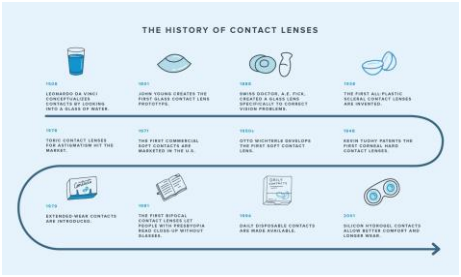
Symposium on Ocular Disease
Sunday AM Session

Hosted by Dr. Deepak Gupta
deegup4919@hotmail.com

Dr. Gupta is not a member of any speakers bureau nor does he get paid by any company mentioned in the lecture

CL Now vs Then



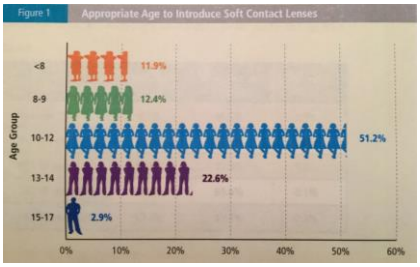
Now



Back Then

- Average age that we fit patients with a CL 30 years ago was 16

At what age would you fit a patient with CL now?



Back Then:
For your presbyopic patients

- Distance only CL with reading glasses
- Monovision

Now

- Multifocal CL



Excuses for not fitting

- Poor optics
- Increased chair time

Poor Optics

- Also easy to fix:
- Set the proper expectations for your patient:
  - Would you be able to accept a CL that meets 80% of your visual needs?

The most important factor is patient selection

Don't pick the Type A personality

Other People to Rule Out

- Patients who are not 20/20 in both eyes are generally bad candidates
- Don't pick someone with .75 D cyl or more
- Low refractive errors are generally poor candidates

Early Presbyopic Patients

- Do well with most major brands
- Relatively easy to achieve binocular vision with contacts
- This will work for the first decade of presbyopia

My protocol

- Patient wants better distance: Two “D” lenses
- Patients wants better reading: Two “N” lenses

For patients that want it all…

- Unequal adds
- Modified monovision
  - Distance in dominant eye
  - Multifocal CL in non-dominant eye

Pharm for Presbyopia

- **Vuity (pilocarpine HCl 1.25%):** The first approved drop, lasting 6 to 9 hours with once or twice-daily dosing.
- **Qlosi (pilocarpine HCl 0.4%):** A lower-dose, preservative-free formula designed for flexible daily use.
- **VIZZ (aceclidine 1.44%):** A once-daily, preservative-free drop that targets the pupil with minimal ciliary muscle impact, lasting up to 10 hours.
- **YUVEZZI (carbachol and brimonidine tartrate):** A once-daily combination drop approved to optimize pupil constriction while reducing side effects.

How they work

- They contract the iris sphincter muscle to reduce pupil size, increasing depth of focus much like squinting.
- **Candidate fit:** They work best for mild-to-moderate presbyopia, typically in adults aged 40 to 55.
- **Side effects:** Common issues include mild headache, eye irritation, and temporary difficulty seeing in dim or dark lighting.

- Risk of RD is 0.50% -- usually within first 2-3 months of starting eyedrops

If you write these prescriptons…

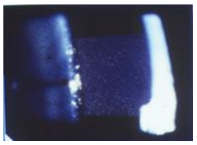
- See the patient more than once a year
  - Dilated exam 2-3 months after starting
  - Dilated exam q 6 months

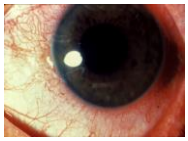
Pt come comes in for emergency visit with red eye irritated eyes

Red Eye Emergencies: Things to quickly rule out

- Iritis
- Acute angle closure glaucoma
- Corneal ulcer
- Herpetic infection
- Fungal infection
- Corneal FB/Penetrating injury

Diagnosing Iritis





- Dull ache
- Photophobia
- Cells and flare
- Ciliary flush
- KP

Work up

VA

SLE

Dilated exam !

