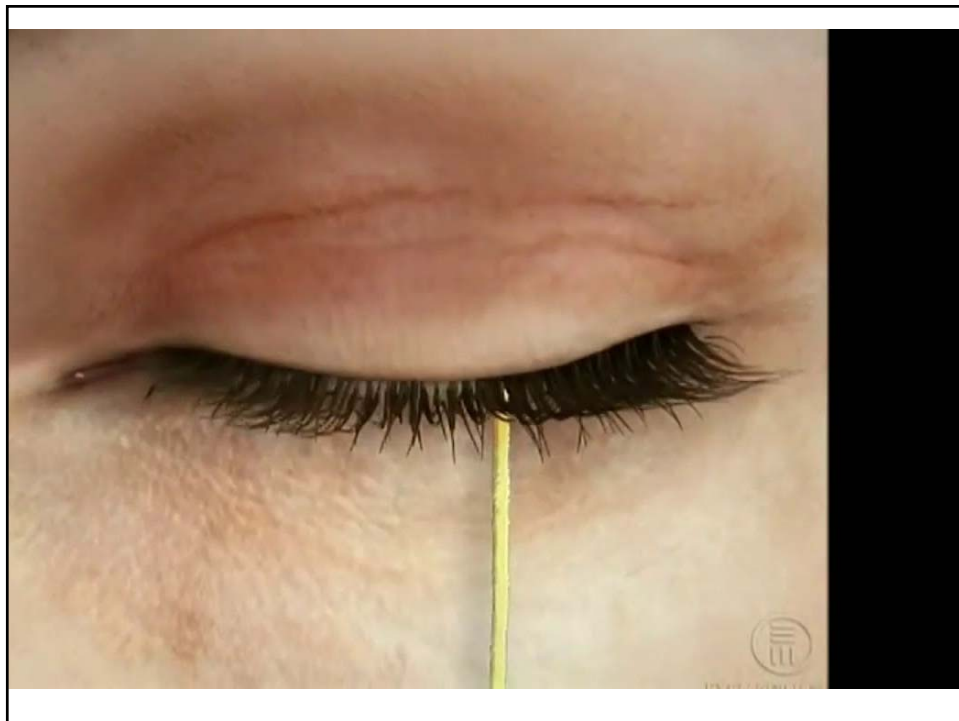
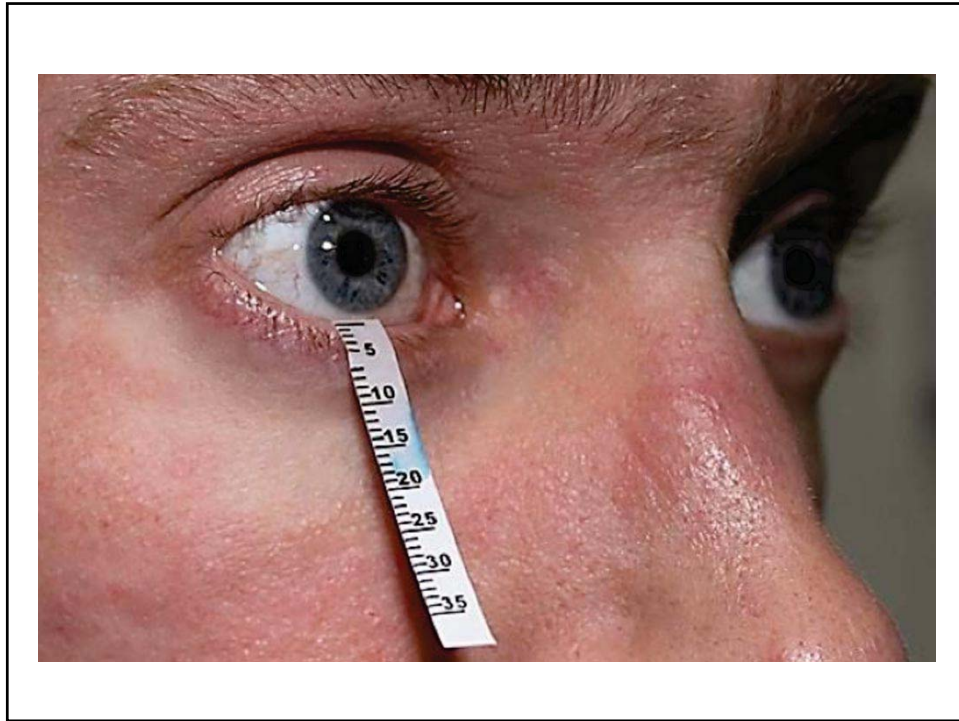
- Could be chronic or acute, depending on form of allergic reaction, Seasonal
 - Irritants (soap, shampoo, chemicals, etc...)
 - Drug allergies
 - Food allergies
 - Hay Fever or allergic reaction
 - Insect bite allergy (ex. Bee sting)

