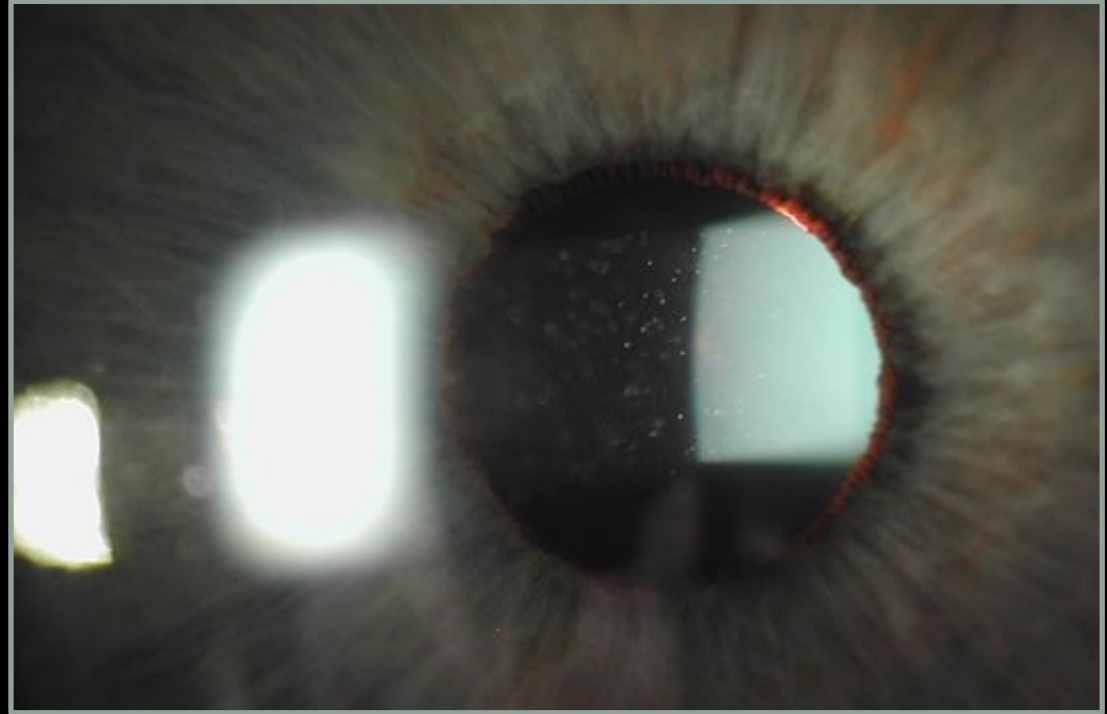


IRITIS



EXAMINATION TIPS & TREATMENT PEARLS

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No disclosures

Identifying Anterior Uveitis

- Three key findings of acute iritis
- Each alone is not specific, but together they are highly suggestive

Redness	Pain	Cells
Ciliary flush	Photophobia Tearing	Flare

Identifying Anterior Uveitis

- **Beware Masqueraders!**
- Conditions that mimic clinical features of iritis

Corneal
ulcer

Lymphoma

Retinitis

Angle
closure

Ocular
ischemia

Idiopathic vs Traumatic Iritis



Traumatic

Self-limiting

Tends to resolve without sequelae

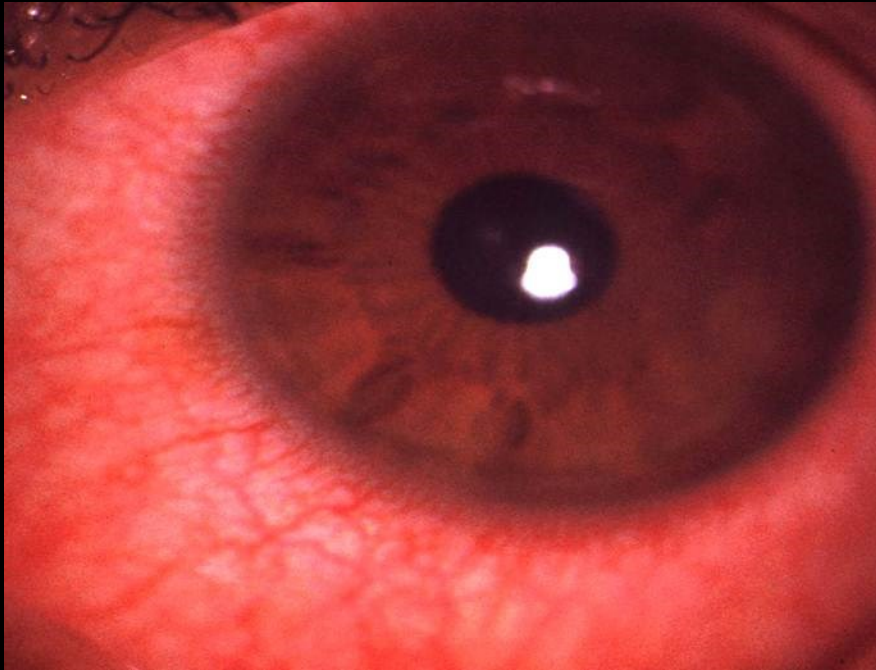


Idiopathic

May become chronic / recurrent / severe

Complications common

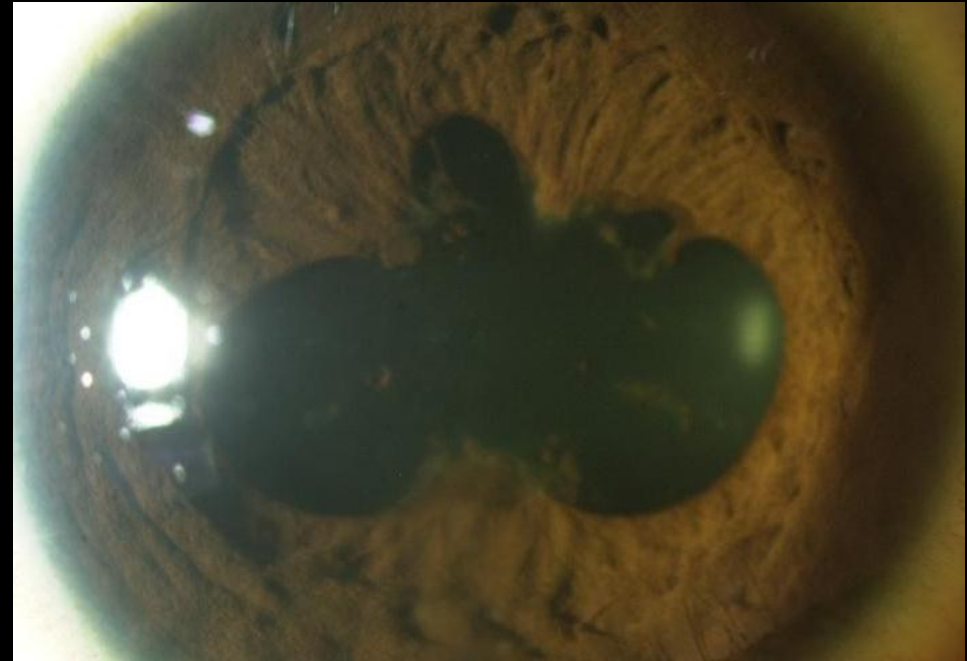
Acute vs Chronic Anterior Uveitis



Common

Painful red eye

Avoid complications with prompt care



Less common

Inflammation is often "silent"

Glaucoma, cataract, synechia common

Clinical Goals

Prompt, accurate
diagnosis



Examination

- R/O masqueraders
- Determine type of iritis
- Stage severity

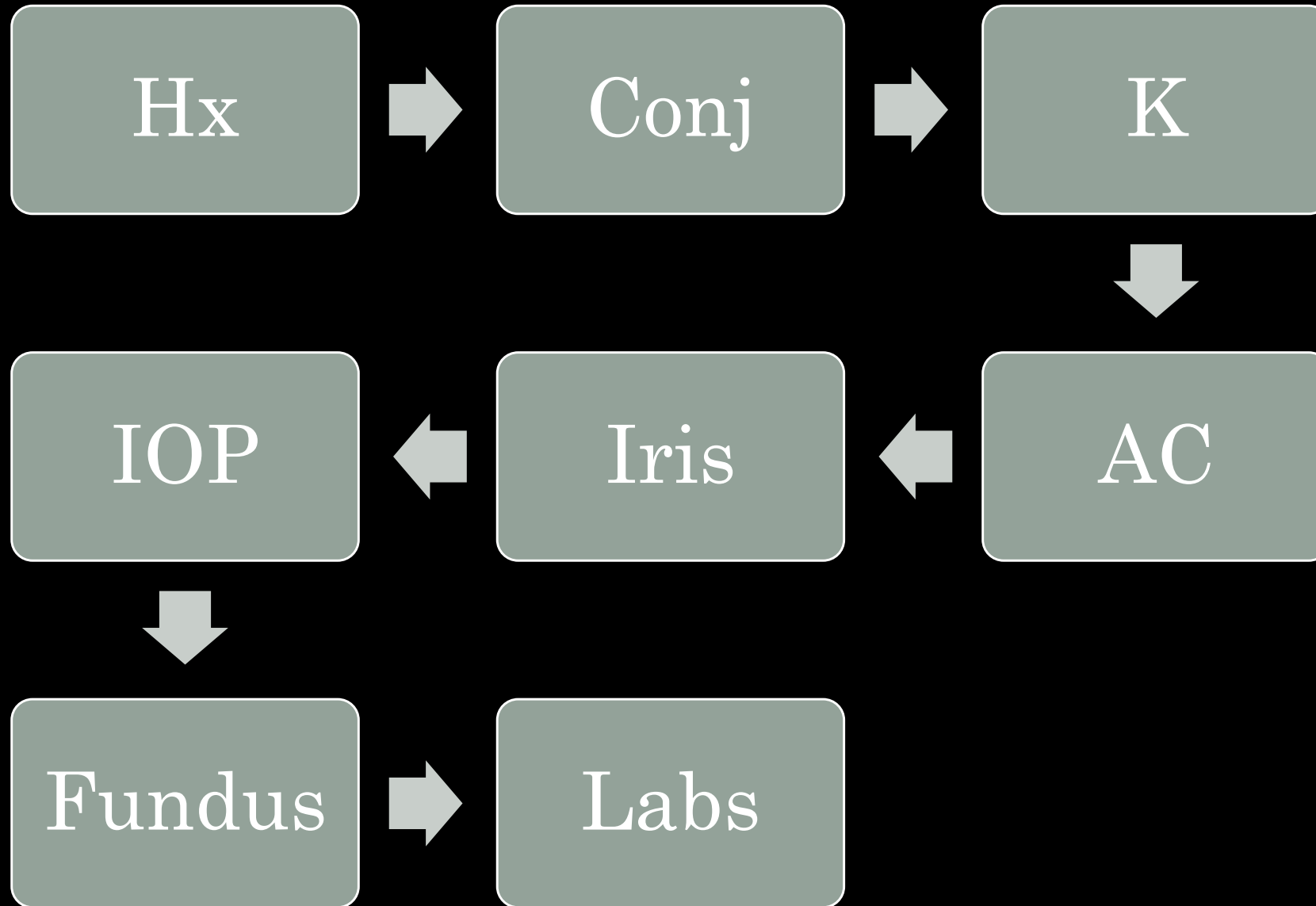
Control inflammation
as quickly as possible



Treatment

- Enough of the right medications long enough
- Knowing when to refer

Examination



History

Prior Episodes

Recurrence
warrants
search for
cause

Recent ocular surgery

R/O
endophthalmitis,
TASS,
Rebound
inflammation
(Durezol)

General health

HLA-B27:

Arthritis, dermatitis,
GI disease

Others:

Sarcoid, syphilis, TB,
Lyme, vaccinations,
and many others

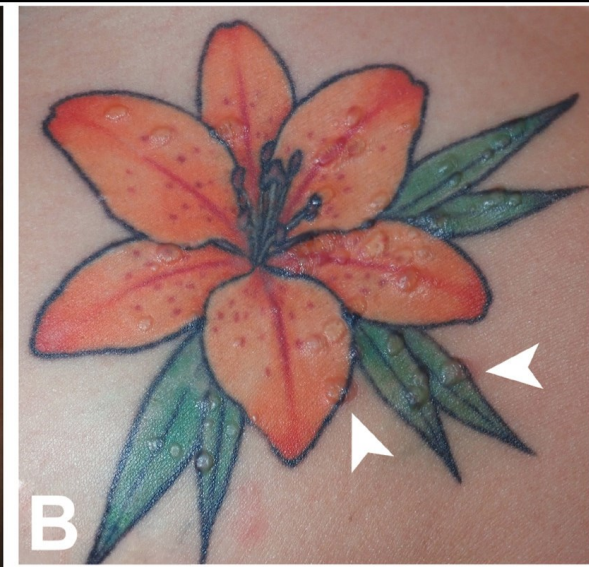
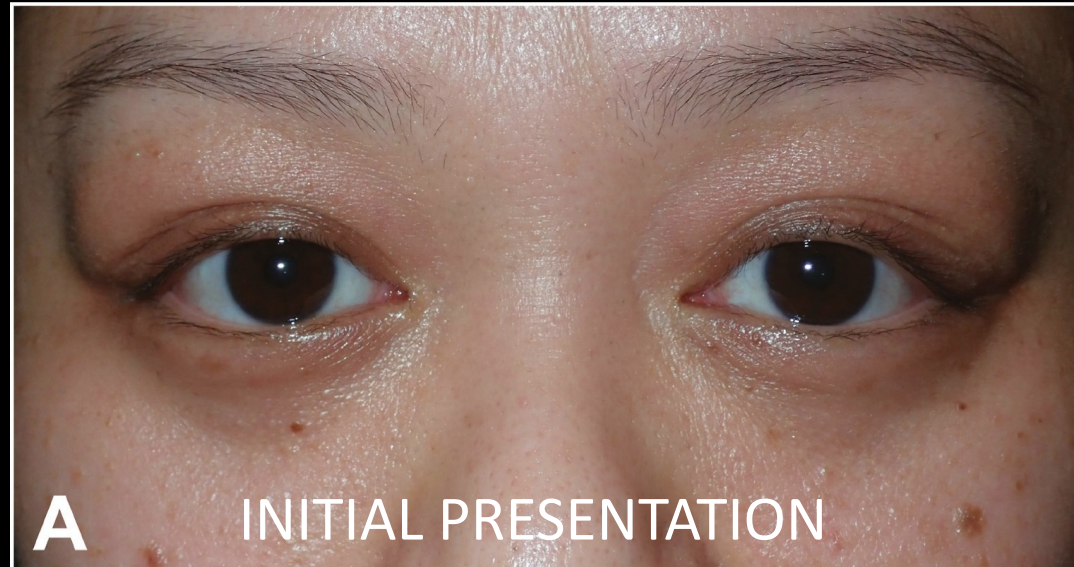
Tattoo-Associated Uveitis

