

Young and Bothered- Ocular Surface Dryness for a New Generation

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you for being with us this year!**

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Cynosure/ Luftronic- Speaker/ Consultant
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Tarsus- Consultant
Tear Science- Consultant All relevant relationships have been mitigated

Lisa Hornick, OD, MBA, FAAO

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Tarsus- Speaker/ Consultant
Dompe- Speaker/ Consultant
Scope- Speaker/Consultant
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CSI Dry Eye Software- Consultant

Ocular Surface Dryness Review

A multifactorial mismatch in the amount and quality of tears provided vs those needed.

DEWS III updated definition:

"Dry eye is a multifactorial, symptomatic disease characterized by a loss of homeostasis of the tear film and/or ocular surface, in which tear film instability and hyperosmolarity, ocular surface inflammation and damage, and neurosensory abnormalities are etiological factors."

Classic Risk Factors for Dry Eye

Age: more common after age of 50; risk increases each decade after 40 years

Sex: more prevalent in women than in men

Hormonal Changes: estrogen, progesterone, and even testosterone, and HRT

Systemic Disease: Autoimmune, Thyroid Disease/ Diabetes

Contact Lens Wear: CL can disrupt the tear film

Medications: Antihistamines, antidepressants, diuretics

Gen Z "Zoomers"-

Characteristics/ statistics that set this generation apart from others (ie millennial, Gen X, Boomers, Gen Alpha)

- Digital natives
- Spending habits- Zoomers prioritize self-care and this can help with patient communication
- Often get medical information from social media and influencers
- Communication style ex. Often prefer texting vs. phone calls and in-person

Gen Z "Zoomers" - Differences in signs and symptoms from other generations

OSD Signs:

Absence of:

less telangiectasia, thickened lid margin

Presence of:

decreased secretions, corneal staining, low TBUT/ NIKBUT, protective ptosis

Gen Z's dry eye symptoms

- Contact lens and cosmetic intolerance
- Eye fatigue end of day
- Fluctuations in vision

Gen Z "Zoomers" - Dry Eye Screening and Testing for Zoomers

Surface staining (don't forget the conjunctiva), gland expression, Korb-Blackie Lid Seal test

Quick Example Case: The Case of the Exposed 15 year-old Sisters
CC of all 3 Triplets: AM dryness and redness that improves over the day

External Exam:

Corneal/conjunctival staining at the lid seal- lower 1/3 of the ocular surface.

Korb-Blackie lid seal test:

3mm incomplete closure with light escape on ALL 3 Triplets!!

Treatment:

Night gel alternated with taping of eyelids nightly

Outcome:

Resolution of AM dryness and surface staining

Inadequate Lid Seal



Causes

- Floppy Eyelid (comorbid with obesity and sleep apnea)
- Post- Blepharoplasty
- Anatomical variant (most common cause seen in the younger population)

The Korb-Black Lid Seal Test

Tools: transilluminator/penlight, dark room

Shine the light on the closed eyelid and examining the lid margin for escaping light

Treatments

- Sleep Tite Sleep Rite
- Gels/Ointments
- Sleep Masks
- Saran Wrap



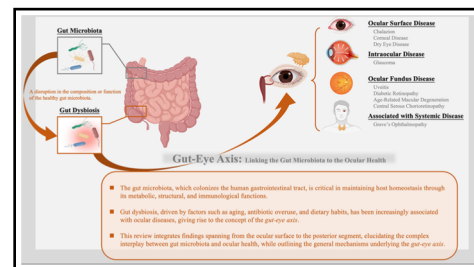
Gut Feelings- The Role of the Gut Microbiome

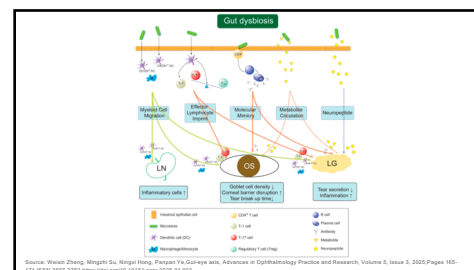
Microbiome: "the collection of all microorganisms (including bacteria, fungi, viruses, and other microbes) that live in a particular environment, such as the human body, or a specific area like the gut"

Specific key microorganisms: the dominant bacteria: "Firmicutes and Bacteroidetes, which make up 90% of the gut microbiota. Other important components are the Actinobacteria, Proteobacteria, Fusobacteria, and Verrucomicrobia phyla. Within these phyla, various genera like Lactobacillus, Bifidobacterium, and Bacteroides are prominent. The gut microbiome also includes fungi like Candida, Saccharomyces, and Malassezia."