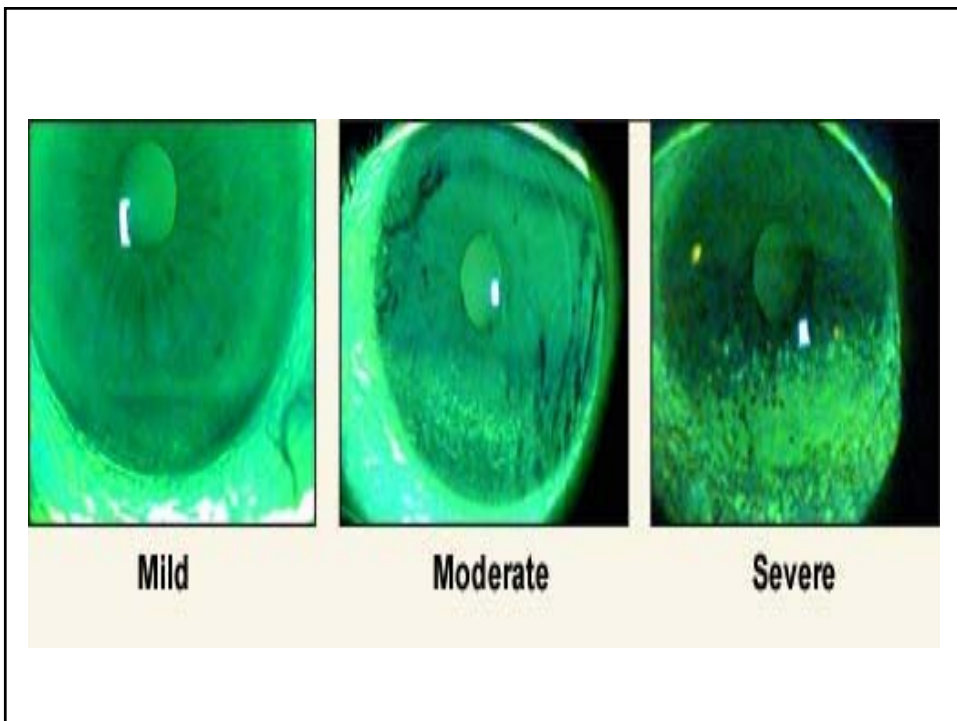
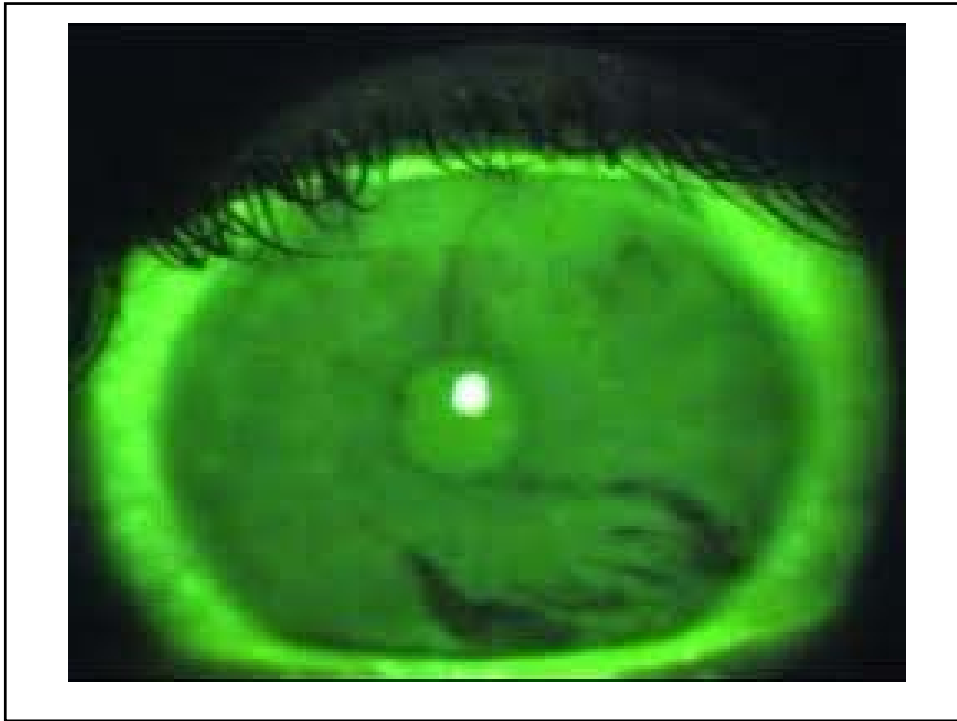


