Advances in OSD: Focus on IPL Lasers, Photobiomodulation and other Advanced Procedures

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Ocular Sciences Oculus OcuMedic Orasis **Oyster Point** Percept RegenerEyes Reichert Rendia RxSight Science Based Health Sentiss Pharmaceuticals Sight Sciences Silk Technologies Sun Pharmaceuticals Surface Pharmaceuticals Tarsus Medical TearClear TrueVision Systems Visant Medical Vital Tears



- 42% of patients complain of symptoms that would indicate DED (60-80M people)
- 30-50 Million in the North America based on longitudinal studies
- 16 Million diagnosed with DED
- 1.7 Million being treated

















































Identify the Sub-type of DED









In Chronological Order

- 1. Symptoms (most significant and when)
- 2. Eyelid assessment with MG expression
- 3. Ocular surface staining with NAFL (#15 yellow Wratten filter)
 - Corneal stain
 - Conjunctival stain
 - TFBUT
 - Tear meniscus height













- 1. In the morning
- 2. Overnight (and morning)
- 3. All day including the morning

Morning Symptoms = ILS

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- 1. Bland ointments or gels
- 2. Overnight hypoallergenic, oxygen permeable eyelid seals





Treating Demodex

- High concentration tea tree oil
- Low concentration tea tree oil
- Manuka extract cleaners
- TP-03
 - PDUFA Date October, 2023
- IPL/LLLT
- MBE-Microblepharoexfoliation

TREATMENT: LLLT

IT CONSISTS OF A PHASE 1 (WITH A SPECIFIC BLUE LIGHT MASK) AND A PHASE 2 (WITH THE STANDARD SUPPLIED RED LIGHT MASK)



PHASE 1 – BLUE MASK

Blue light stimulates porphyrins and creates an anti-bacterial action.



PHASE 2 – RED MASK

Red light stimulates ATP by increasing and improving cellular activity, it reduces inflammation and oedema and works on Meibomian glands.

| SUGGESTED PROTOCOL | |
|---------------------------------------------------------------------------|--------------------------------------|
| | Week 1, 96 hrs apart |
| Blue Mask for 15' | 2 Applications |
| Red Mask for 15' | 2 Applications |
| In the same session apply first the followed by the red one for 15 mir | blue mask for 15 minutes nutes more. |
| 13 | |
| | 45 |



Staphylococcal Blepharitis



- Itching and Burning of the palpebral margin
- Mattering
- Hyperemia
- Conjunctival irritation with lacrimation
- Photophobia & foreign body sensation

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TREATMENTS INDICATIONS ARE SUBJECTED TO LOCAL LAWS

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| SUGGESTED PROTOCOL | |
|------------------------------------------------------------------------|-----------------------------------------|
| | Week 1, 96 hrs apart |
| Blue Mask for 15' | 2 Applications |
| Red Mask for 15' | 2 Applications |
| In the same session apply first the followed by the red one for 15 mir | blue mask for 15 minutes nutes more. |
| 13 | |
| | 49 |







Blepharoexfoliation Video





| TREATMENT | |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | IT CONSISTS OF AN APPLICATION WITH THE STANDARD SUPPLY RED LIGHT MASK |
| | RED MASK |
| | Red light stimulates ATP by increasing and improving cellular activity, it reduces inflammation and edema Works on Meibomian glands. |
| | 32 |
| | 56 |



