



SUNCOAST SEMINAR

Presented by the
**Pinellas Optometric
Association**

Course Syllabus

Suncoast Seminar 2025

Schedule of Events

Saturday, April 26, 2025

- 7:45 am – 8:15 am **Registration** - Exhibit Hall - Continental Breakfast
breakfast sponsored by Johnson & Johnson Vision
- 8:15 am – 9:55 am **Cataract Surgery Pre, Peri, and Post Op: Putting the Patient First (TQ) (COPE pending)**
Pit Gills, M.D. and Andreas Zacharopoulos, O.D.
- 9:55 am – 10:40 am **Break** - Exhibit Hall open
sponsored by Eye Institute of West Florida
- 10:40 am – 12:20 pm **Fuchs Corneal Dystrophy, Keratoconus, and Other Ectasias (TQ) (97310-TD)**
Erin Greenberg, M.D.
- 12:20 pm – 1:10 pm **Lunch** (included in registration) - Exhibit Hall Open
sponsored by St. Luke's Cataract & Laser Institute
- 1:10 pm – 1:20 pm **Lighthouse of Pinellas Update**
- 1:20 pm – 1:30 pm **F.O.A. Update**
- 1:30 pm – 3:10 pm **Our Top Topical Meds (TQ) (96194-PH)**
Joseph Pizzimenti, O.D.
- 3:10 pm – 3:30 pm **Break**
sponsored by Sight360
- 3:30 pm – 5:10 pm **Interprofessional Care of Retina Patients Using Multimodal Imaging (TQ) (96193-GO)**
Joseph Pizzimenti, O.D.

Sunday, April 27, 2025

- 7:30 am – 8:00 am **Registration** - Continental Breakfast
breakfast sponsored by Updegraff Laser Vision
- 8:00 am – 9:40 am **Emerging Trends in AMD (TQ) (96192-TD)**
Joseph Pizzimenti, O.D.
- 9:40 am – 10:00 am **Break**
sponsored by Pinellas Optometric Association
- 10:00am – 11:40 am **Prevention of Medical Errors (94908-EJ)**
Joe Sowka, O.D.
- 11:40 am – 12:00 pm **Lunch** – included in registration
sponsored by Newsom Eye
- 12:00 pm – 1:40 pm **Florida Jurisprudence (94437-EJ)**
Joe Sowka, O.D.

Cataract Surgery Pre, Peri, and Post Op: Putting the Patient First

Suncoast Seminar
Pit Gills, MD & Andreas Zacharopoulos, OD

Pit Gills, MD
Andreas Zacharopoulos, OD, FAAO



Putting the Patient First

- Attention to detail at every step
- From first contact to post-op recovery
- Focus on safety, customization, and continuity

The Journey Begins

- First Contact: OD Referral
- Seamless hand off from referring Optometrist
- Gathering critical patient history
- Foundation for trust and care

Referrals Made Easy



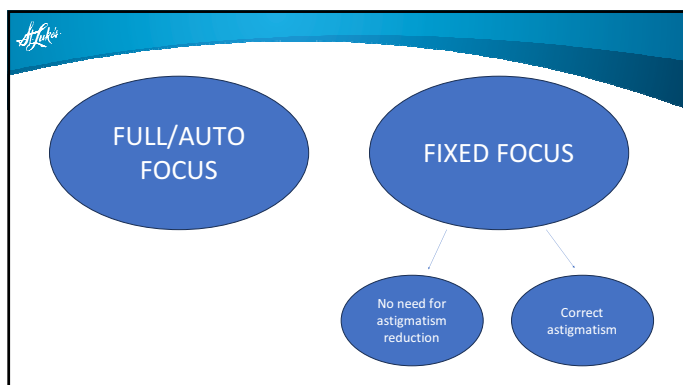
Direct line to Care Coordination for our Referral Partners (727)-943-3338

Comprehensive Cataract Evaluation

- Pre-evaluation video texted to patients – explaining what to expect on the day of the day of their cataract evaluation.
- Biometry: ARGOS for precision
- Corneal topography: All patients, multiple measurements to ensure consistency
- Pentacam: Prior refractive surgery patients
- Macular OCT: All patients

IOL Selection: Beyond the Numbers

- Review symptoms and patient goals
- Detailed surgical discussion, especially for previous refractive surgery patients
- Truly hearing the patient's needs
- Simplified decision tree for IOL selection



Modifications for Complex Cases

- RK: HCL over refraction
- Fuchs Corneal Dystrophy
- Cogan's/Salzmnn Nodules: Keratectomy first
- Pterygium: Consider removal prior
- Diabetics & ERM considerations

The Surgical Experience

- Pre-surgery video texted to patients – explaining what to expect on the day of surgery.
- Pre-medical questionnaire & clearance screening
- H&P prior to the day of surgery or on surgery day
- Pre-op: Chaplain support
- OR: CRNA, UV lighting, hearing headphones, language line for translation services

Immediate Post-op Assessment

- Same-Day Post-Op Check
- Evaluation IOP (high/low)
- Toric IOL axis verification
- Post-op Drop schedule given
- Ensuring a strong start to recovery – include the patient and their family/friend in the post op discussion.

Optimizing Post-op Care

- Compounded Drops: Pre-Moxi-Brom, convenience and compliance
- High-Dose Schedule: Generic vs. brand comparison
- Simplifying recovery for patients

From Surgery to Recovery

- Pit Gills, MD: Pre-and Peri-Op Focus
- Andreas Zacharopoulos, OD: Post-op Management
- Continuity for patient success

Cataract Surgery Pre, Peri, and Post Op: Putting the Patient First Part 2: Post Op Care

Pit Gills, MD
Andreas Zacharopoulos, OD, FAAO



Financial Disclosures

- None

Introduction

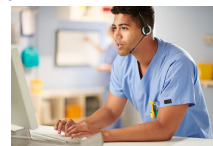
- I see patients full time at the St. Petersburg location.
- I practice full medical optometry
 - Glaucoma workups, AMD, diabetic retinopathy, dry eye, walk-ins etc.
- Co-manage complex cases
 - Cornea with Dr. Brandon Rodriguez, MD
 - Retina with Dr. Alphonso Ponce, MD
 - Others with Dr. Warren Scherer, MD on Thursdays



Introduction

- But at the end of the day, at least 1/4th of my exams are Post Ops
- I'm also **On-Call** every ~2 months for a full week
 - Important for cataract surgery; we want to be there for our patients as they recover
 - If they call with a mild ocular issue, we can provide reassurance & guidance
 - If they call with a serious complication, we will address

Fortunately, triaging is manageable
because our surgeons are amazing!



Main Objective of this Lecture

- To discuss how we manage patients post operatively
- If you as an OD do **not** co-manage: we will co-manage, then we will send back to you
- If you as an OD do **co-manage**: we will review some clinical pearls for managing post op complications as well as triaging



AMERICAN ACADEMY
OF OPHTHALMOLOGY

Protecting Sight. Empowering Lives.™

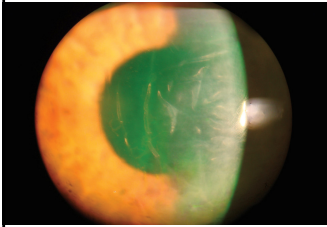
Cataract in the
Adult Eye Preferred
Practice Pattern®



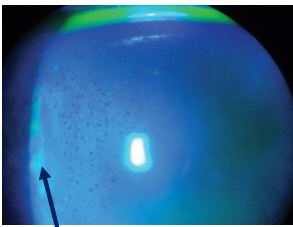
Same Day Post Op Complications

- Corneal Edema
- Corneal Abrasion
- IOP Spikes
- Less frequent:
 - Hyphema
 - Toric IOL Rotation
 - Retained lens fragment

Corneal Edema



Descemet's Folds

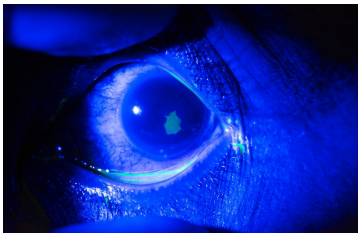


Microcystic Edema
(Edema should typically be coming from the wound)

<https://www.reviewofoptometry.com/article/the-cornea-in-crisis>

Corneal Abrasions

- Peri/Post-Op Dryness
- Post-Op Rubbing
- Surgical Trauma
 - Speculum/phacoemulsification



<https://www.wheatoneye.com/eye-conditions/cornea-external-disease/corneal-abrasions/>

IOP Spikes!

- "Elevated pressure is the most frequent postoperative complication **demanding treatment** following phacoemulsification."
- "As many as 18% to 45% of patients may experience an IOP greater than 28 mm Hg following phacoemulsification, but **most pressures will return to normal by 24 hours postoperatively.**"
- "In most patients, postoperative increases in IOP are **transient and benign.**"

Gokhale, P., MD, & Patterson, E., MD. (2007, June). *Elevated IOP After Cataract Surgery*. Glaucoma Today. https://glaucomatoday.com/articles/2007-may-june/0507_07.html

Treating IOP Spikes

- Most are mild and transient, however:
 - If <25mmHg = No treatment
 - But call us with any symptoms of pain!
 - If >25mmHg = IOP lowering drops and recheck in 30mins
 - If lower than 25, RTC 1 week for post op
 - If >29mmHg = IOP lowering drops, Diamox, and if necessary: **"burp the wound"**
 - Rx IOP lowering drops and RTC the next morning
- Protocol can vary if the patient also has glaucoma

Why does the IOP Spike?

- Retained viscoelastic
- Trabeculitis
- Retained lens fragment

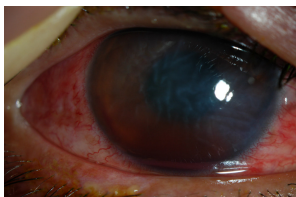
Peak Incidence of IOP: 4-12 hours after surgery

SUMMARY: Same Day Post Op Complications

- Corneal Edema
- Corneal Abrasion
- IOP Spikes
- Less frequent:
 - Hyphema
 - Toric IOL Rotation
 - Retained lens fragment

Hyphema

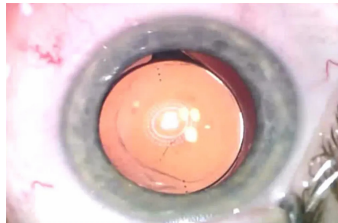
- Iris trauma during surgery/MIGS
- Blood thinners
- Treatment:
 - Pred QID
 - Brimonidine BID
 - Incline head position when sleeping



<https://eyewiki.org/hyphema>

Toric IOL Rotation

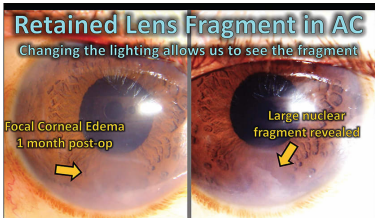
- If rotated on same Day or 1st few days,
 - Capsule may not have contracted enough to hold IOL
- If rotated after a few weeks,
 - Likely from trauma
- If small rotation, patient may not notice
 - Ex. <15 degrees
- Large rotations may require re-positioning by the surgeon



<https://www.eyeworld.org/2023/toric-troubles-postop-rotation/>

Retained Lens Fragment in AC

Changing the lighting allows us to see the fragment



- Rare but can happen
- Easily spotted at the slit lamp
 - Unless hidden behind corneal edema
- Send for AC wash out

<https://ophthalmologymanagement.com/issues/2019/may/removing-and-preventing-retained-lens-fragments/>



Same Day Post Op Complete!

RTC 1 week for Post Op w/ Dilation!

Steps in the "90+ Day Post Op Care"

Same Day Post Ops

→ **Triaging**

One Week Post Ops

Triaging

One Month Post Ops

Triaging

Triaging: The next 2-3 days after Surgery

The most common phone calls tend to have the following symptoms:

- Blurry Vision
- Discomfort/Redness
- Photopsia
- PAIN!

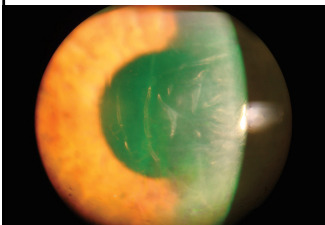
Let's see how patients would describe each of these!

Blurry Vision

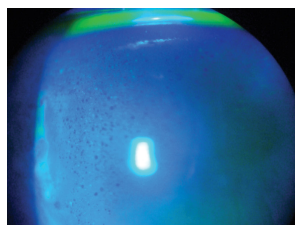
"Vision was clear right after surgery, but 6 hours later now its BLURRY!"

- If no pain (or just mild irritation), usually this is corneal edema
- Patient can wait ~2 days and watch the vision improve
 - If no improvement, we can assess
- Consider Muro drops
- Likely not concerning unless there is SHARP PAIN

Corneal Edema can persist for over a week!



Descemet's Folds



Microcystic Edema

When you see this in your chair, make sure the IOP isn't high!