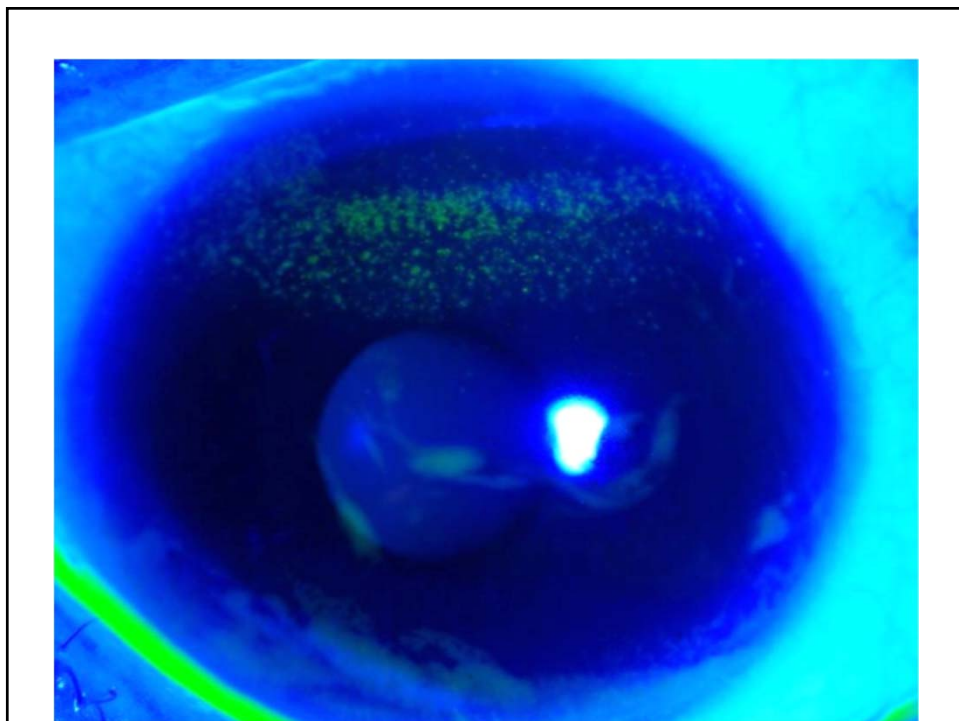
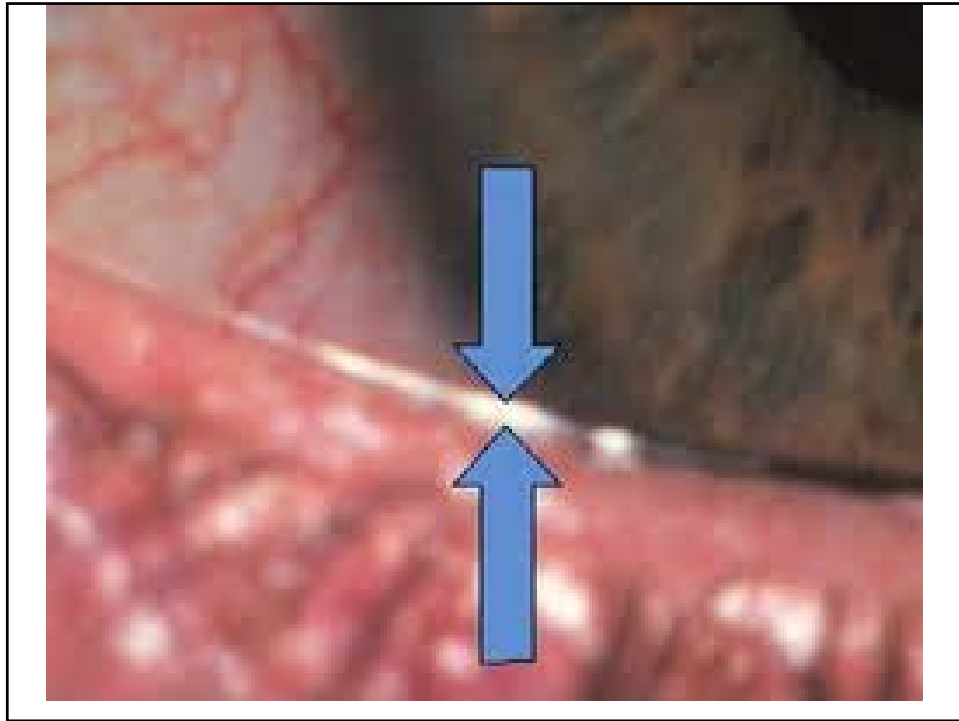