Key roles of the gut microbiome on the human host:

- Nutrient metabolism
- Removal of toxic compounds
- Defense against pathogens
- Strengthening of the intestinal barrier
- Stimulation and modulation of the immune system.





Gut- Eye Axis Disease States

These conditions have a positive association with Dry Eye:

Food Allergies- Overall Food Allergy (1.4x greater risk), Lactose/Dairy (1.6x greater risk), Celiac, Any Alcohol that is fermented/digested can trigger allergic response (with histamines) --> concurrent allergic conjunctivitis / chronic inflammation

Food Sensitivities- takes longer to manifest - Gluten, Sugar, Dairy, Alcohol --> allergy or inflammation

Acid Reflux- pepsin-related ocular surface damage; reflux was commonly associated with DED, as about 45% of DED patients had suspected reflux!

IBS (Irritable Bowel Syndrome)- significantly lower tear testing amounts (Schirmer's test and IBUT (P=0.002 and P=0.001 respectively than controls, and increased inflammatory T-cells. Exact cause is not known, but thought to be triggered by food sensitivity/ allergies, nervous system disorders, stress, infections, hormonal changes.

Gut- Eye Axis Disease States

These conditions have a positive association with Dry Eye:

SIBO (Small Intestine Bacterial Overgrowth)- linked to pathogenesis in rosacea, and inflammatory T-cell (Treg and TH17 cells). Secondary to conditions that cause lack of movement: diabetes, gastric bypass surgery, stomach ulcers, too many antibiotics/ narcotics. Requires specific antibiotic treatments.

Crohn's Disease/Gut Autoimmune- associated with altered gut microome, especially Sjogren's Disease

Eye Signs of Food Allergy and Gut Dysbiosis

Allergies

- Inflammatory dark circles around the eyes with brownish/red undertone
- Eye/lid eczema- flaky red skin, scaliness
- Conjunctival redness and papillary response
- Itching
- Corneal SPK

Intolerance/ Gut Dysbiosis

- Recurrent lid lesions (chalazia)- Family XIII AD3011 group and Catenibacterium genera
- Concurrent blepharitis - Demodex (mites) or Staphylococcus (bacterial)
- Dry eye- Corneal SPK, burning, redness, watery eyes

Gut Questions

Are there any foods that don't make you feel well?

Dairy and Gluten in particular. Also sugar and spice.
 Fatigue, bloating, heartburn, burping, itch/hives, nausea/ vomiting?
 Timeline- is it hours (Allergy) or next day or chronic (sensitivity)
 Chronic Constipation? Diarrhea?

How does alcohol affect you?

Redness (particularly cheeks/ ears)? Itching? Intense day after?

Gut Checks- Referral Options

Gastroenterology- severe symptoms, interrupting lifestyle

Allergist- hives and itching, nausea/vomiting

Functional Medicine- intolerances, SIBO

Dietician- can be helpful for balancing nutrients and menu ideas. Dietitians, especially RDs and RDNs, have a strong foundation in nutrition science, typically requiring a bachelor's or master's degree from an accredited program, supervised practice hours, and passing a national board exam. Nutritionists can be helpful but have looser training/ regulation.

Eye Doctor Gut Support

Allergies

Topical Antihistamine/ Mast Stabilizer- for allergic conjunctivitis
 Careful with topical steroids - kids are more likely to be steroid responders
 Topical tacrolimus for eczema

Dysbiosis

Lids lesion/ Blepharitis treatment: lid hygiene, Xidemy drops, light-based therapies (PLLLL)
 Probiotic Supplement (kids and adults): Good bacteria that we can replenish supplements
 Streptococcus thermophilus, Lactococcus lactis and Lactobacillus delbrueckii
 Probiotic Foods: Good bacteria that we can replenish through food
 Prebiotic Foods: These are fiber-rich foods that help probiotics flourish by providing a steady, nutrient-rich diet