Simultaneous onset of uveitis and inflammation of tattooed skin

Onset weeks-years after tattoo was created

Bilateral and recurrent iritis

Patients may have latent signs of sarcoid



Symptoms: Pain

Painful Masqueraders

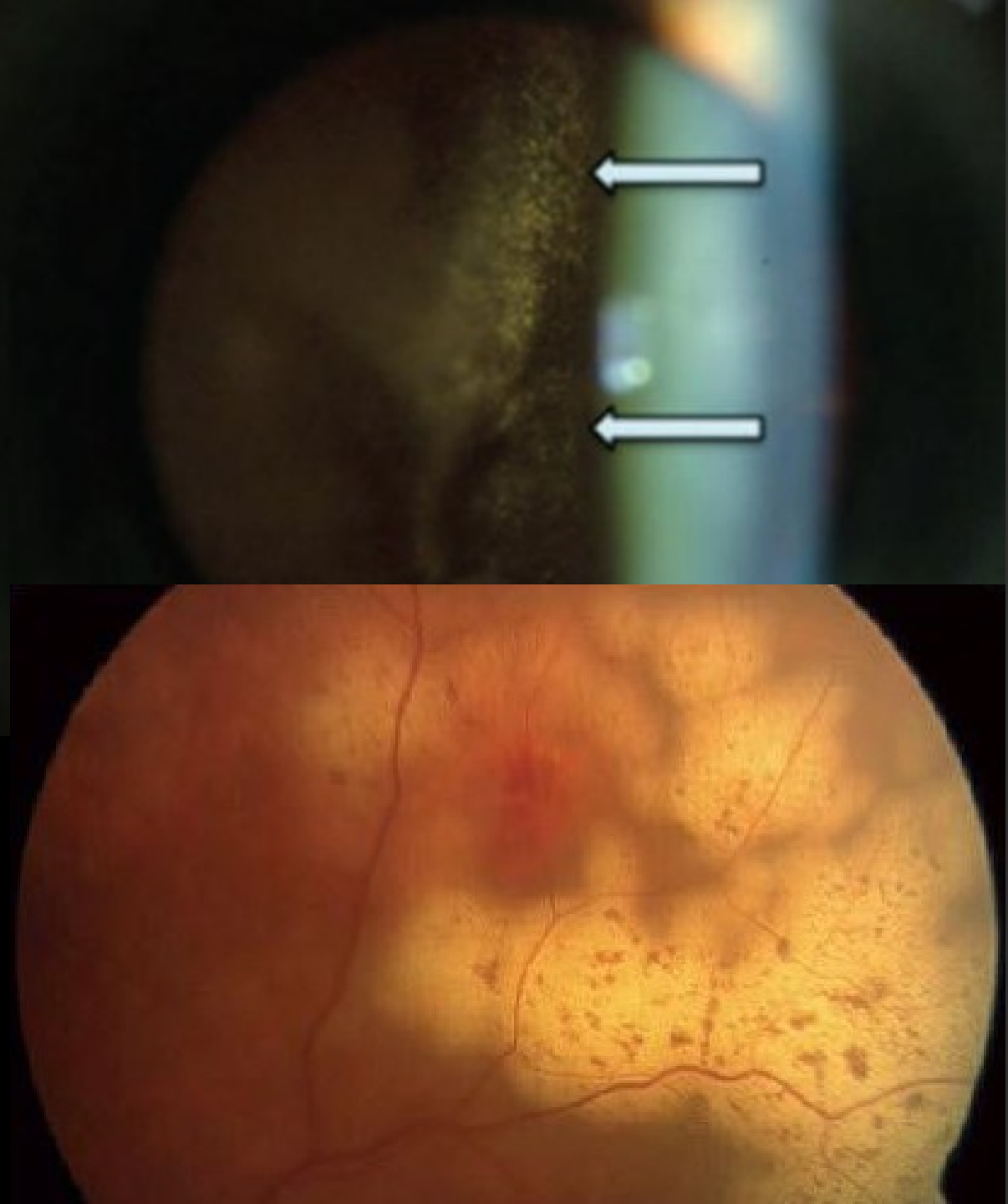
- Corneal abrasions
- Corneal ulcers
- Angle-closure
glaucoma
- Posner-Schlossman

Non-Painful Masqueraders

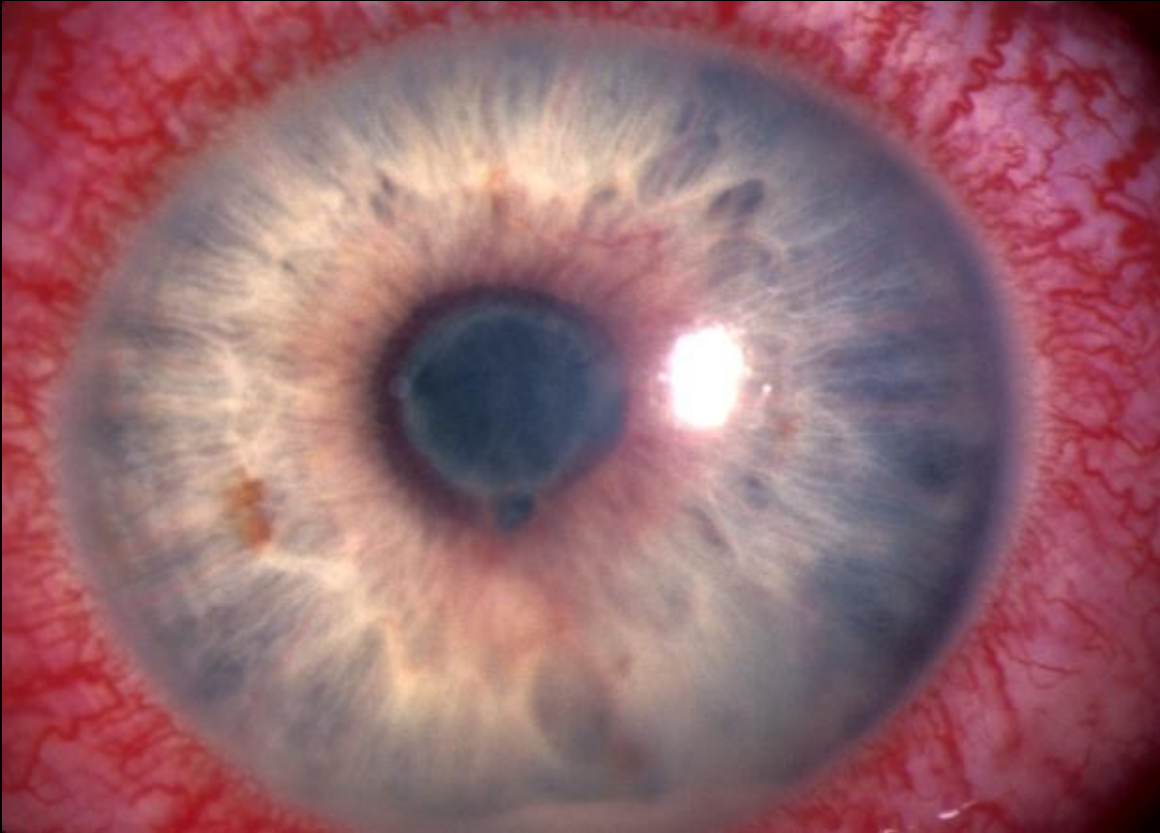
- Lymphoma
- Ocular ischemic
syndrome
- Post seg inflam
- Juvenile rheumatoid
arthritis

Lymphoma

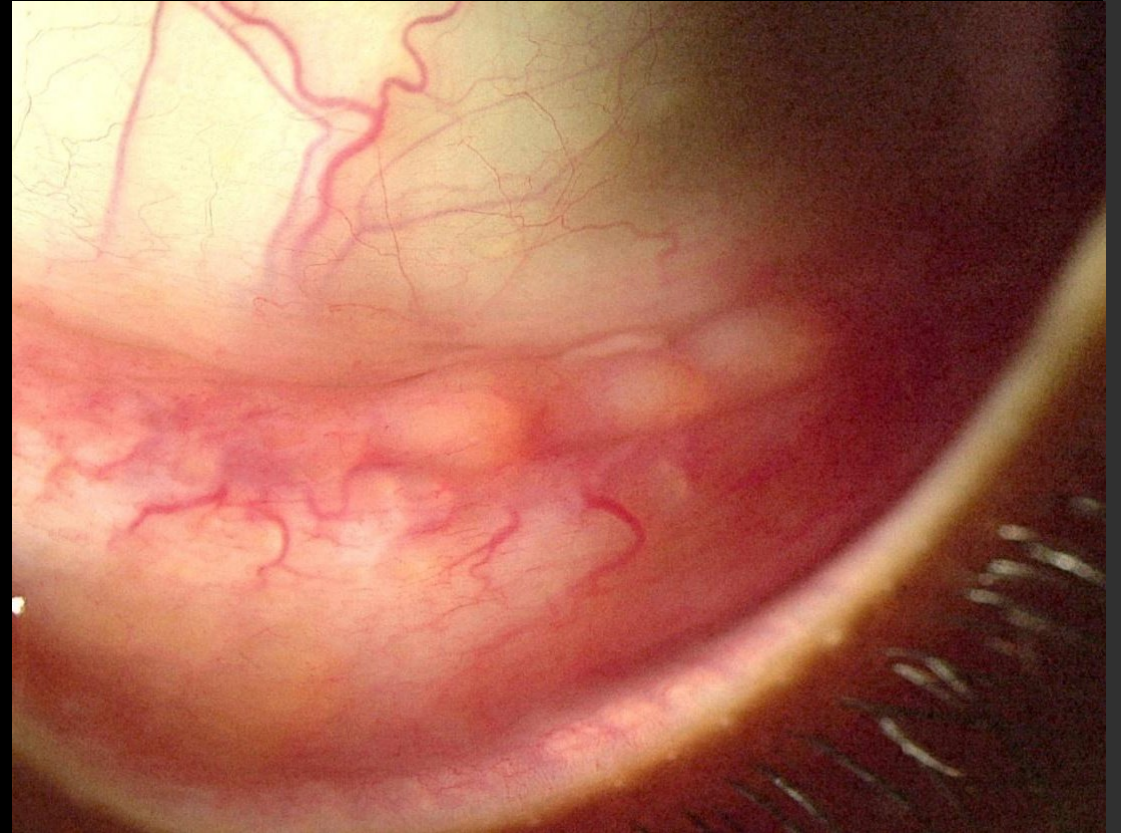
- Infiltration of the vitreous and choroid by malignant WBC
- Older adult with cells in the vitreous of one or both eyes
- Frequently misdiagnosed as vitritis or chronic uveitis
- Suspect in uveitis patients that do not respond to steroids



Conjunctiva



Ciliary flush



Sarcoid granulomas

Sarcoid

- Chronic, idiopathic granulomatous disorder
- In the differential diagnosis of any ocular inflammatory dx
- **Noncaseating granulomas**
- Chest x-ray: hilar adenopathy
- Labs: Angiotensin converting enzyme, serum lysozyme