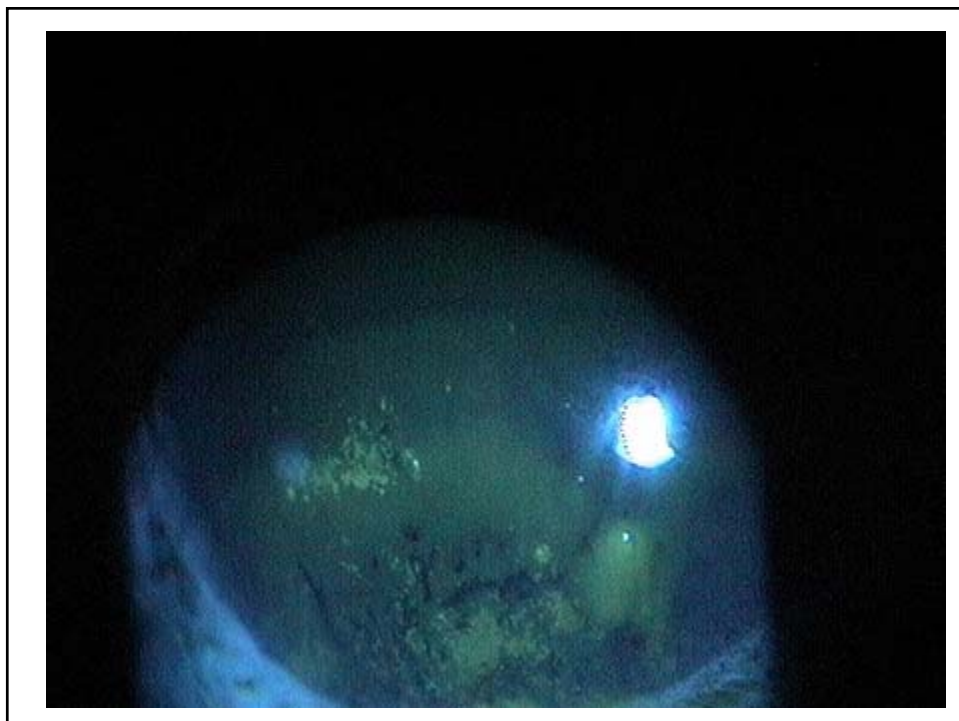
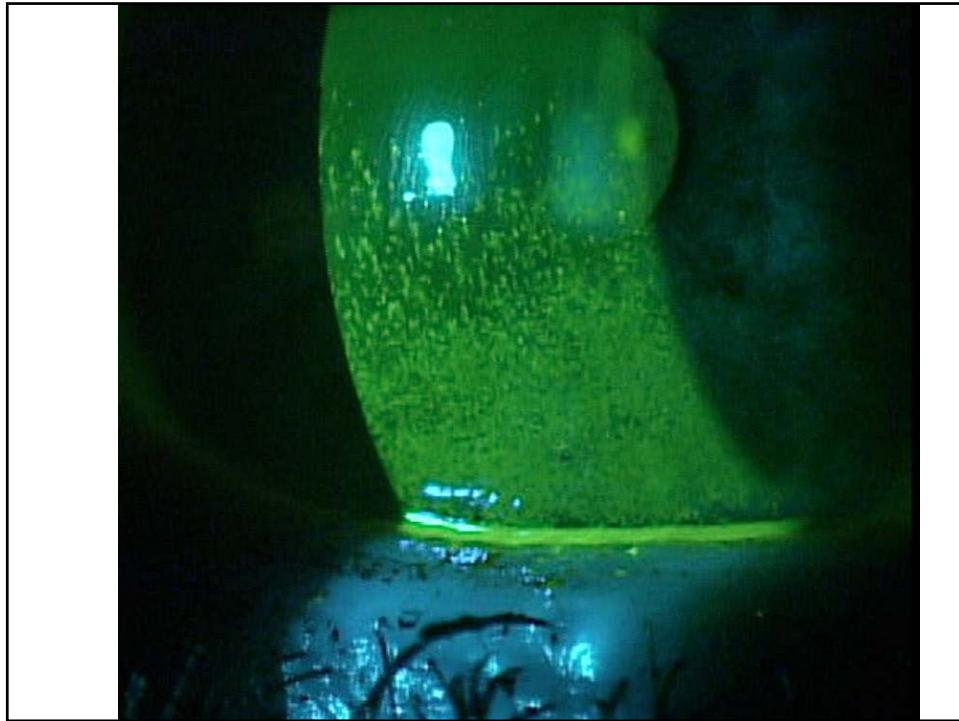
Dry Eye Testing

