ADVANCED DIAGNOSTIC TESTING IN DRY EYE DISEASE

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SOUTHERN COLLEGE OF OPTOMETRY

DISCLOSURES

• NONE

DRY EYE DISEASE

• CHRONIC
• MULTIFACTORIAL
• CHARACTERIZED BY DISTURBANCES IN TEAR FILM & OCULAR SURFACE
• FEMALES > MALE

DID SOMEONE SAY DRY EYE?

• ENVIRONMENTAL CONDITIONS
  • ARID
  • COMPUTER USE
  • CONTACT LENS WEAR
• SYSTEMIC DISEASE
  • SJOGREN'S SYNDROME
  • LUPUS
  • STEVENS-JOHNSON SYNDROME

http://www.revophth.com/content/d/therapeutic_topics/i/1334/c/25584/
PREVALENCE IN THE UNITED STATES

- 3.2 million women age 50 and over
- 1.68 million men age 50 and over

WORLD TOUR OF DRY EYE RESEARCH

RESEARCH

- Women’s Health Study
- Beaver Dam Eye
- The Salisbury Eye Evaluation
- The Melbourne VIP
- The Canadian Experience

WOMEN’S HEALTH STUDY

- Large-scale study
- 39,876 female health professionals
- 45-84 yo
- Randomized control trial
- Assessing effects of aspirin & vitamin E on prevention of cardiovascular disease and cancer
- A four-year follow-up questionnaire asked about ocular dryness & irritation
- Prevalence was 6.7%

WOMEN’S HEALTH STUDY

- Asian & Hispanic women more likely than Caucasians
- Hormone replacement therapy (HRT) increased risk
- Estrogen users 49% greater risk
- Estrogen plus progesterone/progestin 39% greater risk
- Older women
  - Prevalence 5.7% < 50yo
  - Prevalence 9.4% > 75yo
  - Age-adjusted = 7.9%

BEAVER DAM EYE STUDY

- Population-based cohort
- 3,722 residents of Beaver Dam, Wisconsin
- 40-84 yo
- Primarily Caucasian
- Self-reported dry eye on 3-year follow-up questionnaire
- Prevalence = 1.8%
- Female > males
SALISBURY EYE EVALUATION

- Population-based study
- 2,520 volunteers
- 65-84 YO living in Salisbury, MD.
- Six item questionnaire, Schirmer’s strips, Rose Bengal testing
- Prevalence = 14.6%

MELBOURNE VIP PROJECT

- Population-based study to evaluate age-related disease
- 926 residents of Melbourne, Australia
- 40-97 years old
- Assessed by: questionnaire, Schirmer’s test, TBUT, staining
- Females more likely to report symptoms but not have signs of dry eye
- Older participants and arthritis sufferers more likely to have 2+ signs

THE CANADIAN EXPERIENCE

- 13,517 questionnaires were completed
- Age range: <10 - >80 years
- “Do you have symptoms of dry eye? 28.7% yes

RESEARCH

- Factors
  - Clinical diagnosis
  - Questionnaires/objective tests
  - Different definitions of dry eye

THE HISTORY OF DRY EYE

- 1946 – Wolff first described the multi-layer tear film
- 1973 – Holly, PhD, explained that deficiency in soluble mucins cause breaks in ocular surface tension & not allow even spreading of tears
- 1997 – Tseng showed that the ocular surface and tear film interacted to produce a healthy ocular surface.

TEAR LAYERS
TEAR LAYER FUNCTION

- Optical
- Mechanical
- Lubricant
- Bactericidal
- Nutritional
- Waste removal

TYPES OF TEARING

- Basal tear is the small quantity of tear produced to maintain a lacrimal film on the corneal surface for both visual and corneal homeostatic purposes.
- Reflex tear produced in response to corneal or conjunctival irritant & physiological factors.