| | | | | Enc | log | enc | ous | He | at | | | |
|-----|--------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------|----------------|-----------------|-------------------|------------|
| | | | Temp | eratures At Tir | mes After Treat | tment | | Stan | dard deviation | and the p-value | ues at specific t | imes |
| | | Before | T = 0 min | T = 2 min | T = 5 min | T = 15 min | T = 25 min | T = 0 min | T = 2 min | T = 5 min | T = 15 min | T = 25 min |
| | Lower | 36.2°C | 35.7°C | 35.8°C | 36.0°C | 35.9°C | 36.1°C | p=0.028 | p=0.100 | p=0.270 | p=0.177 | p=0.326 |
| | Upper | 36.5°C | 36.3°C | 36.7°C | 36.4°C | 36.5°C | 36.1°C | p=0.257 | p=0.253 | p=0.371 | p=0.500 | p=0.103 |
| IPL | Lid | ±0.65 35.5°C | ±0.69 39.6°C | ±0.67 37.1°C | ±0.73 35.7°C | ±0.66 35.6°C | ±0.72 35.5°C | p<0.001 | p<0.001 | p=0.262 | p=0.320 | p=0.323 |
| | Tampla | 36.0°C | 37.6°C | 36.5°C | 35.9°C | 36.1°C | 35.8°C | p<0.001 | p=0.016 | p=0.316 | p=0.316 | p=0.171 |
| _ | Temple | 10.07 | 10.08 | 10.03 | 10.05 | 10.04 | 10.00 | | | | | |
| | Lower | 35.9°C | 40.4°C +0.58 | 39.6°C +0.60 | 37.1°C +0.72 | 36.5°C | 35.3°C +0.72 | p<0.001 | p<0.001 | p<0.001 | p=0.006 | p=0.042 |
| F | Upper | 36.2°C +0.65 | 41.8°C +0.65 | 40.7°C +0.67 | 37.5°C +0.69 | 37.5°C +0.67 | 36.1°C +0.70 | p<0.001 | p<0.001 | p<0.001 | p<0.001 | p=0.371 |
| 111 | Cheek | 35.4°C +0.79 | 39.8°C +0.75 | 38.8°C +0.63 | 36.7°C +0.67 | 36.5°C +0.71 | 36.1°C +0.76 | p<0.001 | p<0.001 | p<0.001 | p<0.001 | p=0.012 |
| | | 35.0°C | 37.7°C | 37.1°C | 36.1°C | 36.1°C | 35.6°C | p<0.001 | p<0.001 | p<0.001 | p<0.001 | p=0.025 |

Pult, H. Messung der Hauttemperatur nach Intense Pulse Light (IPL)-Anwendung sowie Low-Level-Light-Therapie (LLLT). die KONTAKTLINSE 4/2020.













CHALAZION: Triamcinolone Injection

 Depending on the size, firmness and duration of the chalazion, 0.2cc to 0.8cc of triamcinolone administered in a translesional approach is effective

<u>ScientificWorldJournal.</u> 2014; 2014: 413729. Published online 2014 Oct 15. doi: <u>10.1155/2014/413729</u> PMCID: PMC4214096 PMID: 25386597

A Comparison of Intralesional Triamcinolone Acetonide Injection for Primary Chalazion in Children and Adults

Jacky W. Y. Lee, Gordon S. K. Yau, Michelle Y. Y. Wong, and Can Y. F. Yuen



















Intense Pulse Light (IPL) Therapy

- Telangiectatic vessels and skin erythema release inflammatory mediators
- IPL targets the abnormal erythematous blood vessels
- Affects mitochondrial activity
- Temperature effect on meibum?
- Photomodulation affecting cytochrome C or activating fibroblasts and collagen synthesis









CONTRAINDICATIONS?







Ocular Rosacea or Non-expressible MGD

STEP 2: LLLT

- 15 MIN X 1
- Consider Expression after treatment 3 of 4

Unique Features

- 1. IPL Technology Automatically Identifies Safe Treatment Level Based On Patient's Condition & Skin Type
- 2. No Gel Required
- 3. LLLT Therapy
 - Complements IPL Treatment
 - Direct Treatment of Lids
- 4. Safe Treatment Of Almost all patient skin types
- 5. Treat More Conditions (Chalazia, Rosacea, Blepharitis,...)
- 6. Low Cost/Patient















Punctal Occlusion Video 180 Day Plugs



















The trigeminal nerve is **accessible within the nasal cavity** and is activated by by OC-01 [now FDA approved as TYRVAYATM (varenicline solution) nasal spray] by activation of **cholinergic receptors**.

The trigeminal nerve provides the pathway for **parasympathetic stimulation** of the lacrimal functional unit (LFU) to activate **complete basal tear film**.



34% of basal tear production is due to inhaling air through the nose¹

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upta A. Heigle T, and Pflugfelder SC. Nasolacrimal stimulation of aqueous tear production. Game a. 1997;16(6):645-648.



















