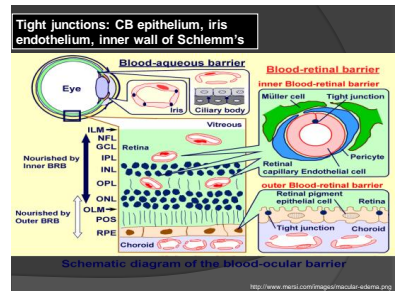
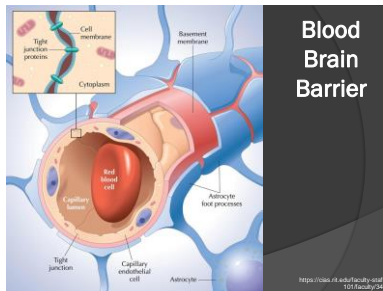
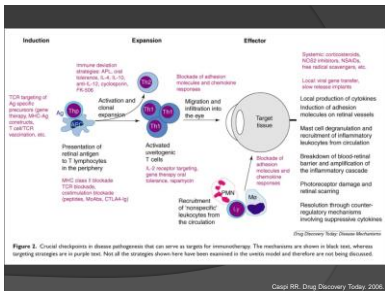




- ### Introduction
- UC Berkeley School of Optometry 2008
  - San Francisco VA Residency 2009
  - VA Staff Optometrist – teaching
  - Regular lecturer at AAO and other meetings
  - No conflicts of interest

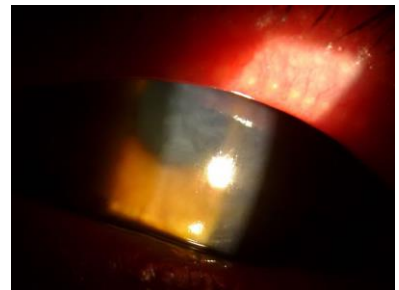
- ### Epidemiology
- 30K cases of new blindness annually in US
    - 10-20% of blindness in US
  - Incidence
    - 17 - 52.4 per 100K person-years
    - 0.2% in general population (Wills)
    - Peak incidence 20-60 y/o, but >65 y/o Northern CA
  - Prevalence
    - 38 - 370 per 100K persons, but 115.3 in Northern CA
  - Females-Males

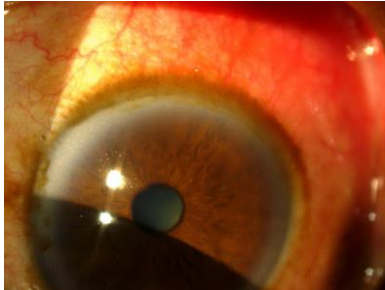
Chang JH, et al. Survey of Ophthalmology. 2005; 40:364-88. Gritz DC, Wong IG. Ophthalmology. 2004; 111(5):491-500. Salim C. Autoimmun. Rev. 2014; Apr; 13(4):591-4. Galbraith JF, Hall AJ. Clin Exp Ophthalmol. 2007; Mar; 35(2):76-82.



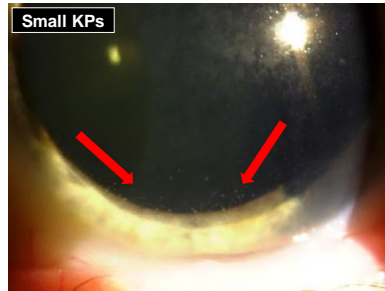
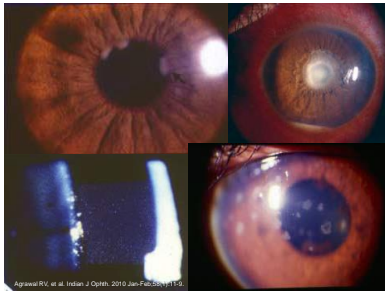
- ### Ocular Immunity
- Immune privilege
    - Blood-eye barriers
    - Minimal lymphatic drainage
    - Little MHC expression
    - Proteins to inhibit immune response
  - Anterior Chamber-Associated Immune Deviation (ACAID)
    - Different immune response than in body
    - Antigens can be tolerated

- ### Presenting Symptoms
- Conjunctival hyperemia
  - Blurry vision
  - Photophobia
  - Periorbital pain
  - Floater
  - Headaches
  - Watery eyes
- How do you go through the differential diagnosis?