COMPOSITION OF THE TEAR FILM

- Tears are very similar to dilute blood
- Reduced protein content
- The pH of tears is similar blood plasma

 TYPES OF TEARING

- Basal secretion and reflex secretion are produced by the lacrimal gland and the accessory glands of Krause and Wolfring
- The amount of tears secreted:
  - 14-33g per 24 hours or 0.5-2.2 μL/minute
  - About 2 μL/minute at 15 years of age
  - Less than 1 μL/minute at 65 years of age

40 drops of water = 2mL

TEAR FILM & BLINKING

- Blinking influences the:
  - Structure
  - Stability
  - Function

TEAR FILM & BLINKING

- 11 subjects
- Mean age, 21.3 years
- Subjects played a computer game for 60 minutes
- Blinking was observed by a web camera
- Every 15 min a non-invasive tear breakup time was measured
TEARS & BLINKING

- **TOTAL BLINK RATE CHANGED VERY LITTLE**
- **COMPLETE AND INCOMPLETE BLINK RATES FLUCTUATED**
- **NONINVASIVE (RING) BREAKUP TIME AT 30 MIN (4.33 ± 2.57 S) WAS SIGNIFICANTLY SHORTER (P < 0.01) THAN THAT AT BASELINE**

HTTP://WWW.NCBI.NLM.NIH.GOV/PUBMED/23770659

TEARS & BLINKING

- **EVEN IF THE TOTAL BLINK RATE DECREASES, THE TEAR FILM REMAINS STABLE SO LONG AS ALMOST ALL BLINKS ARE COMPLETE.**
- **THE INCOMPLETE BLINKING CONTRIBUTES TO TEAR FILM INSTABILITY AND IS VARIABLE WITH PROLONGED VDT EXPOSURE.**
- **THE STUDY INDICATED THAT THE TEAR FILM STABILITY WAS DETERMINED BY BLINKING QUALITY, AND THE PREDOMINANCE OF BLINKING TYPE RELATES TO TEAR FILM STABILITY.**

TEARS & BLINKING

- **CHANGES IN THE TEAR FILM LIPID LAYER AS A FUNCTION OF BLINKING WERE INVESTIGATED USING A CUSTOM-DESIGNED SPECULAR REFLECTION MONITORING SYSTEM.**
- **104 SUBJECTS’ LIPID LAYERS WERE MEASURED UNDER CONDITIONS OF NORMAL (“BASELINE”) BLINKING AND “FORCEFUL” BLINKING WAS QUANTITATED ON THE BASIS OF SPECIFIC INTERFERENCE COLORS.**
- **DELIBERATE, FORCEFUL BLINKING WAS FOUND TO SIGNIFICANTLY INCREASE THE LIPID LAYER THICKNESS (LLT) OF THE TEAR FILM.**

HTTPS://Www.ncbi.nlm.nih.gov/pubmed/7954337

TEARS & EMOTION

- **CRYING WITH SORROW AND LAUGHTER ARE EXCLUSIVELY HUMAN CHARACTERISTICS**
- **SIMILAR TO FACIAL EXPRESSION AVAILABLE TO HUMANS**
- **THE PARASYMPATHETIC NERVE FIBERS THAT ARE SECRETOMOTOR TO THE LACRIMAL GLAND ARE DISTRIBUTED FOR MUCH OF THEIR COURSE WITH THE FACIAL NERVE, THE MOTOR NERVE OF FACIAL EXPRESSION.**

TEARS & ART

- **PHOTOGRAPHER ROSE-LYNN FISHER (2010)**
- **“TOPOGRAPHY OF TEARS”**
- **USING MICROSCOPES TO PHOTOGRAPH DRIED HUMAN TEARS.**
TEARS & ART

TYPES OF DRY EYE

• **EVAPORATIVE DRY EYE**
  - CAUSED BY MEIBOMIAN GLAND DYSFUNCTION
  - LEADING CAUSE OF DRY EYE WORLD WIDE

• **AQUEOUS-DEFICIENT DRY EYE**
  - DECREASED TEAR PRODUCTION AT THE LACRIMAL GLAND
  - PREVALENT IN AUTOIMMUNE DISEASE

TYPES OF DRY EYE DISEASE

EVAPORATIVE DRY EYE = 65-86% OF CASES
AQUEOUS DEFICIENT DRY EYE = 14-20% OF CASES

CAUSES OF DRY EYE SYMPTOMS

• AGING
• LID LAXITY
• LAGOPHTHALMOS
• FLOPPY EYE LID SYNDROME

CAUSES OF DRY EYE SYMPTOMS

• MEDICATIONS
  - ORAL
    - ANTIPSYCHOTICS
    - ANTIDEPRESSANTS
    - CERTAIN AIRE HYPERTENSIVES
    - DECONGESTANTS
    - ISOTRETINOIN-TYPE DRUGS FOR ACNE
CAUSES OF DRY EYE SYMPTOMS