What percentage of uveitis has posterior involvement?

20%

Treatment

1. Cyclogyl 2% or Scopolamine .25% or Atropine 1%
2. Topical Steroid – Pred Forte or Durezol

When you are done…

- Taper slowly

- QID x 1 week
- TID x 1week
- BID x 1week
- QD x 1week

Textbook: Herpes Simplex

ACG



- Pt complaint of dull ache
- Steamy Cornea
- Mid fixed dilated pupil
- Elevated IOP

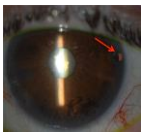
ST: Treatment of ACG

PACG : Treatment of the acute attack

- Pilocarpine eye drop 1-2% in the affected and the fellow eye
- Topical beta-adrenergic blocker
- Carbonic anhydrase inhibitor

Long Term – PI Procedure





How to rule out ocular penetration

- History
- SLE Exam – Seidel's sign
- Dilation
- IOP

Did you know that there are 2 million eye infections a year?

3 main type of conjunctivitis

- Bacterial
- Allergic
- Viral

What is the most important risk factor for bacterial conjunctivitis

Wearing contact lenses

Bacterial Conjunctivitis

- **What's usually not part of diagnosis ?**
  – **CULTURING**

When to Culture

- When something in history or exam seems out of the ordinary
- When patient fails to get better

Antibacterial agents

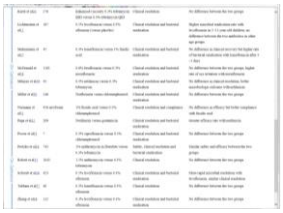
- Sulfa Preparations
- Erythromycin
- Bacitracin
- Bacitracin / Polymyxin B
- Bacitracin / Polymyxin B / Neomycin
- Tetracycline
- Gentamycin
- Tobramycin
- Trimethoprim / Polymyxin B

Which Antibiotic is the best?

What is the proper dosing?

- QD
- BID
- TID
- QID

How important is our choice of Antibiotic?



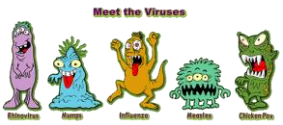
Clinical Ophthalmology 2010; 4:1451-1457

What happens if we do nothing in bacterial conjunctivitis?

Treating with placebo results in “cure” in 65% of patients with 2-5 days

2 Most Common Viruses We See

- **Herpes Simplex**
- **Advenoviruses**



How you manage Adenoviruses? depends on if you are…

- **Conservative**
- **Liberal**
- **Progressive**

Conservative

- Usually self-limiting
- Warn patient about infectious nature
- OTC lubricants and cool compresses

Liberal

- Rx: Zylet or Tobradex QID
- See patient for follow-up in 7-10 days and then discontinue medication if totally resolved

Progressive

Herpes Simplex

Zirgan (Ganciclovir)



- Formulated as gel, not solution
- Targets only infected cells
- Recommended dosing 5x/day
- Being used off-label for adenoviruses

Why use orals?

- To treat severe disease
- To prevent recurrence
- Must be initiated within 48 hours of onset of rash in order to be effective and prevent post herpetic neuralgia

Allergic Conjunctivitis

Almost all treatments are now OTC

- Patanol and Pataday
- Zaditor
- Lastacaft

Steroids and Allergic Conjunctivitis

- **Soft steroids such as Alrex or Lotemax work well**

Rx: Alrex and combination product together

D/C Alrex after 1-2 weeks and keep combination for LT therapy

Steroids…

- Decrease Inflammation
- Prevent Scarring
- Increase patient comfort

What is the most potent topical steroid?

Difluprednate (Durezol)



- **First emulsion formulation of a steroid**
- **Ketone based product of Prednisilone**
- **Equal efficacy of Pred with half of the dosing**

What is the safest topical steroid?

