IPL, DED, MGD, and other Fun Acronyms ☺

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Financial Disclosures

- Allergan
- CynoSure
- Dompe
- Lumenis
- Eyevance
- Horizon
- Optovue
- Osmotica
- Compulink
- Novartis
- Versant
- Sun

Dry Eye Disease Today & Tomorrow??

- Based on current polls there are about 38 million Americans suffering with dry eye and over the next decade will increase by almost 10% (if current incidence remains the same)
- MADE (Mask Associated Dry Eye

Measure DED patients

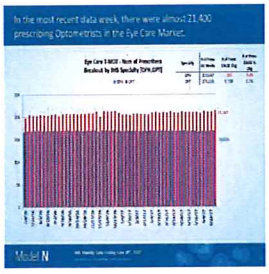
- About 3 of 10 patients have Dry Eye Disease
- Document how many are identified and treated in your practice.
- Think of it like your optical capture rate.

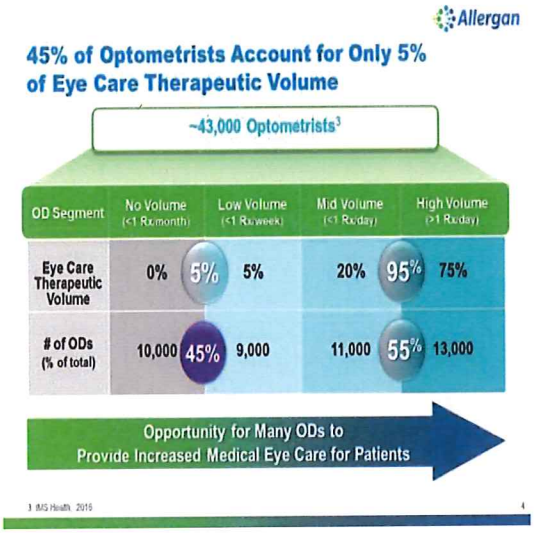
Are Patients Getting the Help They Need?

- According to Gallup Poll
- Patients have seen on average 3.1 physicians before they are diagnosed with Dry Eye Disease

Do you see Dry Eye Disease as an obstacle or opportunity?

- AOA says OD's provide 88% of the comprehensive eye exams today.
- Yet MD's write 55% of the prescriptions.
- Of the 45% of OD's that do write it's 5% of us that are the high prescribers
- We should OWN this disease. Why the gap?





Use of Artificial Tears

- 90.8% have already tried using artificial tears

Leinert et al. *Ophthalmology.* 2016.

- The 2015 Gallup poll conducted via online interviews with a national sample of 776 adults who reported suffering from dry eyes asked Dry Eye sufferers (n = 776), "How long have you been using artificial tears lubricant eyedrops?"1
- Majority of patients (**65%**) had been using ATs for **2** or more years, and **44**% had been using ATs for more than **3** years
- AT users were then asked, "Which, if any, of the following problems or concerns do you have with the treatment you are currently using?"[1]
- 38% of AT users stated that ATs only provide temporary relief; 35% stated they had to use ATs several times a day[1]
- **Reference:**

- 1.The Gallup Organization, Inc. *The 2015 Gallup Study of Dry Eye Sufferers.*Princeton, NJ: Mul Sponsor Surveys, Inc.; 2015.

Quality of Life

- Diminished Reading
- Blurry Vision
- Driving at night
- Computer Work
- CL Intolerance

- Are you able to enjoy the things you like to do everyday? Hobbies too?

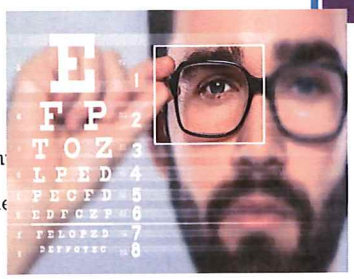
Contact Lens Intolerance

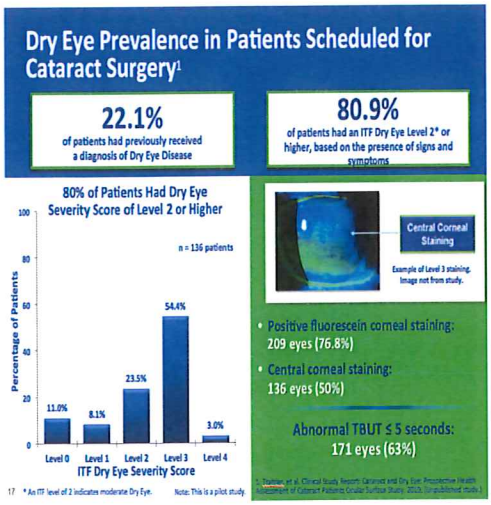
- Approximately 35 million people in the United States wear contact lenses,[1] with a 15.9% dropout rate reported citing discomfort and dryness as the leading causes of intolerance.[2]

Contact Lens Association of Ophthalmologists,Inc.Information Center.Thinking about contact lenses? http://www.contactlensdocs.com/information_center/thinking.htm.Accessed May 27,2010.
Rumpakis J.New data on contact lens dropouts:an international perspective.Review of Optometry. http://www.revoptom.com/content/d/contact_lenses_and_solutions/c/16929/.Accessed January 15,2010.

Affects Everything We Treat

- Contact Lens Patients
- Glasses Rx and
  - especially Rx Checks
- Aesthetics Co-Managemen
- Oculoplastic Co-Manageme
- Glaucoma Compliance
- Refractive Surgery
- Cataract Surgery Co-Management





DEWS I

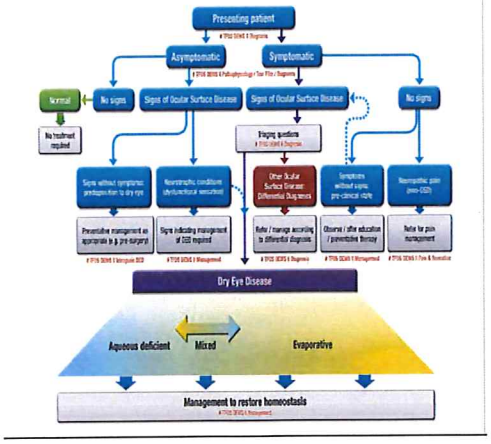
"Dry eye is a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface."

—The Definition and Classification of Dry Eye Disease: Report of the Definition and Classification Subcommittee of the International Dry Eye WorkShop (DEWS). *Ocul Surf*. 2007;5(2):67-204.

TFOS DEWS II

- 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. (Think pain without stain.)

TFOS DEWS II



What diagnostic testing should I do?

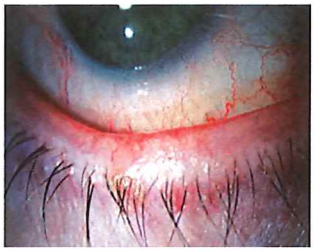
- The goal of any diagnostic testing is to help you paint a clearer picture of what is happening with your patient and guide your clinical decision-making. Simply put, does this diagnostic tool add value? What I mean by that is:
- Will it change my treatment protocol?
- Will it help educate my patient?
- Does it enhance my patients' experience?