• MEDICATIONS
  - OPHTHALMIC
  - GLAUCOMA MEDICATIONS
  - ALLERGY MEDICATIONS
  - PRESERVATIVE SENSITIVITIES

• DEMODEX
  - DEMODEX FOLLICULORUM
  - DEMODEX BREVIS

BLEPHARITIS AFFECTS AS MANY AS 70 TO 80 MILLION AMERICANS
UPWARDS OF 80 PERCENT OF THOSE PATIENTS COULD HAVE DEMODEX MITES

• MEN > WOMEN
  - THE INCIDENCE OF DEMODEX INFESTATION INCREASES AGE
  - 64 PERCENT OF THE POPULATION OLDER THAN 65 YEARS OF AGE
  - 100 PERCENT OF THE POPULATION OLDER THAN 70 YEARS OF AGE

• TRAUMA/SURGICAL/MEDICAL TREATMENT
  - REFRACTIVE
  - CATARACT SURGERY
  - LID PROCEDURES
  - BURNS
  - RADIATION THERAPY
CAUSES OF DRY EYE SYMPTOMS

- Nutritional Deficiencies
  - Vitamin A
  - Omega 3

CAUSES OF DRY EYE SYMPTOMS

- Diabetes
- Thyroid Disease
- Autoimmune Disease

WHAT DO WE KNOW ABOUT DED?

We know:
- What Dry Eye Disease Is
- Who Is at Risk

PSYCHOLOGY OF DRY EYE

- Extroverts scored higher on McMonnies Dry Eye Questionnaire than introverts
- Patients with a greater sense of well-being scored lower

PSYCHOLOGY OF DRY EYE

- 89 Dry Eye Subjects (13 Sjogren’s Patients & 73 Control Subjects)
  - Zung Self-Rating Anxiety Scales (SAS)
  - Zung Self-Rating Depression Scales (SDS)
  - Ocular Surface Disease Index (OSDI)
  - Anxiety and depression scores of the DES group were significantly higher than the control group
  - The prevalence of DES subjects with anxiety or depression symptoms was significantly higher than in the control group
PSYCHOLOGY OF DRY EYE

- SAS scores were found to be correlated with OSDI and educational level. SDS scores were found to be correlated with OSDI.
- Neither SAS nor SDS scores were correlated with age, sex, household income, tear break up time [ BUT ], Scheiner Test 1 [ S1T ], corneal fluorescein staining [ Fl ], or visual acuity.

PSYCHOLOGY OF DRY EYE

- Conclusion:
  - Anxiety and depression are correlated with DES, demonstrating that DES is an important public health problem that merits increased attention and research.

PSYCHOLOGY OF THE EXAMINATION

- Change the "single visit" mentality
- Treatment is a process
- Individualized care

HOW DOES DRY EYE COMPARE?

- Eyeglasses examination $125-200
- Contact lenses examination $150-200
- Eye examination $60-225
- Dry eye care $300-800 (upwards of $1600-1800)

*Figures based on one year

HOW DOES DRY EYE CARE COMPARE?

Medical Office Visit: OSD Evaluation
99212  $68.63
99213  $68.63
99214  $68.63

Medical Office Visit: Follow-up
99212  $68.63
99213  $68.63
99214  $68.63

Follow-up Revenue per Year
99212(x3)  $144.00
99213(x3)  $194.79

FRUSTRATED YET?
FRUSTRATED YET?

• 55 MILLION AMERICANS SUFFER FROM DRY EYE SYMPTOMS
• 40 MILLION OF THOSE CASES GO UNDIAGNOSED

72% of patients: Artificial tears only
62% of patients: Demand “something better”
97% of patients: Report condition as “frustrating”

SO, WHAT’S A DOCTOR TO DO?

NOW, IT’S TIME TO RALLY

ECONOMIC IMPACT

• $4 BILLION ANNUALLY
• WHEN SOCIETAL COSTS ARE CONSIDERED...
• MISSED WORK
• LOSS IN PRODUCTIVITY
• THE IMPACT IS...

$55.4 BILLION PER YEAR

SO, WHAT’S A DOCTOR TO DO?