Lotemax gel

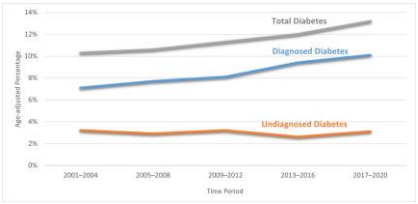
- Loteprednol 0.5%
- Same active ingredients as drops but now you don't need to shake bottle since its' not a suspension

When prescribing steroids…

- Always document baseline IOP and IOP at follow up
- Always write on the Rx "discard unused portion"

Diabetes Mellitus

39 million people have diabetes in the U.S.



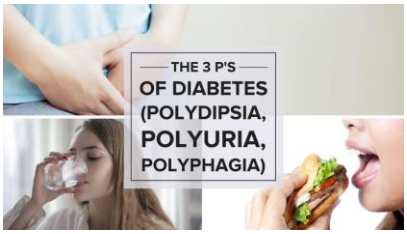
Type 1 Diabetes

- Auto immune disease
- Insulin therapy is required
- Usually diagnosed earlier in life
- Usually abrupt emergence of symptoms

Type 2 Diabetes

- The most common form
- Gradual onset of symptoms
- Usually diagnosed later in life

3 classic symptoms of DM



2 values to ask every diabetic patient

- Fasting blood glucose
  - < 100 is normal
  - Between 100 and 125 is borderline
  - > 126 suggestive of Diabetes

2 values to ask every diabetic patient

- Reflects the percentage of free glucose bound to hemoglobin in RBC

2 values to ask every diabetic patient

- Glycosylated hemoglobin
  - < 5.6% is normal
  - Between 5.7 to 6.4% is borderline
  - > 6.5% is diabetic

Treatment

- Diet changes
- Exercise

- Oral Medications
- Insulin

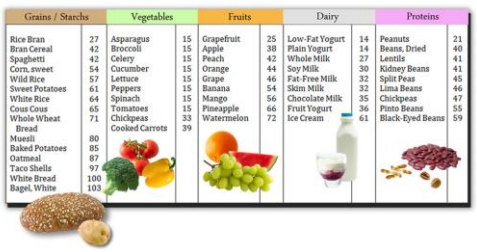
Diet changes

- Lifestyle changes are as important as medications
- Take a walk anytime after eating – lowers blood glucose 20%

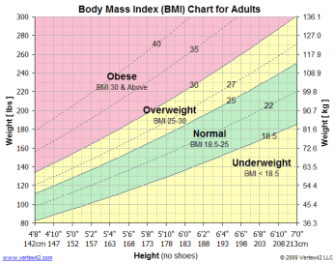
Glycemic Index

Low GI (<55), Medium GI (56-69) and High GI (70>)

Grains / Starchs		Vegetables		Fruits		Dairy		Proteins	
Rice Bran	27	Asparagus	15	Grapefruit	25	Low-Fat Yogurt	14	Peanuts	21
Bran Cereal	42	Broccoli	15	Apple	38	Plain Yogurt	14	Beans, Dried	40
Spaghetti	42	Celery	15	Peach	42	Whole Milk	27	Lentils	41
Corn, sweet	54	Cucumber	15	Orange	44	Soy Milk	30	Kidney Beans	41
Wild Rice	57	Lettuce	15	Grape	46	Fat-Free Milk	32	Split Peas	45
Sweet Potatoes	61	Peppers	15	Banana	54	Skim Milk	32	Lima Beans	46
White Rice	64	Spinach	15	Mango	56	Chocolate Milk	35	Chickpeas	47
Cous Cous	65	Tomatoes	15	Pineapple	66	Fruit Yogurt	36	Pinto Beans	55
Whole Wheat Bread	71	Chickpeas	33	Watermelon	72	Ice Cream	61	Black-Eyed Beans	59
Muesli	80	Cooked Carrots	39						
Baked Potatoes	85								
Oatmeal	87								
Taco Shells	97								
White Bread	100								
Bagel, White	103								



Lose Weight: What is normal BMI?