Erythema nodosum



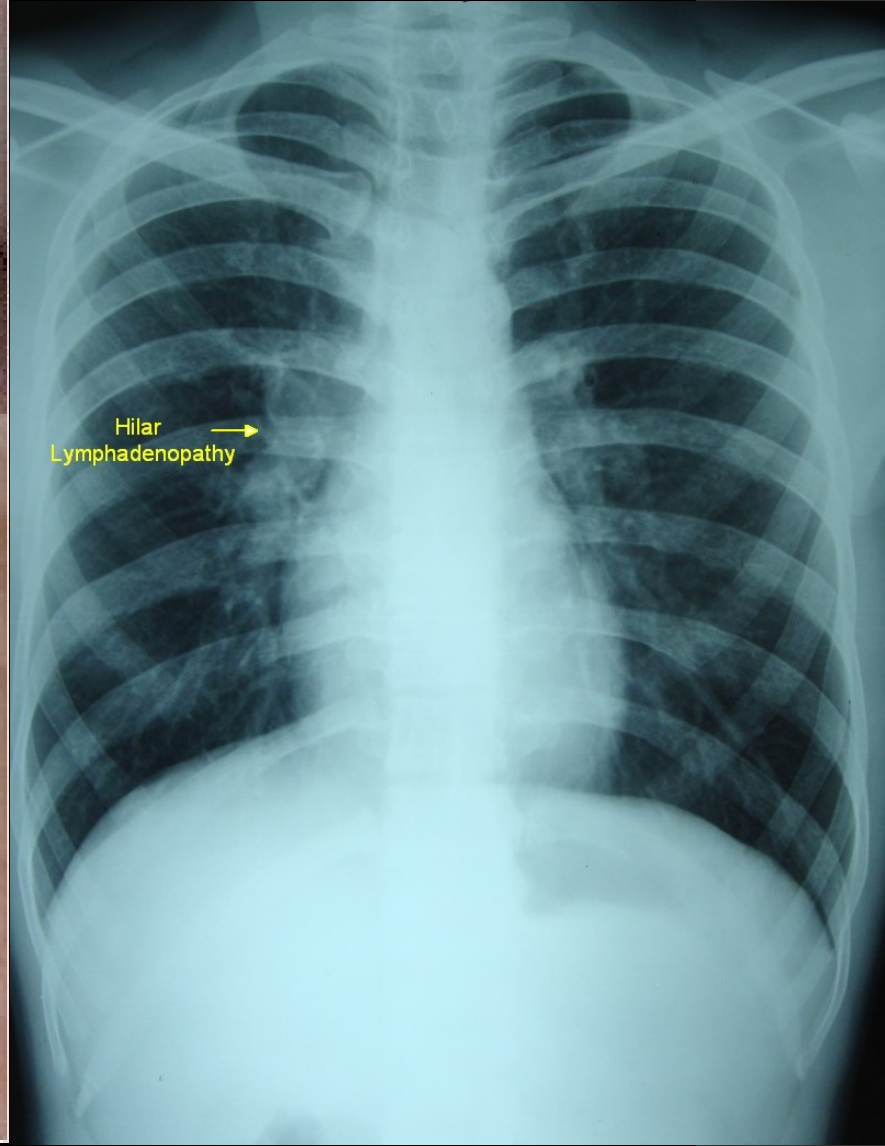
a

Papules



b

Hilar Lymphadenopathy



c

Annular plaques

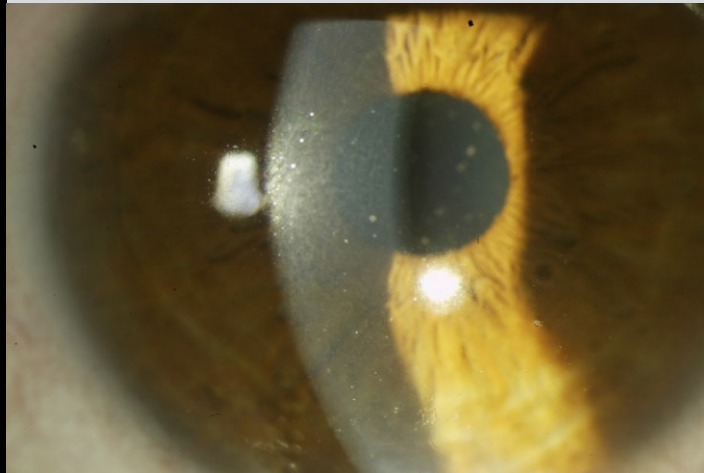


d Lupus pernio

Cornea: Keratic Precipitates

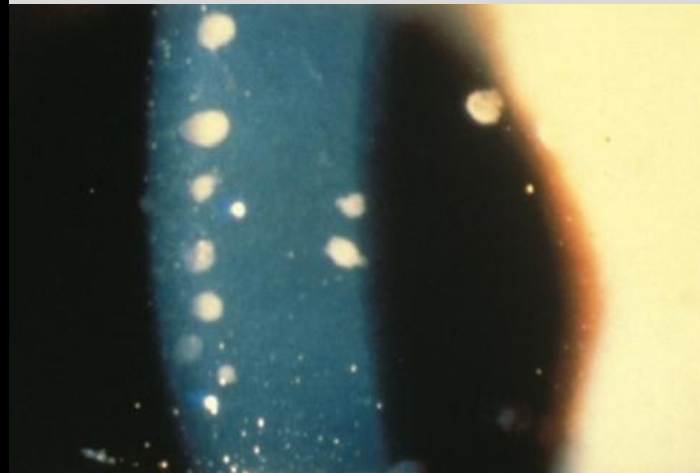
Fine KPs

Acute
Nongranulomatous



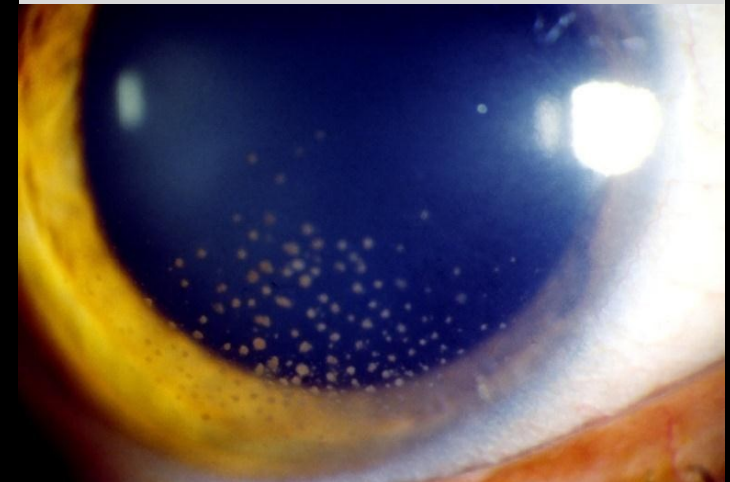
Mutton-Fat KPs

Chronic
Granulomatous



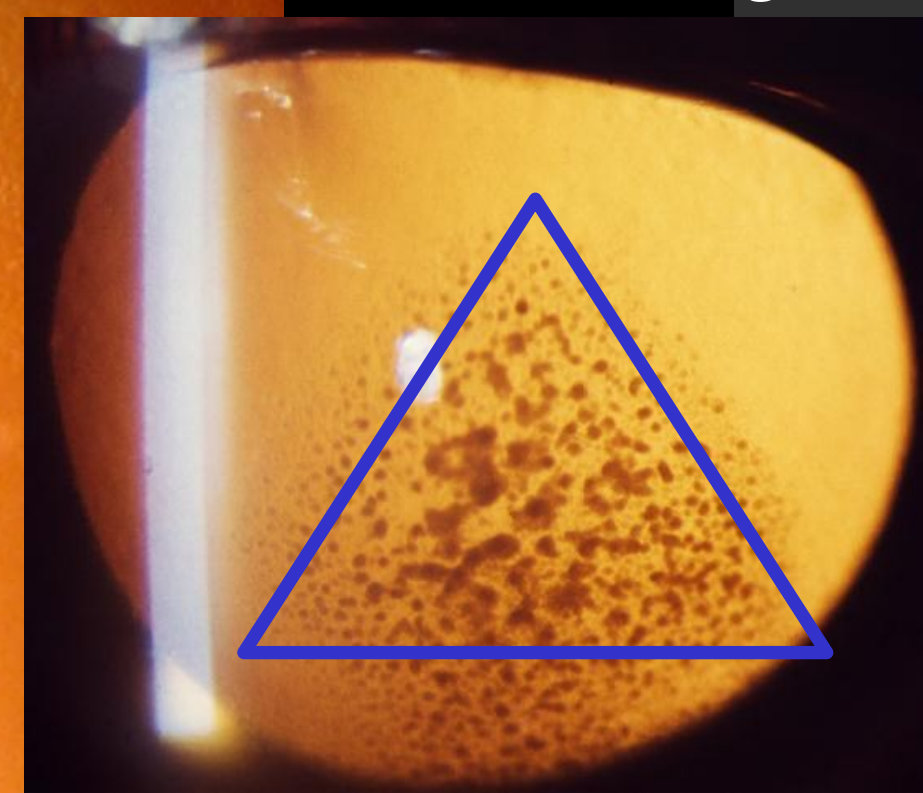
Pigmented KPs

Chronic
Prior episode





Arlt's Triangle



AC: Examination Technique



AC: Flare vs Cells

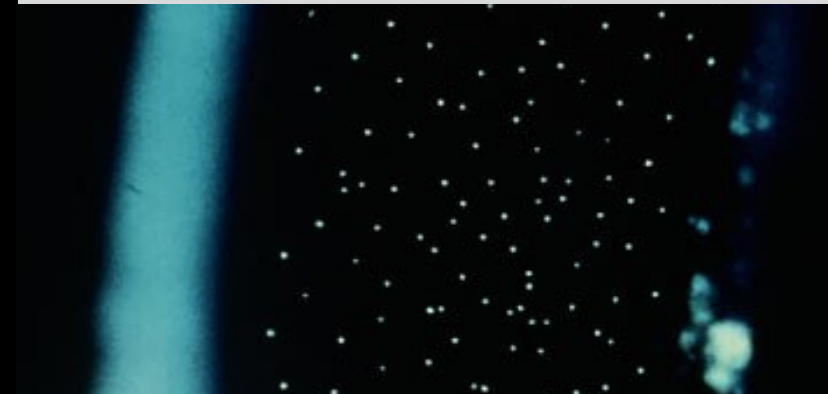
Flare

Aqueous haziness
Protein + fibrin



Cells

Discrete white dots
White blood cells



AC: Flare vs Cells

Flare

Breakdown of
blood-aqueous barrier
from any cause

Not a reliable indicator of
active inflammation

Cells

Infiltration of the
anterior chamber by
white blood cells

Usually a reliable indicator
of active inflammation

AC: Grading Cells

- **Important:** Stage severity of inflammation
- Quality of optics, intensity of illumination, size of beam all influence grading
- **Strive for consistency** – change in inflammation is usually more important than absolute grade

TABLE 3. The SUN* Working Group Grading Scheme for Anterior Chamber Cells

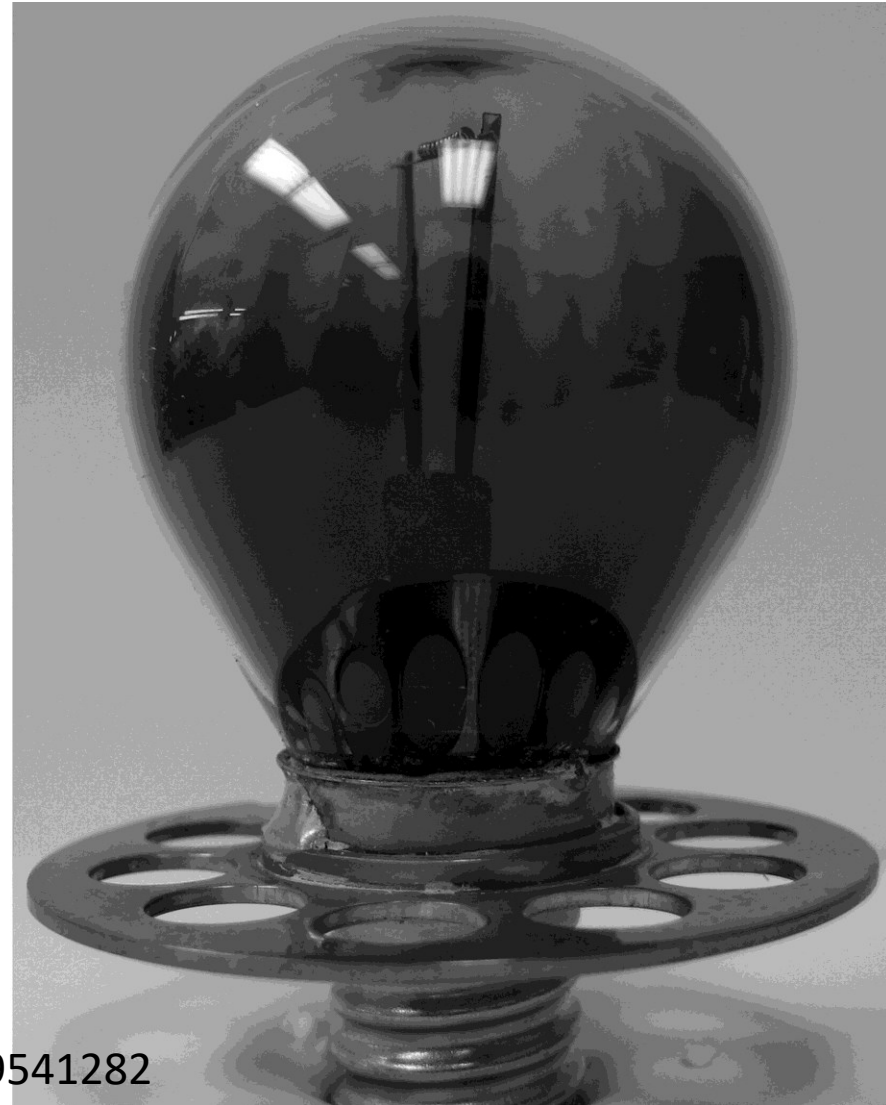
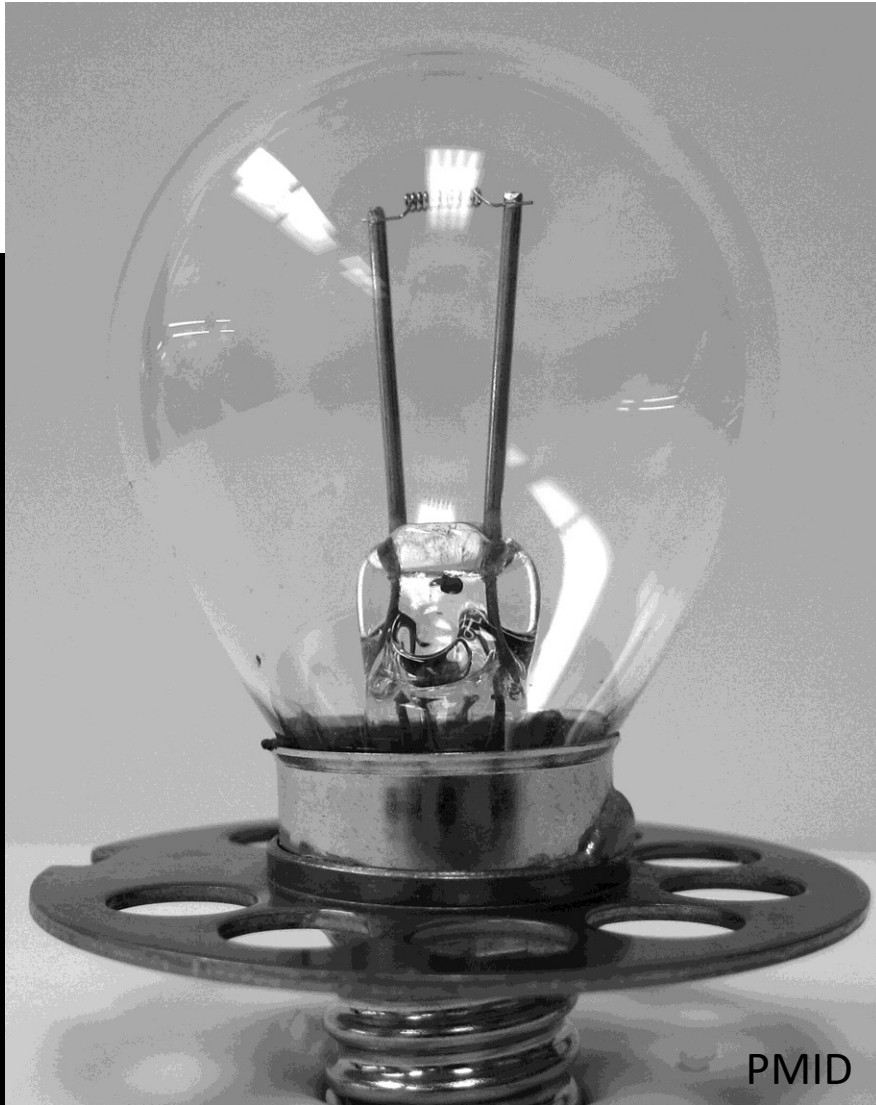
Grade	Cells in Field [†]
0	<1
0.5+	1–5
1+	6–15
2+	16–25
3+	26–50
4+	>50

*SUN = Standardization of uveitis nomenclature.