DIAGNOSTIC TESTING
ADVANCED DIAGNOSTICS IN DED
- Tear Osmolarity
- EPS Inflammation
- Oculus Keratograph 5m
- Lipview
- Zonequick
- Microscopy

TEAR OSMOLARITY
- Osmolarity vs Osmolality
- Freezing Point Osmometer
- Vapor Pressure Osmometer
- Electrical Impedance Osmometer

TEAR OSMOLARITY
- Tear Lab Osmolarity System (Tear Lab)
  - Cost of Unit and Disposable
  - Reimbursement
  - Single-use Microchip Embedded with Gold Electrodes
  - 50 NL Collected

TEAR OSMOLARITY
- Pros
  - Easy to Administer
  - Quick Results
  - Reimbursable by Medicare
- Cons
  - Cost of Unit
  - Cost of Disposable
  - Variability of Testing

TEAR OSMOLARITY
- Osmolarity increases with advancing dry eye disease
- Asymmetry of findings
TEAR OSMOLARITY

• DOES IT WORK?
  • IN A STUDY OF 300 PATIENTS, TEARLAB IDENTIFIED:
    • 89% OF NORMAL SUBJECTS
    • 75% OF SUBJECTS WHO HAD MILD-OR-MODERATE DRY EYE DISEASE
    • 95% OF SUBJECTS WHO HAD SEVERE DRY EYE DISEASE USING A DIAGNOSTIC CUTOFF OF 308MOSMS/L.¹

• YOU'RE SURE IT WORKS?
  • TEARLAB DEVICE OUTPERFORMED CORNEAL STAINING AND SCHIRMER'S TESTING IN CORRECTLY IDENTIFYING PATIENTS WHO HAD MILD-TO-MODERATE DRY EYE. (ARVO 2010)

TEAR OSMOLARITY

• CONTACT LENS FITTING
• MATERIAL SELECTION
• REPLACEMENT FREQUENCY
• CARE SYSTEM
• GLAUCOMA TREATMENT
• MED SELECTION
• CATARACT AND REFRACTIVE SURGERIES
• PROPHYLACTIC TREATMENT

• MICROTHERMAL ANALYSIS UTILIZING AN INTEGRATED COLLECTION AND ANALYSIS DEVICE
• 83861 (EFFECTIVE JANUARY 1, 2011)
• UNILATERAL TEST
  • THE SECOND EYE SUBMITTED USING A “59” MODIFIER

MMP-9

• MATRIX METALLOPROTEINASE 9
• PROTEOLYTIC ENZYMES
• PRODUCED BY STRESSED EPITHELIAL CELLS
• VITAL IN WOUND HEALING AND INFLAMMATION

INFLAMMADRY

• RAPID PATHOGEN SCREENING (SARASOTA, FL)
  • DETECTS SARS SARS-CoV-2 IN TEARS
  • COST PER UNIT AND POTENTIAL REIMBURSEMENT
  • STUDIES INDICATE MMP-9 AS A USEFUL BIOMARKER FOR DIAGNOSING, CLASSIFYING AND MONITORING DED

RAPID PATHOGEN SCREENING (SARASOTA, FL)

DETECTS SARS SARS-CoV-2 IN TEARS

MMP-9

MATRIX METALLOPROTEINASE 9

PROTEOLYTIC ENZYMES

PRODUCED BY STRESSED EPITHELIAL CELLS

VITAL IN WOUND HEALING AND INFLAMMATION
MMP-9

- Increased levels detected in:
  - K sicca (KCS)
  - Corneal ulcers
  - Ocular rosacea
  - Sjogren's syndrome
  - MGD

Tear MMP-9 Activity in Normal Control and DTS Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>MMP-9 Activity (ng/mL)</th>
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<tr>
<td>Normal (n = 18)</td>
<td>8.39 ± 4.70</td>
</tr>
<tr>
<td>DTS1 (n = 15)</td>
<td>35.57 ± 17.04*</td>
</tr>
<tr>
<td>DTS2 (n = 11)</td>
<td>66.17 ± 57.02*†</td>
</tr>
<tr>
<td>DTS3 (n = 9)</td>
<td>101.42 ± 70.58*‡</td>
</tr>
<tr>
<td>DTS4 (n = 11)</td>
<td>381.24 ± 42.83*‡</td>
</tr>
</tbody>
</table>

Data shown are the mean ± SD.
* P < 0.008 Compared with normal.
† P < 0.003 Compared with normal and DTS1.
‡ P < 0.001 Compared with normal and the other DTS severity groups


MMP-9

- Strong correlation with:
  - Survey scores
  - Fluorescein staining
  - Fluorescein TBUT

INFLAMMADRY

- A small applicator touched to the conjunctiva
- Snaps into a test cassette
- Cassette tip is submerged in solution
- Results are obtained in 10 minutes
- Similar to Adeno-Detector

INFLAMMADRY

- Pros
  - Inexpensive
  - Fast
  - Identifies presence of inflammation
- Cons
  - Does not quantify inflammation
  - Does not identify cause