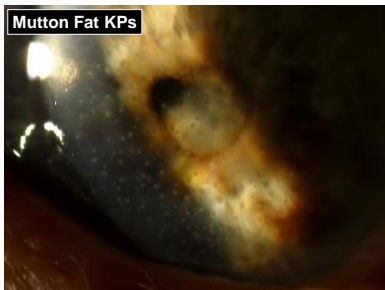




- ### Additional Signs
- ⦿ Corneal edema
  - ⦿ AC cells/flare
  - ⦿ KPs
  - ⦿ Miotic or mid-dilated pupils
  - ⦿ Posterior synechiae or PAS
  - ⦿ IOP changes
  - ⦿ Iris nodules
  - ⦿ Hypopyon



- ### Keratic Precipitates
- ⦿ White cells (leukocytes) on corneal endothelium
  - ⦿ Inferior, Arlt's triangle, concentrated, or diffuse
  - ⦿ Usually resolve after treatment
  - ⦿ Older KPs can be pigmented



- ### Mutton Fat KPs
- ⦿ Larger, greasy-white
  - ⦿ Macrophages and epithelioid cells
  - ⦿ Granulomatous uveitis



### Hypopyon

- ◉ Marker of severe inflammation; uncommon
- ◉ Layered WBCs in anterior chamber
- ◉ Risk factors: HLA-B27+, Behcet's, or spondyloarthropathy
- ◉ Resolves with treatment (specialist)
- ◉ Outcomes similar to those w/o hypopyon

Zaidi AA, et al. Ophthalmol 2015.

### Classification

- ◉ International Uveitis Study Group (IUSG)
  - 1987
- ◉ International Ocular Inflammation Society (IOIS)
  - 1998-2000
- ◉ Standardization of Uveitis Nomenclature (SUN)
  - 2004

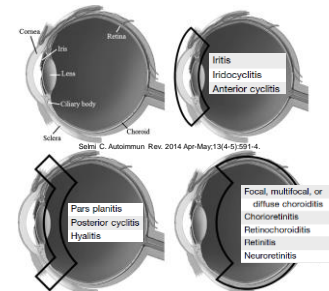
### Standardization of Uveitis Nomenclature (SUN)

- ◉ Started in 2004
- ◉ Worldwide experts
- ◉ Benefits include:
  - Type is determined by predominant site of inflammation
  - Helps narrow differential dx
  - Other complications don't influence type
  - CME doesn't necessarily mean posterior

### SUN classification

- ◉ Anterior (50-90% of cases) = seen in AC
  - Iris and ciliary body (CB)
- ◉ Intermediate = seen in vitreous
  - CB and pars plana
- ◉ Posterior = seen in retina or choroid
- ◉ Panuveitis = all

Selro C. Autoimmun Rev. 2014 Apr-May;13(4-5):591-4. SUN Working Group. J Ophthalmol. 2005.



### SUN Classification

- ◉ Onset
  - Sudden or insidious
- ◉ Duration
  - Limited (<3m) or persistent (>3m)
- ◉ Course
  - Acute – sudden and limited
  - Chronic – persistent >3m
  - Recurrent – repeated after 3m w/o tx

SUN Working Group. J Ophthalmol. 2005.

### Anterior Chamber Cells

Grade	Cells in Field
0	< 1
0.5+	1 – 5
1+	6 – 15
2+	16 – 25
3+	26 – 50
4+	50+

**1mm x 1mm, high-intensity beam**

SUN Working Group. J Ophthalmol. 2005.

### Anterior Chamber Flare

Grade	Description
0	None
1+	Faint
2+	Moderate (iris/lens clear)
3+	Marked (iris/lens hazy)
4+	Intense (fibrin/plastic aqueous)

SUN Working Group. J Ophthalmol. 2005.

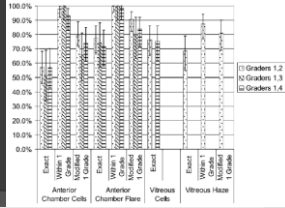
### Significance of Flare?