Your role in Diabetic Retinopathy

- See if patient has it
- If BDR, decide testing and frequency of monitoring
- If proliferative, decide the urgency of referral to retinal specialist

Eye Exam Recommendations

If you take vision plans:

2 visits a year

1 – vision plan (undilated)

2 – dilated exam billed to medical

What is normal BP?

- Systolic = 120 mm Hg
- Diastolic = 80 mm Hg

Categories of BP in Adults*

BP Category	SBP		DBP
Normal	<120 mm Hg	and	<80 mm Hg
Elevated	120–129 mm Hg	and	<80 mm Hg
Hypertension			
Stage 1	130–139 mm Hg	or	80–89 mm Hg
Stage 2	≥140 mm Hg	or	≥90 mm Hg

What is emergency criteria for HTN?

- Systolic pressure over 180
- Diastolic pressure over 120

Treatment

- Lifestyle Changes
- Diet
- Medications

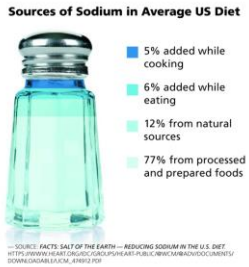
Lifestyle Modifications

- Lose weight
- Quit smoking
- Exercise

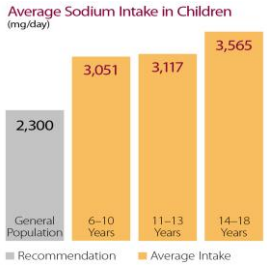
Sodium consumption and BP

- How much do we actually need?
- 180 mg
- How much is adult daily recommended amount?
- 1500 mg

Where does the sodium come from?



How much do we actually consume?



Grades of HTN Retinopathy

- Grade 1
  - Vascular Attenuation
- Grade 2
  - As grade 1 + Irregularly located, tight constrictions - Known as `AV nicking` or `AV nipping` - Salu's Sign
- Grade 3
  - As grade 2 + Retinal edema, CWS and flame-hemorrhages 'Copper Wiring' + Bonnet's Sign + Gunn's Sign
- Grade 4
  - As grade 3 + optic disc edema + macular star ' Silver Wiring '

How many people with HTN have ocular manifestations?

80%

If your patient has HTN retinopathy

- Perform fundus photography
  - Helps with patient education
  - Documents your findings
  - Increases revenue for your practice

Thyroid and TED

When things go wrong

- Hyperthyroid – 90 % of cases
- Hypothyroid – 10 %

Lab Testing

- Three primary tests:
  - TSH
  - T3
  - Free T4
- TSH is produced by pituitary gland
- Thyroid Gland Produces T4 which is converted to T3
- Alterations in hormonal balance can cause problems to arise

Hyperthyroidism

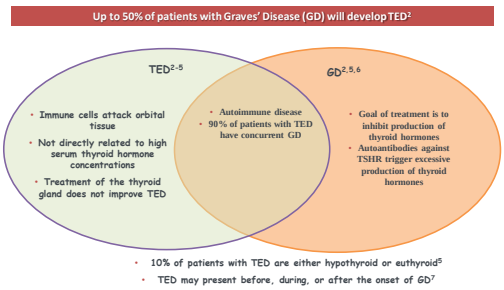
- Leads to cell growth
- Signs/symptoms:
  - Increased heart rate with palpitations
  - Increased respiratory rate
  - Diarrhea
  - Increased metabolism leading to resorption of bone and fat

Hypothyroidism

- Fatigue
- Weight gain
- Gastric dysfunction

Ocular Complications

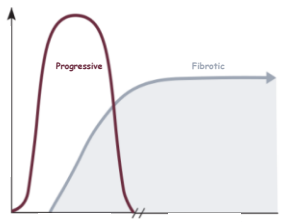
TED is the Most Common Extrathyroidal Manifestation of Graves' Disease[1]