Multifactorial Disease

- Multifactorial etiology makes the disease more complex, and in many cases seen clinically, patients have some components of both aqueous deficiency and evaporative disease.
- Diagnostic equipment shouldn't be aimed at identifying whether the patient has aqueous deficient OR evaporative dry eye disease. The correct combination of diagnostic tools should identify BOTH.
- The very fact that dry eye disease is multifactorial demands that we know both. Ultimately, diagnostic testing goals should be to help clinicians identify dry eye disease and determine the level of severity

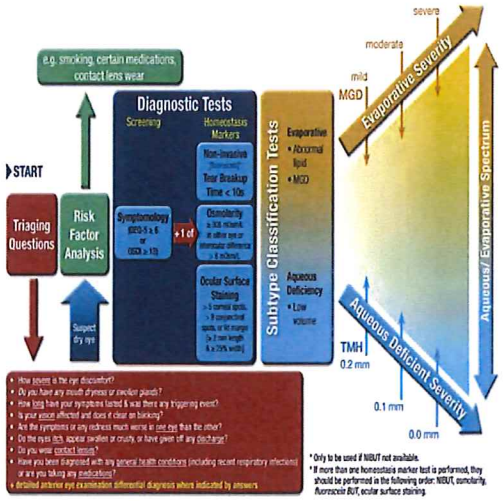
Could help to separate them out

- Symptoms-Ask Questions
- Lid structure and function
- Tear Composition
- Ocular Surface



Step by Step Approach

- Ask the right questions-SPEED,OSDI-6
- Review Medical history and Medications-Autoimmune or Sleep Apnea, Anti-Anything Med's
- CL wearer
- Skin Health/Rosacea/ Telangiectasias
- Blink reflex-Neurotoxins?
- Lid Seal
- Snap Test, Lid position-Fillers?
- Make-up Placement/ Ingredients
- Lash Serums
- Meibography/ Meiboscore
- Interferometry
- TearLab
- MMP-9
- Tear Meniscus Height
- Lissamine Staining
- LWE
- Line of Marx
- NaFl
- TBUT
- Masquerader's-Eg. Conjunctivochalasis, TED-new drug-Tepezza^{R}, NLD, EBMD, others?



Symptoms

- OSDI or OSDI-6 (Ocular Surface Disease Index-*Allergan*)
- SPEED (Standardarized Patient Evaluation of Eye Dryness and Ocular Surface Disease Index-*TearScience*
- DEQ-5 (The Dry Eye Questionnaire-*Chalmers et al*)

Ask Better Questions

- Walk me through your typical day.
  - (How you use your eyes?)
- Do your eyes itch, water, or burn?
- Do you put drops in?
- or feel like you should?
- If you do put drops in, DO THEY HELP?
- Does your vision fluctuate?
- Make a connection and identify PAIN
- When we are aware of our eyes, something is wrong!

Dry Mouth? Joint Pain?

- Sjogren's
  - Primary
  - Secondary
- Other health concerns?
- Testing
  - ANA, RF, SS-A(Ro), SS-B/(La), SP-1, PSP, CA-VI (Bausch & Lomb-Procure and Quest Labs as of 01/23/18) 95% specificity

Tear Composition

- Tear Osmolarity-This diagnostic tool measures the saltiness of tears, or osmolarity. In reviewed literature Osmolarity readings above 308 mOsms/L or an inter-eye difference of >8 mOsm/L are an indication of mild osmolarity and loss of homeostasis[3,4].
- MMP-9 (Metalloproteinase-9) is a nonspecific inflammatory marker that can be present in patients who have dry eye disease[5].

Osmolarity

- Normal
  - Between 280-295 mOsm/L[1]
- Hyperosmolar
  - Central pathophysiologic mechanism for all forms of
  - Causes inflammation and apoptosis & reduces the ability of mucins to lubricate
  - Leads to a breakdown of homeostatic control causing tear film instability
  - 308 mOsm/L is a highly sensitive cut-off point that delineates a normal from a mild/moderate dry eye population. 316 mOsm/L for moderate/severe.
  - Inter-eye difference=Hallmark of DED (>8 mOsms/L between eyes)
  - Unstable tear film causes inter-eye differences
- [1]Potvin, Richard et al, Clinical Ophthalmology 2015:9 2039–2047

Tear Hyperosmolarity

- Hyperosmolarity stimulates a cascade of inflammatory events on the ocular surface
  - – IL81alpha – TNF8alpha – MMP-9
- Can lead to surface cell apoptosis, including the goblet cells

- Reference: [2]DEWS[3]Report[2007 The[4]Ocular[4]Surface

MMP-9 plays a role in basement membrane degradation, since basement membrane contains collagens, including Type IV Collagen, which can be degraded on by MMP-9. Normal levels of MMP-9 in human tears ranges from 3-41ng/ml

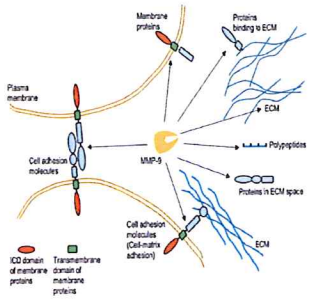
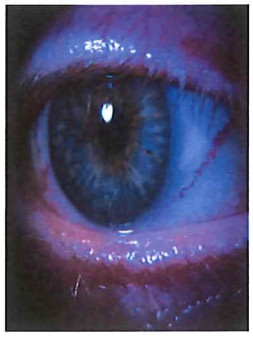


Figure 2. Schematic illustration about targets of MMP-9 in extracellular environment

Tear Quantity

- Tear Meniscus Height-This information tells us how much tear volume is present. The normal average is 0.2mm[6].
- Lissamine Green-This vital dye stains devitalized cells of the conjunctiva. Symptoms and conjunctival staining characterize Level 1 dry eye disease[1]. No corneal signs will be present. This dye is a must have otherwise you will miss Level 1 severity and may put off treatment until the patient progresses to Level 2 or 3.
- NaFl (Sodium Fluoroscein)-This vital dye stains corneal breaks and devitalized cells of the cornea. Certainly an important indicator in establishing the health of the cornea.
- Measuring TBUT or Tear Break Up Time gives important information about how long the tear film stays in place or the stability of the tears.
- Phenol Red is a patient preferred Shirmer's test. It measures tear volume in 15 seconds with much less reflex tearing than Shirmer's. Nice to have when an objective measure of tear volume is needed for those truly aqueous deficient patients.

What is your purpose?



Change Your Mindset

- ~3.8 million cataract surgeries performed last year in the US (What % have MGD)
- ~3 million glaucoma patients, 1.5 million actively treated
- ~40 million dry eye patients with symptoms in the US

Do you have systems in place to uncover these patients?

Are your patients well controlled?

- Do you wish you had more options?
- Do you understand how to incorporate all your options?
- DED is a vision based disease-Mother nature has devised this system well, but also no with devices
- Goal-Restore homeostasis
- 86% of the time it fails
- *James Jester 2015 Journal*

Simplicity is the key to brilliance-

Bruce Lee

- Questions
- Risk Factor Analysis
- Diagnostics
- Classification and Treatment

- Dews II Diagnostic Algorithm

Step Therapy

- Patient education is so crucial!
- We start here and we step up therapy until we reach the symptomatic and therapeutic

  levels needed to appropriately

  manage your disease.
- Build Trust!

TFOS DEWS II

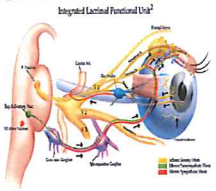
- Dry Eye is a **multifactorial** disease of the ocular surface characterized by a loss of ***homeostasis*** of the tear film, and accompanied by ocular symptoms, in which tear film instability and ***hyperosmolarity***, ocular surface ***inflammation*** and damage, and ***neurosensory*** abnormalities play etiological roles. -The Definition and Classification of Dry Eye Disease, *Ocular Surface Journal, TFOS 2017*
- There is NO silver bullet diagnostically or therapeutically for this disease!

- Birfurcation of aqueous deficient and evaporative?