- Retrospective review
- 198 eyes of 114 children at Jules Stein
- Laser photometry to quantify flare
- Flare related to: AC cells, KPs, band K, synechiae, and cataract
- Flare is not a function of disease duration
- High flare is associated with vision loss

Holland, G. *Trans Am Ophthalmol Soc* / Vol 105/2007

### Interobserver Agreement in Grading Activity and Site of Inflammation in Eyes of Patients with Uveitis

JOHN H. KEMPEL, SUDHA K. GANESH, VIRENDER S. SANGWAN, AND SIVAKUMAR R. BATHINAM



### Interobserver Grading

- AC cells
    - Exact agreement: 51.4 – 57%
    - Within 1 grade: 93.1 – 100%
  - AC flare
    - Exact agreement: 71.4 – 77.4%
    - Within 1 grade: 98.2 – 100%
  - Vitreous cells
    - Exact agreement: 75.4 – 76.4%
- True change = more than 1 grade**

Kempel, JH, et al. *Ophthalmology* 2008;116:813-818

### Considerations

- Instrument variation
- Observer examination technique
- AC chamber depth
- Cell variations in different parts of AC
- Impact of NaFl on grading flare
- Media effects on vitreous haze
- Vitreous structure and cell location

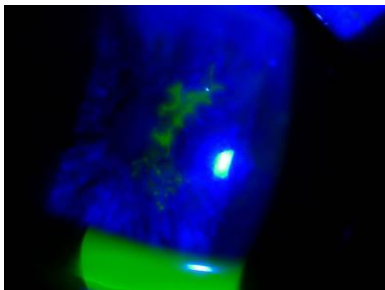
Kempel, JH, et al. *Ophthalmology* 2008;116:813-818

### Uveitis Causes

- Idiopathic
- Traumatic/Surgical
- Autoimmune
  - JIA/AS/Behcet's
  - Ulcerative colitis
  - Reiter's syndrome
  - Lens induced
- Drug induced
- Masqueraders
- Infectious
  - Syphilis
  - TB
  - HSV/VZV
  - Adenovirus
  - Toxo, Borrelia, etc
  - Corneal compromise
- Malignancy
  - Leukemia
  - Lymphoma
  - Melanoma
  - Retinoblastoma

### HLA-B27

- HLA molecules present antigens on all nucleated cells in the body
  - Mediate acquired immune response
- 15% relative risk of acute anterior uveitis
- Males
- Unilateral
- Non-granulomatous
- Frequent recurrences
- Order test?



### HSV/VZV

- Unilateral
- Diffuse, fine, stellate or dendriform KPs
- OHTN
- Iris atrophy (sectoral)
- Corneal scars (past episodes)
- Caution Pred Forte
- Antiviral use

Ng A, Chew SP. *Can Ophtol* 2011;22:483-488

ORIGINAL ARTICLE

### Visual Prognosis and Ocular Complications in Herpetic versus HLA-B27- or Ankylosing Spondylitis-associated Anterior Uveitis

Lisette Hoeksma, MD<sup>1,2</sup> and Leonoor I. Los, MD PhD<sup>1,2</sup>

<sup>1</sup>Department of Ophthalmology, University Medical Center Groningen, University of Groningen, Groningen, The Netherlands and <sup>2</sup>W. J. Koff Institute, Graduate School of Medical Sciences, University of Groningen, The Netherlands

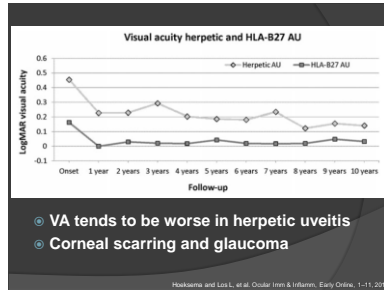
- 45 pts with HSV
- 17 pts with VZV
- 113 pts with HLA-B27 or AS
- Retrospective, observational

Hoeksma and Los L, et al. *Ocular Immun & Inflamm*, Early Online, 1-11, 2015

### Herpetic vs. HLA-B27

Any complication	Herpetic 94%	HLA-B27 74%
Glaucoma	Herpetic 23%	HLA-B27 4%
Cataract	Herpetic 40%	HLA-B27 22%
CME	Herpetic 1%	HLA-B27 9%
Posterior synechiae	Herpetic 31%	HLA-B27 45%

Hosokawa and Losi L, et al. Ocular Inm & Inflamm. Early Online. 1-11, 2015



### Drug Induced

- Prostaglandin analogs
- Cons:
  - Uveitis reportedly associated with travoprost, latanoprost, bimatoprost, etc
  - Granulomatous and non-granulomatous
  - CMV anterior uveitis has been reported in immunocompetent pts

Babu K, Murthy GJ J. Ophthalmol. Inflamm Infect. 2013 Jul 9;3(1):55

### Drug Induced

- Pros:
  - "There is little evidence that PGA disrupt the blood-aqueous barrier and only anecdotal evidence suggesting an increased risk of these rare findings"
  - "PGA may be used in uveitic glaucoma when other topical treatments have not lowered IOP to the patient's target range"