1. Gillespie EF, et al. *Curr Neurol Neurosci Rep.* 2012;12(1):118-124. 2. Bahn RS. *N Engl J Med.* 2010;362(8):726-738. 3. Tallstedt L, et al. *N Engl J Med.* 1992;326(26):1733-1738. 4. Gorman CA, et al. *JAMA.* 1982;247(1):333-2338. 5. Rumley GR, et al. *Am J Ophthalmol.* 1996;121(6):626-634. 6. Menconi F, et al. *Autoimmun Rev.* 2014;13(4-5):398-402. 7. Eckstein AK, et al. *Br J Ophthalmol.* 2006;90(8):1052-1054.

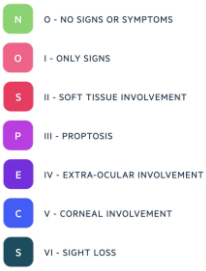
Inflammation During Progressive TED Advances to Chronic Fibrosis[1]

- Progressive (active), inflammatory phase of TED can last up to 3 years[1,2]
- Patients eventually progress to the fibrotic (inactive) phase of TED, which is characterized by irreversible fibrosis[1]
- Fibrosis begins during the progressive (active) phase and leads to the lasting sequelae associated with permanent disfigurement and functional visual impairment[1,3]



1. Bhatti MT, et al. *J Neuroophthalmol.* 2014;34(2):186-197. 2. Barrio-Barrio J, et al. *Ophthalmol.* 2015;2015:249125. 3. Bartlun ED, et al. *Clin Ophthalmol.* 2009;3:543-551.

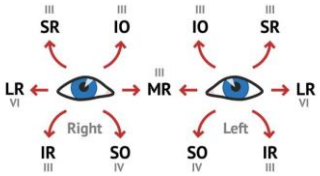
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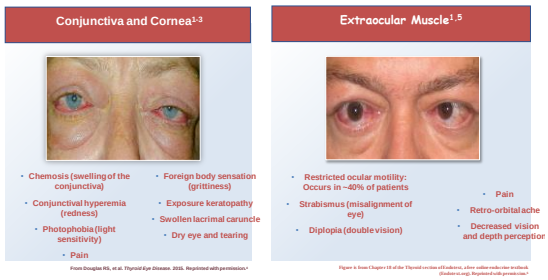
CAS

Table 1. CAS Scoring		
Pain	1	Pain behind the eye (in the last four weeks)
	2	Pain on eye movement (in the last four weeks)
Redness	3	Eyelid hyperemia
	4	Conjunctival hyperemia in more than one quadrant
Swelling	5	Eyelid edema
	6	Chemosis
	7	Swelling of the caruncle
Impaired function	8	Increase in proptosis ≥2mm over one to three months
	9	Decrease in motility in any direction ≥5° over one to three months
	10	Decrease in visual acuity >one line on Snellen

Basic Sensory motor exam



Ongoing Inflammation and Expansion of Orbital Tissues Leads to Changes in Physical Appearance



From Douglas RS, et al. *Thyroid Eye Disease*. 2015. Reprinted with permission.[4]

Figure 4 from Chapter 18 of the Thyroid section of Endotext, a free online endocrine textbook (Endotext.org). Reprinted with permission.[5]

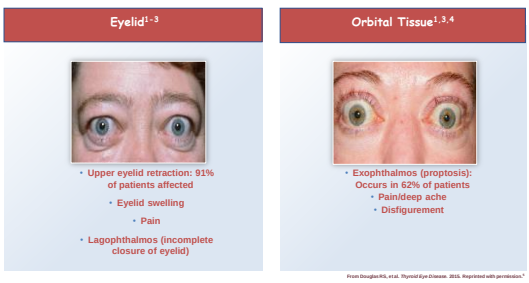
94

1. Rudnas ED, et al. Clin Ophthalmol. 2009;3:543-551. 2. Rubin RS. *N Engl J Med*. 2018;362:726-738. 3. Lisbon C, et al. EyeRounds.org. https://webeye.ophth.uiowa.edu/eyeforum/tutorials/thyroid-eye-disease/. Published November 18, 2016. Accessed March 26, 2019. 4. Douglas RS, et al. *Thyroid Eye Disease*. New York: Springer Science+Business Media; 2015. 5. Bartley GB, et al. *Am J Ophthalmol*. 1996;121(4):426-434. 6. Bartalena L. Graves' disease: complications. In: Feingold KR, Anawalt B, Boyce A, et al., eds. *Endotext*. South Dartmouth, MA: MDText.com Inc; 2000.