- Shirmer Test 50% 10 mm in 5 minutes
- Phenol Red Thread 20mm in 15 seconds
- Tear Break-up Time
- Corneal Staining
- Tear Prism Height
- Debris in Tear Film
- Questionnaires 80% - 72%
- Tear Lab Osmolarity Test
- InflammDry Detector MMP-9, 85/90% - 95%
- Tear Stability Analysis System
- Keratograph 5 M Topo, MGD, TBUT, Meniscus, Red
- Micro Assay System Lactoferrin, IgE
- Eye Prim Conjunctival Cells
- Sjo Test



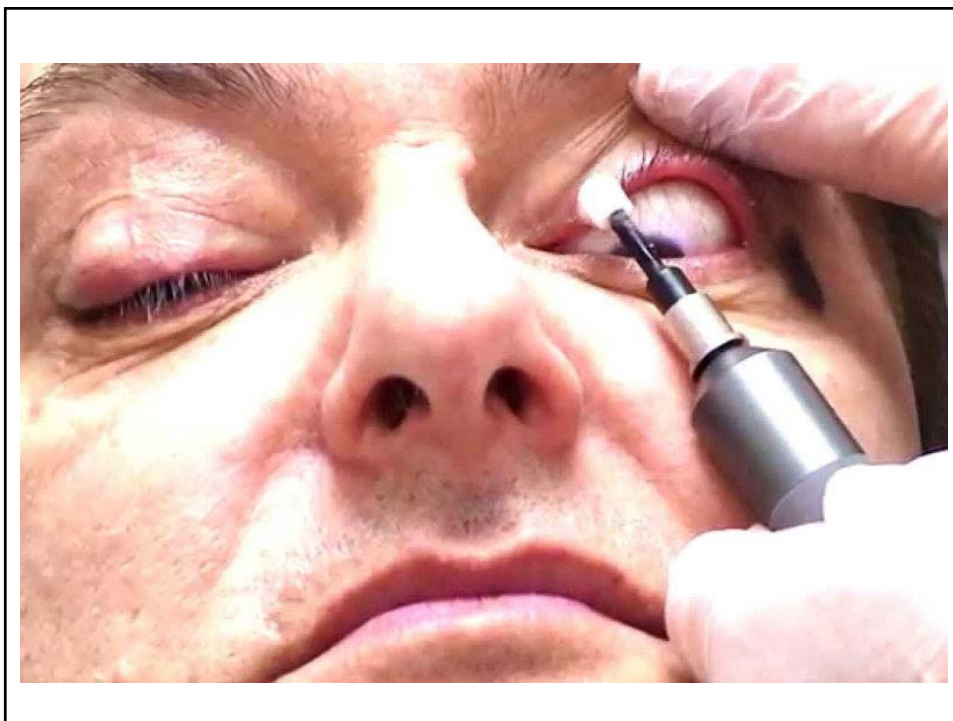






TREATMENT OF Dry Eye

1. **Lid Scrubs/Lid Hygiene:** warm compress, cleaning, massage lids, BlephEx.
2. **Lubrication/Hydration** with Tears. AT and NPAT
3. Low steroid dose for inflammation – **Restasis, Xiidra** - takes 6 weeks to 3 months
Moderate steroid dose – **Lotemax** – will work in 3 days to a week
4. Oral Antibiotic – **Azithromycin or Doxycycline** - Anti-Inflammatory/Immunomodulatory, Blocks inflammatory cell migration, Inhibits various cytokines
5. Topical Antibiotic – **AzaSite** - Anti-Inflammatory/Immunomodulatory
Drop down combination – **Tobradex** – Antibiotic/Anti-inflammatory
On the cheap: Walmart \$4 Maxitrol **Neomycin/Polymyxin/Dexamethasone**
For Staphylococcus - Avenova (hypochlorous acid) spray.
6. Autologous Tears
7. Punctal Plugs
8. Krill/Omega – EPA, DHA
9. Scleral Lenses



AUTOLOGOUS SERUM EYEDROPS

- ✦ Promote the epithelial healing process in corneal alkali wounds.
- ✦ Serum contains various factors including Vitamin A, Epidermal growth factor, transforming growth factor beta, basic fibroblast growth factor, Insulin like growth factor, Substance P as well as proteins such as lactoferrin and lysozyme.
- ✦ Alkali -injured corneal epithelial wounds heal faster when treated with amniotic membrane suspension than with autologous serum or preservative-free artificial tears.