Hershey MG, Chen TC. Semin Ophthalmol. 2011 Jul-Sep;26(4-5):285-9

### ORIGINAL ARTICLE

#### Brimonidine Induced Anterior Uveitis

Jacqueline Beltz, MBBS, FRANZCO<sup>1</sup> and Ehud Zatzir, MD, FRANZCO<sup>1,2</sup>

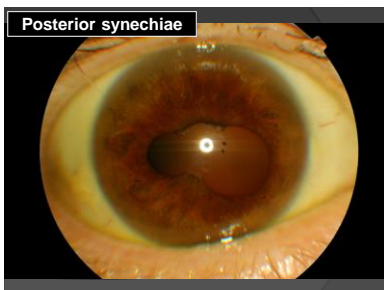
<sup>1</sup>Centre For Eye Research Australia, The Royal Victorian Eye and Ear Hospital, Melbourne, Australia and <sup>2</sup>Melbourne Eye Specialists, Fitzroy, Victoria, Australia

- 19 eyes in 12 glaucoma patients
- Onset 7 days to 5 years after starting
- Granulomatous KPs and conjunctivitis
- D/c brimonidine led to resolution
- No recurrence over 15-52 months

Beltz and Zatzir. Ocul Immunol Inflamm. 2015 Sep;23:1-6

### Uveitis Complications

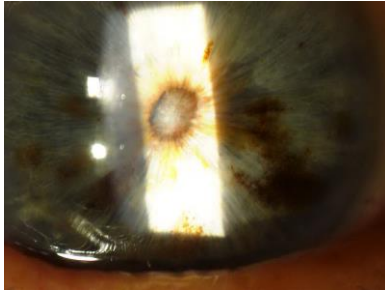
- Band keratopathy
- Cataract
- Posterior synechiae
- Glaucoma
- Retinal detachment
- Phthisis
- ONH atrophy
- CME
- Blindness



### Posterior Synechiae

- Adhesion of iris to lens
- Acute anterior uveitis or chronic posterior uveitis
- Can cause IOP issues, angle closure
- Attempt to break with dilation

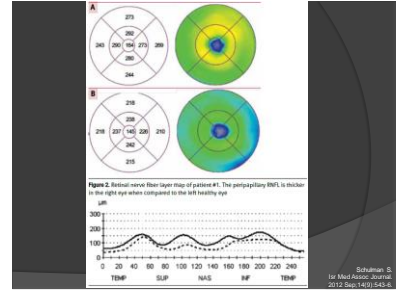




### Optical Coherence Tomography Characteristics of Eyes with Acute Anterior Uveitis\*

Shih Shulman MD, Dafna Goldenberg MD, Zohar Hahot Wilner MD, Michaela Goldstein MD and Meira Neudorfer MD

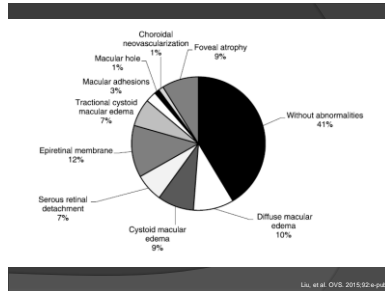
- Acute anterior uveitis rarely results in macular or ONH edema
- Retina and peripapillary RNFL were thicker in uveitis eyes vs. controls
- Not correlated with type of uveitis
- Only 28 eyes



ORIGINAL ARTICLE

### Macular Abnormalities in Chinese Patients with Uveitis

- 58.6% of patients had macular involvement
- CME (25.4%) and ERM (12.6%) most common
- Tractional CME, macular hole, CNV, diffuse ME, and serous RD also occur



### Epidemiological data of the study patients with uveitis

Age, mean ± SD (range), y	36.7 ± 14.6 (16–73)	
Bilateral/unilateral, n	132/149	
Male/female, n	137/144	
Anatomic uveitis form	Study participants	With abnormalities
Anterior	56 (94 eyes)	22 (26 eyes)
Intermediate	28 (40 eyes)	21 (26 eyes)
Posterior	104 (136 eyes)	46 (75 eyes)
Panuveitis	76 (114 eyes)	62 (86 eyes)
Vogt-Koyanagi-Harada syndrome	12 (24 eyes)	12 (24 eyes)
Behcet disease	5 (5 eyes)	5 (5 eyes)