Dr. Doll #1 tip: IF IT MAKES YOU FEEL BAD, DON'T EAT IT

<p>Probiotics: These are good bacteria that we can ingest through food choices and supplements*. To improve healthy colonization in the digestive tract, probiotics must be taken or eaten regularly. Note: if you have any digestive discomfort and want a probiotic, make sure to choose a probiotic that is clinically proven to improve gut health.</p> <p>Sources of Probiotics</p> <ul style="list-style-type: none"> Fermented vegetables (sauerkraut, kimchi, pickles, sauerbraten) Fermented fruits (fruit leathers, jams, green papayas, pickled jackfruit) Yogurt, kefir, sour cream, buttermilk (plain, no added sugar, with live and active cultures) Kombucha, a fermented beverage Fermented condiments (homemade ketchup, miso, salsa, pickled ginger) Water kefir, coconut milk kefir Homemade coconut milk or cashew yogurt Banana Nuts, miso, tempeh, and tamari sauce <p>Optimize in Integrative and Functional Medicine</p> <p><small>© 2018 by the American College of Nutrition</small></p>	<p>Prebiotics: These are fiber-rich foods that help probiotics flourish by providing a steady, nutrient-rich diet. Other prebiotics break down prebiotics in the colon; they produce lactic acid, a short chain fatty acid, which feeds digestive cells and protects the digestive tract from harmful bacteria.</p> <p>Sources of Prebiotics</p> <ul style="list-style-type: none"> Asparagus Artichoke Banana Dandelion greens Eggplant Endive, radicchio Garlic, leeks, onions Honey Jerusalem artichokes (sunchoke) Jicama Kale Legumes Whole grains (e.g. oats) Yogurt Resistant starch: cooked and parboiled rice, tiger nuts, cooked and cooled potatoes, cooked and cooled legumes (soaked or sprouted)
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The Case of Spicy Dry Eye

22 y/o WF referred by external provider

Symptoms: dryness, burning, contact lens intolerance, recurrent chalazia

Has tried: Artificial tears > 4x daily, hot compresses, fish oil, topical antibiotics

Medical History Review: Seasonal Allergies, on Birth Control Pill, Acne

Gut Questions: "Spicy food" has been bothering her "lately" - last 6 months and she loves "Mexican food." Has acid reflux and altered gut motility either too fast or slow. Does not eat dairy or drink alcohol often, but does eat cheese with Mexican food as well as having a cocktail or beer. She also took antibiotics repeatedly for recurrent ear infections as a kid.

Case of the Spicy Dry Eye

Exam findings: healing chalazia on RUL with incomplete lid closure when sleeping, Demodex blepharitis, 1+ corneal staining, meibomian gland dysfunction

Eye Treatment: Okra-based lid hygiene nightly, returned for 3 IPL followed by meibomian gland expression with radiofrequency technology, PF gel for sleeping

Gut Support: Recommended Pre/Probiotic diet, pause cheese and alcohol

Referral: Offered Gastro and Functional Medicine (FM) referrals, patient chose functional medicine, as she could self-refer.

Gut Diagnosis from FM: SIBO with Dairy Sensitivity

Gut Treatment: specific antibiotics, eliminate dairy, continue Pre/ Pro-biotics

Spicy Gut- Eye Axis Outcome

1. No recurrence of lid lesions or blepharitis- patient performs okra- based hygiene nightly
2. Resolution of current chalazion/ dry eye symptoms
3. Reduction in facial acne
4. Resolution of gut symptoms as long as she avoids dairy + alcohol
5. Spicy turned out not to be the issue- can eat salsa and hot sauce

Patient quotes:

She disclosed re-trying dairy and it "did not go well."

She "knows cheese won't be part of her life."

She can "live without cheese because avocados are working instead."

Skin Issues- Where Eyecare meets Skincare

- Demodex Blepharitis
- Rosacea
- Recurrent chalazion in different locations
- Skin care products and ingredients
- Acne and Accutane Use

Skin Issues- Demodex Blepharitis

Caused by Demodex mites

Characterized by collarettes on lashes

Causes symptoms of: itching, irritated and red eyes

Can occur in patients of all ages

Can be overlooked on examination if not careful

Treated with Lotilaner 0.25% drops BID x 6 week and lid hygiene



Skin Issues- Rosacea



Subtypes:

Type 1. **Erythematotelangiectatic or Vascular Rosacea:** Areas on the skin with visible blood vessels or telangiectasia.
 Type 2. **Papulopustular or Inflammatory Rosacea:** Along with facial redness, there are often erythematous papules and pustules.
 Type 3. **Phymatous Rosacea:** This subtype most commonly affects the nose. Patients present with tissue hypertrophy manifesting as skin thickening and hyperplasia of sebaceous glands.
 Type 4. **Ocular Rosacea:** Characterized by inflammation of the eyes and eyelids, blepharitis, conjunctival injection, lid margin telangiectasia, chalazion, and hordeolum formation.