Discomfort/Redness

"My eye is dry/itchy"

"My eye has had some mild dull pain since the surgery"

"My eye is red" or "There is a red spot in my eye since the surgery"



<https://www.optometrists.org/general-practice-optometry/guide-to-eye-health/eye-and-eyelid-problems/subconjunctival-haemorrhage/>

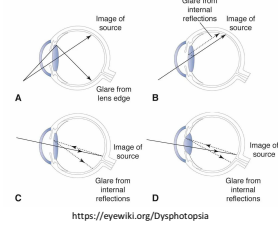
- Usually dryness/inflammation, to be expected
 - Remember, surgery is a form of "precise trauma".
- Redness is either hyperemia or sub-conj heme
- Can recommend PF Artificial tears multiple times; CALL US if pain worsens

Photopsia

"I see lights in the edge of my vision!!!"

How concerned are we here?

Pseudophakic Dysphotopsia



- Strobe-like/mild lights, especially in an arc, is often noted when a bright light is positioned oblique to a patient's gaze
 - We reassure, can examine at the 1-week post op
- Of course, if these are described as "lightning strikes", similar to "flashes of light", we examine to rule out a retinal tear

<https://eyewiki.org/Dysphotopsia>

Boach, L. "Shedding Light on Pseudophakic Dysphotopsia". Dec 1 2014 <https://www.aao.org/eyenet/article/shedding-light-on-pseudophakic-dysphotopsia>


PAIN!!!

"My eye has lots of SHARP Pain, it's unbearable!"

"My eye started hurting VERY bad ~3 days after surgery"

- In these cases, we **always** examine, then treat accordingly:
 - Corneal Abrasion → ointment and/or BSCL, see back in 2 days
 - IOP Spike → Burp wound + Rx IOP lowering drops, see back tomorrow
 - Both of these conditions are most likely to occur on the same day as the surgery
- TASS/Endophthalmitis (will get to this in a few slides)

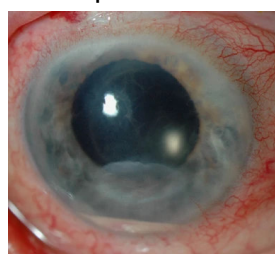
"Burping the Wound"



- When IOP at or > 35mmHg
- "Modified" Paracentesis
 - Wound already made by the surgeon
 - I'm just applying mild pressure to wound
- Either blunt instrument on the adjacent sclera, or by needle on the wound itself
 - Instill Proparacaine, antibiotic drop, burp the wound, antibiotic drop
 - STILL need to prescribe IOP lowering drops and see the next day!**

<https://www.reviewofoptometry.com/article/a-hiccup-or-a-burp>

TASS or Endophthalmitis?



<https://www.nature.com/articles/6702923>

Table 1

Clinical characteristics of endophthalmitis and toxic anterior segment syndrome (TASS)

Clinical characteristic	TASS	Endophthalmitis
Timing	12–24 hours (early)	3–7 days (can have slight delay)
Pain	None to mild discomfort	Moderate to severe
Visual acuity	Mild decrease	Moderate to severe decrease
Intraocular pressure	Normal to increased	Normal
Corneal edema	Severe (limbus-to-limbus)	Variable extent
Fibrin	Mild or absent	Typically present
Vitreous cell	Mild or absent	Typically present
Hypopyon	Minimal or absent	Often present

Adapted from Hernandez-Bugantes et al. [1].

Sengillo et. al. Postoperative Endophthalmitis and Toxic Anterior Segment Syndrome Prophylaxis: 2020 Update. Ann Transl Med. 2020

Endophthalmitis

- 0.1% = very rare
- 70% from "gram positive coagulase-negative Staphylococcus"
- Prevention as per the AAO*
 - "Two pharmacologic interventions have been shown to reduce the rate of postoperative endophthalmitis conclusively in clinical trials. They include **treating the eyelids and conjunctival cul de sac with povidone iodine** immediately before surgery and **injecting cefuroxime into the anterior chamber** at the conclusion of surgery."
 - Moxifloxacin is currently the most common intracameral prophylactic agent in use in the United States, whereas cefuroxime is preferred in European countries. There is no evidence to date to suggest the superiority of either agent

**Cataract in the Adult Eye Preferred Practice Pattern"

Treatment?





Off to Retina **ASAP** for IV antibiotics

Steps in the "90+ Day Post Op Care"

Same Day Post Ops

Triaging

→ **One Week Post Ops**

Triaging

One Month Post Ops

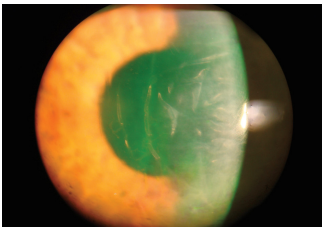
Triaging

One Week Post Op Complications

- Persistent corneal edema (Descemet's Folds)
- Other less frequent: IOP spike, Toric IOL Rotation, iritis from noncompliance, retained lens fragment
- Endophthalmitis
 - VERY RARE at St Luke's

Persistent Corneal Edema

- Usually with severe/hypermature cataracts, or with Fuch's
- If VA 20/40 or better and patient is unbothered, add Muro but keep schedule
- If VA 20/50 or worse or if patient nervous, we'll often postpone surgery
 - Add Muro, see back in 1 week
 - VA will improve; now patient has less anxiety having the 2nd eye done



SUMMARY: One Week Post Op Complications

- Persistent corneal edema (Descemet's Folds)
- Other less frequent: IOP spike, Toric IOL Rotation, iritis from noncompliance, retained lens fragment
- Endophthalmitis
 - VERY RARE

1 Week Post Op Complete!
Patient is Ready to Have the 2nd Eye Operated on!
(Or if 2nd eye not ready for surgery, then RTC 1 month Final Post Op)

Before they Proceed with the 2nd Eye...

- Patients are warned that they may PERCEIVE that the 2nd eye is reacting “worse” to cataract surgery
- **“Second Eye Syndrome”**
 - Reduced anxiety/more familiarity with the surgery = increased recall of the experience
 - Comparing discomfort of 2nd eye with already healing 1st eye
- Conclusion: “Oh no! The 2nd eye is responding worse, I think something is wrong!”
- If not warned, they may call with these concerns

Steps in the “90+ Day Post Op Care”

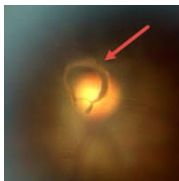
Same Day Post Ops
Triaging
One Week Post Ops
→ **Triaging**
One Month Post Ops
Triaging

Triaging: Over One Week After Surgery

- Not as likely to get many phone calls since post op inflammation is dramatically reducing; VA should have improved at and after 1 week
- If they call, it’s usually one of 2 things:
 - Flashes/floaters
 - Sudden blurry vision

Weeks After: Flashes/Floaters

“I’m seeing flashes/floaters!”



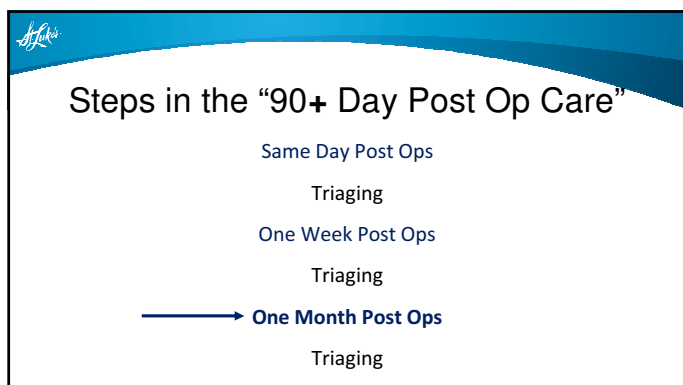
<https://www.eyecenters.com/retina-and-vitreous-louisville/posterior-vitreous-detachment/>

- We know that any surgery will accelerate the incidence of a PVD
- Schedule for a dilated exam within 1-2 days
 - Or see ASAP if “curtain over vision”, or prior history of a tear/RD

Weeks After: Blurry Vision

“It has been 2-3 weeks since my surgery, but suddenly my vision has suddenly gotten worse!”

- Unusual, needs to be addressed
 - Could be many different diagnoses...but likely not endophthalmitis, so can probably be seen in clinic the next day
- As always, any phone call with sudden **severe** blurry vision or pain needs to be seen urgently regardless of when the surgery was done
- Toric IOL Rotation – unlikely after the 1st week unless trauma
 - If so, IOL can be rotated in the Operating Room easily.



One Month Post Op Complications

- Early PC Haze
- Rebound Iritis
- Cystoid Macular Edema

- Less frequent: rotated IOL, retained lens fragment

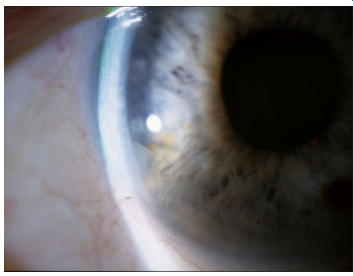
Rebound Iritis

- “Light Sensitivity” (*worse than just “glare”*)
- Rebound from patient stopping their drops early
- Rebound from taper needing to be longer
- Non-20/20 patients may also have CME

- PEARL: Pred QID or Lotemax TID until NO MORE CELLS, then taper slowly
 - Ex. if no cells, taper by 1 drop every 5-7 days
 - Do NOT taper if it has improved to “trace cells”. They probably will rebound again



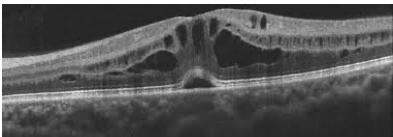
<https://www.opthalmologyexpertservices.com/blog/2013/anterior-uveitis>



If your patient has **rebound iritis**, regardless if 1 week or 1+ months, always make sure it's not because of a hidden lens fragment!

Cystoid Macular Edema


- Any 1 month post op that is not 20/20 should get a Mac OCT
 - Also consider on patients with ERMs or Diabetic Retinopathy
 - Ex. I've had patients with 20/25 and 1+ PCO, but the Mac OCT shows edema!
- Treatment:
 - Steroids
 - NSAIDS



<https://www.eyecenters.com/retina-and-vitreous-louisville/cystoid-macular-edema/>

Clinical Pearl for CME

- Sometimes Generic Pred doesn't penetrate as well as Pred Forte
 - But Pred Forte may be expensive
 - I'll often switch to generic Durezol QID + NSAID and that seems to be more effective!
 - Can find a GoodRx coupon for difluprednate for \$45-55 if not covered



<https://www.goodrx.com/durezol/what-is>

Steps in the “90+ Day Post Op Care”

Same Day Post Ops

Triaging

One Week Post Ops

Triaging

One Month Post Ops

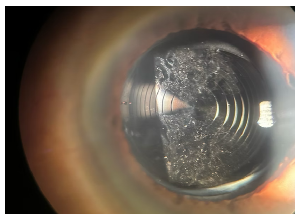
→ Triaging

Triaging: After the Final Post Op

- Even more unlikely, since there should not be major complications at this point
- Again, if they call, it will probably be:
 - Flashes/Floaters
 - Blurry Vision (sudden or gradual)

The Classic Blur After the 90 Day Post Op Period

“My vision was great after cataract surgery, but now it’s 3 months later and it’s gotten bad again!”



<https://www.cataracthelp.com/pc>

The Expected Secondary Cataract!

- “PC Haze”
- Stats may vary in the literature, tends to be 10-50% within 5 years*
- At the 1 month post op, the patient is warned on the possibility of recurrence of their blurry vision or glare, and to not panic
 - When they inevitably have those symptoms, they can call and we can confirm that they need a YAG Capsulotomy

*Eballé AO et al. Secondary cataract: an epidemiologic and clinical survey at the Yaounde Gynaeco-obstetric and Paediatric Hospital. Clin Ophthalmol. 2011;5:847-51. Epub 2011 Jun 22.

YAG Post Op Complications

- Most common: Floaters for a few days after surgery
 - More if a PVD is elicited
- Retinal tears – extremely uncommon but we dilate every YAG post op
- Iritis/Macular Edema – also uncommon, however:
 - if VA not 20/20 and/or concurrent ERM/DR, we will do a Mac OCT
- One final complication that we haven’t reviewed yet:

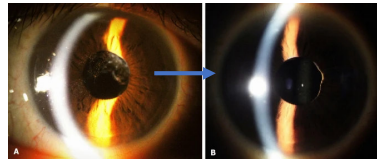
New Patient: Surprising Diagnosis

- Had cataract surgery somewhere else, here for annual DFE
- “Vision has gotten slightly blurrier in the right eye since last year”
 - VA OD 20/50, BCVA 20/30
 - VA OS 20/20
- The usual suspects:
 - PC haze
 - Dryness/corneal issue
 - An underlying retinal issue
- But for this patient...



Vitreous Prolapse!