**28-75% with anterior or intermediate uveitis had macular involvement!**

### Risk of Relapse in Primary Acute Anterior Uveitis

Lili Grosswald, MD,<sup>1</sup> Craig W. Newcomb, MS,<sup>2,3</sup> Elenor David, MBBS, MPH, PhD,<sup>1</sup> E. Okay Koyuncu, MD, MPH,<sup>2,3</sup> Douglas A. Jahn, MD, MBA,<sup>2,3</sup> Grazia A. Levy-Clarke, MD,<sup>2,4</sup> Robert E. Newcomb, MD, MPH,<sup>1</sup> James T. Rosenbaum, MD,<sup>2,3</sup> Eric B. Sallier, MD, MPH,<sup>2,3</sup> Jennifer E. Thorne, MD, PhD,<sup>2,3</sup> C. Stephen Foster, MD,<sup>2,3</sup> John H. Kempen, MD, PhD,<sup>1,2,3</sup> for the Systemic Immunosuppressive Therapy for Eye Diseases Cohort Study

- 102 pts with first time uveitis
- Seen within 90 days
- Female 60%, Caucasian 78%

### Risk of Relapse in Primary Acute Anterior Uveitis

Lili Grosswald, MD,<sup>1</sup> Craig W. Newcomb, MS,<sup>2,3</sup> Elenor David, MBBS, MPH, PhD,<sup>1</sup> E. Okay Koyuncu, MD, MPH,<sup>2,3</sup> Douglas A. Jahn, MD, MBA,<sup>2,3</sup> Grazia A. Levy-Clarke, MD,<sup>2,4</sup> Robert E. Newcomb, MD, MPH,<sup>1</sup> James T. Rosenbaum, MD,<sup>2,3</sup> Eric B. Sallier, MD, MPH,<sup>2,3</sup> Jennifer E. Thorne, MD, PhD,<sup>2,3</sup> C. Stephen Foster, MD,<sup>2,3</sup> John H. Kempen, MD, PhD,<sup>1,2,3</sup> for the Systemic Immunosuppressive Therapy for Eye Diseases Cohort Study

- 40 pts had recurrence
- 24% relapse incidence per person-year
- At 1.5 years, 61% were in remission
- Main risk factor: 18-35 y/o group

### Topical cyclosporine A 0.05% for recurrent anterior uveitis

Shreya S Prabhu, Roni M Shtein, Monica M Michelotti, Theresa M Cooney

- Patients on Restasis AND conventional tx:
- Fewer episodes of anterior uveitis
  - Shorter duration of episodes
  - Fewer total days of inflammation per year
  - Small, retrospective study (only 8 pts)

**Topical cyclosporine A 0.05% for recurrent anterior uveitis**

Shreya S Prabhu, Roni M Shtein, Monica M Michelotti, Theresa M Cooney

**Table 2 Characteristics of uveitis episodes**

	Control period (SD)	Cyclosporine period (SD)	p Value
Average episodes/year	4.3 (2.5)	0.36 (0.32)	0.03
Average duration of episodes (days)	41.6 (20.5)	13.3 (14.0)	0.002
Average days of uveitis/days of follow-up	0.24 (0.17)	0.02 (0.02)	0.006
Average max AC cell grade per episode	1.2 (0.7)	0.53 (0.59)	0.07

Prabhu SS, et al. JGCO. 2015; Aug 14

**Factors Predictive of Remission of New-Onset Anterior Uveitis**

- Pickupem Anamombath, MD,<sup>1,2</sup> Maxwell Pindil, MS,<sup>2</sup> C. Stephen Foster, MD,<sup>1,2</sup> Sallaband S. Pajot, MBBS, MS,<sup>2</sup> Sarma S. Gangaraju, MD, MPH,<sup>2,3</sup> Douglas A. Jabs, MD, MBA,<sup>2,4,5</sup> Umar A. Lovi-Clarke, MD,<sup>1,2</sup> Robert D. Nussenblatt, MD, MPH,<sup>1,2</sup> James T. Rosenbaum, MD,<sup>1,2,3,6</sup> Eric B. Sakler, MD, MPH,<sup>1,2,3</sup> Jennifer E. Thorne, MD, PhD,<sup>1,2,3</sup> John H. Kempen, MD, PhD,<sup>1,2,3,6</sup>
- 999 eyes with first time uveitis
  - Lower incidence of remission in:
    - Behcet's
    - JIA
    - Bilateral uveitis
    - Pseudophakic eyes
    - 1+ vitreous cells or more
    - VA <20/200
- Anamombath P, et al. Ophthalmology. 2015;en:1-7