Hertel Exophthalmometry



Recognizing the Signs and Symptoms of TED



From Douglas RS, et al. *Thyroid Eye Disease*. 2015. Reprinted with permission.[4]

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1. Rudnas ED, et al. Clin Ophthalmol. 2009;3:543-551. 2. Lisbon C, et al. EyeRounds.org. https://webeye.ophth.uiowa.edu/eyeforum/tutorials/thyroid-eye-disease/. Published November 18, 2016. Accessed March 26, 2019. 3. Bartley GB, et al. Am J Ophthalmol. 1996;121(4):426-434. 4. Rubin RS. *N Engl J Med*. 2018;362:726-738. 5. Douglas RS, McCoy A, Gupta S. *Thyroid Eye Disease*. New York: Springer Science+Business Media; 2015.

Scleral Show



Be diligent about TED

- In general, once the ocular manifestations show up, they don't go away even with the systemic disease gets under control

Treatment of hyperthyroidism

- Oral antithyroid medication – methimazole, propylthiouracil
- Radioactive iodine
- Surgical thyroidectomy

Treatment of hypothyroidism

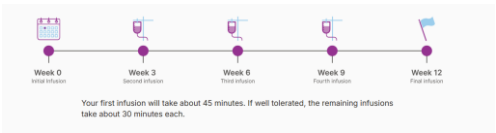
- Synthroid –



Treatment of hypothyroidism



Dosing of Lumvoa



How Lumvoa works

Lumvoa's mechanism of action is not fully understood, and is based on laboratory studies.

- In TED, the body's immune system mistakenly attacks the muscle and fat tissue around the eyes. This can cause swelling, inflammation, and a buildup of tissue around the eyes
- Lumvoa is designed to block signals on cells that play an important role in driving the inflammation and tissue changes seen in TED
- By blocking this signal, inflammation and swelling behind the eyes may decrease and improve symptoms

The primary measurement of the study: how does Lumvoa affect eye bulging (proptosis)?

Less eye bulging (proptosis)

In active TED, improvement of eye bulging was seen at Week 15

70% of people taking Lumvoa had reduced eye bulging at 15 weeks vs 5% with placebo*

(Lumvoa n=75 Placebo n=38)

Some people saw improvement of eye bulging as early as Week 3

About 70% of people who had reduced eye bulging at 15 weeks maintained their improvement at 52 weeks

A secondary measurement of the study: how does Lumvoa affect double vision (diplopia)?

Improvement in double vision (diplopia)†

59% of people taking Lumvoa experienced improvement in double vision at 15 weeks vs 20% with placebo

(Lumvoa n=50 Placebo n=26)

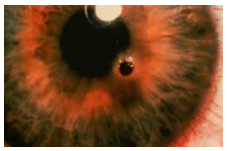
Double vision completely went away at 15 weeks in

49% of people taking Lumvoa vs 12% with placebo

How to use this info?

- Discuss with patients with TED and/or Grave's disease
- Ask patient to ask their PMD about it

Rust ring secondary to metallic Corneal Foreign Body



How much do you remove?

- None
- All
- Somewhere in between

Do you need to get it all?

- Depends on who you ask?
- My general rule: Get roughly 80% or as much as I can in 2 separate visits
- Use Alger brush if possible

Rust ring secondary to metallic Corneal Foreign Body

Must get it out or run the risk of corneal neovascularization



Muro 128

Recurren Corneal Erosion

What are management options?