Neural Pathways Are Critical- LFU

Lacrimal Functional Unit Regulates Tear Secretion[1]

1. Corneal nerves sense dryness
2. Brainstem is activated
3. Parasympathetic activity to gland
- Nasal nerves also critical in maintaining normal tear film



Naso-Lacrimal Reflex Critical to Normal Tear Production

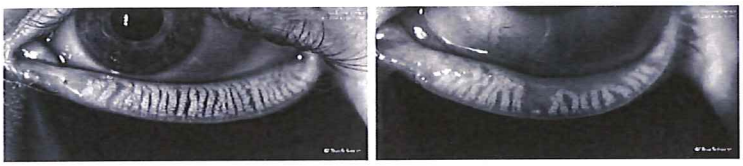
- Normal nasal breathing activates trigeminal nerve[3]
- Nasal breathing drives 34% of basal tear production[4]
  - Pflugfelder lab showed in controlled trial by administering nasal anesthesia

1. Dart DA. *Prog Retin Eye Res* 2008;28:155-77; 2. From Dry Eye and Ocular Surface Disorders, New York, 2004, pp 11-39;
3. Zisbart-Pedersen K. *Arch Otolaryngol.* 1985;81:457; 4. Gupta A, Heigle T, Pflugfelder SC. *Cornea* 1997;16:645-8

AAOpt 2016, Craig, et al. 4

MGD

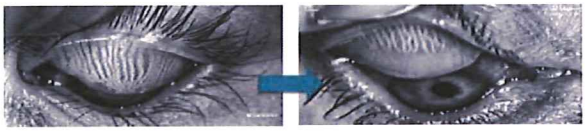
- *Meibomian gland dysfunction (MGD) is a chronic, diffuse abnormality of the meibomian glands, commonly characterized by terminal duct obstruction and/ or qualitative/ quantitative changes in the glandular secretion. This may result in alteration of the tear film, symptoms of eye irritation, clinically apparent inflammation, and ocular surface disease.* –*Nesson JD, Shimazaki J, Benitez-Del-Catillo JM, et al. The international workshop on meibomian gland dysfuntion:report of the definition and classification subcommittee.Invest Ophthalmolo Vis Sci. 2011 Mar 30;52(4):1930-7*



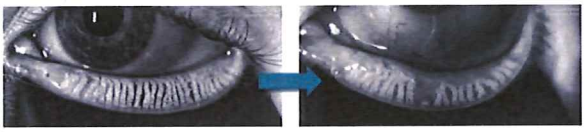
Meibomian Gland Anatomy

- Large Sebaceous glands
- Located in the tarsal plate
  - More in the upper lid (30-40)
  - Less in the lower lid (20-30)

Upper Eyelid

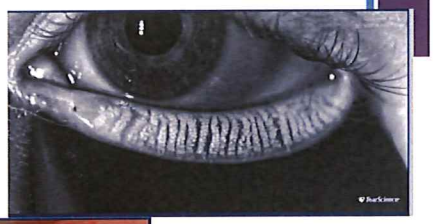


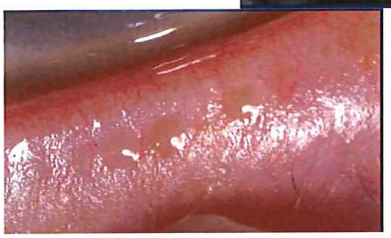
Lower Eyelid



Structure and Function

- Normal Structure
- Normal Function

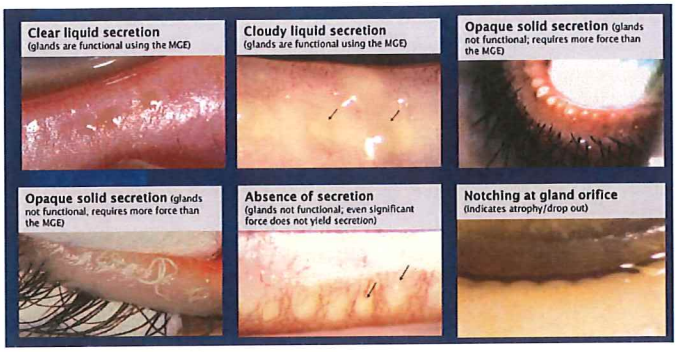




Grading System

- **Meibum quality** is assessed in each of 8 glands of the central third of the lower lid on a 0-3 scale for each gland: 0=clear meibum; 1=cloudy meibum; 2=cloudy with debris (granular); 3=thick, like toothpaste [range 0-24].
- **Expressibility of meibum** is assessed from 5 glands: 0= all glands expressible; 1=3-4 glands expressible; 2= 1-2 glands expressible; 3=no glands expressible. This can be assessed in the lower or upper lid.
- **Numerical staining** scores refer to a summed score of staining of the exposed cornea and conjunctiva. The Oxford scheme has a scale range of 0-15 and the DEWS scale has a scale range of 0-33.

Examples of Meibomian Gland Evaluation



MGD is Progressive

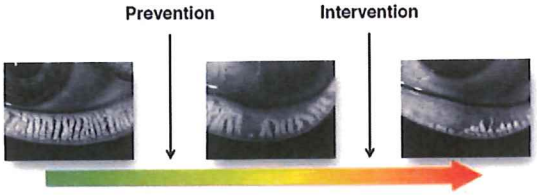
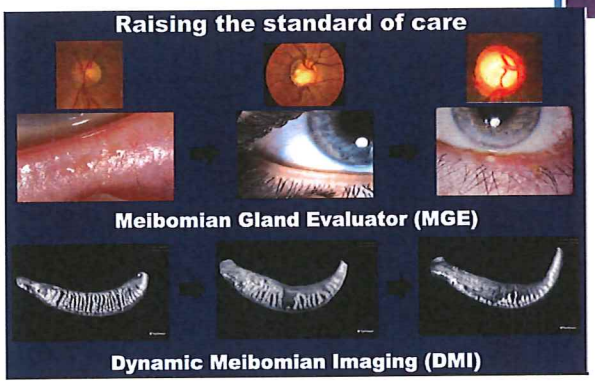


Image from TearScience

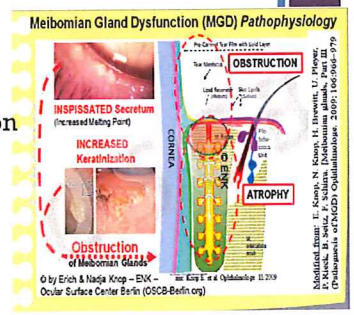
What other disease is structure before function important?



Pathophysiology

- **Increased Viscosity**
  - Due to altered lipid and increased melting point
  - Bacterial colonization
- **Hyperkeratinzation**

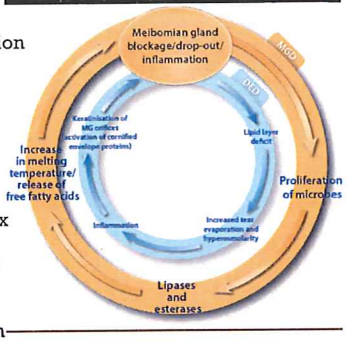
- **Signs**
  - Lid Foam
  - Obstructed Gland Orifice
  - Lipid Crusting
  - Collarettes
  - Telangiectasia
  - Lid Margin Redness



OCEAN-MGD arises from any combo of six separate conditions

- Primary obstructive hyperkeratinization (plugging)
- Abnormal meibomian secretion
- Eyelid inflammation
- Corneal and conjunctival inflammation
- Epithelial damage
- Microbiological changes
  - (Staph sp., P acnes and
  - Demodex sp., B. oleronius)

- Think
- BEISTO
  - Bugs-Bacterial Burden/Demodex
  - Enzymes
  - Inflammation (IL-6, IL-17, PGE2)
  - Stasis of Meibum
  - Temperature Increase
  - Obstruction/hyperkeratinization



Emerging strategies for the diagnosis and treatment of MGD: Proceedings of the OCEAN group meeting. *Ocular Surface* 2017 15, 179-192

B-Taylor et al. *J Cosmet Laser Ther* 2014:16(2):96-103 and Prieto et al *Lasers Surg Med.* 2002:30(2):82-5.
E-Calderhead, RG. *Laser Ther 2007;*16(2):97-108
I-Lui et al. *AJP* 183:81-90
S-YueYin et al. *Curr Eye Res* 2018 4:1-6
T-Craig et al. *IOVS* 56:1965-70
O-Dell et al. *Clin Ophthal* 2017;11:817-827

Slide courtesy of Laura Periman MD

Diagnostic DED Work Up

- SPEED Questionnaire
- Tear Osmolarity
- InflammaDry®
- Lissamine Green Staining AND NaFl
- TBUT
- TMH
- Meibomian Gland Evaluator (MGE)
- Meibomian Gland Imaging

Table 16
Staged management & treatment recommendations for dry eye disease[1,2,3].