- Many causes, but likely from rupture of the posterior capsule
 - During surgery or YAG; or from weak zonules over time
- Treatment
 - If BCVA is good and no other complications (**high IOP**, CME etc), monitor closely
 - Otherwise, send for vitrectomy:



<https://www.nature.com/articles/s41598-021-95527-0>

The End

Any Questions?

Thanks for Listening!

References

- AAO Handout "Cataract in the Adult Eye Preferred Practice Pattern", 2022
- Gokhale, P., MD, & Patterson, E., MD. (2007, June). *Elevated IOP After Cataract Surgery*. Glaucoma Today. https://glaucomatoday.com/articles/2007-may-june/0507_07.html
- Sengillo et. al. Postoperative Endophthalmitis and Toxic Anterior Segment Syndrome Prophylaxis: 2020 Update. Ann Transl Med. 2020
- Eballé AO et al. Secondary cataract: an epidemiologic and clinical survey at the Yaounde Gynaeco-obstetric and Paediatric Hospital. Clin Ophthalmol. 2011;5:847-51. Epub 2011 Jun 22.
- Roach, L. "Shedding Light on Pseudophakic Dysphotopsia", Dec 1 2014 <https://www.aao.org/eyenet/article/shedding-light-on-pseudophakic-dysphotopsia>

Update on Selected Cornea Topics

Suncoast Seminar April 2025
Erin Greenberg, MD

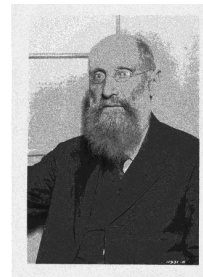


Fuchs' Corneal Dystrophy

I have no Financial Disclosures.

Fuchs' Dystrophy Background

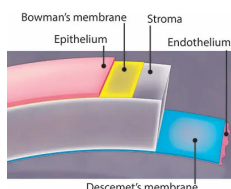
- First described by Ernst Fuchs in 1910 (before the invention of the slit lamp!)
- In 1920's, the disease was understood to primarily affect the endothelium
- Vogt described corneal guttata as "drop like endothelial excrescences"



PAC - Fuchs' corneal dystrophy <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4099772/>
Wikipedia - Fuchs' dystrophy https://en.wikipedia.org/wiki/Fuchs%27_dystrophy

Non-Medical Illustration: Endothelial Excrescences (Fuchs' Dystrophy) (Image ID: 554188417)

Fuchs' Dystrophy Background



- **Corneal Dystrophies** are a group of rare genetic eye disorders in which abnormal material builds up in the cornea
 - Typically bilateral
 - Hereditary
 - Progress slowly (usually)
 - Can affect any layer of the cornea
- **Fuchs' Corneal Dystrophy (FCD)**: Progressive, bilateral corneal endothelial dystrophy in which the endothelial cells slowly die off causing corneal edema and decreased vision

FECD-Epidemiology

- Progressive, bilateral endothelial dystrophy
- Affects about 4% of the US population over 40
- F>M predilection
- Hereditary (autosomal dominant) or sporadic
- Leading cause of corneal transplantation

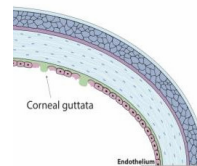
allMedicine - Fuchs Endothelial Dystrophy Background <https://www.allmedicine.com/publication/1392841>
medscape

Early and Late Onset Fuchs' Dystrophy

	Early Onset	Late Onset
Symptom Onset	Before age 50	After age 50
Initial presentation	Early as 20s and 30s	5th-7th decade of life
Genetics	COL8A2, more likely familial	TCF4, sporadic cases more commonly late onset
Clinical Course	More aggressive, rapid progression	Slower, more gradual progression

FECD- Pathophysiology

- Endothelial cell dysfunction
- Guttata formation
- Descemet's membrane thickening
- Endothelial cell loss
- Corneal Edema
- Oxidative Stress



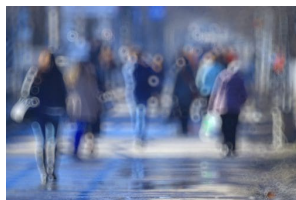
Diagnosis and Management of Pseudophakia: A Scientific Review. Scientific Figure on ResearchGate. Available from: <https://www.researchgate.net/publication/330442465> [Accessed 27 Jul 2025].

- Mutation in TCF4 gene and COL8A2 (collagen type VIII), among others

Fuchs' Endothelial Dystrophy Background - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5727222/>

FECD Diagnosis- History

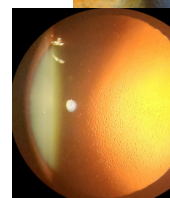
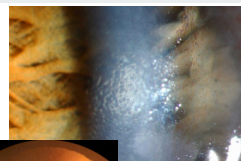
- Family History
- Early Symptoms
 - Morning blurred vision
 - Fluctuating vision
 - Glare and halos around lights
- Late Symptoms
 - Persistent blurry vision
 - Gritty feeling or FBS
 - Photophobia
 - Pain from bullae
 - Decreased contrast sensitivity



<https://www.mvlsocenter.com/conditions/fuchs-dystrophy/>

FECD Diagnosis- Clinical Signs

- Slit Lamp Findings
 - Central Guttata
 - Stromal Edema
 - Microcystic Edema
 - Bullae
 - Subepithelial Scarring, fibrosis
 - Late stage NV



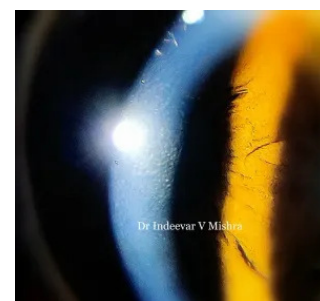
<https://imgup.com/ndfwe-efchsfuchs-endothelial-corneal-dystrophy-basem-mlcd-kr-ndf/>

© 2025 American Academy of Ophthalmology

FECD- Natural Progression and Staging

- Stage 1
 - Central corneal guttae
 - Usually asymptomatic
 - Some do not progress past Stage 1
- Stage 2
 - Endothelial decompensation, stromal edema
 - Peripheral guttae, MCE
 - Reduced vision
- Stage 3
 - Bullous keratopathy, erosions, fingerprint lines
 - Worsened visual acuity
- Stage 4
 - End-stage disease
 - Scarring, NV

FECD - Stage 1



Dr. Indeevar V Mishra

© 2025 American Academy of Ophthalmology

FECD - Stage 2



© 2025 American Academy of Ophthalmology

FECD - Stage 3



© David Holdmann, MD

FECD - Stage 4



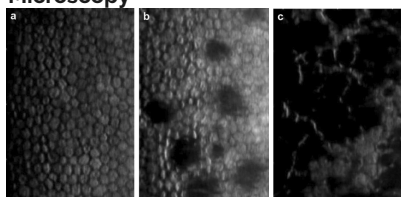
© 2025 American Academy of Ophthalmology

Diagnostic Equipment

- Specular Microscopy
- Confocal Microscopy
- Pachymetry
- AS-OCT



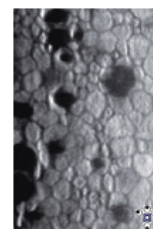
Specular Microscopy



Go, Y. I. X., Lin, W. Y. S., Li, Y. C. et al. Deep learning for detection of fuchs endothelial dystrophy from widefield specular microscopy imaging: A pilot study. Eye and Vision, 11 (2019). <https://doi.org/10.1186/s13047-021-00478-7>

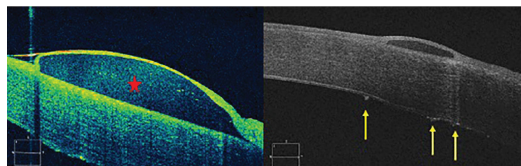
Endothelial Cell Counts

- Number of endothelial cells per square millimeter of corneal area
- Born with 4000 cells, normal adult has 2000-2500
- Hallmarks of Fuchs on Specular Microscopy:
 - Low cell count
 - Gutatta
 - Polymegathism, Polymorphism
- Contact Inhibition
- 500-800 cells/mm² is thought to be threshold for corneal decompensation
- Monitor serial ECCs
- Surgical Decision-making
- Pre- and Post-Operative assessment



Craig Thomas, O.D., Use Specular Microscopy to Diagnose Corneal Disease, Review of Optometry June 17, 2009

Anterior Segment OCT



Miras, Bhawan. The Endothelium and Corneal Transparency: A Clear Connection. Cornea And Contact Lenses, Feb 15 2023.

Non-surgical Management

- Hypertonic Saline (5% NaCl) Drops and Ointments
 - Draw fluid out of cornea, reducing edema (MCE) and blur, especially in AM
- Warm Air
 - I.e. Hair dryer, can promote corneal dehydration
- Soft BCL
 - Pain relief from bullae
 - Use antibiotic drop
- Lifestyle Modifications
 - Smoking cessation
 - UV protection with sunglasses
 - Management of DM and CV risk factors



<https://www.eyemedicalnews.com/healthcare-news/2023/02/15/corneal-dystrophy/> <https://www.eyemedicalnews.com/healthcare-news/2023/02/15/corneal-dystrophy/>

Surgical Management- When to operate?

- When medical management is no longer sufficient to provide satisfactory vision and quality of life
 - Interfering with ADLs/functional vision
 - Persistent corneal edema
 - Chronic blurry vision, progressively worsening
 - Pain or discomfort
- When cornea is at risk of permanent damage
- Patient factors - age, overall health, visual needs
- Consider the cataract

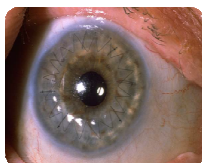
Surgical Options

- Penetrating Keratoplasty
- Endothelial Keratoplasty - gold standard
 - DMEK: Descemet's membrane EK
 - DSAEK: Descemet's stripping Automated EK
- Descemet's Stripping Only (DSO)/ Descemet's stripping without EK (DWEK)



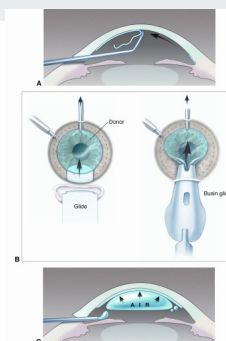
Penetrating Keratoplasty

- Full thickness corneal transplant
- Historical first line treatment for FECD
- Now indicated in only complex cases
- Longer recovery, higher risk of rejection



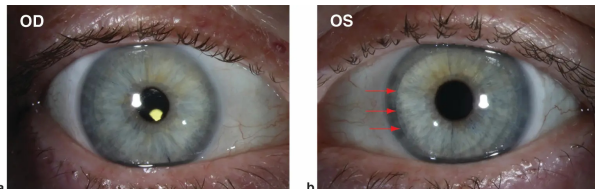
EK Procedure

- DSAEK
 - Thin layer of posterior stroma attached to DM and endothelium
- DMEK
 - Only DM and endothelial cells



Endothelial Keratoplasty

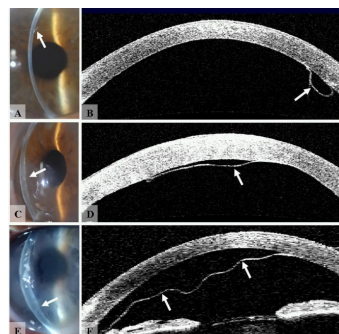
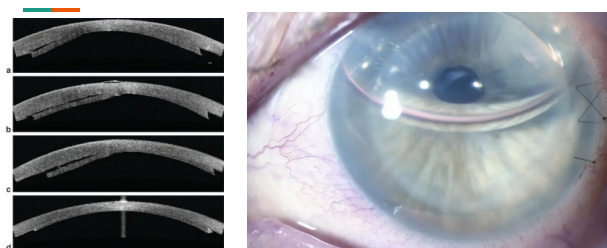
DMEK / DSAEK



© 2025 American Academy of Ophthalmology

EK Surgical Considerations

- Positioning
- Possibility of re-bubble
- Rejection



28

DSAEK vs DMEK

- Studies show DMEK has statistically significant superior BCVA outcomes at 5 years post-op^{1,2}
- DMEK has faster visual recovery and higher proportion achieving excellent vision^{2,3}
- Similar intraoperative endothelial cell loss¹
- Some studies show lower re-bubbling rate in DMEK¹
- Some surgeons consider DMEK more technically challenging
- DSAEK advantageous in complex eyes (s/p vitrectomy or glaucoma surgery)
- Comparable long-term survival
 - One study showed 96% graft survival rate at 5 years for both DMEK and DSAEK¹
 - Graft rejection rates are also reported to be comparable^{1,4}

Fig 1. Haddad EJ. Comparison of Long-Term Outcomes of DSAEK and DMEK in Pseudo Exfoliative Glaucoma. Cornea. 2024 Feb 1;43(2):184-189. <https://doi.org/10.1097/ICO.0000000000003242>