Early signs/ symptoms in Zoomers: erythema (redness) of cheeks and nose and lid margins, fluctuations in vision

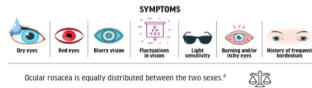
Associated with and often occurs concurrently with Demodex blepharitis which can cause rosacea

Source: <https://medrxiv.org/content/10/20/2020.07.14.20138888v1>

Skin Issues- Rosacea Facts

Eye care providers may be the first ones to diagnose rosacea

OCULAR ROSACEA FAST FACTS



Ocular rosacea is equally distributed between the two sexes.⁴

20%

Of patients with ocular rosacea, 20% have ocular signs before dermatologic findings.¹

90%

Of patients with ocular rosacea, as many as 90% have only minimal skin changes.²

Image courtesy of Modern Dermatology.
 Source: <https://medrxiv.org/content/10/20/2020.07.14.20138888v1>

Skin Issues- Rosacea Treatments

Avoid Triggers

Wear SPF

Oral antibiotics (Doxycycline)

INTENSE PULSED LIGHT (IPL)



Photo posted with patient permission

Skin Issues- Recurrent Chalazia

Recurrent chalazion (in different locations)

Patients of all ages can have recurrent chalazia

Treatment options include:

- Warm Compresses
- Topical and Oral Antibiotics
- IPL -if over 18 years old
- Low Level Light Therapy (LLLT) - any age

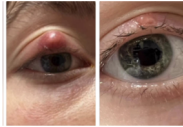


Photo courtesy of Dr. Wile Isaacoff

Skin Issues- Skincare Products and Ingredients

Examples of ingredients that can potentially cause damage to the ocular surface
(Top 10 with the most significant adverse effects according to the TFOS report):

1. ***Benzalkonium chloride (BAK)** : toxic, allergen, irritant
 2. **Chlorphenesin** : toxic, allergen, irritant, immunosuppressant
 3. ***Formaldehyde releasing compounds**: toxic, carcinogen, allergen
 4. **Parabens**: toxic, endocrine disruptor, allergen
 5. **Phenoxyethanol**: toxic, allergen, irritant
 6. **Phthalates**: cytotoxic, endocrine disruptor, neurotoxic, some banned in Europe
 7. ***Prostaglandin analogs**: MGD, periorbitalopathy, hyperemia, eyelid ptosis
 8. ***Retinoids**: toxic to meibomian glands
 9. **Salicylic Acid**: irritant, restricted use in Europe
 10. **Tea Tree Oil**: toxic to meibomian gland epithelial cells, allergen
1. ***Acrylates** (Dr. Hornick's addition): Be aware of allergic potential, can cause contact dermatitis

Source: <https://www.tfof.org/ingredients>

Skin Issues- Acne and Accutane Use

Accutane (Isotretinoin) is a oral medication prescribed for severe acne. It is thought to help acne by decreasing the size of sebaceous glands and sebum production.

Side effects of taking Isotretinoin include evaporative dry eye due to decreased function of the meibomian glands.

- Studies have found that Isotretinoin can
- decrease the size of meibomian glands
 - increase tear osmolarities
 - increase tear evaporation
 - cause lacrimal gland atrophy



Source: https://nyepwki.org/Outer_Membranous_of_Isotretinoin

Nerves and Refractive Surgery

Corneal Nerves send messages through a nerve pathway that tells tear glands to release tears in response to evaporation and irritation. They also cue the blink response.

In classic LASIK, the nerves are cut (blade or laser). In PRK the corneal tissue is chemically/ laser/ removed.



Healthy Refractive Surgery Nerve Healing

Healing Times:

Corneal sensitivity has been studied to return about **6 months** after refractive procedures.

After **PRK**, nerves recover to near preoperative densities by **2 years** and density does not decrease in the third year.