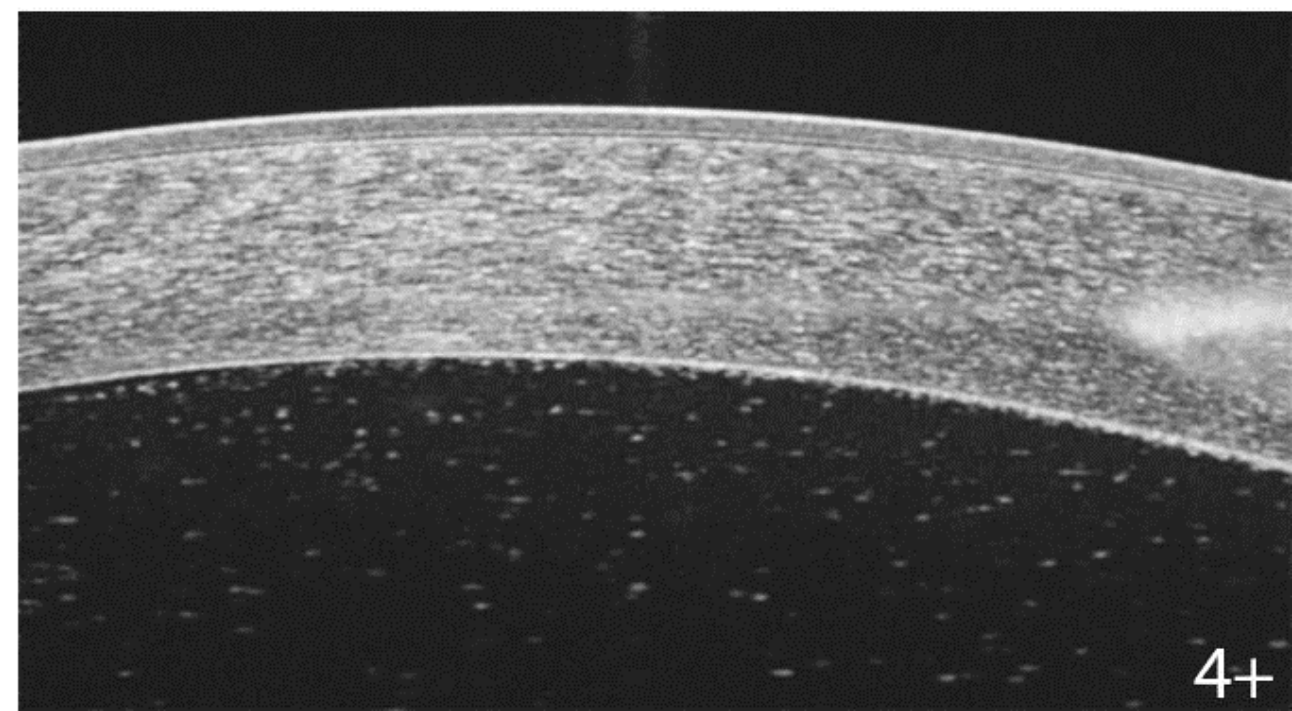
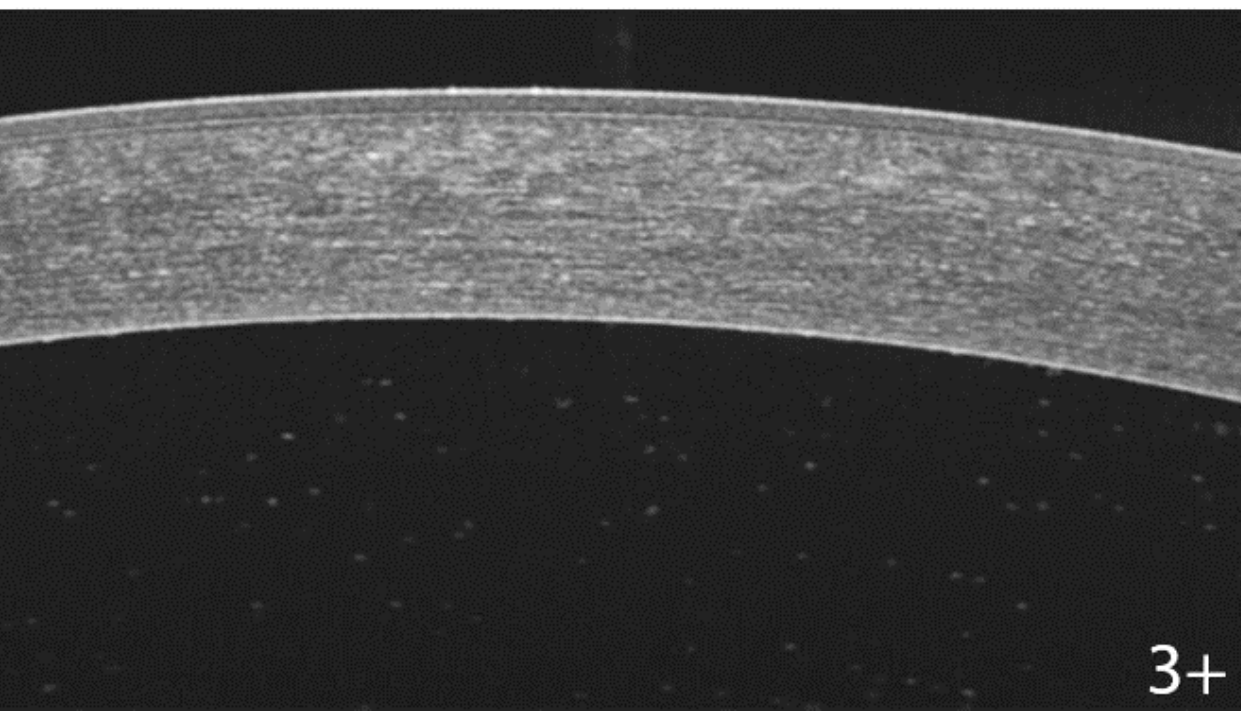
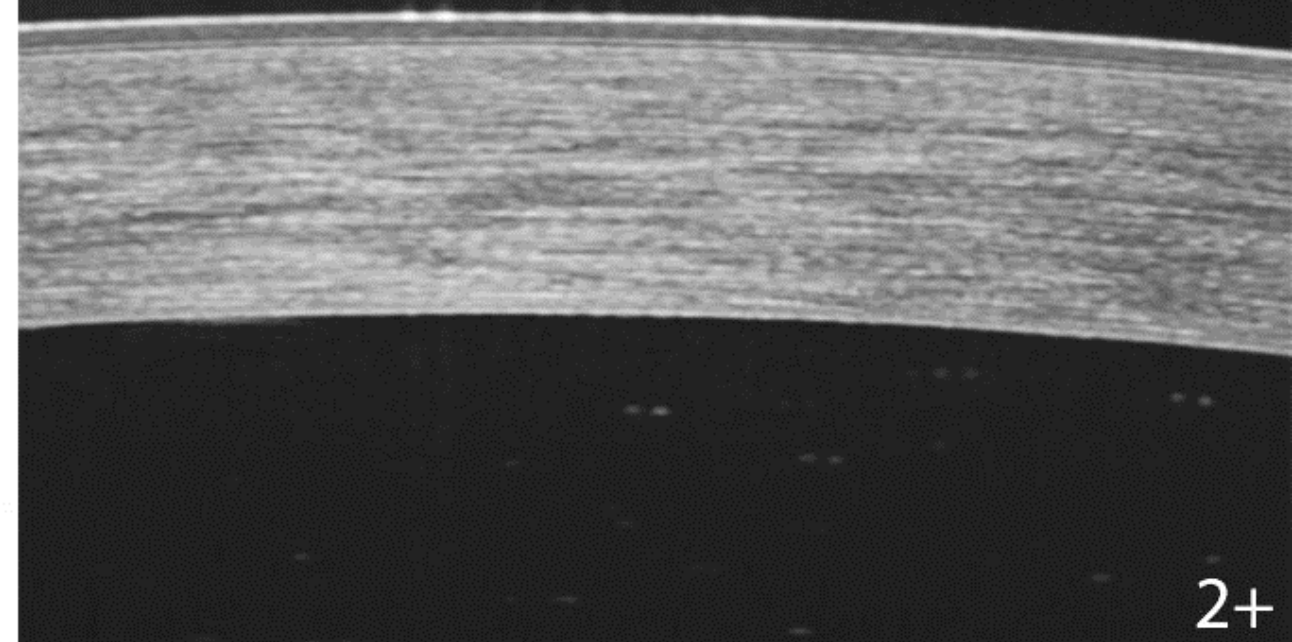
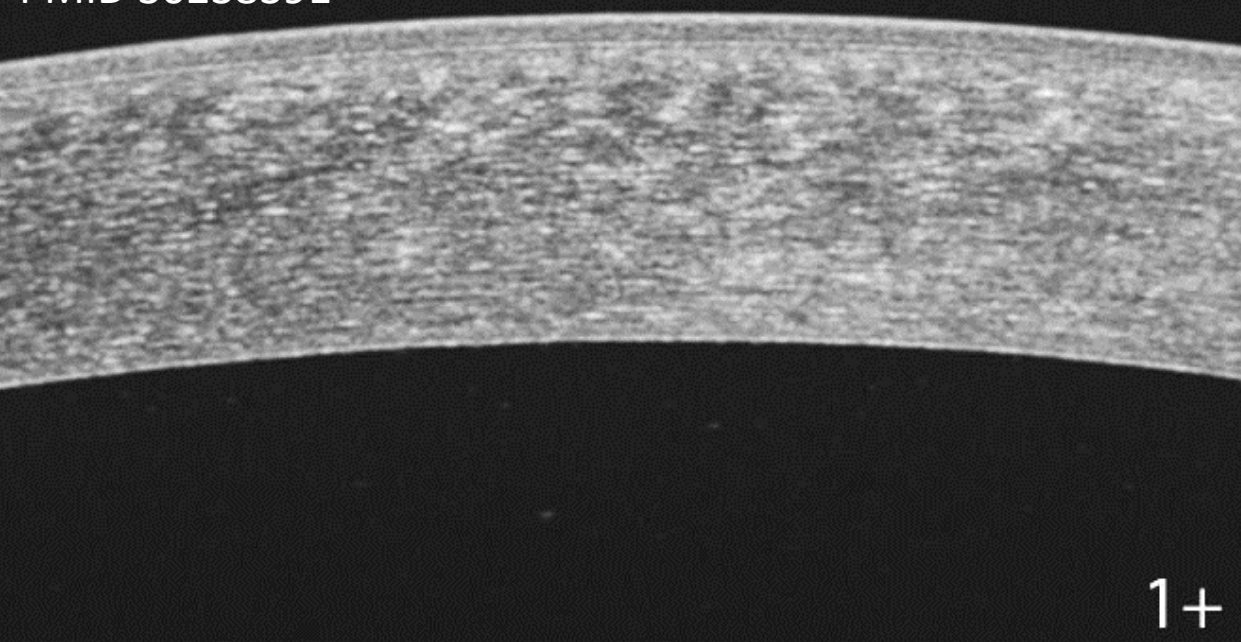
[†]Field size is a 1 mm by 1 mm slit beam.

PMID: 16196117

The Effect of Biomicroscope Illumination System on Grading Anterior Chamber Inflammation



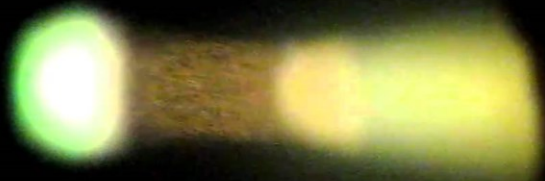
PMID 19541282



AC: Red, White & Who?