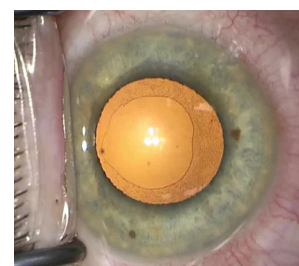
Yang SM, Sharma N, Chen ES, Shah RK, Salvar N, Hsu F, Patel GJ. Long-term Outcomes in Fellow Eyes Comparing DSAEK and DMEK for Treatment of Pseudo Exfoliative Glaucoma. Cornea. 2023 Jan 1;41(1):1-7. <https://doi.org/10.1097/ICO.0000000000003242>

Sharma N, Sharma N, Chen ES, Shah RK, Salvar N, Hsu F, Patel GJ. Long-term Outcomes in Fellow Eyes Comparing DSAEK and DMEK for Treatment of Pseudo Exfoliative Glaucoma. Cornea. 2023 Jan 1;41(1):1-7. <https://doi.org/10.1097/ICO.0000000000003242>

Trout T. Four-Year Survival Comparison of Endothelial Keratoplasty Techniques in Patients With Pseudo Exfoliative Glaucoma. Cornea. 2024 Feb 1;43(2):184-189. <https://doi.org/10.1097/ICO.0000000000003242>

Descemet's Stripping Only

- Patient selection
 - Central guttata
- Rho Kinase inhibitors
- Early edema and blurry vision
- No risk of rejection



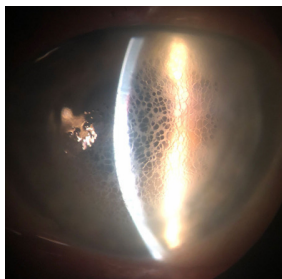
Haddad, Lin. The latest in DMO. Eye World. Dec 2023. <https://www.eyeworld.org/2023/The-latest-in-dmo/>

- **Cell Therapy:**
- Injected Endothelial Cells (Aurion Biotech, Emmecell - netependocel, EO2002).
- Restore endothelial function without transplant, delay or prevent surgery.
- Clinical trials: promising early results (↑VA, ↓corneal thickness).
- Approved in Japan (Aurion Biotech).
- Phase 3 trials (2025), potential FDA approval (2026-2027).
- **Rho-Kinase Inhibitors:**
- Ripasudil, ROCK inhibitors - enhance healing post-DSO.
- Accelerate wound healing, improve endothelial cell density.
- **Gene Therapy & Small Molecules:**
- Targeting molecular mechanisms of degeneration.
- Disease-modifying treatments (early stages).

EyeWorld - Corneal cell therapy: current status and looking to the future - <https://www.eyeworld.com/2024/corneal-cell-therapy-current-status-and-looking-to-the-future/>
Ophthalmology Times - Advancing Fuchs dystrophy care: Long-term success of descemet stripping only - <https://www.ophthalmologytimes.com/view/advancing-fuchs-dystrophy-care-long-term-success-of-descemet-stripping-only> PMC - Therapeutic future of Fuchs endothelial corneal dystrophy: An ongoing way to explore - <https://pmc.ncbi.nlm.nih.gov/articles/PMC11034692/>

- Inhibits Rho-associated kinase (ROCK) which is involved in cellular shape, movement and adhesion
- Originally developed for glaucoma to lower IOP
- Mechanism of Action in Fuchs Dystrophy:
 - Enhance survival and function of endothelial cells
 - Improves endothelial cell adhesion to DM
 - Stimulates endothelial cell migration
 - May potentially reduce fibrosis and guttae formation (still under investigation)
 - Decrease corneal edema by improving endothelial cell function
 - So far, the most promising use of ROCK inhibitors is as adjunct therapy along with DSO

Genetic Ophthalmic Solution 0.4% - Pharmaceuticals Medical Devices Information - KEGG DRUG, https://www.kegg.jp/medcui/bi/jgic_med_product/jgic_med_00364207
 Rho Kinase Inhibitors for Fuchs Endothelial Dystrophy - PubMed, <https://pubmed.ncbi.nlm.nih.gov/36774586/>
 Advancing Fuchs dystrophy care: Long-term success of desmocal stripping only - Ophthalmology Times, <https://www.ophthalmologytimes.com/view/advancing-fuchs-dystrophy-care-long-term-success-of-desmocal-stripping-only>
 Repasudil ophthalmic solution for fuchs endothelial corneal dystrophy. - PubMed - NCBI, <https://pubmed.ncbi.nlm.nih.gov/3784457/>
 Therapeutic future of fuchs endothelial corneal dystrophy: An ongoing way to explore - PMC, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10346936/>



Bronner, Aaron and Do, Huy. Skip the Scalpel? A medical approach to endo recovery. Review of Optometry April 15 2021.

33

Questions?

Update on Selected Cornea Topics

Suncoast Seminar April 2025
Erin Greenberg, MD



I have no Financial Disclosures.

Keratoconus and Other Corneal Ectasias

Corneal Ectasias

- Corneal ectasias are a group of uncommon, noninflammatory eye disorders characterized by the bilateral thinning of the central, paracentral or peripheral cornea
 - Keratoconus
 - Pellucid Marginal Degeneration
 - Keratoglobus
 - Post-refractive surgery ectasia

Keratoconus Overview

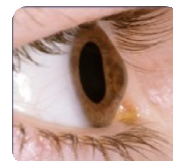


www.aoa.org

- Keratoconus is a bilateral, progressive corneal ectasia resulting in irregular astigmatism and loss of visual function, with onset in teenage years.¹
- Affects 1 in 2000 people in the US.²
- As of 2016, keratoconus was the most common indication for penetrating keratoplasty in the United States.³
- Eye Bank Association of America noted ~6,195 transplants/year in patients with keratoconus.³
 - Predicted 73% of grafts fail within 20 years; 98% at 30 years⁵

Keratoconus Epidemiology

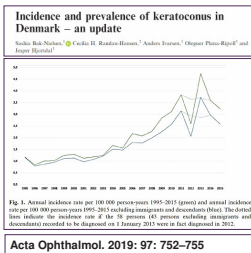
- Average age: depends on study, typically around 15
- Male to female ratio: also depends on study
 - Some say 2/3 to 1
 - Some say 1 to 1
- Racial demographics
 - Variable
 - More common in Asian, Black, Arabic populations. Slightly more common in Hispanic compared to Caucasian



Keratoconic Cornea

Studies Suggest Prevalence May be Higher in Certain Populations

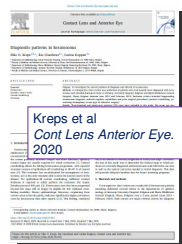
Reference	Prevalence	Geography
Kennedy et al. 1986	0.05% or 1:2000	US
Jonas et al. 2009	2.3%	India
Millodot et al. 2011	2.3%	Israel
Xu et al. 2012	0.9%	China
Hashemi et al. 2014	2.5%	Iran
Godefrooij et al. 2017	0.26% or 1:375	Netherlands
Torres Netto et al. 2018	4.79%	Saudi Arabia
Chan et al. 2020	1.2% or 1:84	Australia
Hashemi et al. 2020*	0.14% or 1:700	Global Meta-Analysis



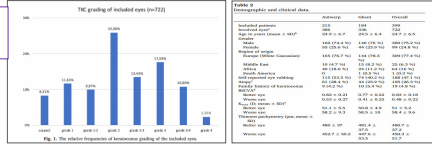
Keratoconus Natural Progression

- More rapid progression in younger age groups
- Slowed progression as patients enter late 30s and 40s
- Rare Progression After 50
- Crosslinking
 - UV light from the sun strikes the cornea and forms crosslinked bonds between corneal stroma

Despite advances in diagnostic tools, keratoconus is still often diagnosed at a relatively late stage



- Analysis of a group of patients who were newly diagnosed with keratoconus (KCN) indicated that only 13% of the patients were diagnosed before 18 years of age
- 70% had reached topographical keratoconus classification stage 2 by the time of diagnosis.



Importance of Early Diagnosis

- As keratoconus progresses, it becomes more challenging to manage
- Keratoconus can be easily overlooked in patients who are currently functioning well in spectacle lenses or soft contact lenses
- Important to diagnose and educate patients before visual function is lost
- Cross-linking is an early intervention to halt or slow the progression of keratoconus
- A published meta-analysis study of >11,000 eyes demonstrated that patients with untreated progressive keratoconus ≤17 yrs of age or with ≥55 D KMax are likely to show ≥1.5D of Kmax progression within 12 months¹

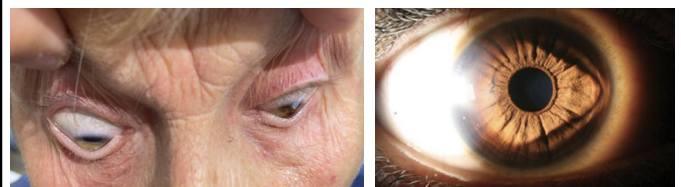
1. Ferdi et al. *Ophthalmology* 2019; 126:935- 945

Keratoconus - Symptoms

- Gradual, progressive vision loss
 - Frequent changes in glasses prescriptions or contact lens fits/refits
- Dry eye- a consequence of irregular curvature
- Photoc symptoms -Glare, halo, starburst
- Ghosting, monocular diplopia
- Distortion of images

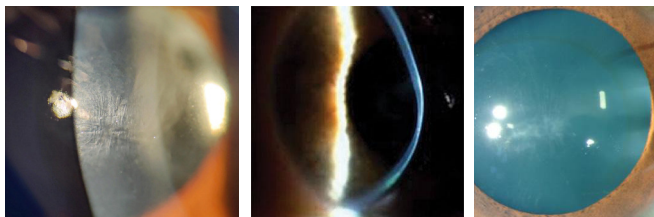
Corneal Ectasia Preferred Practice Pattern® Garcia-Ferrer, Francisco J. et al. *Ophthalmology*, Volume 126, Issue 1, P170- P215

Keratoconus- Diagnosis- External Signs



© 2025 American Academy of Ophthalmology

Keratoconus- Slit Lamp Findings

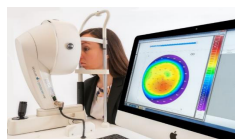
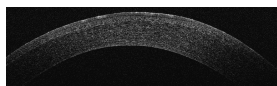


Keratoconus Diagnosis - Refraction

- Progressive increase in myopia and/or astigmatism
- Scissoring reflex or oil drop sign on retinoscopy

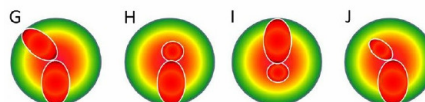
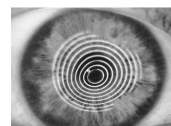
Keratoconus - Diagnostic Equipment

- Placido Topographer
- Scheimpflug Tomographer
- Anterior Segment OCT



Placido Topography

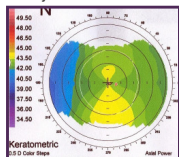
- Early signs of keratoconus
 - Egg-shaped placido rings
 - Skewed radial axis
 - Asymmetric bowtie



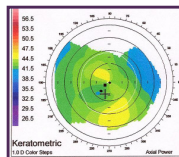
Y.S. Rubenwiz: Keratoconus. Survey of Ophthalmology Vol 42, Num 4, Jan/Feb 1996

Keratoconus Topography - Suspicious for KCN

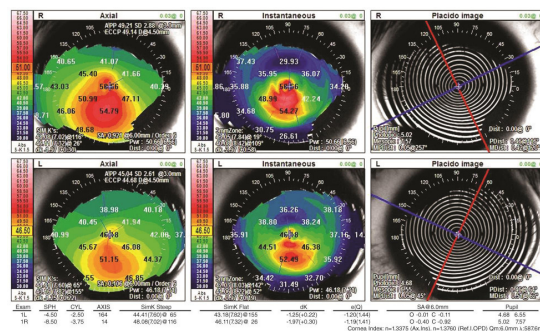
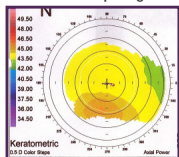
Asymmetric Bow-tie



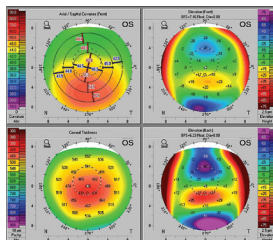
Skewed Radial Axis



Inferior Steepening

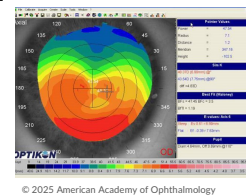


Keratoconus - Tomography



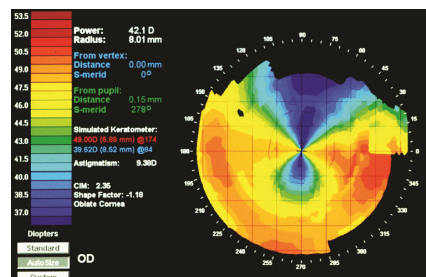
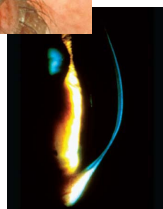
Pellucid Marginal Degeneration