Both subbasal and stromal corneal nerves in LASIK flaps recover slowly and **do not return to preoperative densities by 3 years after LASIK**

Post-Surgery Healing: Blinking and Tear Production

Blink rate of LASIK patients (all the way back to a 2001 study) was **decreased by up to 40%**, and the difference in mean blink rate pre- and postoperatively remained statistically significant at postoperative months 3, 6, and 12. Reduced blinking results in exposure.

Tear production drops - multiple studies have determined with Schirmer and Tear Break-Up times from 3 month to 3 years

More Severe Nerve Impact

Corneal Neuralgia- "Pain without Stain"

Sensation is far worse than the appearance. Patients complain of pain (aching and boring), burning, foreign body sensation and light sensitivity. These manifestations can be debilitating. Depression, fatigue, joint pain and suicidal thoughts can also be present.

A proparacaine challenge test can determine whether pain is coming from local source (corneal) or peripheral source (central nervous system). If proparacaine doesn't relieve symptoms, may need help from pain management specialists.

Neurotrophic Keratitis- "Stain with No Pain"

Sensation is far better than the appearance. Patients complain of reduced/ fluctuation vision. They don't feel SPK or larger corneal defects.

Reduced/ absent corneal sensitivity hallmarks this condition.

Refractive Surgery- Treatment/ Recovery Options

Goals: facilitate calm nerve healing and support ocular surface

J Ophthalmol. 2017 Aug 15; 2017

Biologic Healing Options- help nerves grow

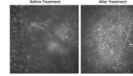
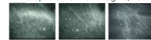
- Amniotic membranes: cryopreserved have evidence of nerve regeneration
- Autologous serum or Platelet Rich Plasma Eye Drops- these are known to improve nerve density in other corneal disease states (Grafts- Host)
- Growth factor/ Oxervate/ Cenegermin- regrows corneal nerves

Anti-inflammatories- calm the inflammatory response, to promote healing

- T-cell/ immunomodulators: cyclosporine, lifitegrast
- Topical Steroids - Intense Pulsed Light/ Low Level Light

Mechanical

- Punctal Plugs- Back tears onto the ocular surface
- PROSE/ Scleral Contact Lens- bathe the eye in moisture



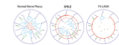
https://ophthologymanagement.com/news/2022

Better Choices for Refractive Surgery

PRK vs LASIK

Melbomian Gland loss and symptoms (OSDI) were significantly lower among the PRK group than in the LASIK group at 3 months post-op in a mid 2025 study

PRK, nerves recover to near preoperative densities by 2 years and density does not decrease in the third year.



SMILE vs LASIK

SMILE refractive surgery seems to cause more vision disturbances than LASIK in the first month post-surgery, but less dry eye symptoms in long-term follow-up.

IMPACT OF ELECTIVE MEDICATIONS & SURFACE INCISIONS ON THE OCULAR SURFACE

- Over-the-counter treatments, including contact lens products, can have side effects
- Elective surgeries as close to the eye can cause dry eye
- If you are considering refractive surgery, ask if you are vulnerable for growth incision, indicate eye surface (SMILE)
- Smaller incision = less nerve damage
- Symptoms of fluctuating vision and blur post-surgery returned to normal after 4 months
- Fewer dry eye symptoms compared to alternate techniques, reported in long-term follow-up

Case of the Regretful New Grad

21 YO WM- External Referral to help with post-operative LASIK Dryness

CC: Burning and irritation worsening end of the day after having LASIK on both eyes 6 months ago. He was gifted LASIK as an early graduation present and was looking forward to computer-based career. Can't function end of the day on screens- fatigue and headache. Concerned he should be better by now, and might not be able to get a job.

Surgical center had recommended artificial tears and punctal plugs. He had also tried hot compresses, fish oil, and NPAT up to 1x/ hour.

Regretful Case Findings

Unremarkable health history. Rare acne as a teen, No gut issues.

External Exam

Mild reduction in corneal sensitivity

1+ diffuse SPK/ PEE across entire cornea and small concentrations at flap interface

Surface punctal plugs present

Mild meibomian gland dysfunction

Regretful to Hopeful Case

Facilitate Healing- we are now out 6 months

1. Cryopreserved Amniotic Membrane 4 days OD and OS
2. Autologous Serum Eye Drops (ASED) 50% 6x daily (Elected by patient over topical immunomodulator as it was actually less compared to his insurance)
3. IPLx 3 with Thermal Pulsation Gland Expression
4. Okra-based lid scrubs at night 2-3x weekly

Hopeful Outcome- 2 year Journey

Topical Therapy: Over one year timeline the patient was able to taper ASED from 6x to 4x to 2x daily and then transition to OTC NPAT for computer protection

Corneal findings: Diffuse PEE/ SPK resolved

Patient able to return to computer work

MGD was stable

Gen Z Lifestyle Factors- Screen Use

Our screen time use continues to increase. Younger people use screens for their schoolwork, regular work and entertainment/socializing.