Red Blood Cells

Hyphema
Trauma



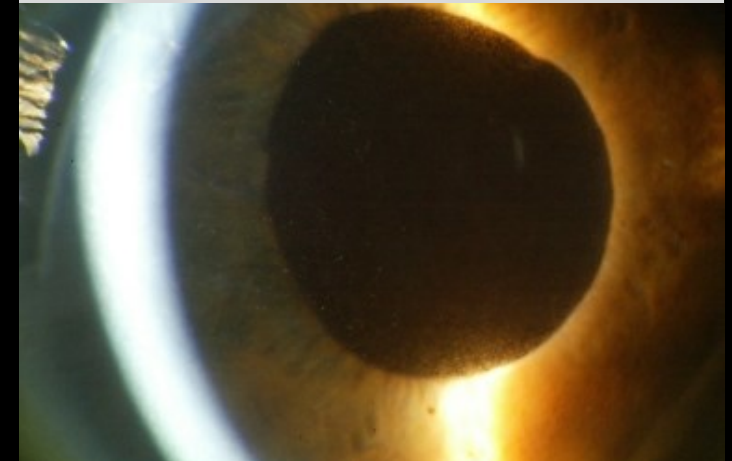
White Blood Cells

Inflammation
Infiltration



Pigment Cells

Surgery / Trauma
PDS



AC: Hyphema, Hypopyon & Fakers

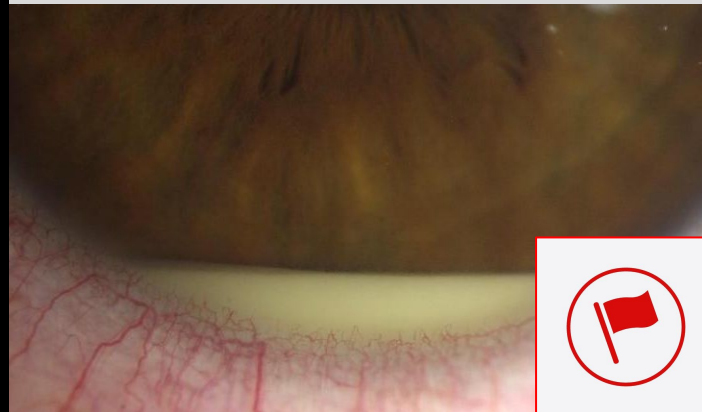
Red Blood Cells

Hyphema



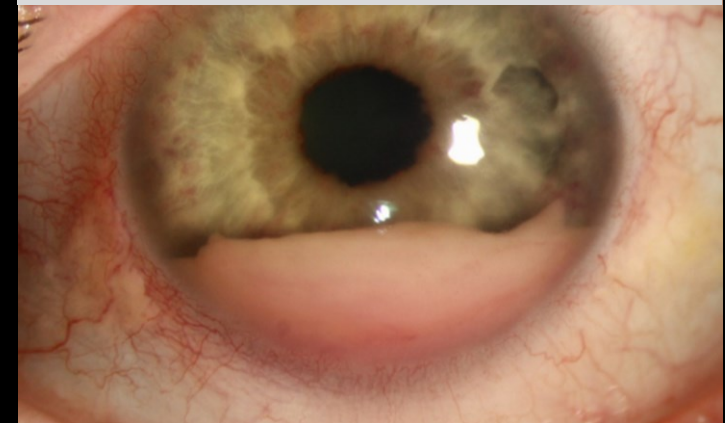
White Blood Cells

Inflammation
Hypopyon

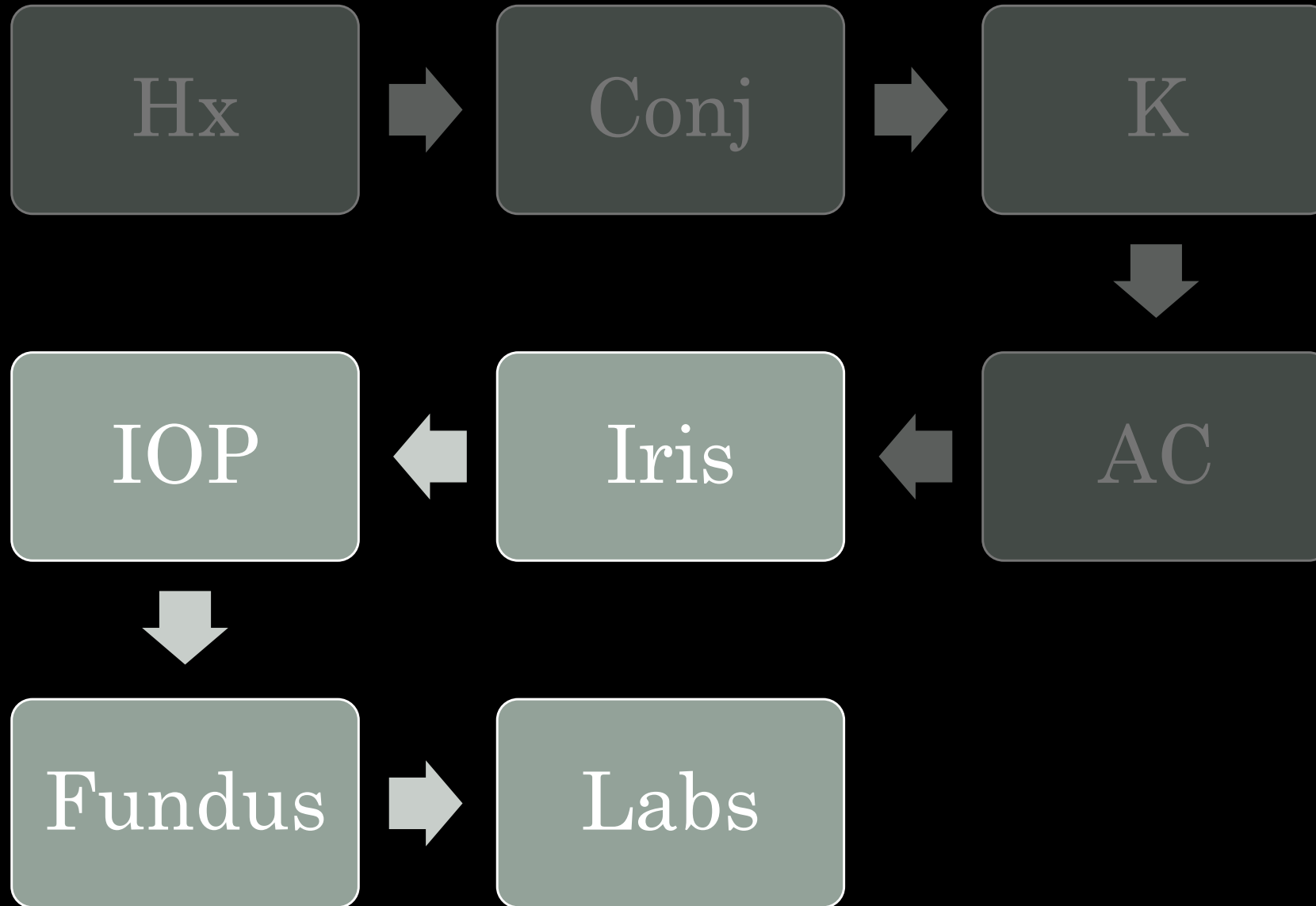


Neoplastic Cells

Infiltration
Pseudo-hypopyon

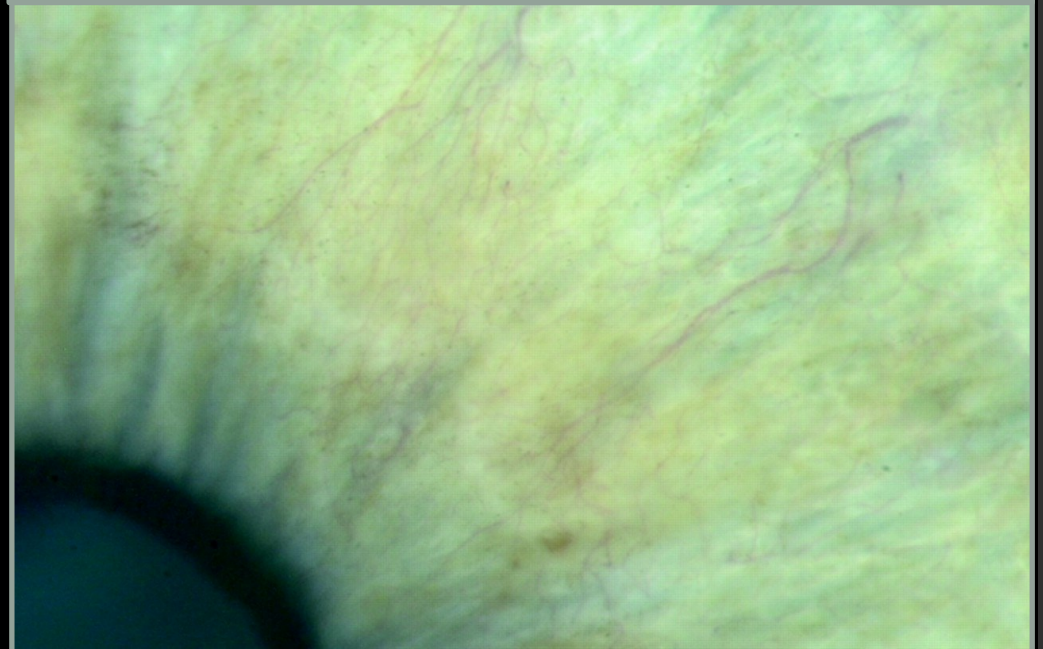
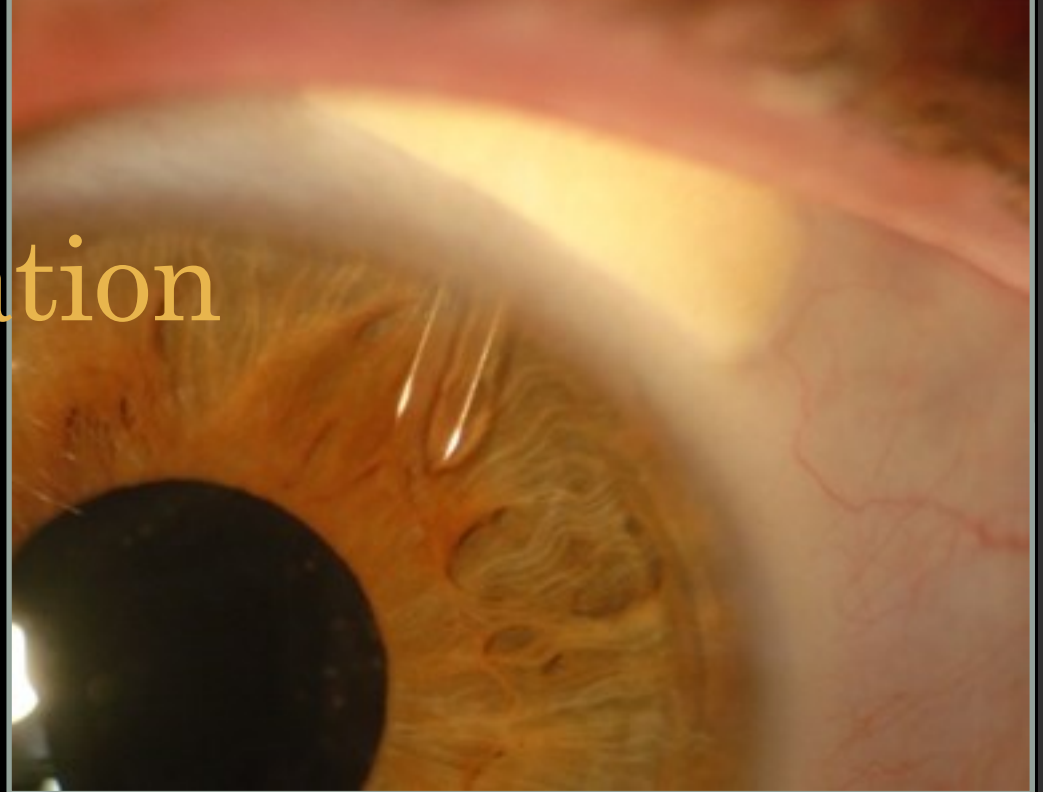


Examination



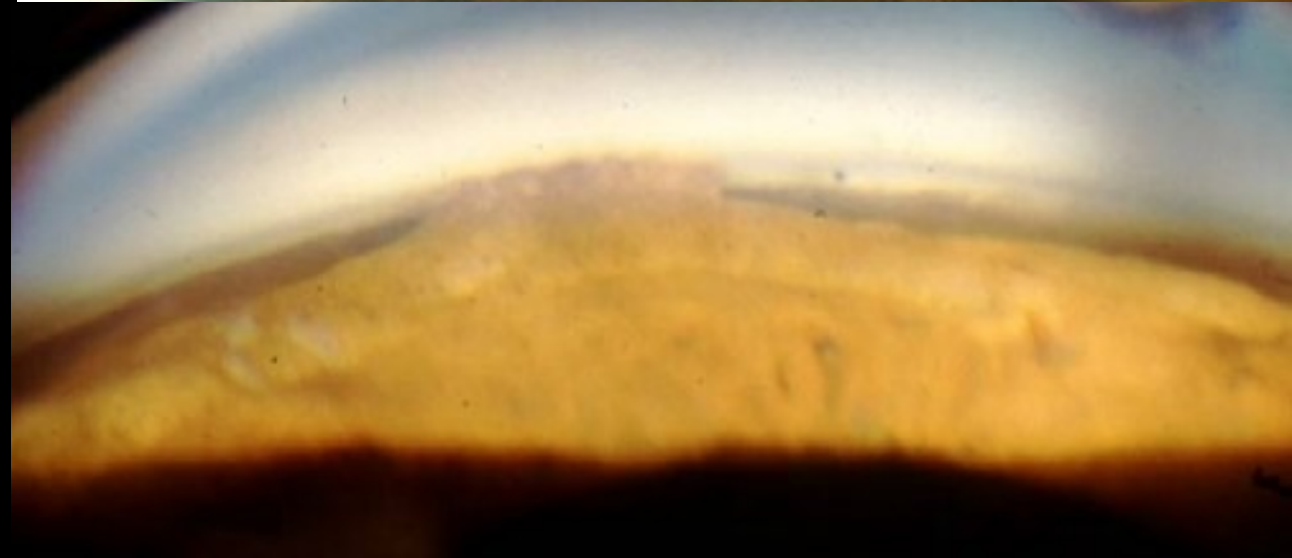
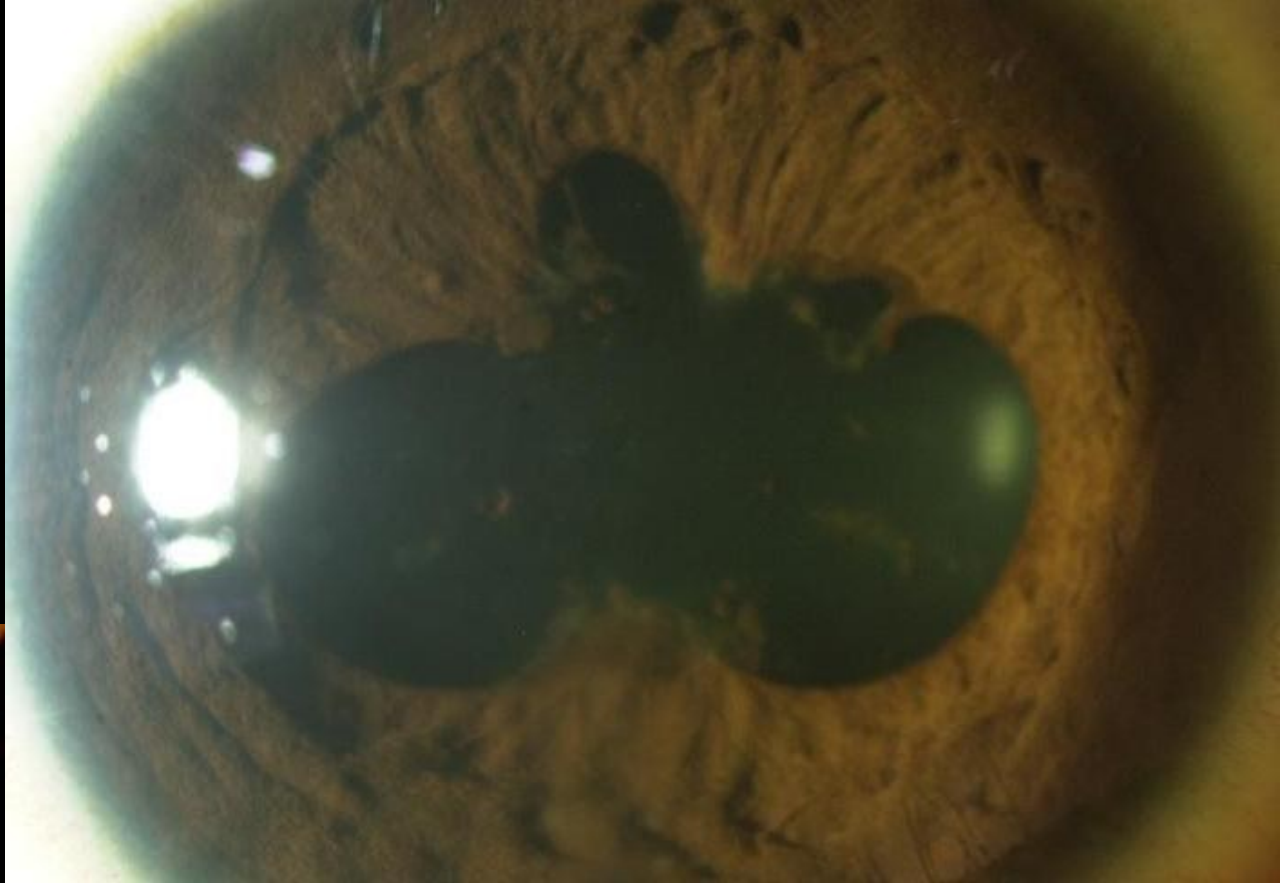
Iris: Neovascularization

- Inflammation can upregulate VEGF and trigger neovascularization
- This would be a sign of **chronic or recurrent iritis**
- Search closely for fine vessels in pupillary region
- Neovascular glaucoma