Step 1:
- Education regarding the condition, its management, treatment and prognosis
- Modification of local environment
- Education regarding potential dietary modifications (including oral essential fatty acid supplementation)
- Identification and potential modification/elimination of offending systemic and topical medications
- Ocular lubricants of various types (if MGD is present, then consider lipid-containing supplements)
- Lid hygiene and warm compresses of various types

Step 2:
If above options are inadequate consider:

- Non-preserved ocular lubricants to minimize preservative-induced toxicity
- Tea tree oil treatment for Demodex (if present)
- Tear conservation
  - Punctal occlusion
  - Moisture chamber spectacles/goggles
- Overnight treatments (such as ointment or moisture chamber devices)
- In-office physical heating and expression of the meibomian glands (advanced device-assisted therapies, such as LipiFlow)
- In-office intense pulsed light therapy for MGD
- Prescription drugs to manage DED[4]
  - Topical antibiotic or antibiotic/steroid combination applied to the lid margins for anterior blepharitis (if present)
  - Topical corticosteroid (limited-duration)
  - Topical secretagogues
  - Topical non-glucocorticoid immunomodulatory drugs (such as cyclosporine)
  - Topical LFA-1 antagonist drugs (such as lifitegrast)
  - Oral macrolide or tetracycline antibiotics

Step 3:
If above options are inadequate consider:

- Oral secretagogues
- Autologous/allogeneic serum eye drops
- Therapeutic contact lens options
  - Soft bandage lenses
  - Rigid scleral lenses

Step 4:
If above options are inadequate consider:

- Topical corticosteroid for longer duration
- Amniotic membrane grafts
- Surgical punctal occlusion
- Other surgical approaches (eg tarsorrhaphy, salivary gland transplantation)

Ocular Surface Health Questions
Please check all symptoms experienced since last visit

☐Dry Eyes
☐Blurry Vision
☐Redness
☐Burning
☐Itching
☐Light Sensitivity
☐Excessive tearing/watery eyes
☐Tired eyes/eye fatigue
☐Stringy mucous in or around the eyes
☐Foreign Body Sensation,Gritty
Scratchy, feeling of sand or grit in eye
Have you used eye drops in the last 2 hours?
Yes☐ No☐
Does your vision change throughout the day?
Yes☐ No☐
Can you wear your contacts comfortably as long as you'd like?
Yes ☐ No☐

Sleep Apnea
Do you wake up in the morning with a headache?
Yes ☐ ☐No
Do you find it necessary to take a nap in the afternoon?
Yes☐ No☐
Do you snore?
Yes☐ No☐

Rosacea
Does your face flush easily, eating spicy foods, alcohol, or hot showers?
Yes☐ No☐
Do you have blasting with certain foods?
Yes☐ No ☐
If so, which ones?

Macular Pigment Ocular Density Questions
Please check all that apply

☐Light colored eyes/and or skin
☐Cardiovascular disease
☐Difficulties driving at night
☐Difficulty distinguishing an object from a similar color background (dark car on a dimly lit street)
☐Family history of AMD or tak en a genetic test (23 & Me) and tested for an AMD risk
☐Outdoor occupation or excessive computer use (7+ hours per day)
☐Bright light sensativity
☐Current or former smoker
☐Low vegetable intake (< 5 servings/day)

External Exam

Would you like your eyes to be more open?
Yes☐ No☐

Are there any areas around your eyes that you wish could be changed such as wrinkles, dark spots or texture? Do people comment that you look tired or angry, etc?
Yes☐ No☐

Differentiation of Various Devices for Skin

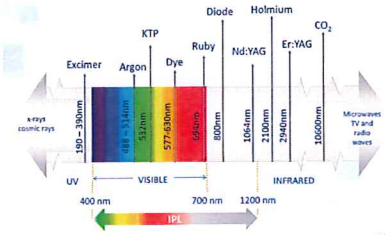
- Laser Light Energies (Lasers-Light Amplification by Stimulated Emission of Radiation)
  - Both ablative and non-ablative (all indications depending on wavelengths)
- IPL Devices of Light Therapy (Intense Pulse Light-filtered light energies)
  - Typically non-ablative devices (melanin reduction, oxy/de-oxy hemoglobin)
- Radio Frequency Devices
  - Typically non-ablative devices (skin tightening, collagen remodeling)
- Ultrasound Devices
  - Typically non-ablative devices (skin tightening, collagen remodeling)

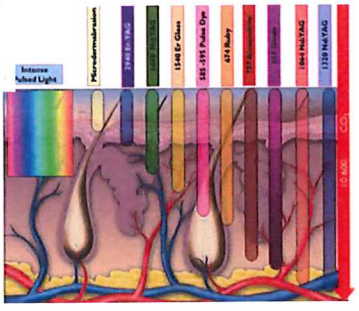
Intense Pulse Light (IPL)

- Differences between Lasers & IPL sources
- Laser Light
  - Monochromatic
  - Coherent
  - Parallel
- Intense Pulsed Light
  - Non monochromatic
  - Non coherent
  - Defocused

laser		intense pulsed light (ipl)	
	monochromatic: can tune out unwanted colors		polychromatic: broad spectrum visible light
	coherent: related in phase over long distances		non-coherent: phases cross each other
	collimated: beam spreads very little		divergent: beam spreads a lot
The diode laser works on an 810nm wavelength, targeted for hair removal		IPL's work a broad spectrum of wavelengths, ranging from 450-1200nm	

Intense Pulse Light (IPL)

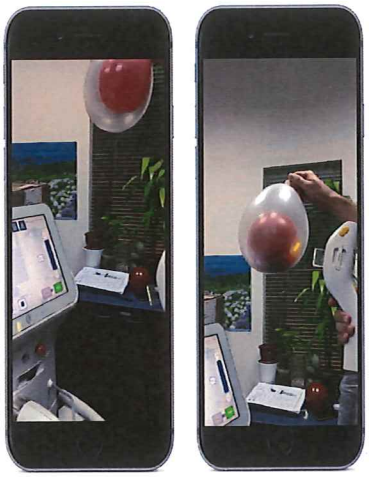




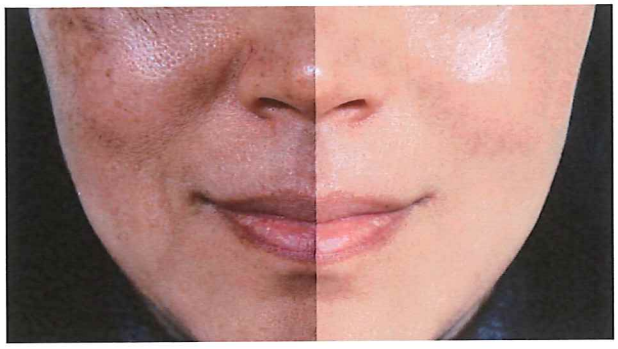
IPL (Intense Pulsed Light)

- How it works
  - Emits a broad, continuous spectrum of light in the range of 515–1200 nm, with the ability to apply filters to target specific *chromophores* (i.e. melanin and hemoglobin).
  - Melanin absorption is in the 400–700 nm range
  - Blood absorption in the 900–1,200 nm range
  - Role of oxyhemoglobin
    - The light that's emitted from the flashlamp is absorbed by the oxyhemoglobin in the blood vessels → generates heat that coagulates the cells
  - Think Red's & Browns!

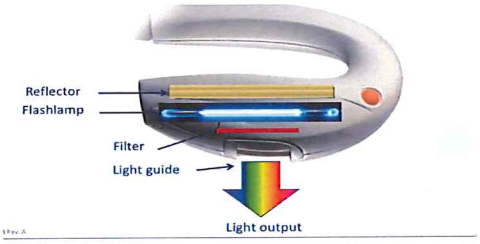
OptiLight safely and effectively targets the ~~in~~flammation



Lumenis OptiLight



Light emitted passes through a filter which "cuts off" undesired wavelengths and maximizes the pass of the chosen ones



Filters for the M22 are available in 515, 560, 590, 615, 640, 695, vascular, 755, and Acne*
*Know what your license allows through your Board of Examiners!