Our blink rate decreases and we have more incomplete or partial blinks when using digital devices.

Normal blink rate is 15 times per minute, when using a digital device it decreases to 5-7 times per minute.

Decreasing blink rates and more incomplete blinks can cause an increase in the obstruction of the meibum in meibomian glands.

This can further lead to **long-term problems** such as gland atrophy.

Gen Z Lifestyle Factors- Screen Use As a Risk Factor

Daily use of a smart phone was identified as a risk for DED.

This could be influenced by time outside, sedentary lifestyle and impaired sleep.

Studies have shown meibomian gland function and structure changes in children as young as **6 years old**.

MGD was associated with subsequent development of more severe DED.

Menu Healtio Search

July 11, 2024 | 1 min read

Prevalence of DED in children slightly lower than adults, but underdiagnosis 'conceivable'

By Kaiti Zoult
Fact checked by Heather Bole

Key takeaways:

- The prevalence of DED in children ranged from 5.9% to 23.1%, with higher rates reported among girls.
- There is little research on the safety and efficacy of DED treatment options in children.

[Perspective from Kaiti Zoult, MD, MS, FAAD](#)

Source: <https://www.healtio.com/news/topstory/20240711/prevalence-of-ded-in-children-slightly-lower-than-adults-but-underdiagnosis-conceivable>

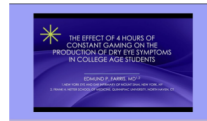
Gen Z Lifestyle Factors- Gaming

MYZE Study Take-aways:

36% of the study participants had normal levels of MMP-9 before gaming and **elevated** levels after.

23/41 participants had an **increase in SPEED score** (average 4.62 points increase)

Frequency of symptoms of eye soreness and irritation increased by **3x**



Poster presented at ASCRS meeting 2024
Source: <https://medrxiv.org/content/early/2024/08/14/2024.08.14.24268888v1>

Gen Z Lifestyle Factors- Gamer Case Study

Ex. Case Study- the 16 y/o chronic gamer

16 y/o white male with cc of red, irritated eyes and vision fluctuation. Has played video games since he was 6 yrs old. Typically plays 3-4 hours on weekdays after school and 8-10 hours on weekends. Admits to playing till 2 am after parents have already gone to sleep.

Exam findings: trace MGD and abnormal TBUT. Structural changes (tortuosity) seen on meibography.

Tx: educated patient on the importance of taking breaks from video games. Gave artificial tears, warm compresses and lid hygiene. Educated patient on the chronic and progressive nature of dry eye disease.

Gen Z Lifestyle Factors- Screen Use Recommendations



Source: <https://contactlensupdate.com/x3/articles/2022/11/ContactLensUpdate.com-7705-Lifestyle-Reports-Patient-Handout.pdf>

Gen Z Lifestyle Factors- Vaping

Tear film disruption: reduced tear break-up time with impact on tear lipids

There isn't good US regulation of what is in vaping liquids:
80 chemicals have been identified in e-liquid
Main Ingredients- Propylene glycol and Glycerin as solvents
Nicotine/THS/Cannabinoids

Other risks:

EVALI (E-cigarette or Vaping Use-Associated Lung Injury)
Explosion injury with unauthorized modifications



Vaping Discussions



Ask specifically about vaping
"smoking" is not "vaping"



Educate to NEVER change/alter/adapt equipment

If associated with dryness, encourage
patient to seek out alternative options
or quitting:

<https://teen.smokefree.gov/quit-vaping/how-to-quit-vaping>



Case of Vaping into Dryness

21 yo/ WM referred by external OD

CC: red, burning, watery eyes that started after Accutane use 1 year prior

History: Cystic Acne with 2 rounds of Accutane in the last year of unknown dosage. Reportedly healthy otherwise.