Bandage CL

PTK



Anterior Stromal Puncture

Doxycycline

- 50 to 100 mg BID
- What do you need to educate patients on?
  - Sunlight exposure
  - GI issues
  - Women: Interfere with BCP

Superficial keratectomy

- Use anesthetic and eye spear to smooth out edges of abrasion



Amniotic membrane

Amniotic membrane is an avascular fetal membrane that lies deep to the chorion and is harvested in a sterile environment from placental tissue obtained during elective cesarean sections.

Donors are screened for transmissible diseases, and the AM is further treated with broad-spectrum antibiotics immediately after collection.

Beneficial Properties of AM

- Acts as a physical barrier to protect conjunctival and corneal epithelium as it heals, and it reduces pain caused by friction of the eyelids over the surface.
- The AM basement membrane promotes epithelial growth through cell migration, adhesion, and differentiation, while also inhibiting cell death.
- The stroma of AM, which contains fetal hyaluronic acid, inhibits fibroblast growth and reduces inflammation through decreased expression of cytokines.

Types of AM on the market

- **Cryopreserved AM.** Involves slow freezing at –80°C using DMEM/glycerol preservation media to allow for slow-rate freezing without ice formation. Example ProKera (BioTissue)
- **Dehydrated AM.** Dehydrated AM is preserved using vacuum with low temperature heat to retain devitalized cellular components. FDA-approved claims for this type of AM are limited to wound coverage. Must be rehydrated for clinical use. Example AmbioDisk (IOP Ophthalmics)

.

After insertion

- Usually follow up in 4-6 days for removal
- Can still Rx antibiotics and/or topical steroids if needed

Dehydrated AM

- Problem: They decenter sometimes
- Solution: Apply an EW SCL over it
- Advantage of dehydrated AM: Cheaper

Dry Eye Disease

- Roughly 20 million people in U.S.

1st Line Defense…



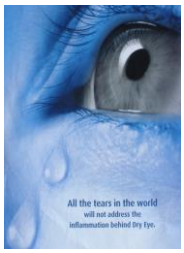
What can we do?

- Punctal plugs
- Lotemax
- Warm compresses
- Biologics
- Humidfiers
- Lacrisert

Types of plugs

- Temporary (5 to 7 days)
- Semi-permanent
- Permanent

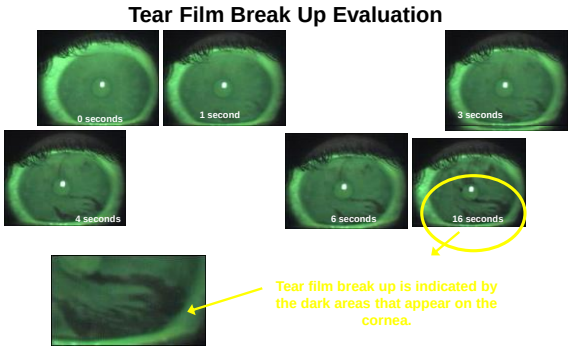
Lotemax (Loteprednol) and Dry Eyes



- **Short-term pulse therapy**

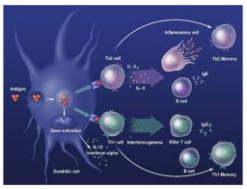
Miebo

- Indicated for evaporative Dry Eye Disease
- Rx product: QID
- Key: Confirm that your patient has evaporative dry eye



Restasis(Cyclosporin)

Mechanism of Action



- **Activated T cells produce cytokines that result in**
- **Increased cytokine production**
- **Neural signal to lacrimal gland that disrupts production of natural tears**

Xiidra (Lifitegrast)

- Works by interfering with T-cells so decreases their impact on the lacrimal gland trying to restore their normal function
- Patients demonstrate improvement as early as 4-6 weeks

Also… Cequa

- Basically another version of Restasis
- = .09% cyclosporine A
- BID dosing
- By Sun pharmaceuticals