MaxG™ Pulsewidth (ms)	Minimum Fluence (J/cm²)	Maximum Fluence (J/cm²)	Fluence Increments
1	3	11	1
2	5	21	2
3	6	30	2
5	6	36	2
10	20	54	2
15	20	60	2
20	20	68	2
25	20	74	2
30	20	80	2
40	20	80	2
60	20	80	2
80	26	80	2
100	32	80	2

Handpiece	Spot size (mm)	Repetition Rate (Hz)	Spectral Range (nm)	Fluence Range* (J/cm²)	Application
MAXG	10 x 15	.2 – 2.0	500 – 670 & 670 - 1200	Up to 80	Pigmented and Vascular lesions (skin types I-IV)

Most popular cosmetic skin procedures performed

Photofacial

- #1 Cosmetic procedure performed in the United States
- 80 million Americans have some kind of venous disorder (80% of those are cosmetic)
  - Rosacea represents 16 million alone
- Hyperpigmentation is the 2nd largest skin disorder in the US (Acne #1)

Chang AL, Bitter PH Jr, Qu K, Lin M, Rapicavoli NA, Chang HY. Rejuvenation of gene expression pattern of aged human skin by broadband light treatment: a pilot study [published correction appears in J Invest Dermatol. 2013 Jun;133(6):1691]. *J Invest Dermatol*. 2013;133(2):394–402. doi: 10.1038/jid.2012.287

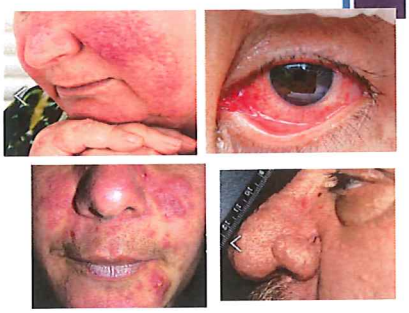
American Academy of Dermatology

IPL

- IPL-Intense Pulsed Light On Label
  - Telangiectasias
  - Photorejuvenation (reds & browns)
  - Acne
  - Rosacea
  - Hair removal
  - Benign Cutaneous Vascular Lesions
    - Angiomas, spider angiomas, leg veins,
    - Venous malformations
  - Poikiloderma
  - Cutaneous Lesions:warts, scars, striae
  - Fine lines and wrinkles-non-ablative
- Now FDA Approved Label in the US
  - Meibomian Gland Dysfunction

Historically Rosacea (a chronic skin condition) was classified into 4 subtypes: New system is 2 Diagnostic Phenotypes

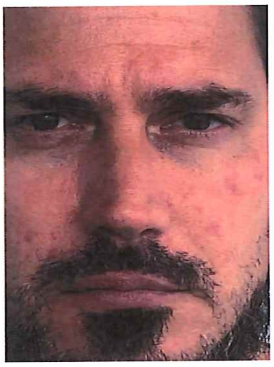
- Erythematoustelangiectatic
- Papulopustular
- Phymatous
- Ocular
- Fixed centrofacial erythema
- Phymatous changes
  - Papules & Pustules
  - Flushing
  - Telangiectasia
  - Ocular Manifestations



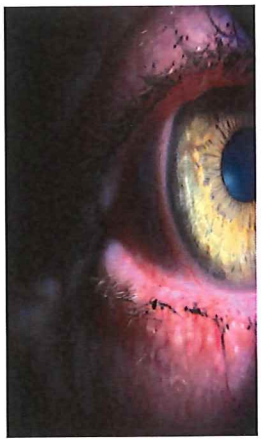
Gallo RL, Granstein RD, Kang S, et al. Standard classification and pathophysiology of rosacea: The 2017 update by the National Rosacea Society Expert Committee. *J Am Acad Dermatol* 2017 Oct 28. pii: S0190-9622(17)32297-1. doi: 10.1016/j.jaad.2017.08.037.

Erythematous-Flushing, Telangiectasia

Papulopustular-Papules and pustules



Ocular

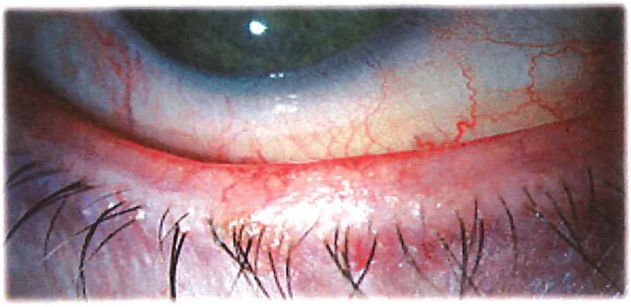


Rosacea and MGD

- 80 % of Rosacea patients suffer from MGD.
  - Viso et al. *Eur Ophthalmic Rev* 2014;8(1):13-6
- Presence of One or More of the Following Primary Features
  - Flushing (transient erythema)
  - Nontransient erythema Papules and pustules
  - Telangiectasia
- May Include One or More of the Following Secondary Features
  - Burning or stinging
  - Red plaques
  - Dry appearance
  - Oedema
- Ocular manifestations
  Peripheral location
  Phymatous changes (most commonly rhinophyma)

- 20% of facial rosacea is preceded by ocular rosacea

Rosacea associated MGD=worse prognosis

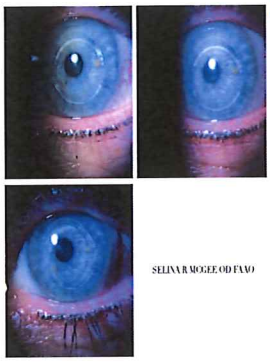


20% of ocular rosacea precedes facial rosacea

- Trigger Avoidance
  - Spicy food, Alcohol, Sun, Caffeine
  - Whole 30, Gluten Free, Dairy Free
- Medications
  - Alpha-Adrenergics Agonist (topical) Rhofade^{R}
  - Beta Blockers (oral)
  - Brimonidine (topical) Mirvaso^{R}
  - Minocycline and low dose Doxycycline 50 mg
  - Ivermectin
  - Azelaic Acid
  - Metronidazole
  - Isoretinoin
- IPL
- PDL (Pulse Dye Laser)

Schaller M, et al. Rosacea treatment update: recommendations from the global ROSacea COnsensus (ROSCO) panel. BJD 2016 Nov 12. 465-471. https://doi.org/10.1111/bjd.15173

Eyelids Before and After



SELINA R MCGEE OD FAAO

Toyos 2017

IPL Treatment

- Face
- Neck
- Décolleté
- Hands
- Up to Fitzpatrick IV-very carefully!

Patient Selection

- Get a fully-detailed medical history-No active lupus
- Use of a medical questionnaire and informed consent form
- Exclude any lesion with malignant potential
- For any suspicion on cancerous lesion, excision biopsy may be considered
- Patients with unrealistic expectations should be identified during the consultation and discouraged
- **DO NOT TREAT MELASMA PATIENTS!**

Skin Assessment

- Tanning of all forms (sun, tanning beds) is formally contra-indicated as melanin would be redistributed and migrate towards upper epidermis building a "light-blocker" to any treatment
- Also exclude self tanning lotions which give the skin a competing artificial coloration through a chemical reaction with the amino acids of the stratum corneum
- Tanned skins CANNOT be "defined" by selecting a darker skin type
- On areas with slower "de-tanning" passed the minimum solar eviction of 3-4 weeks, recommend gentle exfoliation of the area 1 week prior treatment

Skin Assessment

- Fitzpatrick Skin Type
- Amounts of Target Chromophore and Competing Chromophore
  - What's a Chromophore?
    - Water, Pigment, Oxyhemaglobin
- Any active sun or lamp exposure
- Ethnicity
- Thickness of skin
- Overall skin health
- Medical history
- Medication Review
- **THIS NEEDS TO BE DONE BEFORE EVERY TREATMENT**

Utilize Pilot Checklist for safety

- Atul Gawande-The Checklist Manifesto

Contraindications

- Treatment should not be attempted on patients with the following conditions in the treatment area:
  - Active infections
  - Dysplastic nevi
  - Significant concurrent skin conditions or any inflammatory skin conditions
  - Active cold sores, open lacerations or abrasions
  - Chronic or cutaneous viral, fungal, or bacterial diseases
  - Exposure to sun, remaining suntan or artificial tanning in the 3-4 weeks pre-op plan
  - Tattoos
- Treatment should not be attempted on patients with a history of skin cancer or pre-cancerous lesions on the treatment area

PRE-TREATMENT PATIENT EDUCATION

- The following should be discussed with patients prior to performing IPL treatment:
- Results are not guaranteed.
- Not all red and brown areas will disappear.
- Red and brown spots removed by treatment may recur, especially with excessive sun exposure.
- Deep wrinkle lines will not be removed by the treatment.
- Adverse effects include redness, swelling, burning, pain, crust formation, bruising, hyper- and hypopigmentation (including striping), and scar formation.
- Multiple treatment sessions (typically three to five) are required for optimal results.
- Maintenance treatments are often recommended four to six months after the initial series.
- In addition, patients should be quoted a price for the treatment course.