- Management**
- DFE at initial exam
  - Ocular treatment
    - Corticosteroids
    - Cycloplegia
    - Injections – sub-Tenon's, intravitreal
    - Implants
  - Oral prednisone
  - Biologics
  - Assess underlying etiology
    - Labs
    - PCP

- CA Optometry Law**
- Unilateral nonrecurrent nongranulomatous idiopathic iritis or episcleritis
  - Consult with an ophthalmologist if condition worsens 72 hours after the diagnosis or if is not resolved in 3 weeks (or 1 week for traumatic iritis)
  - If the patient is still receiving medication 6 weeks after diagnosis, the optometrist shall refer the patient to an ophthalmologist

- Cycloplegia**
- Benefits
    - Quick relief
    - Reduce pain and photophobia
    - Break/prevent posterior synechiae
    - Stabilize blood-aqueous barrier
  - Atropine, homatropine, scopolamine, etc
    - More frequent dosing due to shorter half-life in inflamed eyes
  - Dilate, but allow some constriction

- Prednisolone Acetate**
- CC(=O)OC1=CC=C2C3=C1OC(=O)C4=CC=CC=C4C3=O
- Mechanism of action
    - Glucocorticoid
    - There is no generally accepted explanation for the mechanism of action of ocular corticosteroids.
    - Induces phospholipase A2 inhibitory proteins → control biosynthesis of inflammatory mediators (prostaglandins and leukotrienes) by blocking release of arachidonic acid.
    - Arachidonic acid is released from membrane phospholipids by phospholipase A2.

**Prednisolone Acetate**

- Inhibits
  - Edema
  - Fibrin deposition
  - Capillary dilation
  - Phagocytic response of acute inflammation
  - Capillary proliferation
  - Collagen deposition
  - Scar formation
- Dosing

Image: webmd.com, 1000meds.com, alcon.com

Topical steroid	Intracranial anti-inflammatory effect* (% Reduction in cell counts)		
Prednisolone acetate 1%	51		
Fluorometholone acetate 0.1%	47.9		
Dexamethasone alcohol 0.1%	40		
Fluorometholone 0.1%	31		
Prednisolone sodium phosphate 1%	19		

Frequency of application of prednisolone acetate 1%	Total drops	Hours of treatment	Intracranial anti-inflammatory effect (% Reduction in cell counts)
4 hourly	6	24	11
2 hourly	10	20	30
1 hourly	18	18	51
30 minutes	34	17	61
15 minutes	66	16.5	68
Each minute for 5 minutes each hour	90	18	72

\* Intact corneal epithelium

Labowitz HM. Ophthalmology. 1980; 87:753-758

- Loteprednol**
- Loteprednol etabonate soln 0.5%
  - Effective for GPC, seasonal allergic conjunctivitis and post-op inflammation
  - Anterior uveitis
    - Effective but less than Pred Acetate
    - Less IOP elevation though
- Loteprednol US Labels Study Group. Am J Ophthalmol. 1999; 127:537-544

### Difluprednate

- Difluprednate ophthalmic soln 0.05%
- FDA approved in 2008
- Inflammation and pain due to surgery
  - QID x 14d, then BID x 1 wk, then taper
- Anterior uveitis
  - QID x 14d, then taper
- Effective at QID dosing compared to 8x/d for PF for uveitis

Fisher, CS et al. J Ocul Pharm Ther. 2015 Oct;26(5):475-83

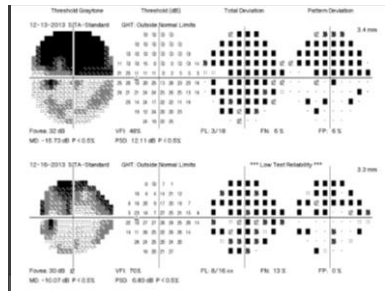
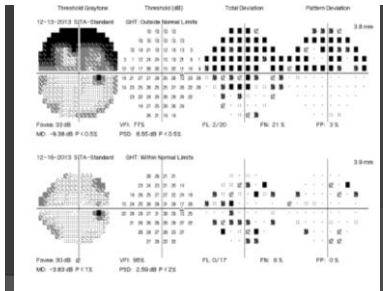
### Follow Up

- No specific schedule
  - Tailored to severity, risk, experience, etc
- 1-2 days after initial presentation
  - Should be no worse
- Daily? Weekly? Monthly?
- Etiology?
  - Cataract surgery vs. HLA-B27 vs. herpetic?