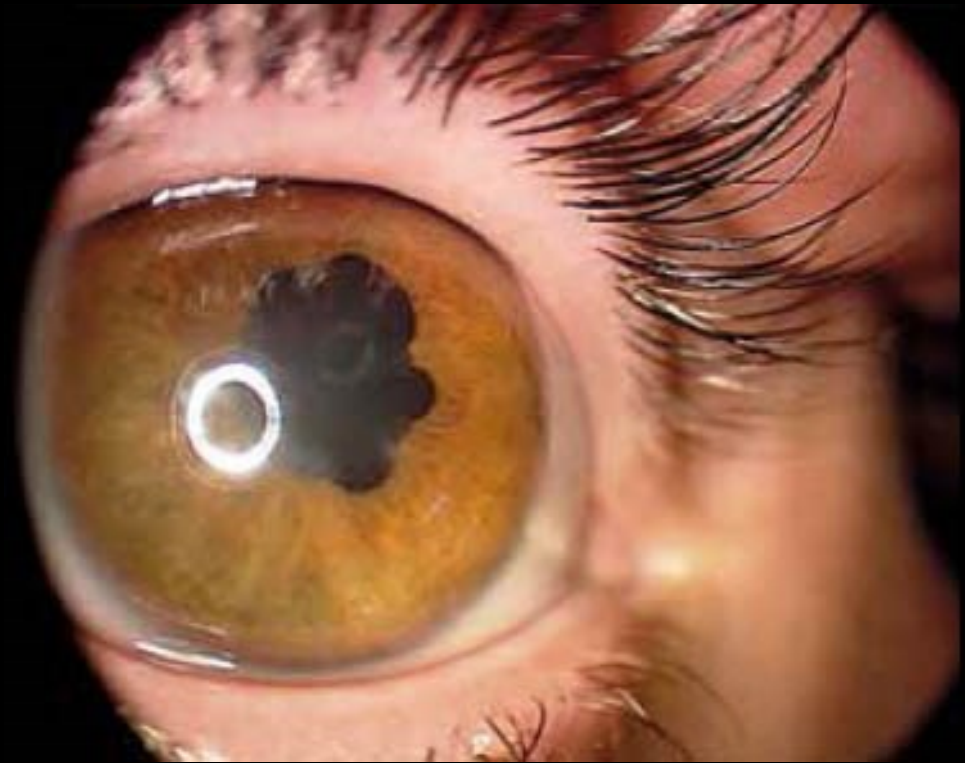
Iris: Synechia

- **Posterior synechia:** Adhesions between the iris and anterior lens capsule
- **Peripheral anterior synechia:** Adhesions between the iris and peripheral cornea
- A sign of **chronic or recurrent iritis**



Iris: Breaking Posterior Synechia

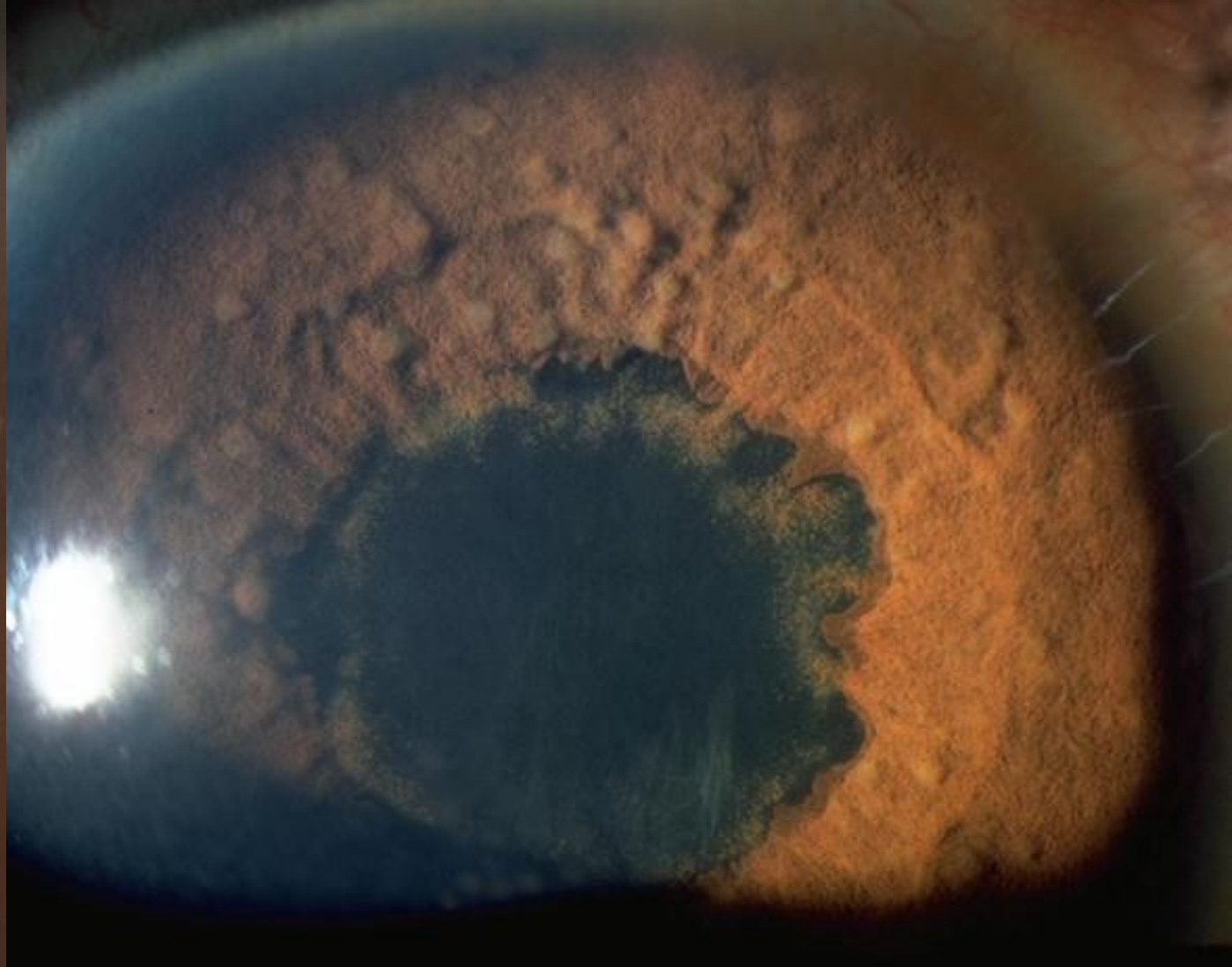
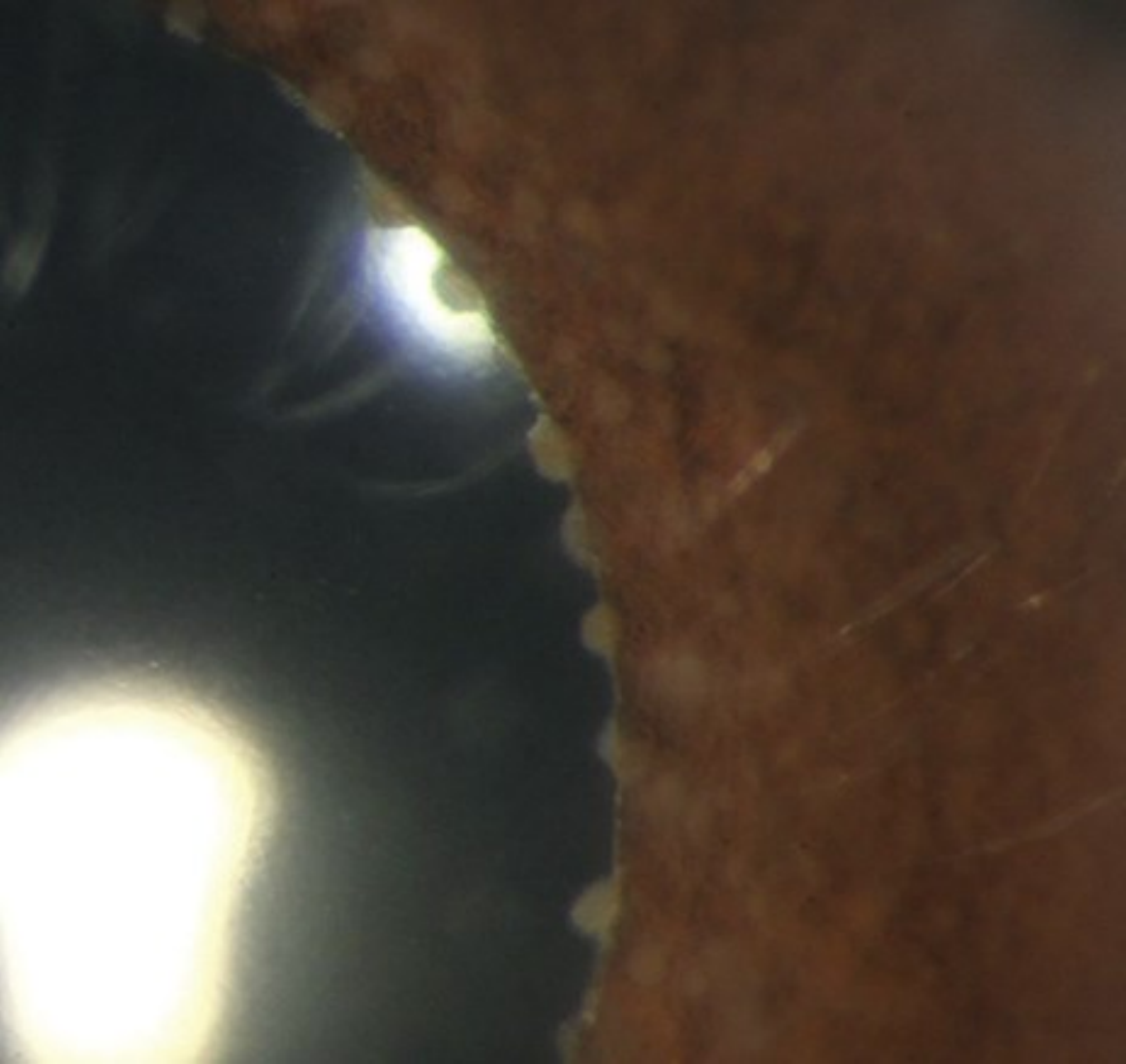
- Fresh, newly formed posterior synechia can be broken by dilating the pupil (but not established synechia)
- Tropicamide plus 1-2gtt of 10% phenylephrine in office can break fresh synechia



Iris: Granulomas

- **Koeppe nodules:** small nodules located on the pupillary border (top)
- **Busacca nodules:** larger nodules located on the mid periphery of the iris.
- **Granulomatous disease is usually chronic** and frequently associated with an underlying systemic disorder





Koepple nodules (left) are located on the pupillary border and are often the site of posterior synechia formation

Busacca nodules (right) are located on the mid periphery of the iris.

Intraocular Pressure

Low IOP

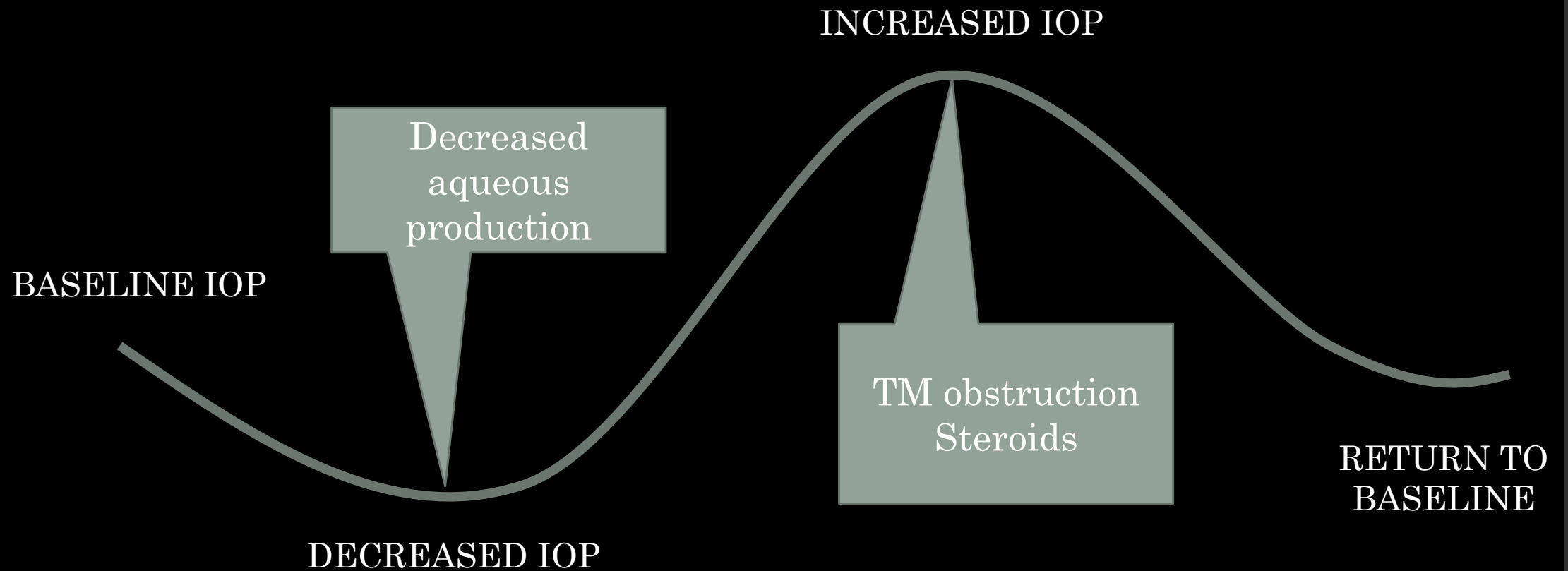
Decreased aqueous
production due to
ciliary body dysfunction

EARLY STAGE

High IOP

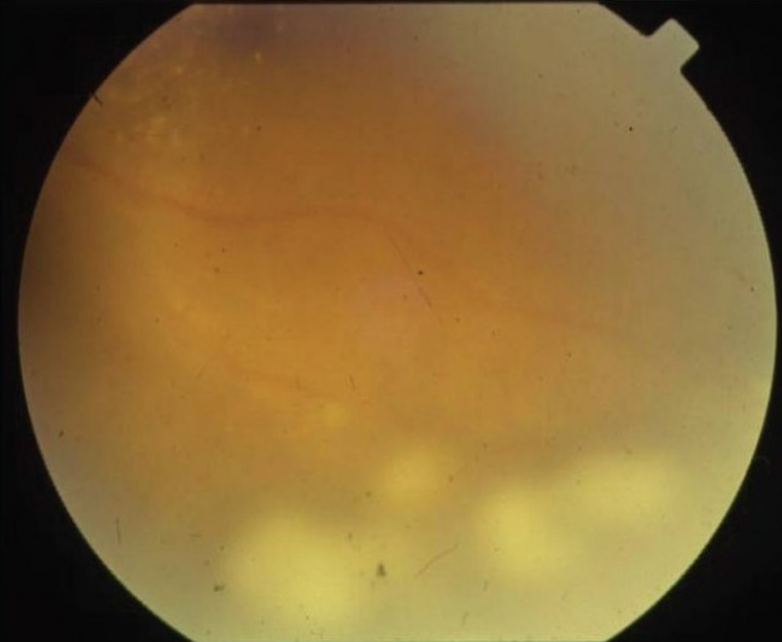
Synechia
TM obstruction
Steroid response