External Findings: Moderate Meibomian Gland Dysfunction with mild gland loss and severe obstruction

Treatments: IPLx 5 followed by Thermal Pulsation Meibomian Gland Expression, Okra-Based Lid scrubs, artificial tears with computer use

6-week Vaping Into Dryness Follow-up

6 weeks after induction therapy, patient was scheduled for follow-up

Patient reported backside of dry eye symptoms over the weekend prior to our visit

Question: "What did you do differently over the weekend?"

Answer: Gaming + Vaping with friends



Doctor Revelation- I had asked him about smoking, NOT vaping at initial visit!!!

Recommendation- STOP vaping or risk backsliding

Vaping Patient Solution

1 month later patient returned and MGD symptoms had subsided

Patient did NOT quit vaping- found his own solution- wearing friend's gaming glasses kept vapors off of face

RE-ed on EVALI



Gen Z Lifestyle Factors- Cosmetics

TFOS Lifestyle Cosmetic Report

Poor regulation of US Cosmetics

11 substances are banned in the United States for use in cosmetics vs. 1300 substance in the European Union.

The following terms have NO regulation:

Hypoallergenic, Natural, pH-balanced, Clinically-Proven, Doctor Recommended

The following terms, while having definitions have NO proven safety benefits:

Organic, Cruelty-Free

Risky Ingredients

Fragrances = proprietary
The -ol family (Citronellol, Geraniol, Linalool)

Preservatives:
Formaldehydes, BAK, Parabens,
Combo of Ethylhexylglycerin + Phenoxyethanol

Metallic Pigments and Glitters:
Iron oxides, titanium dioxide, copper, aluminum, ultramarine blue, violet, pink, manganese violet, carmine, chrome oxide, iron blue, bismuth oxychloride, and mica

Bulking Agents
Talc and Mica
Talc with Asbestos

Emollients/Bases
Petroleum, Latex, Lanolin, Silicone
Resins

Emulsifier
Stearic acid

Nylon
Used in mascaras to "build lashes"

Gen Z Lifestyle Factors- Cosmetics, Don't forget the Males

Males are also interested in cosmetics - including skincare and makeup

Case: 19 y/o male WM with cc: dry, irritated eyes

Exam findings: make-up and debris on lids and lashes, 1+ MGD and abnormal TBUT, trace papillary reaction to conjunctiva

Tx: Educated patient on importance of removing eye makeup at night with a safe eye makeup remover. Also educated him on the importance of lid hygiene and replacing his eye makeup on a regular basis. Recommended PFATs and Optase eye makeup remover.

Gen Z Lifestyle Factors- Cosmetic Removers

Main types of makeup removers all disrupt the tear film temporarily with different risks

Oil- fewest ingredients, but most temporary blur

Oil-free- full of surfactants that can cause dryness and eczema

Micellar- watch other ingredients

Cleanest Option: Microfiber Cloths
No need for chemical cleaning

Need to be kept clean- watch for detergent ingredients/fragrance, etc.

Combines well with other removers



Case of the Convenient Makeup Remover

10 y/o WF Child competition dancer used the "hotel room" makeup wipes at a travel competition and 2hrs later presented with edema, redness, and itching of face and eyelids.

Wipe included fragrance, surfactants, and harsh preservatives

Treatment: oral/ topical eye drop antihistamines, OTC hydrocortisone on cheeks (avoid eyes), cold compresses

Outcome: significant improvement in 24 hours, with resolution in 48-hours



Gen Z Lifestyle Factors- Lash Craze and Cosmetics

A study by Amador et al.(2015) showed the optimum length for eyelashes to be **1/3 the eye width**

Lashes that are not the correct length (too long) can actually divert airflow, allergens, and debris directly to the ocular surface.

The elongation trend is NOT healthy.

A 2022 Mintel report indicates that **33% of Gen Z women use false eyelashes**, compared to 17% of women overall.

In the US, the top consumer demographic for lash extensions are females aged 18-34 years old, comprising 51% of the industry.

Elongation Methods- Synthetic Lashes



Fake Lashes: Applied by consumer at home w/ glue or magnets/metallic liner

Eyelash Extensions: Applied by a professional esthetician

Ingredients: formaldehyde, latex, metallic (iron) fragments, fragrances

Complications: Allergic contact dermatitis, chalazions/hordeola, blepharo keratoconjunctivitis, lash-fall, and abrasions secondary to application, removal

Elongation Method- Eyelash Growth Serums

Eyelash growth serums (ELGS) can contain ingredients that are potentially detrimental to the ocular surface, including actual or synthetic prostaglandins (PGA).