Oculus Keratograph 5M

- Tear film analysis by non-invasive (non-contact) scanning software
  - Meniscus height
  - Non-contact keratography (meniscus)
  - Tear dynamics
  - Bulbar redness
  - Topography
OCULUS KERATOGRAPH 5M

- Non-invasive Keratograph Tear Break up Time Analysis
- Uses Placido disc ring based corneal topography
- Unique objective
- No dye required
- Initial and average break recorded

OCULUS KERATOGRAPH 5M

- Non-contact Meibography/Meboscan
- Evaluation via infrared photography
- Increased maneuverability compared to K4

OCULUS KERATOGRAPH 5M

- Tear Meniscus Height
- Helps determine tear film quality
- Amount of tears at lower tear meniscus
- White or infrared illumination
- High resolution camera to record images

OCULUS KERATOGRAPH 5M

- Tear Dynamics
- Interference color pattern and structure evaluation
- Video can record up to 32 images per second
- Evaluating spread of particles in tear film

OCULUS KERATOGRAPH 5M

- Topography
- Guarantees perfect reproducibility
- Useful in observation and management
- Corneal disease: keratoconus, keratoconus
- Corneal thickness
- Pre- and post-surgical examinations

OCULUS KERATOGRAPH 5M

- Bulbar Redness / R-Scan
- 1st instrument to offer fully automatic determination of bulbar redness
- Documents and classifies bulbar & minor redness objectively
- Detects conjunctival vessels & assesses degrees of redness
• Uses interferometry to measure lipid layer thickness between blinks
• Quantitative assessment in interferometric color units (ICU)

Pilot Study: 137 consecutive patients completed speed test, then measured ICU by LIPIVIEW
- Speed >10, 74% had LLT of 60NM or less
- Speed = 0, had LLT 75NM or greater
• Linear regression analysis found statistical significance between LLT and symptom score
  As LLT increased, symptom score decreased

LIPIVIEW

C Factor
ICUs
Partial/Complete Blinks
Video Display
ZONEQUICK

- Red cotton thread treated with phenolsulfophthalein
  - Red (basic) = Tear volume indicator
  - Yellow (acidic) = Water absorption indicator

ZONEQUICK

- Testing conditions
  - No anesthesia
  - 5 minutes after other drops instilled
  - May be used with contact lenses


MICROSCOPY

- Demodex visible at slit lamp
- Cylindrical dandruff
- Base of lashes
- Microscopy for patient education

MICROSCOPY

- Epilation maneuver
- Movement in a clockwise fashion prior to removal

MICROSCOPY

- Plate to slide
- Observe under lower magnification
- Increase magnification
- Photograph
CASE 1

- 84 YO WF
- (+) SEVERE DRY EYE FOR 1 YEAR
- ORAL MEDS:
  - METFORMIN
  - LISINOPRIL
  - GLYBURIDE
  - SERTRALINE
  - ASA
  - GLUCOSAMINE

CASE #1

Drye Eye Complaint
Chronic dryness, increasing for 1 year
Associated symptoms: Burning, stick, photophobia
Effect to ADL’s: Unable to read, cannot go outside comfortably
Medications for DED: Restasis BID, Non-preserved Systane, doxycycline 100mg BID, Omega 3FA

CASE #1

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<tr>
<th>EX VA</th>
<th>20/100 OD</th>
<th>20/200 OS</th>
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<tr>
<td>UDVA</td>
<td>FROM OU</td>
<td>FROM OU</td>
</tr>
<tr>
<td>ODVA</td>
<td>FROM OU</td>
<td>FROM OU</td>
</tr>
<tr>
<td>Pupils</td>
<td>EMER APO</td>
<td>EMER APO</td>
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<tr>
<td>IOP60</td>
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<td>22</td>
</tr>
<tr>
<td>OSI</td>
<td>79</td>
<td>79</td>
</tr>
<tr>
<td>Osm</td>
<td>301 OD</td>
<td>301 OS</td>
</tr>
</tbody>
</table>

Inflammadry: Negative

CASE #1

- DIAGNOSED WITH GLAUCOMA IN 1970’s
- WAS TAKING 3 GLAUCOMA MEDS FOR YEARS... AND YEARS... AND YEARS
- RECENTLY CHANGED TO NON-PRESERVED ZIOPTAN