LATE STAGE

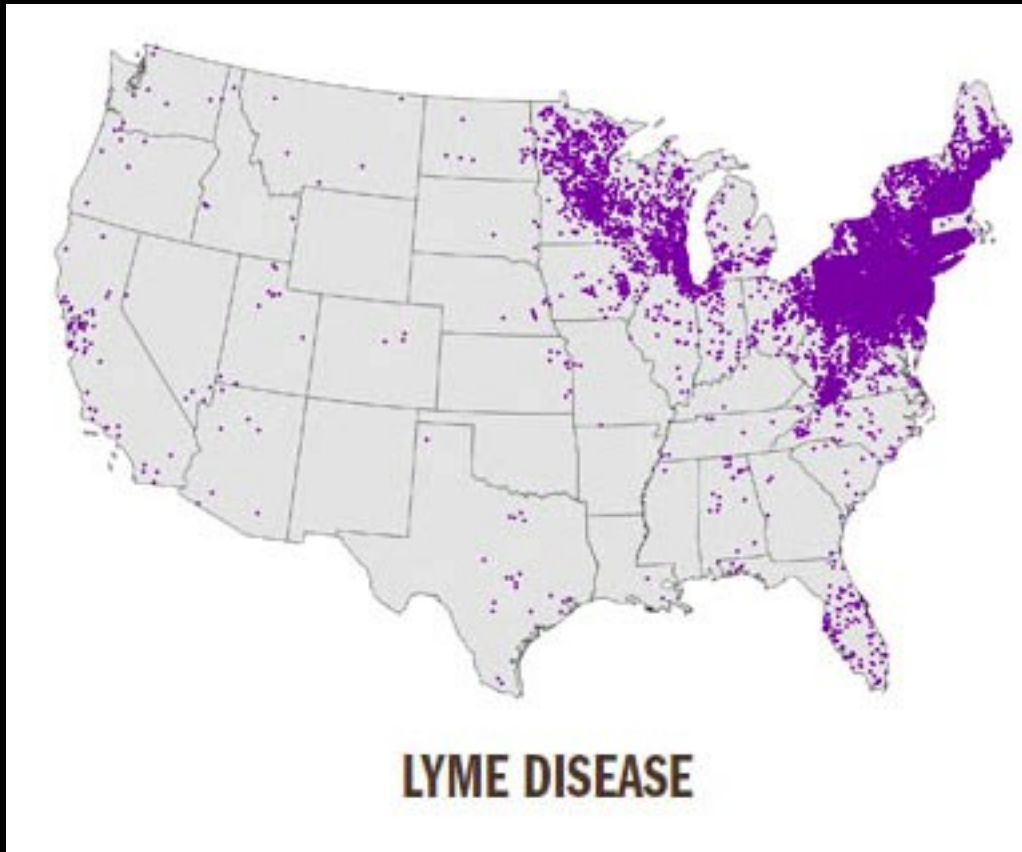


Posterior Segment

- A view of the vitreous & ocular fundus is always required at presentation
- R/O posterior uveitis (eg toxo) and masqueraders (eg. lymphoma)
- If a DFE cannot be performed during the initial visit, do it at a 24-48 hour follow-up visit



Laboratory Testing



What to Order

CBC w/ diff

ESR + CRP

VDRL (*Syphilis*)

ACE (*Sarcoid*)

PPD (*TB*)

Chest Xray

HLA-B27

Consider Lyme disease in endemic regions

Syphilis

- In the differential of any ocular inflammatory disease
- Screening tests include VDRL and RPR. FTA-ABS test is used to confirm
- **Co-infection with HIV is common**
- 65% of all syphilis cases occur in the MSM population



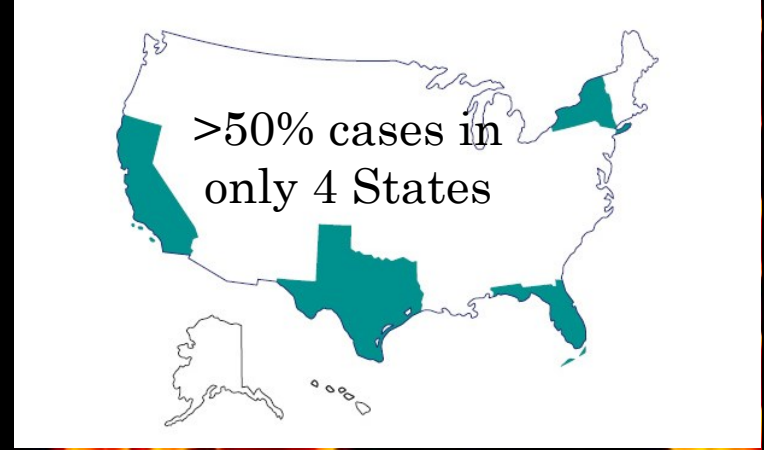
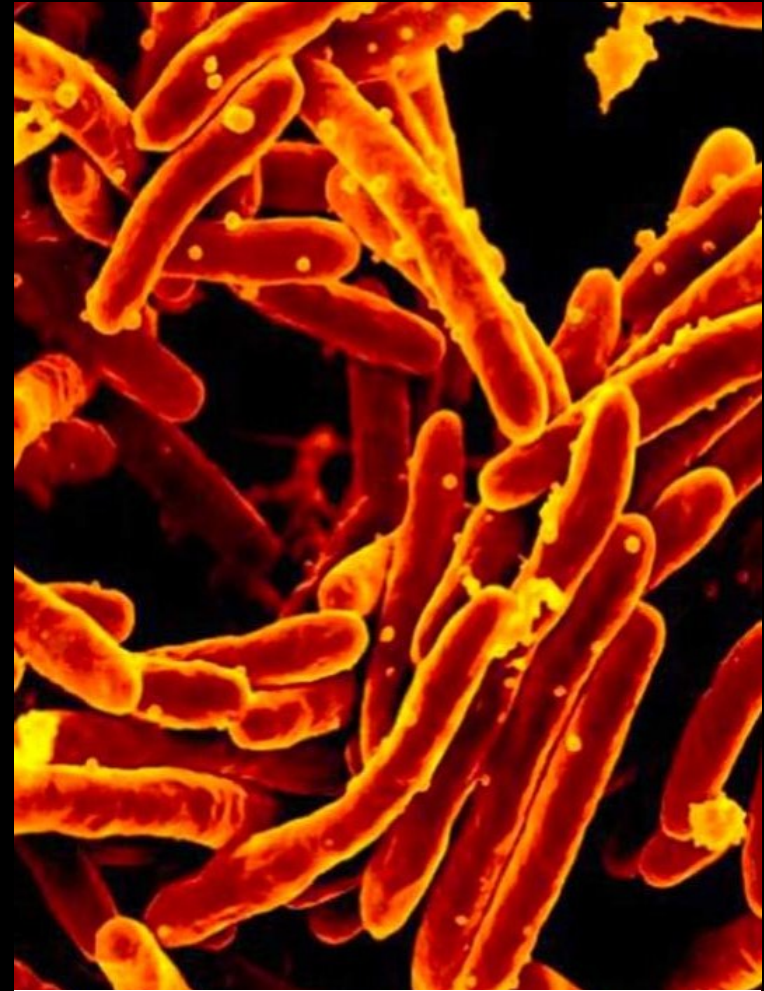
Syphilis & Iritis

- Uveitis is the most common ocular manifestation
- **Isolated anterior uveitis** is the most common presentation of syphilitic uveitis
- Syphilitic **anterior uveitis** is **14.5 times more likely to be HIV-positive** than HIV-neg
- IOP elevation common



Tuberculosis

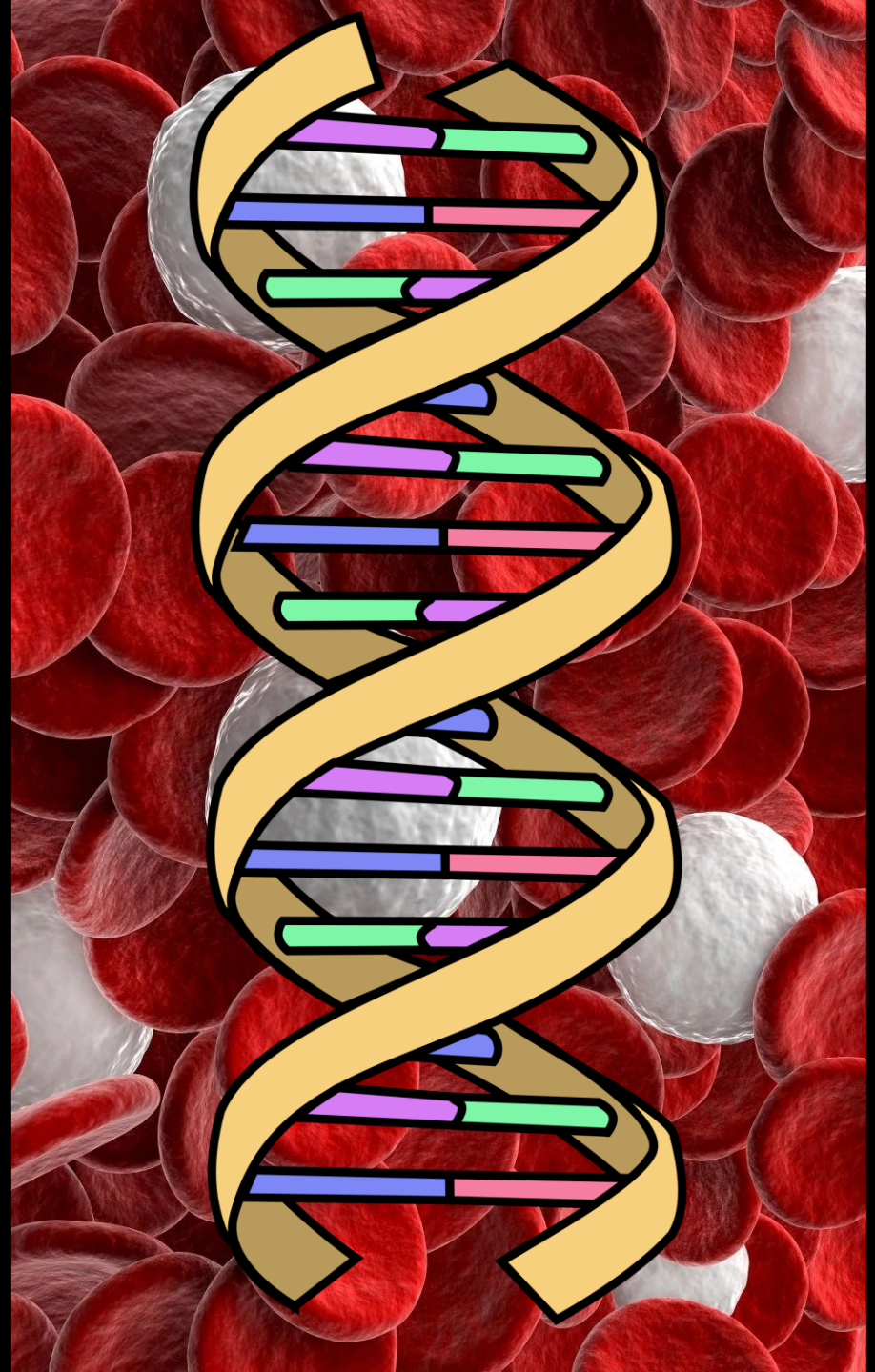
- In the differential of any ocular inflammatory disease
- Screening tests include tuberculosis skin test (PPD) and chest x-ray
- Most common in developing countries, **immigrant populations** and immunocompromised patients



HLA-B27

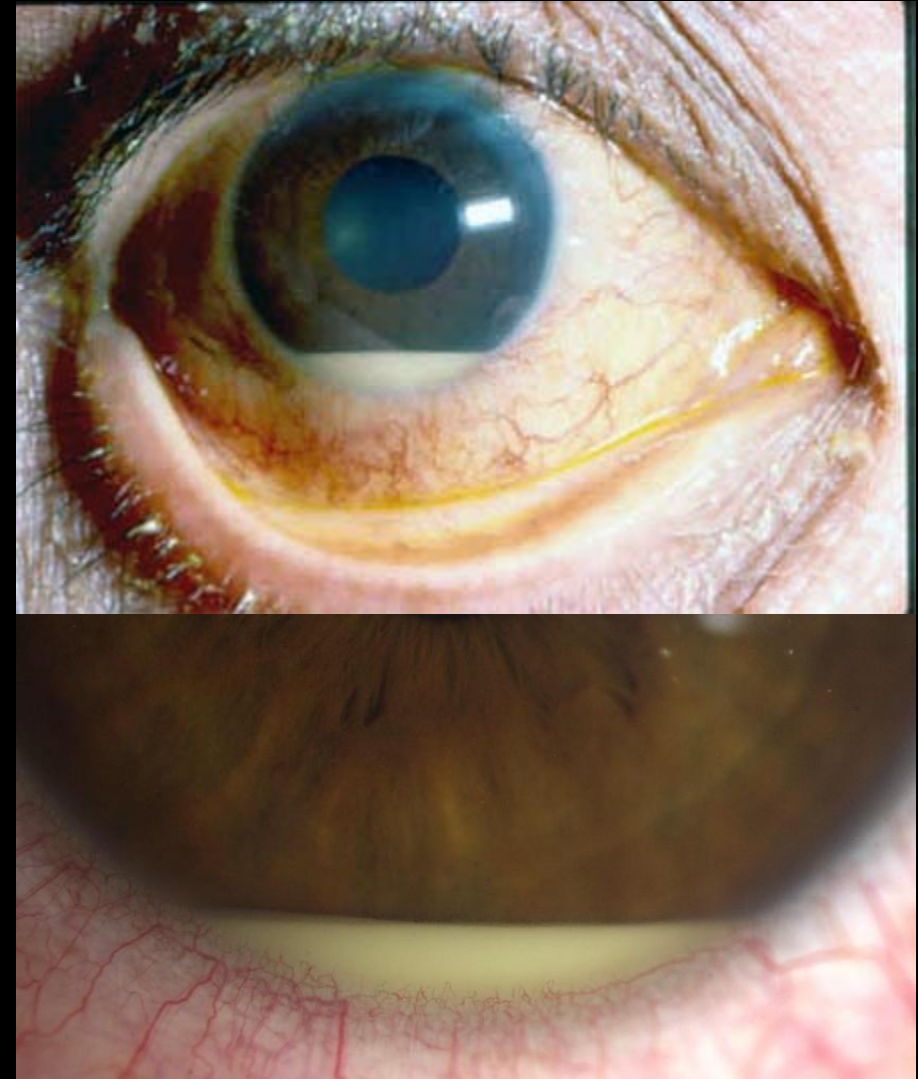
- Prevalence is 6-13% among whites and 2-4% among blacks
- In the US, **18-32% of acute anterior uveitis is associated with HLA-B27**
- Inflammatory arthritis common
- Ask about rheumatologic, dermatologic and GI symptoms