Guttridge R. Herp AJ. Clin Exp Ophthalm. 2007 Mar;35(2):75-82

### Case 1

- 80 y/o Hispanic male
- CC minimal near blur
  - BCVA 20/25- due to mild cataracts
- IOPs 8/10 mmHg
- C/Ds 0.75



### Treatment started

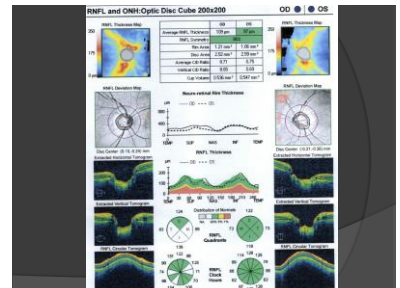
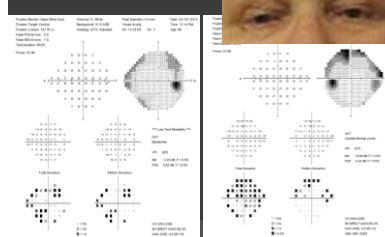
- Latanoprost OU qhs
- Develops questionable allergy, d/c drops
- Allergy subsides
- Switched to Travatan OU qhs
- Develops mild anterior uveitis

### Exam Flow Sheet

Date and Time	IOP	Meds/Notes
11/05/13 1027	8/10	none
12/13/13 1200	12/14	HVF,gonio,pachy
12/16/13 1342	13/14	HVF, start latanoprost 1/1
02/05/14 0840	12/12	none, HVF
02/14/14 -		Chemosis/redness, stopped latanoprost
02/18/14 1105	9/12	none 2' allergy, started travatan Z
02/27/14 1540	11/13	travatan Z 1/1, 8 cells
02/28/14 1308	9/10	PF1% 4/0, Cyclop 2/0, 4-5 cells
03/03/14 1144	12/13	PF1% 4/0, Cyclop 2/0, 2 cells
03/05/14 1130	9/10	PF1% 4/0, Cyclop 2/0, 3-4 cells
03/07/14 1226	11/12	PF1% 4/0, Cyclop 2/0, 1 cell
03/10/14 1152	12/12	PF1% 4/0, Cyclop 2/0, 1 cell
03/12/14 1227	14/12	PF1% 4/0, Cyclop 2/0, clear (ophth)
04/03/14 1200	12/13	none, HVF

14 visits in 5 months

### HVF - Taped Lids





## Case 1 – Discussion points

- Prostaglandin induced uveitis
- Management
  - Discontinue PGA vs. using PF/cyclo
- Follow-up schedule
- Overtreatment of glaucoma

## Case 2

- 48 y/o Asian male
- Past Medical Hx:
  - HLA-B27+
  - Ankylosing spondylitis
  - Acromegaly
  - CAD/CHF
  - HTN
  - Hypercholesterolemia
  - Sleep apnea

## Iritis Episodes

- Multiple recurrences of anterior uveitis
- VA 20/20 OU, IOP WNL
  - OD: 10/31/07 to 11/23/07
    - Tx w/ Pred Forte and Scopolamine
    - Pt did not return for last f/u
  - OS: 3/13/08 to 5/9/08
    - Tx w/ Pred Forte and Scopolamine less effective
    - Oral prednisone 60mg w/ taper

## Latest Iritis

- OS: 12/18/08 to Feb 2008
- VA 20/20 OU, IOP WNL
  - Similar initial presentation, 3+ cells/2+ flare
  - Self medicated with PF q3-4 hrs and scopolamine
  - Increased PF to q1 hr, good response
  - After 1 week, 1+ AC cells remained

## The Plan Changes

- 2 weeks into tx, significant flare-up
  - Still on PF q 1 h, Scopolamine qd OS
- Started oral prednisone
  - 60mg x 1 wk, 40mg x 1 wk, 20 mg x 1 wk
- Consult about other tx options

## Etanercept (Enbrel)

- Subcutaneous injection, 25 or 50 mg, 2x/wk
- Binds specifically to TNF, a naturally occurring cytokine involved in inflammatory and immune responses
- Blocks interaction with cell-surface tumor necrosis factor receptors (TNFRs)
- Elevated levels of TNF are found in involved tissues and fluids of patients with RA, JIA, psoriatic arthritis, ankylosing spondylitis, and plaque psoriasis