CASE #1

Cylindrical blepharitis
CASE #1

**TREATMENT**
- **LID HYGIENE** – CLIRADEX WIPES BID X 10 DAYS THEN QHS FOR 20 DAYS
- **LIPIFLOW TREATMENT** – BEGIN ACUVAIL BID FOR 3 WEEKS, THEN QD FOR 2 WEEKS
- **RTC 6-8 WEEKS**

**FOLLOW UP EXAMINATION**
- "GOOD DAYS AND BAD DAYS"
- DRYNESS LESS OF A PROBLEM SINCE TREATMENT AND VISION IS IMPROVING
- ABLE TO READ THE NEWSPAPER

**cc DVA**

- **20/60 OD (PH: 20/30) 20/100 (PHNI)**
- EOMs FROM OU
- CV FROM OU
- PUPILS BRILLELAND
- SPIND 1x
- O/e (OD) 32.0
- O/e (OS) 30.6

**CASE #1**

- **Lashes free of debris**
- **Improved meibomian gland function**
- **Clear secretions**
CASE #1

SPK persists after treatment
Improved LG staining

CASE #1

CONSULTATION WITH PATIENT'S OD AND OMD
RTC 4 WEEKS FOR PROKERA OD

CASE #2

52 YO WF
OCCUPATION: WEB DESIGNER
HOBBIES: COMPUTERS, READING, EXERCISE
MEDS: LORAZEPAM, CYMBALTA, FLAX SEED OIL
ADDITIONAL DIAGNOSES: HEMOCHROMATOSIS, ANEURYSM

Dry Eye Complaint
Dry symptoms worsening, "OTC's don't work."
Associated symptoms
Eye fatigue, discomfort, worsening in the evening, often worsened
Effort in ASLS:
Efforts, most, less, resolving
Medications for DED
Similasan "Dry Eye Relief" has use "all" artificial tears, warm compresses, cold packs

CASE #2

c Cylindrical blepharitis
Telangectasias at lid margin

CASE #2

cc DVA
20/20 OD   20/20 OS
EOMs FROM OU
Pupils 6MM W/6D
SPED 1.4/3.0
OSM 34/100
Inflammation Negative
WORK (visual): 6/10 OD 4/30 OS
Osm 294 OD   277 OS
CASE #2

- RECOMMEND BLEPHEX AND LIPIFLOW TREATMENT. PATIENT DECLINES.

CASE #2

- VISIT #3
  - PATIENT REPORTS SIGNIFICANT IMPROVEMENT AND RELIEF
  - ADLS NOT EFFECTED AT THE END OF THE DAY
  - CONTINUING LID SCRUBS AND SYSTANE BALANCE QID
RESTASIS

WHY AM I DOING EVERYONE KEEP PICKING ON ME?

RESTASIS OPPORTUNITIES

CASE #3

57 YO WHITE, FEMALE
• DRY EYE DISEASE FOR 8 YRS
• WAS RX'D RESTASIS 6 YEARS AGO
• DISCONTINUED BECAUSE SHE THOUGHT “IT DIDN'T HELP”

RESTASIS OPPORTUNITIES

• TEARWELL TESTING REVEALED A POSITIVE INFLAMMADRY
• PATIENT EDUCATION PROVIDED & MOTIVATION CLIMBS
• RESTASIS & LOTEMAX PRESCRIBED
• AT 3 MONTH FOLLOW-UP INFLAMMADRY IS NEGATIVE
• PATIENT COMPLIANCE IS FURTHER REINFORCED

CASE #4

43 YO ASIAN, FEMALE
• INITIALLY TREATED BY ANOTHER PRACTICE WITH LID SCRUBS & SYSTANE BALANCE
• SYMPTOMS PERSISTED
• SELF-APPOINTED AT TEARWELL

RESTASIS OPPORTUNITIES

• TEARWELL TESTING REVEALS NO SIGNIFICANT EVIDENCE OF MGD OR BLEPHARITIS
• FAINTLY (+) INFLAMMADRY
• 12MM/15MM ZONEQUICK
• 308/319 TEARLAB
• RESTASIS, LOTEMAX (2 WK COURSE) & OPTIVE NON-PRESERVED SENSITIVE ARE INITIATED

RESTASIS OPPORTUNITIES

• 3 MONTH FOLLOW UP
• SYMPTOMATIC IMPROVEMENT IN OSI & SPEED SURVEYS
• (-) INFLAMMADRY
• 15mm/15mm ZONEQUICK
• 306/310 TEAR LAB
• PATIENT DIRECTED TO CONTINUE TREATMENT AND RTC 3 MONTHS

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THANK YOU