- Less common than KCN
- Epidemiologic data are less certain
- Diagnosed typically ages 20-40, progression commonly occurs past age of 50 unlike KCN
- No male/female or racial predilection
- Similar symptoms as KCN



Pellucid Marginal Degeneration - Diagnosis

- Slit lamp
 - More central protrusion compared to KCN
 - Steepening is often more inferior compared to KCN
 - Typically NO Vogt's striae or Fleischer ring
- Refraction
 - More likely to be along 180 degree axis in plus cyl and 90 degree axis in minus cylinder, but can be the opposite if the inferior steepening is very high
 - Very difficult refractions

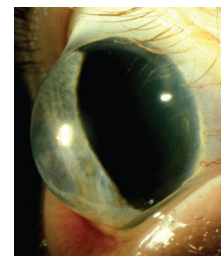


Keratoglobus

- Epidemiology
 - Presents at birth or early infancy
 - Some reports of acquired keratoglobus presenting in late childhood/teenagers
 - Very rare
 - No known gender predilection
- Natural progression very unpredictable

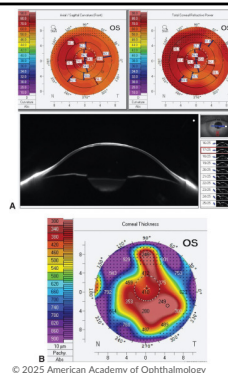
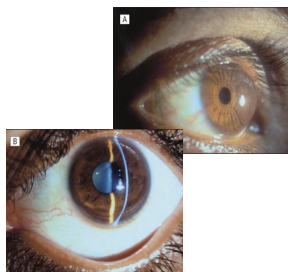
Keratoglobus - Symptoms

- Poor vision since birth, eye rubbing, hydrops like symptoms



Keratoglobus - Diagnosis

- Slit lamp
 - Globular protrusion of the cornea
 - Diffuse thinning from limbus to limbus
 - Scarring
 - No Vogt's striae or Fleischer ring
- Refraction
 - High myopia
 - Irregular astigmatism



© 2025 American Academy of Ophthalmology

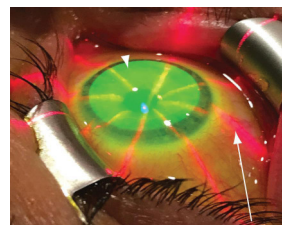
26

Post-Refractive Ectasia

- Irregular corneal curvature following refractive surgery
 - Secondary to decreased structural integrity causing destabilization of the corneal support network
- Can occur in LASIK, PRK, SMILE
- RK, LRIs, AKs
- Progression is variable and can occur in any decade of life
- The onset of ectasia ranged from 0.2 to 192 months across the three procedures with a mean of 41 ± 50 months in PRK, 35 ± 24 months in LASIK, and 18 ± 13 months in SMILE

◦ Moshirfar M, Tukan AN, Bursdell N, Liu HY, McCabe SE, Ronquillo YC, Hoopes PC. Ectasia After Corneal Refractive Surgery: A Systematic Review. *Ophthalmol Ther*. 2023;10(6):753-776. doi: 10.1007/s40123-023-00383-w. Epub 2023 Aug 30. PMID: 34417707; PMCID: PMC6589911.

Management and Treatment of Corneal Ectasias



© 2025 American Academy of Ophthalmology

Goals of Care

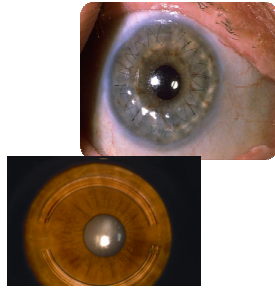
- Identify it and monitor for progression
- Treat symptoms
- Improve vision
- Prevent progression

Identify and Monitor for Progression

- Monitor refractive changes
- Serial topography/tomography
- Exam findings

Treatment

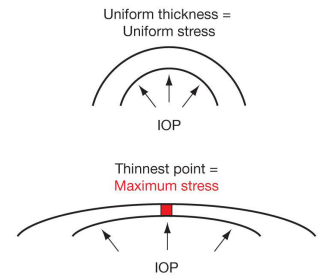
- Non-surgical treatments
 - Glasses, contact lenses, scleral contact lenses
- Surgical interventions
 - Intacs, PKP



© 2025 American Academy of Ophthalmology

Preventing Progression

- Avoid eye rubbing
 - Educate patients
 - Artificial tears (PF), anti-histamines
- Corneal-Crosslinking



© 2025 American Academy of Ophthalmology

Corneal Crosslinking

- Crosslinked bonds are naturally formed in the cornea
 - Result of UV-A light interaction with corneal collagen
- 50 years by the sun...30 minutes with standard crosslinking protocol
- FDA approved for PROGRESSIVE Keratoconus and post-refractive ectasia
 - Ages 14-65

1. An increase of ≥ 1.00 D in steepest keratometry
☐ OD Date: K_{max} ☐ OS Date: K_{max}
2. Increase of ≥ 1.00 D of cylinder (Cyl) in subjective or manifested refraction
☐ OD Date: Cyl: ☐ OS Date: Cyl:
3. A myopic shift of ≥ 0.50 D of spherical equivalent refractive error (MRSE)
☐ OD Date: MRSE: ☐ OS Date: MRSE:
4. A decrease of ≥ 0.10 mm in back optical zone radius (BOZR) in corneal rigid gas permeable lenses
☐ OD Date: BOZR: ☐ OS Date: BOZR:
5. Progressive deterioration of best spectacle corrected visual acuity (BSCVA) worse than 20/20
☐ OD Date: BSCVA: ☐ OS Date: BSCVA:
6. Failed spectacle correction or contact lenses ☐ OD ☐ OS
 - ☐ Applicable (continued progression in a contact lens wearer, and/or inadequate function in glasses or contacts, and/or contact lens intolerance)
 - ☐ Not Applicable (no progression and adequate function in glasses or contacts)

34

Crosslinking - Patient Education

- Very safe and effective way to reduce or stop progression
- Crosslinking is NOT a refractive procedure
- Goal is stabilization - not visual improvement
 - Though we do see 3-4 diopters of flattening of K_{max}
- Post-op evaluation for visual recovery will be necessary - usually hard contacts are still necessary in moderate and late stages
- Adverse event rate less than 5%
 - Not counting stromal haze...
- "Failure rate" of around 8% in KCN, higher in ectasia

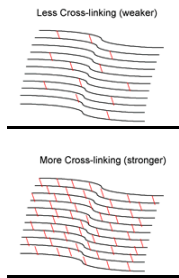
FDA-Approved iLink Cross-Linking Procedure

- **Photrex® Viscous** (riboflavin 5'-phosphate in 20% dextran ophthalmic solution)¹
- **Photrex®** (riboflavin 5'-phosphate ophthalmic solution)¹
- **KXL®** ultraviolet light delivery system in corneal collagen cross-linking procedures.²



Crosslinking Procedure

- Procedure Involves:
 - Removal of epithelium (epi-off)
 - 30 min riboflavin application & 30 min exposure 365 nm UVA light, 3.0 mW/cm²
 - Intraoperative corneal thickness minimum: 400 microns, checked prior to UV light application
- Physiology:
 - Activated riboflavin and reactive oxygen species interact in cornea to form crosslinks; stiffens cornea
 - Laboratory studies suggest 328.9% increase in biomechanical rigidity²



¹Wattchow JM, O'Donnell C, Radhakrishnan H. Biomechanical properties of corneal tissue after ultraviolet A-riboflavin crosslinking. *J Cataract Refract Surg*. 2013;39(5):451-42.
²Wattchow JM. Crosslinking treatment of progressive keratoconus. New York, Curr Opin Ophthalmol. 2006; 17:356-60.

1. Remove epithelium.
2. Soak cornea with Photrex® Viscous (riboflavin 5'-phosphate in 20% dextran ophthalmic solution).
30 minutes
3. Check for flare.
4. Once flare is observed, measure corneal thickness.
If corneal thickness is less than 400 µm, instill 2 drops of Photrex® (riboflavin 5'-phosphate in ophthalmic solution) until the corneal thickness increases to at least 400 µm.
5. Irradiate for 30 minutes.
Continue applying Photrex® Viscous (riboflavin 5'-phosphate in 20% dextran ophthalmic solution) during irradiation.

Post-Operative Precautions

- Patients should be advised NOT to rub their eyes for the first five days after their procedure.
- Discomfort, light sensitivity, foreign body sensation
- Severe pain or sudden decrease in vision warrants a phone call
- If the bandage contact lens that was placed on the patient's eye on the day of treatment falls out or becomes dislodged, the patient should be advised not to replace it and to contact their eye care provider immediately.

Follow-up Care

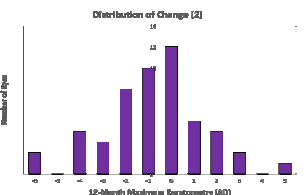
- Drop Regimen
 - Antibiotic (moxifloxacin) QID x 1 week or until epithelium has closed
 - Steroid regimens vary - usually 1-2 months with slow taper
- Remove the bandage contact 4-7 days after procedure
- Corneal haze
 - Onset 3-4 weeks after CXL, mostly resolves around month 3-4
- Still require monitoring for progression after CXL
- Don't forget about the second eye!

Contraindications and Adverse Events

- Cross-Linking not advised during pregnancy, no official stance on breastfeeding mothers
- Ulcerative keratitis can occur; most common ocular adverse reaction was corneal opacity (haze)
 - Other side effects may include punctate keratitis, corneal striae, dry eye, corneal epithelium defect, eye pain, light sensitivity, reduced visual acuity & blurred vision.

Crosslinking Results

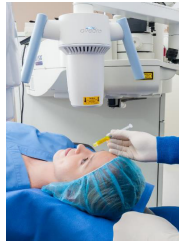
- Retrospective study of patients with progressive keratoconus who underwent Crosslinking at the Byers Eye Institute, Stanford University¹
- n=57 eyes with ≥12-month follow-up, mean age 16.4 yrs ± 2.5 at the time of the procedure
- Mean improvement in Kmax of -0.8 D at 12mo, -1.3D at 24mo, 86% of eyes within ±1D change from pre-op KMax at 12mo
- Anterior stromal haze was observed in the majority of eyes. Persistent epithelial defects were reported in 2 eyes, resolved with 1 and 6 mo after first observation, respectively
- No other adverse effects were reported



1. Saleh et al. *Cornea*, 2021 Apr 14, Epub ahead of print.

Conclusions

- Corneal ectasias can be serious vision threatening conditions that are often challenging to diagnose and treat
- Patients with progressive keratoconus/ectasia should be educated regarding risks and benefits of the FDA-approved iLink cross-linking procedure.
- Optometrists play a critical part in ensuring early diagnosis, monitoring, and continuing care of these patients.
- Financial hurdles have prevented some patients from treatment in the past. Now the FDA approved iLink Crosslinking procedure is approved by many insurance companies.



Welcome!

THE SUNCOAST SEMINAR
PRESENTED BY THE PENNELL OPTOMETRIC ASSOCIATION
**Hyatt Regency Clearwater
Beach Resort and Spa**
on the beautiful Gulf of Mexico
Clearwater Beach, Florida
April 26 - 27, 2025

Our Top Topical Meds

Joseph J. Pizzimenti, OD, FAAO
pizzimen@uiwtx.edu

Financial Disclosures

With respect to this course, I have no relevant financial relationships to declare.

What pharmacotherapy means to optometry

The ability to use pharmaceutical agents has enabled optometrists to become true primary health care providers.

Course Goal

- To provide current and accurate information about key topical drugs that are used to treat eye diseases.
- Case examples
- "Topical" discussion

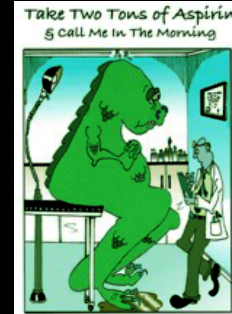
Routes of Drug Administration:

- Alimentary
 - Sublingual
 - Oral
 - Rectal
- Parenteral
 - Subcutaneous (SC)
 - Intramuscular (IM)
 - Intravenous (IV)
- Other
 - Periocular
 - Intraocular
 - Inhalation
 - Topical

Principles of Pharmacology

- Pharmacokinetics: What the body does to a drug
- Pharmacodynamics: What the drug does to the body
- Always keep in mind contraindications, side effects and drug interactions before starting medication.
- Drug risks vs. benefits
- Keep in mind the age and weight of the patient
 - Consider starting with one half in the young or elderly (po)
 - Elderly often on multiple meds – may lead to adverse reactions/interactions

Know Your Patient



Each patient is
unique.