Amniotic Membrane Types

Cryopreserved

<u>Pros</u>

- FDA Approved
- Proprietary Freezing Process
- Ease of use (fitting a contact lens)

<u>Cons</u>

- Requires refrigeration and space in office
- Has to be thawed before use
- Ring placement can be uncomfortable
- Shorter shelf-life
- Price



| Neurotrophin-3/Neurotrophin-4 | NT-3/NT-4 |
|---------------------------------------------------------|------------------|
| Basic fiberblast growth factor | bFGF |
| Beta nerve growth factor | β-NGF |
| Epidural growth factor/Epidermal growth factor receptor | EGF/EGF-R |
| Glial cell line-derived neurotrophic factor | GDNF |
| Heparin binding growth factor | HB-EGF |
| Hepatocyte growth factor | HGF |
| Platelet-derived growth factor | PDGF-AA/PDGF-BB |
| Placenta growth factor | PIGF |
| Stem cell factor | SCF/SCF-R |
| Transforming Growth Factor Alpha | TGFa/TGFb1/TGFb3 |
| Vascular endothelial growth factor | VEGF |

| Protein | Abbreviation |
|-------------------------------------------------|--------------|
| Growth differentiation factor 15 | GDF-15 |
| Interleukin 1a | IL-1α |
| Interleukin 1 Beta | IL-1β |
| Interleukin 1 receptor antagonist | IL-1ra |
| Interleukin 12 p40 | IL-12p40 |
| Interleukin 17 | IL-17 |
| Osteoprotegerin | OPG |
| Interleukin 8 | IL-8 |
| Intercellular adhesion molecule 1 | ICAM-1 |
| Tumor necrosis factor | TNF |
| Interleukin 4 | IL-4 |
| Interleukin 5 receptor | IL-6R |
| Macrophage colony-stimulating factor 1 receptor | MCSF R |
| B lymphocyte chemoattractant (CXCL 13) | BLC |
| Eotaxin 2 | Eotaxin-2 |

| Diseases with Pre-existing Epithelial Defects to promote wound healing and reduce complications (debridement is optional) | Diseases without Epithelial Defects to prevent further damage and promote regeneration (no debridement/PTK) | Diseases with Unhealthy Epithelium or Basement Membrane to promote regeneration (after debridement/PTK) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| neurotrophic persistent corneal epithelial defect post-infectious recalcitrant corneal ulcers (e.g. herpetic, vernal, and bacterial) non-healing epithelial defect after PRK/PTK acute chemical/thermal burns acute Stevens-Johnson syndrome/toxic epidermal necrolysis | dry eye syndrome superficial (punctate) keratitis filamentary keratitis radiation keratitis; whorl pattern indicative of limbal stem cell injury exposure (Graves) keratopathy | recurrent corneal erosion, EBMD Salzmann's nodular degeneration bullous keratopathy during/following DSEK haze after PTK partial limbal stem cell deficiency corneal dystrophy (e.g., Reiss Buckler) |
| epidermal necrolysis | I | I |







| | TEARS | SERUM |
|--------------------------------------------------------------------------------------------|------------|--------------|
| | \bigcirc | B |
| Ph | 7.4 | 7.4 |
| Osmolality | 298 | 296 |
| Albumin (mg/l) | 54 | 35-55 |
| EGF (ng/ml) | 1.5 | 0.7 |
| TGF-b (ng/ml) | 2-10 | 6-33 |
| Vitamin A (mg/ml) | 0.02 | 46 |
| Lysozyme (mg/ml) | 1.4 | 6 |
| SIgA (ug/ml) | 1190 | 2 |
| Fibronectin (ug/ml) | 21 | 205 |
| Hepatocyte GF, NGF, IGF-1, Substance P, Complement, Fibroblast GF, cGRP, other Ig, etc. | | \checkmark |



KOL Serum Tears Survey

Overview

Six Respondents

- Victoria Chin, OD, Mann Eye Institute
 Paul Karpecki, OD, Kentucky Eye Institute
- Marjan Farid, MD, University of California, Irvine
- Pedram Hamrah, MD, New England Eye Center -- Tufts
- Shachar Tauber, MD, Mercy Clinic Eye Specialists
- Winston Chamberlain, MD, Casey Eye Institute

Key Questions

- How do you decide on starting therapy with serum tears in a dry eye patient with unspecified symptoms or significant MGD?
- What is your preferred starting formulation of serum tears?
- Are there particular types of patients you have found respond well to serum tears?
- What percentage of moderate and severe patients do you prescribe serum?





























| Active Ingredients | White Petrolatum (90%), Lanolin (6.9%), Light Mineral Oil (1.4%) |
|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Inactive Ingredients | Retinol Palmitate (Vitamin A) |
| Preservative Free | \checkmark |
| Phosphate Free | \checkmark |
| Sterile Period (from first opening) | 6 months |
| Presentation | 0.18 fl. oz. (5g) |
| No of Applications | 300 |
| Indications | Moderate to Severe Forms of Dry Eye which require a more viscous ointment. Recommended for night time use |





Thank You

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