## Latest Iritis

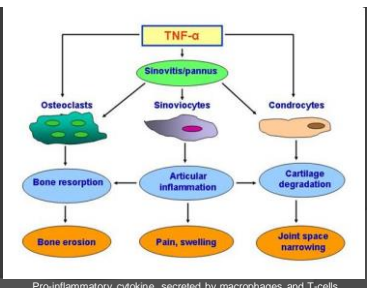
- OS: 12/18/08 to Feb 2008
- VA 20/20 OU, IOP WNL
  - Similar initial presentation, 3+ cells/2+ flare
  - Self medicated with PF q3-4 hrs and scopolamine
  - Increased PF to q1 hr, good response
  - After 1 week, 1+ AC cells remained

## The Plan Changes

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## TNF Inhibition

- Review of 69 papers in 2013
- Etanercept appears to be inadequate for ocular inflammation
- Infliximab and adalimumab show encouraging results
- More long-term studies are needed

## Adalimumab (Humira)

- Subcutaneous injection, 40 mg, 2x/month
- Binds specifically to TNF-alpha, not TNF-B
- Blocks interaction with the p55 and p75 cell surface TNF receptors
- Also lyses surface TNF-expressing cells in vitro in the presence of complement
- Decreases levels of acute-phase reactants of inflammation (CRP, ESR, and cytokines (IL-6))
- RA, JIA, psoriatic arthritis, AS, psoriasis

## TNF Blocker Warnings

- Tuberculosis, sepsis, and fungal infections
- CNS-demyelinating disorders
- Blood dyscrasias
- Lymphoma
- HBV reactivation
- Heart failure
- Injection site infection

## Adalimumab effectively reduces the rate of anterior uveitis flares in patients with active ankylosing spondylitis: results of a prospective open-label study

M Rudwaleit, E Rodevand, P Hoek, J Vanhoof, M Kron, S Kary, H Kopper **2008**

- 1250 pts with anterior uveitis and AS
- 51% reduction in recurrence overall
- 68% reduction in those with recent episode

Ann Rheum Dis published online 28 Jul 2008

## JAMA Ophthalmology | Original Investigation **2016** Effect of Adalimumab on Visual Functioning in Patients With Noninfectious Intermediate Uveitis, Posterior Uveitis, and Panuveitis in the VISUAL-1 and VISUAL-2 Trials

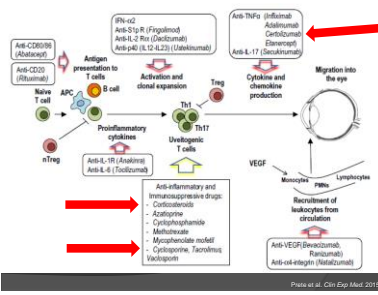
John Sheppard, MD, Avani Joshi, PhD, Keith A. Betts, PhD, Stacie Huggins, MA, Sameer Turi, MD, Najim Chen, MD, Martha Sloop, PhD, Andrew C. Dick, MD

### FDA approved adalimumab on 7/1/16 for intermediate, posterior, and panuveitis

## Intravitreal Adalimumab for the Control of Breakthrough Intracocular Inflammation. **2017**

Shirley J. Wessinger, MD, PhD, David S. Finkelstein, MD, PhD, David S. Finkelstein, MD, PhD, David S. Finkelstein, MD, PhD

**Abstract**  
PURPOSE: Investigate the efficacy of intravitreal adalimumab in breakthrough panuveitis in patients on systemic adalimumab for more than 3 months.  
METHODS: Retrospective study of patients on systemic adalimumab with breakthrough panuveitis requiring intravitreal adalimumab therapy.  
RESULTS: Seven eyes of four patients with Adalimumab therapy disease panuveitis were included and all were maintained on systemic adalimumab for 7.3 months (range 2-11) with intravitreal adalimumab for 4.1 months (range 2-10) before breakthrough uveitis. The total number of attacks was 13 over 24.5 months (range 12-30). Resolution of attacks was defined as return to baseline visual acuity with resolution of inflammatory markers. Three attacks resolved after only one injection and 10 attacks required an average of 2.4 injections (range 2-3). No patients in ocular inflammation were noted.  
CONCLUSIONS: Intravitreal adalimumab warrants further investigation as a potentially effective, practical, and safe adjunctive therapy for the control of breakthrough inflammation in select patients maintained on systemic adalimumab.



## Case 2 – Discussion points

- Recurrent uveitis
  - Treatment may not be the same each time
- Management
  - Consult with MD/uveitis specialist

## Conclusions

- Anterior uveitis is highly variable
  - Full exam with DFE
- Determine etiology and properly classify
  - Helps guide treatment
- Be aggressive with treatment
  - Consult with PCP/Ophthalmology

## Thank you!

Questions?  
davehicks.OD@gmail.com

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