Choosing the Proper Drug Therapy

- Patient considerations
 - Immune system viability
 - Kidney and liver function
 - Pregnant or nursing
 - Age
 - Allergy history
- Safety profile of the drug
- Efficacy of the drug
- Cost considerations



General Principles:

- Drug Metabolism – Most drugs are metabolized by liver enzymes
- Drug Excretion – The kidney is the major route
- Some drugs are excreted after metabolism
- Some drugs are excreted unchanged
- Therefore, proper liver function is critical for metabolism of medications, and kidney function is integral to drug excretion.

Topical Meds

- Absorbed directly into bloodstream, so not broken down by GI or liver.



Practice-building Tip

- **When Rx-ing for Peds:**
- Place a courtesy call and send follow-up letter to pediatrician.
- Especially with po meds



Local (Ocular) Side Effects of Topical Medications



Posterior Subcapsular Cataract

Glaucoma

Systemic Side Effects of Topical Medications

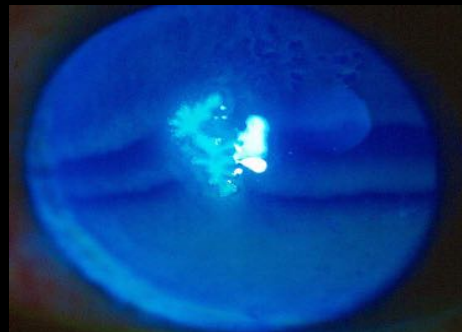
- The eye is not an isolated organ.
- All topical agents should be considered as potentially systemically potent.
- To avoid systemic SEs:
 - Medical Hx and current meds, vit, supp, herbs
 - Rx. **Appropriate drug, concentration and dosing schedule**
 - Have patient close eyes, digital occlusion

Special populations, special Rx.



25 year old female

10 weeks pregnant



Treatment?

HSVK

Pregnancy Category C



Pregnancy Category B

- Acyclovir (Zovirax®)
- Acute infection - 400 mg PO 5x/day X 7 d
 - HSV Keratitis
 - Dendritic ulcer
 - HSV Blepharodermatitis
 - Lid involvement



Traditional FDA Use-in-Pregnancy Ratings

<u>Category</u>	<u>Description</u>
A	No risk in humans or animals
Absolutely safe	
B	No evidence of risk in humans, or adverse findings in animals.
Probably safe	or In the absence of adequate human studies, animal studies show no fetal risk. The chance of fetal harm is remote, but remains a possibility.

<http://www.fda.gov>

Use-in-Pregnancy Ratings

<u>Category</u>	<u>Description</u>
C	Risk can not be ruled out; but the potential benefits may outweigh the potential risk.
Questionably safe	
D	Positive evidence of Risk
X	Contraindicated in Pregnancy

<http://www.fda.gov>

Instillation of Medications

Proper technique can significantly increase efficacy!



QUESTIONS?



My Dandy Dozen!



My "Go-to" Drugs



- Prednisolone Acetate 1%
- Prednisolone Sodium Phosphate 1% sol
- Bromfenac .09%
- Tobramycin .3% + Dexamethasone .1/.05%
- Cyclosporine .05/.09%
- Moxifloxacin .5%
- Tobramycin .3%
- Alcaftadine 0.25%
- Travoprost-Z .004%
- Levobunolol HCl .25% or .5%
- Doxycycline/Minocycline
- Acyclovir
- Prednisone

The majority of red eyes that present to us are primarily **inflammatory** and/or **allergic** in nature.

In immunocompetent patients, most red eyes will get better if we do **nothing**.

Inflammation and Allergy



- Prednisolone Acetate 1%
- Prednisolone Sodium Phosphate 1% sol
- Bromfenac .09%
- Tobramycin .3% + Dexamethasone .1/.05%
- Cyclosporine .05/.09%
- Moxifloxacin .5%
- Tobramycin .3%
- Alcaftadine 0.25%
- Travoprost-Z .004%
- Levobunolol HCl .25% or .5%
- Doxycycline/Minocycline
- Acyclovir
- Prednisone

What's in YOUR dozen?



Fluoroquinolones

- Besifloxacin .6% susp
- FDA indication for bact. conj., including **Pseudomonas, MRSA**
- Durasite vehicle
 - Lengthens ocular surface contact time
- **No systemic counterpart;** decreases resistance



Steroids and Bacterial Keratitis

- **What does the evidence show?**
- Steroids for Corneal Ulcers Trial (**SCUT**)
- No significant benefit overall
- May improve outcome in severe BK (*Pseudomonas*)
 - Add steroid after 24-48 hrs of FQ
- **Not** for *Nocardia* infection.
- Avoid steroid if:
 - Severe thinning
 - Large epi defect
 - Diabetes or immuno-suppression
 - Suspect Acanthamoeba, Fungi



Topicals for MRSA

- Polymyxin B/Trimethoprim
- **Eradication of MRSA conj and keratitis**
- Besifloxacin, Tobramycin, Polysporin ung, and **fortified Vancomycin** are other options for MRSA



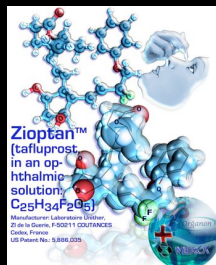
Systemic Tx. For MRSA

- Bactrim (**trimethoprim/sulfamethoxazole**)
 - 1-2 tabs
 - q12h x 1 wk
 - Kills ocular, systemic MRSA



Tafluprost

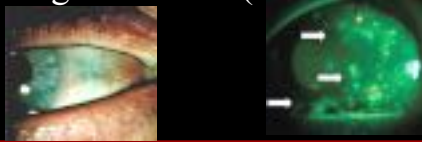
- FDA Approves ZIOPTAN™ (Merck)
- **Tafluprost** ophthalmic solution
- Once-Daily
- Comparable to other PGs
- **Preservative-Free**



PG CONTRAINDICATIONS



Lifitegrast-Xiidra (Shire)



- Binds to the integrin lymphocyte function-associated antigen-1 (LFA-1), a cell surface protein found on leukocytes.
- Blocks the interaction of LFA-1 with intercellular adhesion molecule-1 (ICAM-1). ICAM-1 is over-expressed in corneal and conjunctival tissues in DED.



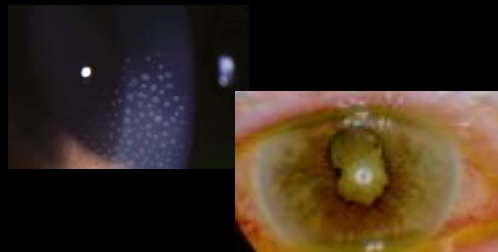
- Highest FDA-approved concentration of cyclosporine (0.09%).
- Solution
- BID dosing
- NCELL technology uses nanomicelles composed of polymers that encapsulate cyclosporine molecules.

Access and Assistance

- Rebate programs (esp. GLC)
- GoodRx.com
- Lower-priced options
 - Polytrim (Polymyxin B / Trimethoprim) sol
 - Maxitrol (Neomycin, Poly B, Dexamethasone) susp, ung
 - Acyclovir po
 - Pred sodium phosphate 1% sol (no shaking)
 - Generic PGs, AA, BB for GLC

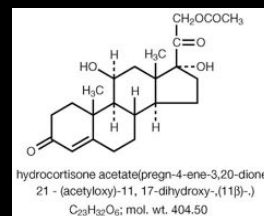


Pharmacotherapy of Anterior Uveitis



What is your **ocular** treatment plan?

Corticosteroids!



Inflammatory Disease



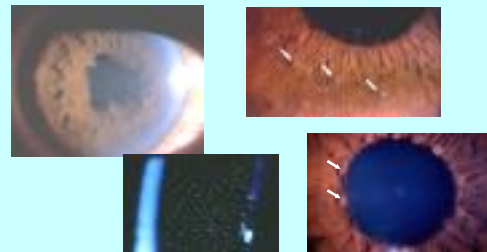
History

- A 34 year-old black female presents symptoms of bilateral redness x 7 days
- Gradual onset, gradual worsening
- Mild pain, mild photophobia OU
- Ocular history positive for previous episodes OU

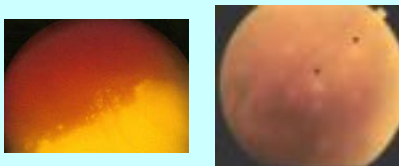
Clinical Findings

- Biomicroscopy
 - 2+ cells in AC OU
 - “Mutton fat” deposits on endothelium OU
 - Iris nodules OU
 - Areas of posterior synechia OU
- TAP: 9 mmHg OD/11 mmHg OS
- DFE
 - “Snowbanking”
 - Gray/white (old) vitreous “puff balls” in ferior PP OU

Anterior Seg Findings



Posterior Seg “Puff-balls” and “Snowbanking”



What is your ocular diagnosis?

Assessment

- Bilateral anterior uveitis
 - Probably recurrent/chronic
- Granulomatous
 - Mutton-fat KPs
 - Iris nodules
- Prior posterior segment inflammation

What is your plan?

Ocular management?
Systemic testing?
Consultation?

A granulomatous uveitis has an increased likelihood of being part of a systemic disease process.

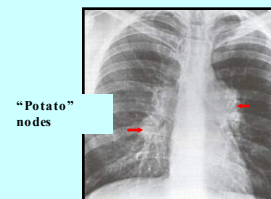
Actual Management

- Treated anterior uveitis using conventional topical meds.
 - Steroid
 - Cycloplegic
- Ordered targeted systemic “uveitis” work-up
 - ACE will be elevated in up to 80% of patients with active Sarcoidosis
- Chest imaging

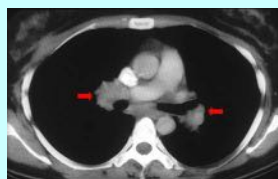
Corticosteroids

- Topical steroids are the mainstay to treat ocular inflammatory conditions
- Choosing which medication to use depends on the severity and location of the ocular inflammation

Bilateral Hilar Lymphadenopathy on Chest X-Ray in Pulmonary Sarcoid



Bilateral Hilar Lymphadenopathy on CT Scan of Chest



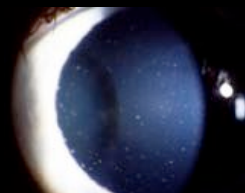
Outcome

- Sarcoidosis
 - Patient was also placed on po Prednisone (short-term)
 - Good ocular response to medical therapy
- What imaging tests to order:
 - Chest X-ray
 - CT of chest and abdomen

Key Points: Sarcoidosis**

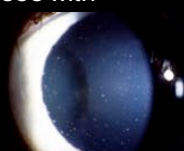
- A multi-system disease.
- Most often occurs between 20 and 40 years of age, with women being diagnosed more frequently than men.
- 10 to 17 times more common in African-Americans than in Caucasians.

A Word About Uveitis



What is uveitis?

- Defined as inflammation of the uveal tract.
- For decades, considered a single disease.
- **Fact: Uveitis entails a multitude of diseases.**
 - Some uveitic diseases are local, ocular immune.
 - Many are systemic diseases with ocular manifestations.



Uveitis is an Immunological Process

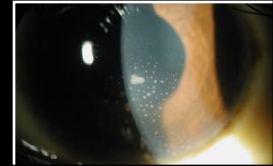


Immune Privilege

- The eye enjoys a special relationship with the immune system.
 - Ability to quench unwanted immune-mediated inflammation.
 - This ability is known as **immune privilege**.
 - Immune privilege enables ocular tissues to remain clear.

Common Etiologies of Anterior Uveitis

- In uveitis, immune privilege is overcome
- **Idiopathic (post-viral syndrome)**
- **Human leukocyte antigen (HLA)-B27–positive or HLA-B27–associated**
- **Trauma or s/p intraocular surgery**



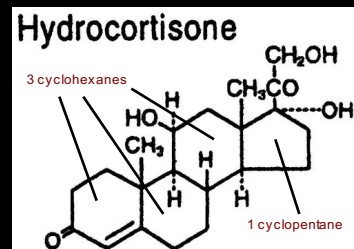
HLA-B27

- HLA-B27 is present in 1.4-8% of the general population.
- However, it is present in **50-60%** of patients with acute iritis.
- HLA-B27 diseases include:
 - Ankylosing spondylitis
 - Reiter syndrome
 - Inflammatory bowel disease
 - Psoriatic post-infectious arthritis



Hypopyon w/+ HLA-B27

The main feature of steroids is the fused ring system.