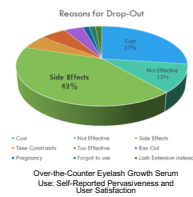
PGA ocular side effects: eye pruritus, conjunctival hyperemia, and skin or iris hyperpigmentation, and even orbital fat displacement

OTC options can contain synthetic PGA with identical side effect to the pharmaceutical option.

Unlike a pharmaceutical, cosmetic companies are not required to list these potential side effects in their packaging.

One of the most common synthetic prostaglandins is "isopropyl cloprostenate"

What do you notice?



Growth Serum Alternatives

Safer ingredients for healthy growth = Polypeptides

Myristoyl Pentapeptide-12/16-17

Myristoyl Octapeptide-1

Copper Tripeptide-1

Read the labels: These PGA-FREE versions can still contain other irritating ingredients, including parabens, formaldehyde derivatives

Think about formulations that do double duty- microbiome control + growth support- there is a version that contains okra solution that helps keep mites and bacteria populations

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IMPACT OF COSMETICS ON THE OCULAR SURFACE



X

Avoid sharing eye makeup!

Sharing products can transfer bacteria and viruses.



Warning

Mascaras have a higher risk of being contaminated from the environment and your eyelashes, which can cause an infection.



Eyelash growth products can cause:

Red eyes

Irritation

Itching

Lash loss

Case of the Lash Addict

19yo Daughter of an existing patient is repeatedly "referred" by her mom to seek help for irritation of eyelids and dry eye symptoms

CC: Dryness and tearing with studying

Health history: ADHD with meds, cystic acne with 1 round of low dose Accutane

External exam: red, inflamed eyelids, mechanical drooping (ptosis) with 4 partial strip lashes attached to each upper eyelid, mild allergic conjunctivitis

Lash Addict in Recovery

Communication/ Psychological Discussion
Photo evidence of inflammation and blepharitis presented
"Don't you want to be special talk"

Offer a Replacement
Okra-based lash serum

Lid Calm-Down
Hypochlorous Acid Spray 2x daily
Low Level Light Therapy - 4 sessions

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Lash Craze- Chemical Soup

Lash Lift/ Perm: goal is curled lashes
Hydrogen peroxide, thioglycolic acid

Lash Tint: goal is dark lashes
Hydrogen peroxide, ammonia



BOTH lift and tint can be done together, usually tint before lift
Complications: Allergic/ toxic keratoconjunctivitis, chemical burn, trauma
Treatment: topical steroids, cryopreserved amniotic membranes

Case of the Bargain Basement Lash Lift

22 y/o AF CC of possible infection from lash lifting kit she found at beauty supply store bargain bin. It was expired by 6 months, but she used it.



External evaluation: 3 + band keratopathy from chemical exposure, inflamed eyelids.

Treatment: topical steroid and antibiotic combo (patient declined amniotic membrane) for 2 weeks.

Outcome: full resolution of keratitis

Swap-out: Polypeptide serum recommended. If she wants to repeat lift, see a professional lash esthetician

Gen Z Lifestyle Factors- Eyelid Tattoos

Tattooed eyeliner does not last forever
Can look like a line or dots between lashes
Black, white, and colored inks contain metallic ingredients, which can be allergy inducing:
Black Ink: Iron oxide, carbon nanoparticles, aluminum silicate
White Ink: Lead carbonate, titanium dioxide, barium



Complications:

Bruising, swelling, infections, scarring, granuloma formation, photo-toxicity, and lamellar keratitis.

Pigment FADE/ SPREAD

A study by Lee et. al also found association with meibomian gland dysfunction (MGD).



Summary and Wrap-Up

Zoom in on Zoomer differences in OSD symptoms and presentation.
They may have more mild signs and greater symptoms. Screen patients for dry eye disease using a questionnaire and meibography imaging (even young patients can have changes). Many are not educated on DED and don't yet know what their symptoms mean.

Communication Enhancers with Gen Z.

Use digital communication tools (ex. Texting vs. phone calls). Use social media platforms to educate- Instagram and TikTok are best.

Educate:

Be sure to educate patients that DED is chronic and progressive. They need to keep their eyes healthy for many years to come! They understand the importance of and are interested in self-care.

Thank you and Questions

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