Pre-treatment Instructions

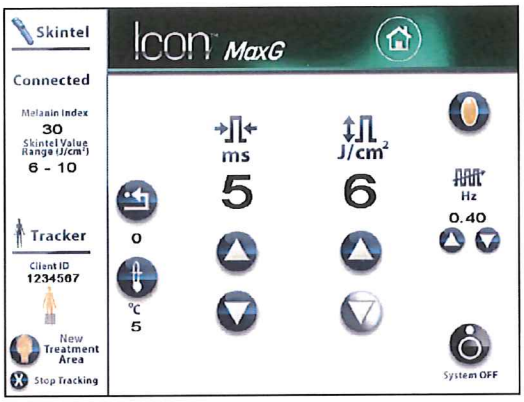
- Do not take isotretinoin (Accutane®) for 6 months before your treatment.
- If you are tanned, please reschedule your appointment.
- Do not apply make-up or lotions on your day of treatment, or be prepared to remove them at our office.
- If you have a history of cold sores, take your prescribed medication (e.g., Valtrex, Famvir, Zovirax) on the day before, day of, and day after treatment.
- Inform the doctor before each appointment if you (1) are taking new medications or (2) have tattoos or beauty marks you do not want treated.
- Inform the doctor immediately if the area being treated feels "too hot."
- Please arrive on time.

Procedure Checklist

- Patient education form read and understood
- Pretreatment instructions reviewed and understood
- Informed consent signed
- Skin type identified
- Pretreatment test site confirmed with no adverse reaction
- Confirm that patient has taken prophylactic antiviral medication has no contraindications for treatment
- Pretreatment photograph taken
- Set up procedure tray including eye shields and masks
- Select treatment parameters
- Perform intense pulsed light treatment
- Provide verbal and written post-treatment instructions to patient
- Complete procedure note including device settings
- Subsequent treatment scheduled

Treatment Parameters-Cut-off filters, pulse duration, fluence, and number of pulses (single, double, triple) per treatment session are chosen to assure safety and selective photothermolysis.

- Mode
  - Single Pulse
  - Double Pulse
  - Triple Pulse
  - 590
  - 560
  - 515
  - Vascular
- Duration (ms) per pulse
- Delay (ms)-Time delay between pulses
- Fluence (Joules/cm^2)
- Cut-off Filter Wavelength
  - 695
  - 640
  - 615



Pulse Durations

- **Pulse durations** are selected to slowly heat vessels to coagulation while avoiding purpura. This allows patients to return to normal activities quickly rather than suffering from purpura for one or two weeks. (PDL-Pulse Dye Laser is notorious for this)

Energy Levels

- **Energy levels** (fluence in J/cm2) are governed by clinical response. If tissue reactions do not occur, fluence levels may be increased by 1 J/cm2 (Lumenis One) or 2 J/cm2 (VascuLight SR or Quantum IPL [Lumenis, Inc.]). A good rule of thumb is to use mild to moderate erythema as the treatment end point. (If target is pigment-1-2 shades darker)
- Vessels should blur or disappear-no purple

Cut-off Filters

- **Cut-off filters** are selected to optimize targeting of the chromophore while filtering out wavelengths damaging to the epidermis. These vary by skin type and target chromophore.
  - 695 nm
  - 640 nm
  - 615 nm
  - 590 nm
  - 560 nm
  - 515 nm

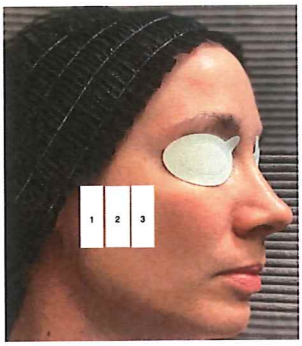
Treatment Aggressiveness

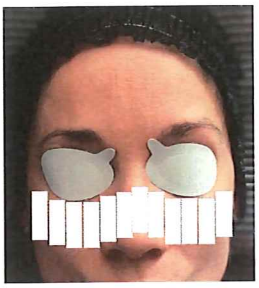
- Less Aggressive
  - Higher cut-off filter
  - Lower fluence
  - Higher pulses
  - Longer delay
  - Eg. 590 nm, Triple pulse, 6 m/s delay, 4 ms
- More Aggressive
  - Lower cut-off filter (meaning treat longer wavelengths and more superficial treatment)
  - Higher fluence
  - Shorter Delay
  - Fewer Pulses
  - Eg. 515 nm, single pulse, 4 ms

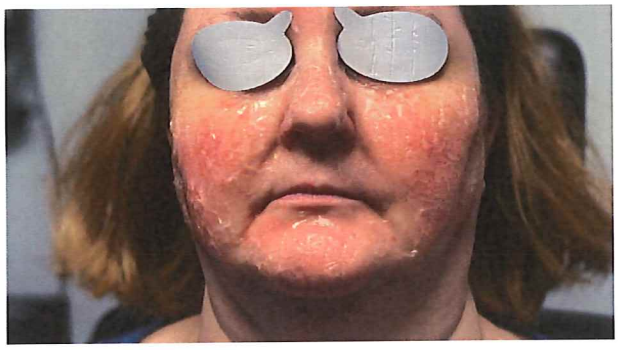
Pearls

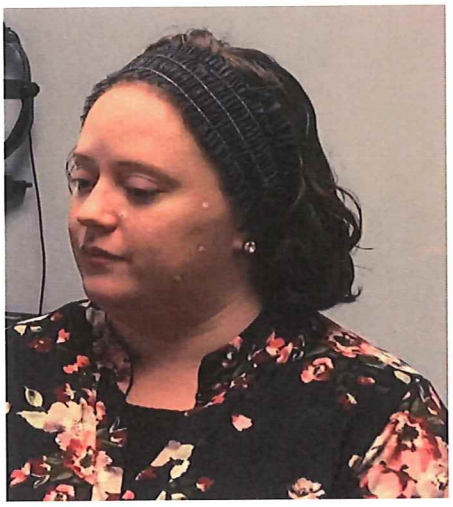
- A good rule of thumb is to use mild to moderate erythema as a treatment endpoint. Darkening of target pigment also represents a treatment endpoint.
- Always double-check that the settings you want to use are the settings you are using.
- As a rule, darker skin types require cautious treatment with lower energies, longer pulse durations, longer delay times, and higher-wavelength filters (e.g. 590, 615, and 640 nm). Deeper in the skin.
- Utilize a white make-up pencil to cover pigment that people want to keep☺