Moderate to Severe Inflammation

- Prednisolone acetate 1% ophthalmic suspension
 - Pred Forte
 - **High anti-inflammatory efficacy**
 - Acetate suspension facilitates **corneal penetration** to provide increased concentrations in anterior chamber
 - Main indications include **anterior uveitis** and **severe episcleritis**

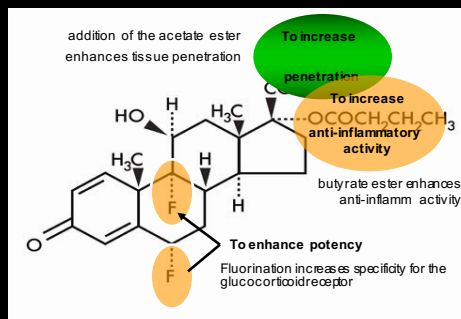


For Severe Inflammation

- Difluprednate .05% **emulsion** (Alcon)
 - No shaking
 - Less frequent dosing
 - BAK-free
- Derived from prednisolone
- FDA indication for postSx. inflamm, pain
- **IOP rise ***



Difluprednate Molecule



DUREZOL™ Emulsion Package Insert

Corticosteroids

- Ocular side effects
 - IOP rise
 - Prolonged use (>3-5 weeks)
 - Cataract formation
 - Decreased healing
 - Promotion of viral and fungal infections
 - Herpes Simplex Virus



Mild-Moderate Inflammation

- Loteprednol etabonate 0.5% (Lotemax)
 - ophthalmic gel
 - post-operative
 - small tendency to increase IOP
 - used "off-label" in DES



Non-preserved loteprednol 0.5% ophthalmic ointment (Lotemax)



Loteprednol etabonate (Alrex) .2% suspension

- A topical ophthalmic steroid that is FDA approved for the treatment of chronic (not acute) allergic conjunctivitis.

When and Why Taper?

- **When** a 2-grade decrease in ant chamber cells is achieved
- **Why?**
 - Sudden withdrawal of a steroid can result in a rebound inflammatory response.
 - This would then require a larger dose of steroid for an even longer period of time because of longer lasting inflammatory activity.

What if there is IOP rise?

Handle it.

Topical Steroid Taper

- An example: start w/1 gt q1h x 2 d, then
 - 1 drop every two hours for three days
 - 1 drop every three hours for three days
 - 1 drop 4 x a day for 4 days
 - 3 x a day for 3 days
 - twice a day for 2 days
 - finally, one drop once a day for 2 days, then
 - discontinue the steroid or have the patient apply it every other day for several more days.

Questions?



Inflammation/Infection

- Phlyctenulosis
 - Small, white limbal nodules w/surrounding redness
 - Response to Staph.
 - Associated with TB
 - Good response to topical AB/steroid such as Tobradex or Zylet
 - Dose QID x 5-7 days



Steroid-Antibiotic Combinations

- Dexamethasone alcohol .1% with tobramycin .3%
 - Moderate/severe inflammation w/risk of infection
 - Now available as a generic



Next Generation

- **TobraDex ST** (tobramycin/dexamethasone ophthalmic suspension) 0.3/0.05%.
- Indicated for inflammatory ocular conditions for which a corticosteroid is indicated and where bacterial infection or risk for infection exists.
- Formulated with a **new vehicle (Xanthum gum)** to enhance bioavailability to targeted tissues.
- Useful for blepharitis/MGD



Steroid/AB Combo



Steroid-Antibiotic Combinations

- These medications are **steroids** and therefore may cause the same side effects
- Primary use** is for control of **inflammation**
- Provides **antibacterial prophylaxis** while treating the ocular inflammation
- Examples:
 - Adenoviral KC w/sig. epi staining
 - Marginal K infiltrate ---->



Steroid-Antibiotic Combinations

- Loteprednol etabonate .5% + tobramycin .3%
- Mild-moderate inflammation and risk of infection
- Steroids by any route of administration can cause CSC! ***



Steroid-Antibiotic Combinations



74 year old WM: Subjective

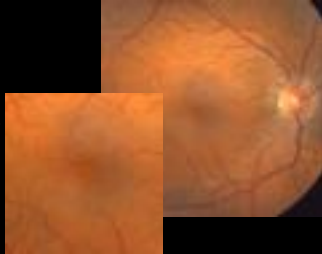
- CC:** Blurred "central" vision (OD) @ distance and near
 - Onset gradual, over 3-4 days
 - Last visit 3 weeks prior showed 20/25 VA OD
- Ocular History:** 7 weeks s/p uneventful cataract surgery with IOL OD
- Medical History:** + HTN x 12 years, + Hypercholesterolemia (both under control w/meds)
- Family Ocular History:** + AMD (mother)
- Allergies:** None
- Topical Meds:** artificial tears

Exam Findings: Objective

- VA:** c Rx OD 20/70 PHNI OS 20/30 PHNI
- Pupils:** (-)APD, PERRLA
- EOMS:** Smooth / Full
- SLE:** Well-centered IOL OD, 1+ CC OS
- IOP:** 12 mm Hg OD, 14 mmHg OS
- CF:** Full OU (periphery) Central blur OD/Amsler +
- Vitreous:** Clear OU

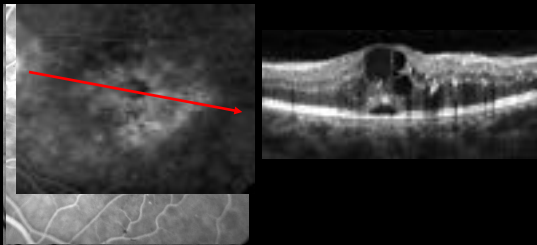
Fundus Evaluation

- DFE shows macular detail obscuration
- "Honeycomb" lesion w/cystic spaces
- Macular elevation



Are there any other tests you would perform?

Optical Coherence Tomography



Additional Testing

- FA demonstrates typical petaloid appearance
- No scanning lasers at the time

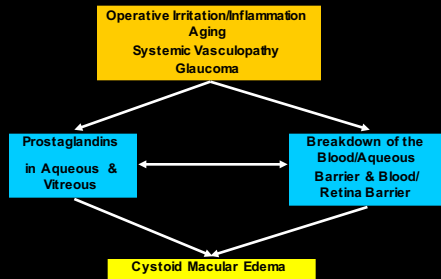


What is your assessment?

Irvine-Gass Syndrome

Post-operative Cystoid Macular Edema (CME)

Hypothesis of Mechanism



Adapted from Miyake K, et al. Jpn J Ophthalmol 2000;44:56-67.

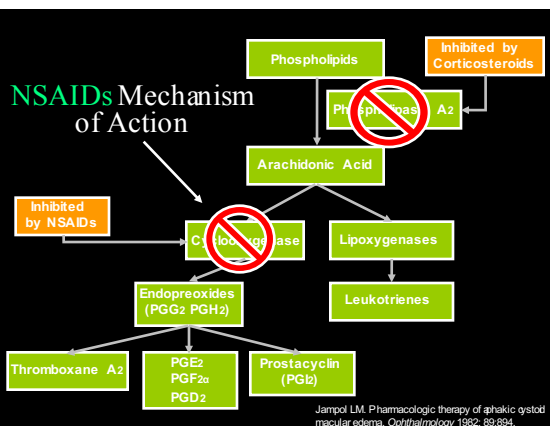
What is your plan?

Treatment of CME

- Topical NSAID x 2-3 mon
- Topical steroid
- **Topical NSAID + topical steroid**
- Periocular anti-inflammatory meds

Non-Steroidal Anti-Inflammatory Drugs (NSAID)

- Effective against mild/moderate ocular inflammation
- Used post-surgically
- Common ocular side effects
 - Injection
 - Burning/stinging on instillation
 - Dryness



Adverse Events Associated With Conventional NSAID Therapy

- Mild/Moderate corneal side effects¹:
 - Burning and irritation
 - Superficial punctate keratitis
 - Delayed wound healing
- Severe corneal issues²
 - Thinning
 - **Perforation due to melts**



1. Flach AJ. Topical nonsteroidal anti-inflammatory drugs in ophthalmology. J Ophthalmol Clin 2002;151:11-2. Math et al. ASCRS 2008.
2. Prescribing information VOLTAREN, AQUAR, AQUARIS.

NSAIDs

- **BROMDAY™**
- ISTA
- bromfenac ophthalmic solution 0.09%
- Once-a-day dosing
 - Begin on the day before cataract surgery through two weeks post-op.



NSAIDs

Prolensa (B&L)

bromfenac ophthalmic solution 0.07%

Formulation:

- Treatment of postoperative inflammation and reduction of ocular pain in patients who have undergone cataract surgery.
- **Once a day Dosing**



Ilevro New Generation Nepafenac

- Nepafenac
- 0.3% suspension
- 1 x/day dosing



NSAIDs: What's new?

Ilevro (Alcon)

Nepafenac Ophthalmic Suspension 0.3%

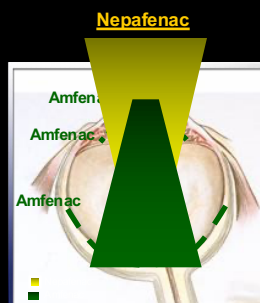
Formulation:

- Ophthalmic non-steroidal _____
- Preservative: 0.005% BAK
- pH: 7.4 (physiologic)
- **Once a day Dosing**



Novel Pro-Drug Structure

- **Optimizes Penetration**
 - Upon dosing, nepafenac rapidly penetrates the intraocular tissues¹
- **Target-Specific Efficacy**
 - Nepafenac is converted to **amfenac** for optimal efficacy²:
 - Cornea
 - Iris/CB
 - Retina/Choroid



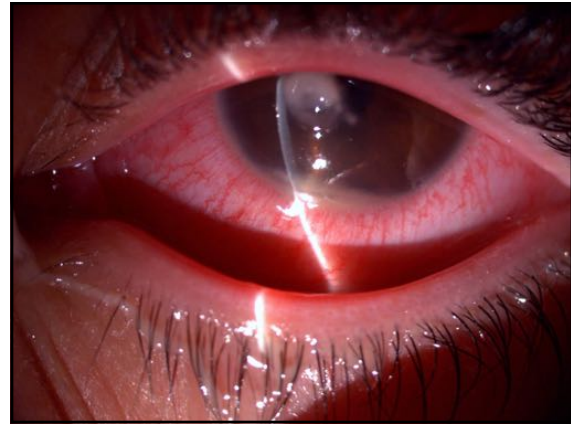
1. Ke, TL, et al, Inflammation, 2000;24(4):371-84.
2. Ke, TL, et al, Inflammation, 2000;24(4):371-84.

“New” (and old) NSAID

- Acuvail™ (Allergan)
 - Ketorolac tromethamine .45%
 - New formulation of Acular .5%
 - Preservative-free
 - FDA approved for pain, post-cataract Sx
 - Dosage is bid



Questions?

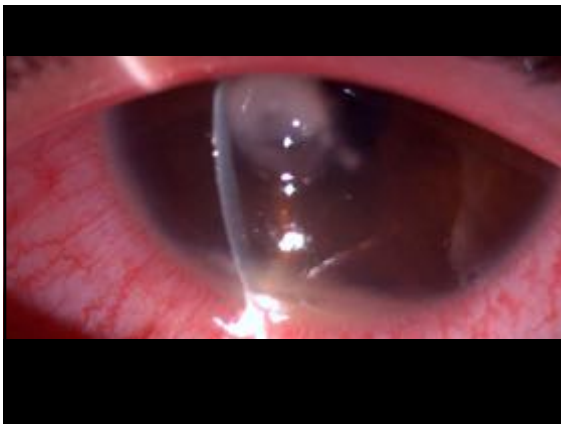


Describe That Image!



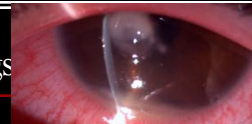
Objective Findings

- **VA:** c SRx OD 20/25 OS 20/80 PH NI
- **Pupils:** (-)APD, PERRLA
- **EOMS:** Smooth / Full
- **CF:** Full OD/OS
- **Lens, Vitreous:** Clear OD/OS
- **IOP:** 13 mm Hg OD, 12 mmHg OS



Objective Findings

- 3+ cell in AC OS
- Hypopyon
- Cornea epi defect w/dense, white infiltrate
 - Para-central location
 - Indistinct borders
 - Surrounding edema
- Mucopurulent discharge
- Posterior segment healthy OD/OS



Differential Diagnosis

- a. Interstitial Keratitis
- b. Bacterial Keratitis
- c. Acanthamoeba Keratitis
- d. Fungal Keratitis
- e. Herpetic Keratitis (HSV, HZV)

Differential Diagnosis

- a. Interstitial Keratitis
- b. Bacterial Keratitis
- c. Acanthamoeba Keratitis
- d. Fungal Keratitis
- e. Herpetic Keratitis (HSV, HZV)

What is your plan?

Treat or turf?

If you treat...