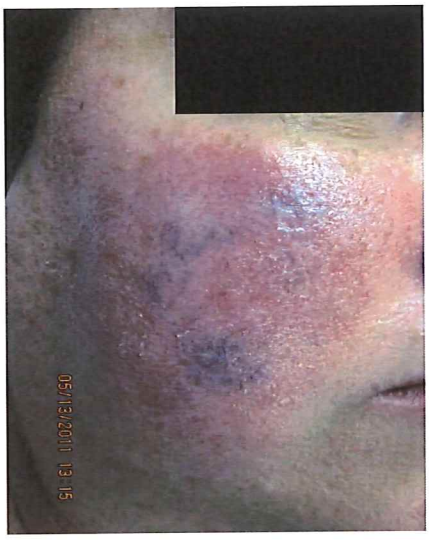
Test 3 and then move on

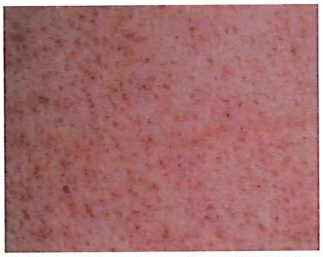












Darkening of pigment and erythema. Skin type II

Post Procedure

- Remove gel with tongue depressor
- Keeps treatment area clean by gently cleansing
- Keeps on moisturizing with an emollient
- Avoids direct sunlight
- Renews application of sun block SPF 30-50 until next session
- Avoids use of deodorants or fragrance as long as skin is sensitive or fragile
- Avoids scrubbing the skin

Pitfalls

- Do not press hard on the skin when treating blood vessels. If you press hard, you will squeeze the target from the vessels.
- Always cover the eyebrows and other hair-bearing areas to avoid unintended hair loss. Stay 1 finger width away from hair and tattoos
- Remove all makeup and lipstick before starting treatment. Dark makeup and lipstick absorb significant amounts of light, which can lead to a burn.
- Do not hurry when treating vessels or pigment. Aggressive treatments can lead to burns. Remember, "You can always add more but cannot take away."

Complications

- Erythema (redness) and edema (swelling) of the treated area can occur
- Irritation, itching,and/or a mild burning sensation or pain similar to sunburn may occur within 48 hours of treatment.
- Pigmentary changes such as hyper pigmentation and hypo pigmentation of the skin in the treated areas can occasionally occur.
- Other known complications of this procedure include blisters, redness, pinpoint pitted scars, bruising, superficial crusting, burns, pain, and infections. These side effects are usually temporary, lasting from five to ten days but can be permanent as well.

FAQ's

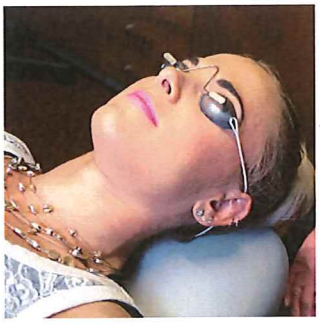
- Can I treat if patient is on doxy?
  - If low dose doxy yes, photosensitivity occurs with UV light, IPL has no UV light
- Can I use topical numbing agents?
  - **No!** Due to the vasoconstrictive properties this will diminish your target rendering your treatment less effective. You also need the patient to give you proper feedback
- Do I need to treat lids and do expression?
  - Periman Protocol=Yes/No. Richard Adler Protocol=Yes/No. Toyos=No/Yes
  - McGee=Depends on the patient/No-All patients improve!!

- Do I do with this before or after Thermal Pulsation (LipiFlow, Tear Care, iLux, etc)
  - Prior to, most patients won't need thermal pulsation in my experience, some still will but wait until 3-4 treatment of IPL before performing, Dr. Ed Jaccoma is doing some very interesting work with RF in conjunction with IPL-stay tuned!
  - No harm in doing more treatments

Shields

Anthonyproducts.com

Innovativeoptics.com



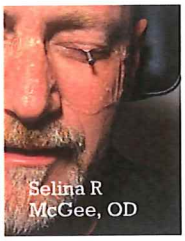
Periman Protocol with M22 "The Dry Eye Master"

- Full face rosacea settings
- Toyos settings to V2 (Double Pass)
- Treat lids

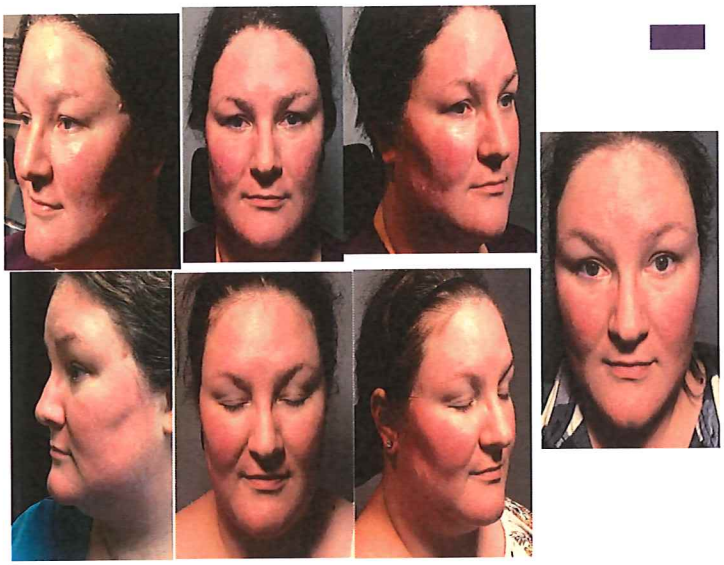
  (with laser grade corneal shields)
- Aesthetic clean-up

  (spot treat pigment and

  telangiectasias)



IPL Demonstration



Treatment Settings
Treating deep & large to smaller & more superficial

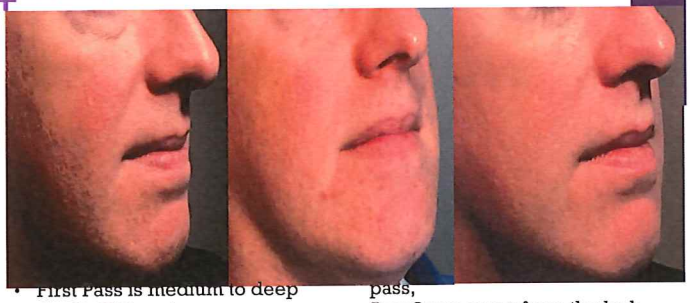
- First Pass I did: medium to deep depth 590 nm, triple pulse, 3ms-30 ms 20 J/cm ^{2}
- 2nd pass Shallow depth 560 nm, triple pulse, 3.0ms 25ms 18 J/cm^2
- Toyos settings over V2 with double pass

  590 filter, triple pulse 6.0 msec pulse, 50msce rest, 12 J/cm^2
- Eyelids-Periman Protocol **LASER Grade Corneal Shields!**

  Small rectangle light guide 3 pulses per lid with double pass, Stay 2 mm away from the lash line (Total 24 pulses)

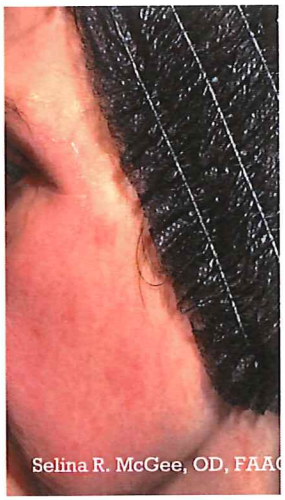
  590 filter, triple pulse 5.0 msec pulse, 50msec rest,10-14 J/cm^2

After 3 treatments



- First Pass is medium to deep depth (590 nm)
- Triple pulse 3.5 ms PD, 25ms D, 21J/cm^2
- Second pass was 560 nm, triple pulse, 3.5ms, 20 ms and 19 J/ cm^2
- Toyos settings over V2 with double pass
  - 590 filter, triple pulse 6.0 msec pulse, 50ms rest, 12 J/

pass,
Stay 2 mm away from the lash line (Total 24 pulses)
590 filter, triple pulse 5.0 msec pulse, 50msce rest,10-14 J/cm^2

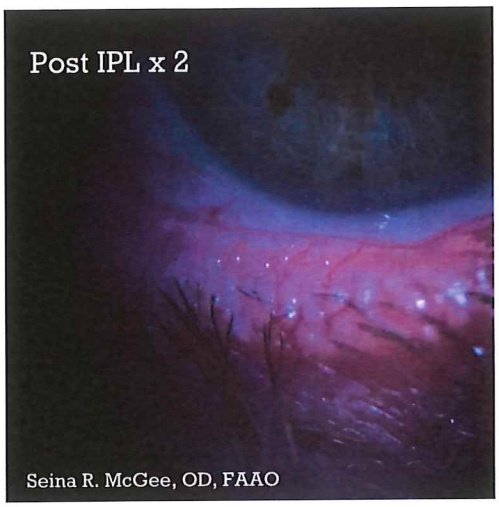


Lentinges-Spot Treat with 6mm circle

- Pigment Lesion Menu
- Type II
- Lentigines
- Light
- Epidermal
- 515 nm filter, Single Pulse, 4.0 msec pulse, 19.0 J/cm^2
- Clinical endpoint the pigment will **Immediately** turn darker-Salmon colored

Telangiectasia's-Spot treat with 6 mm circle

- Vascular Lesion Menu
- Skin Type II
- Circle
- Facial Telang
- Shallow or Medium
- Vacular Filter, Double Pulse, 3.5 ms 15 ms 28 J/cm^2
- Clinical endpoint-Vessel vaporizes-very satifsfying☺

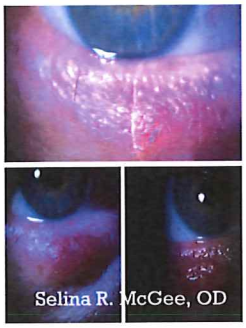


Patient with DED, MGD but no facial rosacea if want photofacial too

- First Pass I did: 560 nm double pulse, 4ms-20 ms 16 J/cm ^{2}
- Toyos settings over V2 with double pass
  590 filter, triple pulse 6.0 msec pulse, 50msce rest, 12 J/cm^2
- Eyelids-Periman Protocol **LASER Grade Corneal Shields!**
  Small rectangle light guide 3 pulses per lid with double pass,
  Stay 2 mm away from the lash line (Total 24 pulses)
  590 filter, triple pulse 5.0 msec pulse, 50msec rest, 10-14 J/cm^2

Chalazia Treatment-Incision Free, Injection Free, Scar Free Management-Pioneered by Dr. Laura Periman

Chalazia Managment

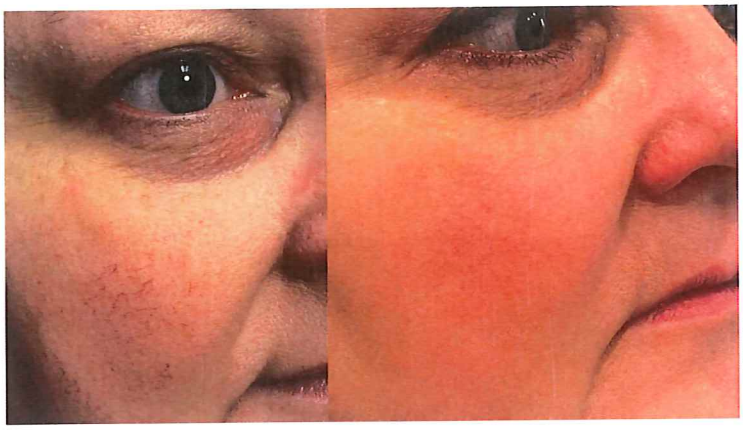


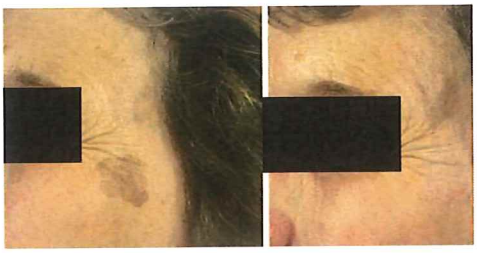
Settings: Periman Protocol with extra pulses on the lesion. Used small light guide with Toyos settings x 2 and then 560nm 3.0ms 25ms 18 J/cm^2

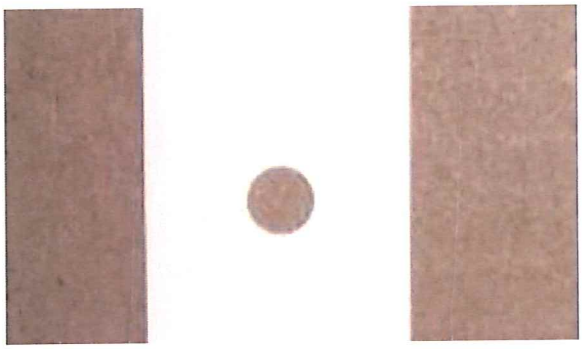
How does IPL actually work? What is it doing to the tissues? Think BEISTO

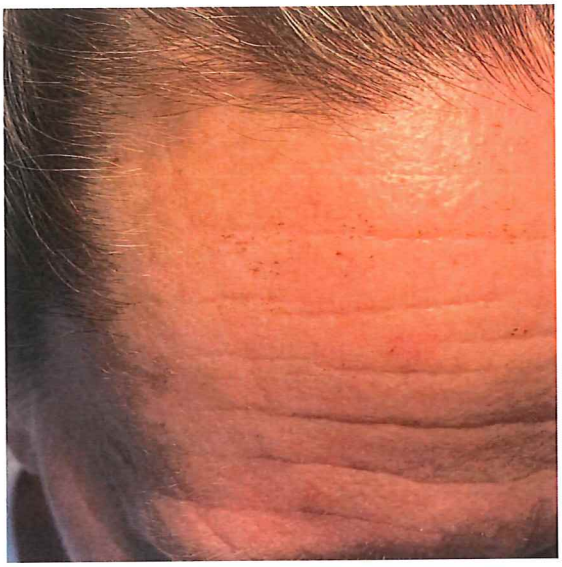
- Photocoagulation
- Photoimmunomodulation
- Photomodulation
- Photothermolysis
- Photosanitization

Epionce Kits

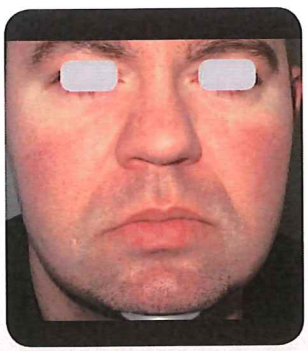




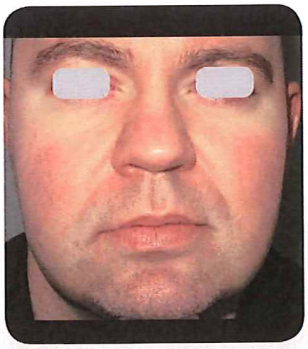




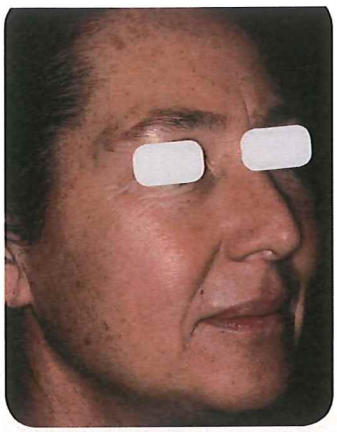
APPLICATION	MaxR, MaxIs	MaxG	MaxYs	1540	2940	1064+
Hair Removal–All Skin Types	•					
Hair Removal, small areas, All Skin Types	•					•
Hair Removal, Including Lighter, Finer Hair Skin Type I-IV			•			
Leg Veins						•
Photofacials (Pigmented and Vascular Lesions)		•				
Pigmented Lesions		•	•		•	
Vascular Lesions		•				•
Fractional Non-Ablative Skin Resurfacing				•		
Striae				•		
Acne Scars and Surgical Scars				•		
Fractional Ablative Skin Resurfacing					•	
Wrinkles, Fine Lines					•	



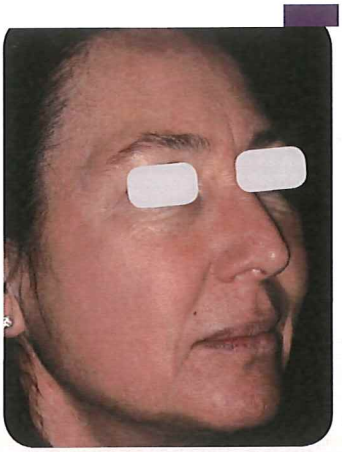
Baseline



After treatment



Baseline



3 months after 3 treatments,

Thank You!!!
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