- Bacteriostatic – stops the growth / replication of the bacteria
- or
- Bactericidal – kills the bacteria

Choosing the Proper Drug Therapy

- Efficacy of Antibiosis
 - MIC = minimum inhibitory concentration
 - Lowest concentration that inhibits visible growth (growth-stopping)
 - Measures bacteriostatic activity of antimicrobials.
 - MBC = minimum bacteriocidal concentration
 - Lowest concentration that kills the microbe

Actual Plan

- Cornea consult same day (Why?)
 - Corneal scrapings performed
- Moxeza 1 gt q30min, Tobrex 1 gt q30min, Scopolamine .25% 1 gt tid
- Fortified AB?
- Daily follow-up
- Scrapings grew Pseudomonas

Bacterial Infection Management



When to Culture an Ulcer

- Infiltrate > 2mm w/epi defect
- Central or paracentral
- Significant tissue loss
- Hypopyon
- Suspect unusual organisms
- Poor response to initial AB therapy
- Post-op



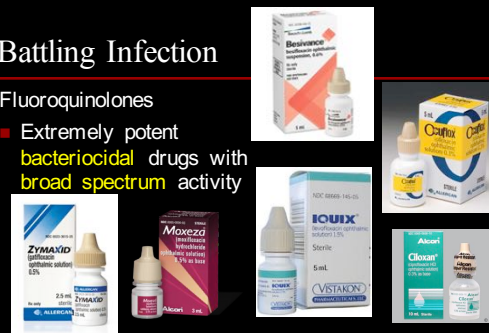
Topical Antibacterial Classes

- First-line Agents for Bacterial Infections
 - Fluoroquinolones eradicate a wide variety of ocular pathogens
 - Aminoglycosides provide broad spectrum coverage, slightly more effective against gram-negative bacteria
 - Polymyxin B combinations provide broad spectrum coverage
 - Macrolides provide broad spectrum coverage
 - Bacteriostatic

Battling Infection

Fluoroquinolones

- Extremely potent bacteriocidal drugs with broad spectrum activity



Fluoroquinolones

- Ciloxan (ciprofloxacin 0.3%, Alcon)
- Iquix (levofloxacin 1.5%, Vistakon)
- Ocuflox (ofloxacin 0.3%, Allergan)
- Quixin (levofloxacin 0.5%, Vistakon)
- Moxeza (moxifloxacin 0.5%, Alcon)
- Zymaxid (gatifloxacin 0.5%, Allergan)
- Besivance (besifloxacin 0.6%, B&L)

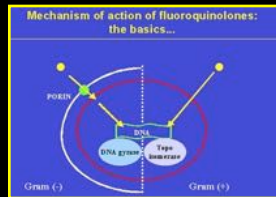
Third Generation FQ

- Levofloxacin 1.5%
- On-label Tx of BK



Fourth Generation FQs

- Interfere with 2 enzymes needed for bacterial DNA synthesis
 - DNA gyrase
 - Topoisomerase IV
- Thus, two separate mutations needed for resistance.



Fluoroquinolones

- Besifloxacin .6% susp
- FDA indication for bact. conj., including *Pseudomonas*
- Durasite vehicle
 - Lengthens ocular surface contact time
- No systemic counterpart; decreases resistance



Topical Anti-bacterials

- Moxeza (moxifloxacin .5%) Alcon
 - Xanthum gum vehicle
- Approved for 4 months of age and up
- Approved for bact. conj.
 - Dosed bid for 7 days
- Well-suited for keratitis



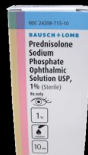
Topical Anti-bacterials

- Zymaxid (gatifloxacin .5%)
- Allergan increased conc. of Zymar (.3%)
- Approved for > 1 year old
- Approved for bact. conj.
- Well-suited for keratitis



Steroids and Bacterial Keratitis

- What does the evidence show?
- Steroids for Corneal Ulcers Trial (SCUT)
- No significant benefit overall
- May improve outcome in severe BK (*Pseudomonas*)
 - Add steroid after 24-48 hrs of FQ
- Not for *Nocardia* infection.
- Avoid steroid if:
 - Severe thinning
 - Large epi defect
 - Diabetes or immuno-suppression
 - Suspect Acanthamoeba, Fungi



WHAT'S NEW?

- Bacitracin is back!
- Fera Pharmaceuticals
- Polypeptide agent used for blepharitis (Staph)
- Indicated for superficial infections involving conjunctiva and/or cornea.
- Good for kids.



Other Antibiotic Ointments

- Ciprofloxacin 0.3%
- Polymyxin B/Bacitracin



Questions?



Case

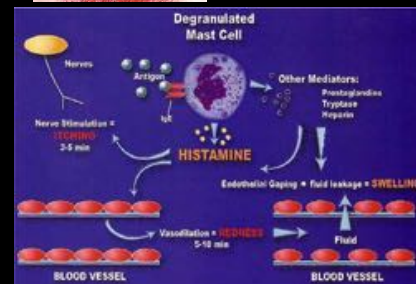
- A 25 year old male states that he has **hayfever** each **spring** and has been congested recently. He complains of **itchy**, red, watery eyes.
- DVA OD: 20/20
OS: 20/20
- Ocular assessment of the conjunctiva is remarkable for moderate redness and a watery/mucous discharge, no corneal staining

Seasonal Allergic Conjunctivitis



Case

- Diagnosis? Management?
- **Ocular allergy**
- Since he is symptomatic and reported seasonal recurrence, an **antihistamine with mast cell stabilizing properties** would provide both **immediate and long term** relief with continued use.



Allergic Conjunctivitis

TREATMENT

- Reassurance
- No rubbing!
- Avoidance
- Cold compresses
- Artificial tears
- **Olopatadine**
- **Ketotifen fumarate (OTC)**
- **Loteprednol**



Allergies

- Olopatadine .1 %
- Dual-action drug: Antihistamine/Mast Cell Stabilizer
- Very safe
- Very comfortable
- BID dosing or qd (Pataday .2%)



Allergies: Pazeo

- Olopatadine 0.7%
- PAZEO® Solution demonstrated statistically significantly improved relief of ocular itching compared to PATADAY® Solution at 24 hours post dose.



REFERENCE:
PAZEO® Solution Package Insert

Bepreve (ISTA Pharm)

- Bepotastine besilate ophthalmic solution 1.5%
- H-1 receptor antagonist
- Inhibitor of the release of histamine from mast cells.
- Bid dosing
- **10 ml bottle**
- Pregnancy Category C
- Approved for children >2 y/o



Lastacast

- **alcaftadine** .25% ophthalmic solution
- **once-daily use**
- H-1 receptor antagonist
 - H1, H2, and H4
- Inhibitor of the release of histamine from mast cells.
- Pregnancy **Category B**
- Approved for children >2 y/o



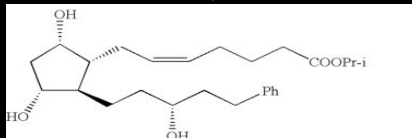
PROSTAGLANDINS

- PG History
 - XALATAN (1996)
 - TRAVATAN (2001)
 - LUMIGAN (2001)
 - TRAVATAN-Z (2006)



Prostaglandins

- Lipid compounds derived enzymatically from fatty acids
- Contain 20 carbon atoms, including a 5-carbon ring.



Prostaglandins

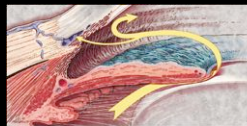
- Latanoprost .005%
 - Lost patent protection in 2011
- Travoprost-Z .004%
- Bimatoprost .01%



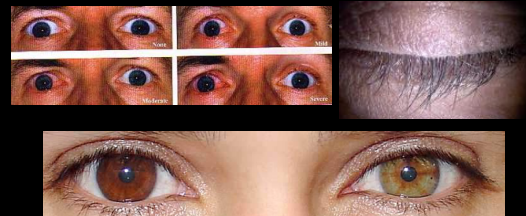
- Prostaglandins have negligible effects on heart rate and blood pressure**

PROSTAGLANDINS

- Mechanism
 - Enhances uveoscleral outflow
- Efficacy
 - 27-34% reduction of IOP
 - IOP reduction starts in 3-4 hours
 - Maximum effect after 8-12 hours
- Dosing
 - Once a day

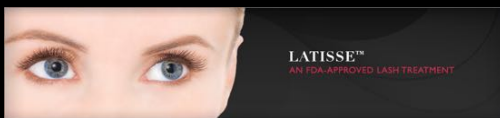


SIDE EFFECTS



Want longer lashes?

Latisse
bimatoprost ophthalmic solution 0.03%



LATISSE™
AN FDA-APPROVED LASH TREATMENT

LATISSE solution is a prescription treatment for hypotrichosis

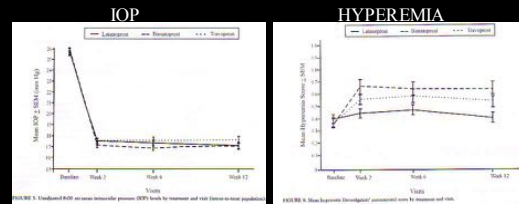
PG CONTRAINDICATIONS



IS THERE A DIFFERENCE?



IS THERE A DIFFERENCE?



XLT STUDY
Parrish RK, ET AL. AJO. May 2003: 688-703

IOP-Lowering Meds

- TRAVOPROST-Z .004% (2006)
 - NO BAK
 - SofZia
 - LESS HYPEREMIA
 - LESS CORNEAL TOXICITY
 - STATISTICALLY EQUIVALENT IOP REDUCTION
- INSTILLATION AIDS
- FUTURE USE IN COMBOS



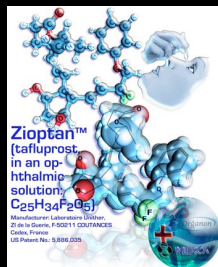
Bimatoprost w/less hyperemia

- Lumigan .01%
 - Optimized formulation with a reduced concentration of bimatoprost.



WHAT'S NEW?

- FDA Approves ZIOPTAN™ (Merck)
- **tafluprost** ophthalmic solution
- Once-Daily
- **Preservative-Free**



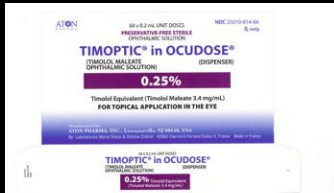
Nonselective Beta-Blockers

- Timolols (maleate, hemi-hydrate)
 - timolol hemi-hydrate 0.25% or 0.5%
- Levobunolol HCl (Betagan)
 - 0.25% or 0.5%
- **Most cost-effective IOP meds**
- **Aqueous produced in NPCE***



WHAT'S NEW?

- Non-preserved Timolol maleate (Aton)
- .25%, .5%



Questions?



Dry Eye Treatment

- Artificial tears Tx is the mainstay of **initial** topical management
 - preservative free vs. preserved
 - **lipid-based**
 - low viscosity (thinner consistency)
 - medium viscosity (medium consistency)
 - high viscosity (thick consistency)
 - ointments

Lipid Layer Enhancement

- Systane Balance (Alcon)
- For evaporative dry eye secondary to MGD
- Enhancement of lipid layer
- Propylene Glycol 0.6%
- Mineral oils
- Oil in water emulsion
- **LipiTech System and demulcent**



It's Back...Soothe XP

Evaporative dry eye syndrome becomes symptomatic when **the lipid** element of the tears fails to maintain a smooth outer surface of the tear film.



Aqueous and Mucin Enhancement

- Soothe Xtra Hydration (Bausch and Lomb)
- For aqueous-deficient dry eye
- Claims enhancement of aqueous and mucin layers



Rx. Dry Eye Therapy

- "Light" topical steroids trial
 - Flarex ® (FML)
 - Lotemax ® (loteprednol)
- Other immunomodulators
 - Restasis ® (cyclosporine A 0.05% ophthalmic emulsion)
 - Xiidra ® (lifitegrast 5% ophthalmic solution)
 - Both these agents are immunomodulators that reduce inflammation at the ocular surface

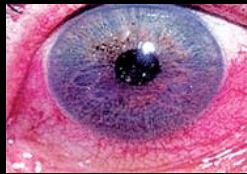
Dry Eye Treatment

- Cyclosporine 0.05% (Restasis)
 - Ophthalmic emulsion
 - Provides anti-inflammatory effects for ocular surface tissues and lacrimal glands
 - Requires 3-4 months of continuous use to reach clinically significant effects and up to 6 months to achieve full therapeutic effects



Cyclosporine emulsion .05%

- RESTASIS® is not a quick fix and may take some time for maximum effect.
- Give it 3 months



Lifitegrast (Shire)

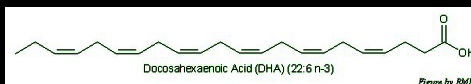


- Lifitegrast binds to the integrin lymphocyte function-associated antigen-1 (LFA-1), a cell surface protein found on leukocytes.
- It blocks the interaction of LFA-1 with intercellular adhesion molecule-1 (ICAM-1). ICAM-1 is over-expressed in corneal and conjunctival tissues in dry eye disease.



Omega-3 Fatty Acids

- Decrease inflammation
- Decrease apoptosis
- Increase tear secretion
- 1-4g/day



Summary

- Effective pharmacotherapy depends on timely diagnosis.
- The ideal topical drug is potent, easy to dose/administer, and cost effective with minimal SEs.
- By staying current, you can better serve your patients and profession.



- "With great power comes great responsibility."
 - Uncle Ben in Spiderman
- Prescribe wisely!

Thanks
and
all that Jazz!



• Joe Pizzimenti pizzimen@uiwtx.edu