PMID: 30148724



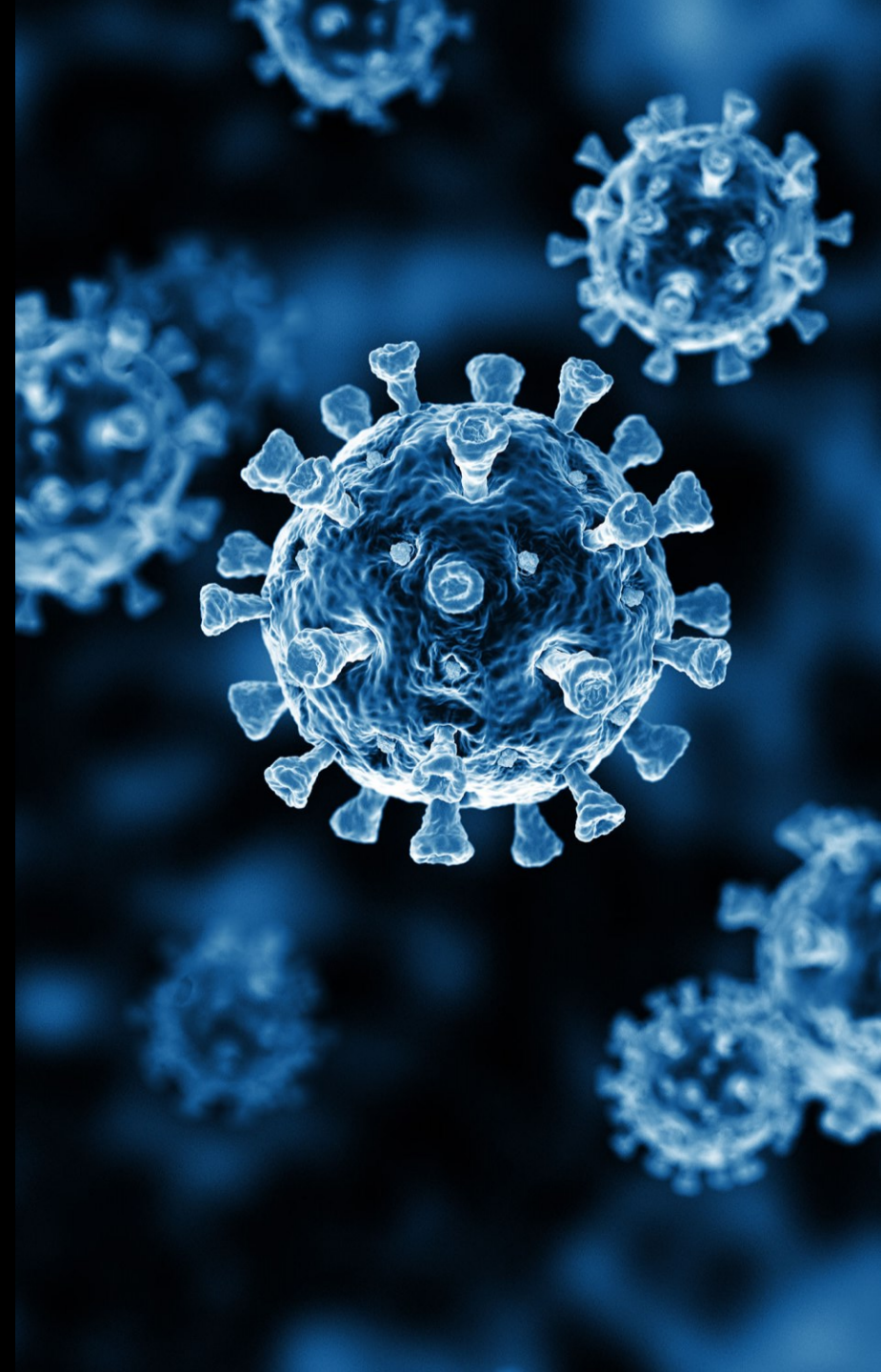
HLA-B27 & Iritis

- Acute, unilateral, nongranulomatous
- May be severe, with hypopyon, posterior synechiae and **plasmoid aqueous**
- **50% of recurrent anterior uveitis is HLA-B27 positive**
- Episodes may alternate between eyes
- Risk factors for recurrence: hypopyon, elevated ESR, male sex

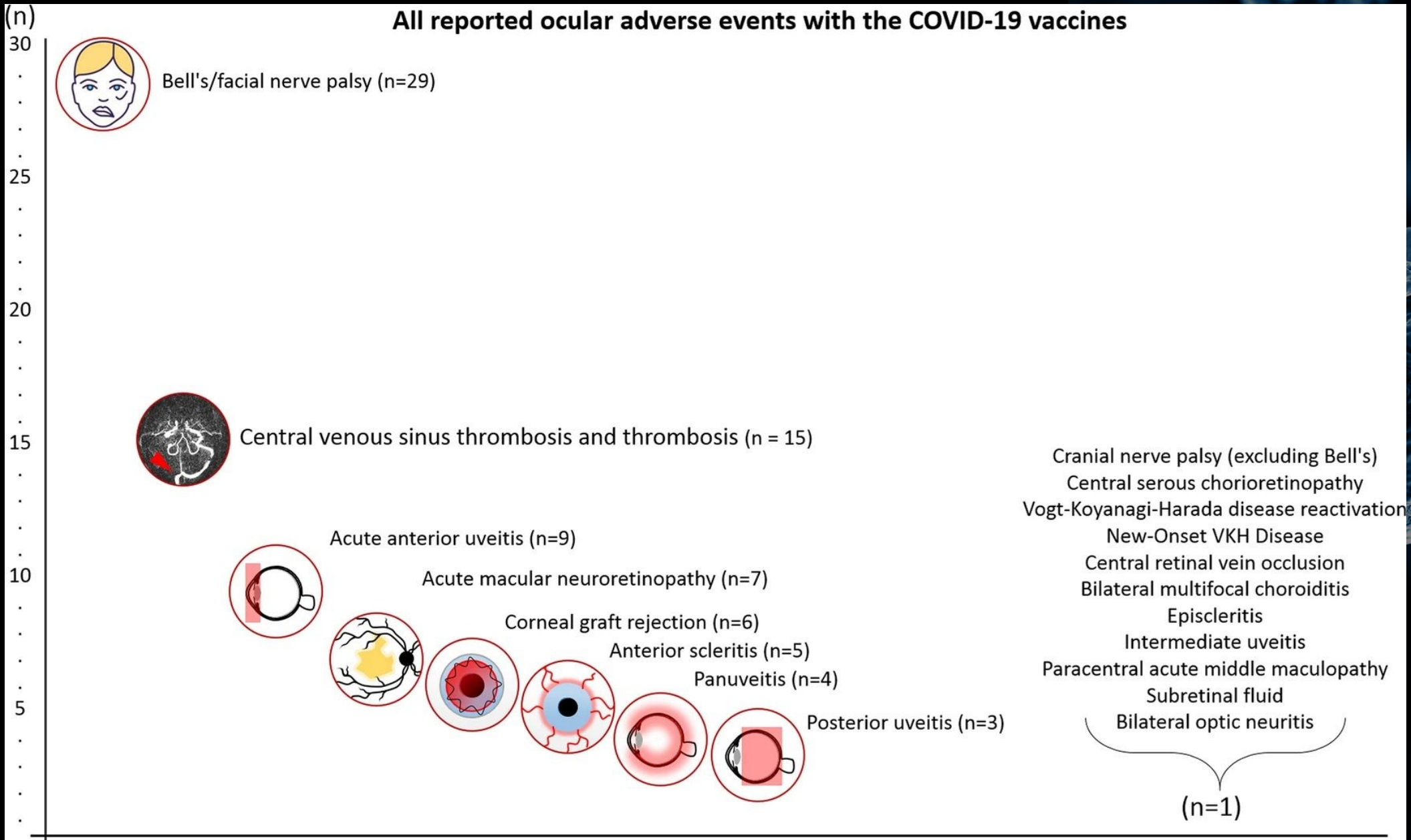


COVID-19 & Iritis

- Viral conjunctivitis is the most common ocular manifestation of COVID-19 infection
- Few reported cases of anterior uveitis associated with COVID-19 infection
- Numerous reports of anterior uveitis following COVID-19 vaccination
- Iritis onset occurs 1-day to 1-month after receiving the first or second dose of the Pfizer or Moderna vaccine.



All reported ocular adverse events with the COVID-19 vaccines



EDITORIAL

Vitamin D and Ocular Inflammation

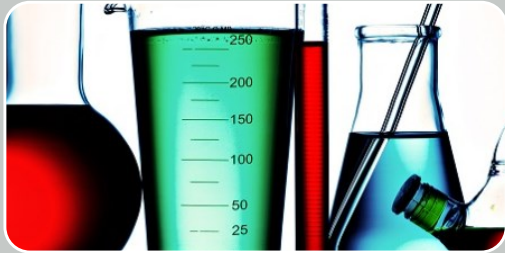
Emmett T. Cunningham Jr, MD, PhD, MPH^{1,2,3}, Lucia Sobrin, MD, MPH⁴, Anthony J. Hall, MD^{5,6},
and Manfred Zierhut, MD⁷

Should we measure serum vitamin D levels in our patients with ocular inflammation?

- On the pro side:**
- Testing requires a simple blood test
 - Many patients with ocular inflammation are deficient
 - Treatment is both easy and effective
- On the con side:**
- Even simple blood tests add cost
 - Most patients with uveitis have normal vitamin D levels
 - There is no level one evidence of benefit

Treatment of Iritis

Keys to successful iritis management



Good
workup and
appropriate
labs

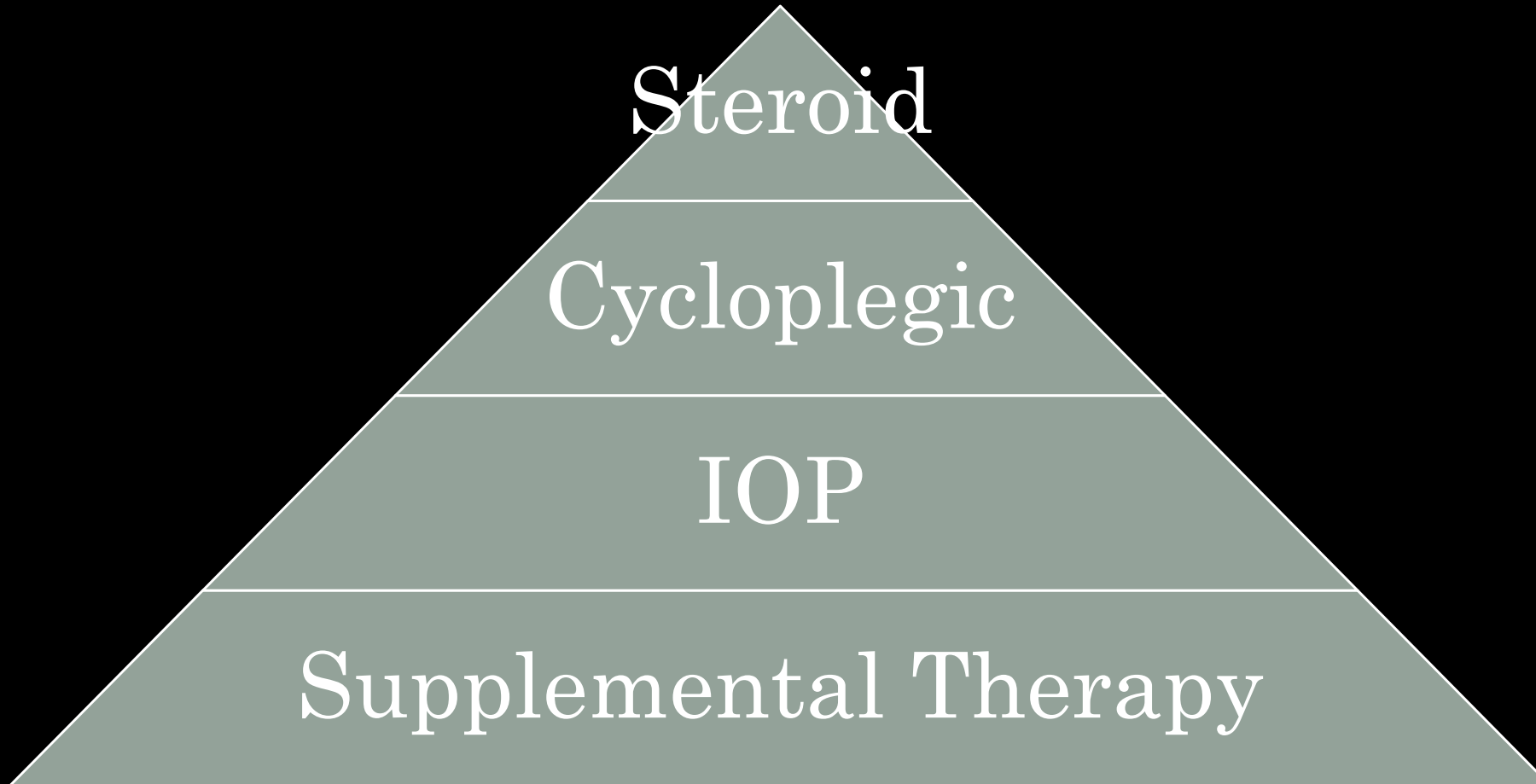


Enough of
the right
medication
long enough



Knowing
when to
refer

Treatment of Iritis



Prednisolone acetate suspension

Name Brand

Smaller, more uniform
particle size

Easier to suspend, stays in
suspension longer

More uniform dosing

Generics

Larger particles

Vigorous shaking required

Nozzle clogging possible

Less uniform dosing

Comparative Analysis of Prednisolone Acetate Suspensions

CALVIN W. ROBERTS¹ and PETER L. NELSON²

ABSTRACT

Purpose: The aim of this study was to determine differences in particle size between three prednisolone acetate suspensions: Pred Forte[®], EconoPred[®] Plus, and generic prednisolone acetate 1%.

The prednisolone particles in Pred Forte were smaller and more uniform at all time points, allowing them to stay in suspension longer. This may result in greater homogeneity between doses and increased ocular bioavailability.

PMID: 17444806



Q1H

- Start steroid at q1-2h dosing
- Monitor at 1-3d, then weekly

Taper

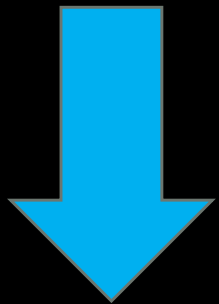
- After 2-step ↓ in AC cells
- If not improved in 2-3 wk, refer

Stop

- Continue steroid at least 4-6 wk
- Monitor 8 wks for rebound

**Loteprednol
etabonate**

ex: Lotemax



**LESS POTENT &
FEWER ADVERSE
EFFECTS**

**Prednisolone
acetate**



**MORE POTENT &
MORE ADVERSE
EFFECTS**



**Difluprednate
emulsion**

ex: Durezol

Loteprednol etabonate

Low risk of IOP elevation
and cataract

Too weak for primary tx of
most iritis cases

Good for...

- (1) long-term maintenance
- (2) pts with severe glaucoma

Difluprednate emulsion

Less frequent instillation

No shaking required!

High risk of IOP elevation

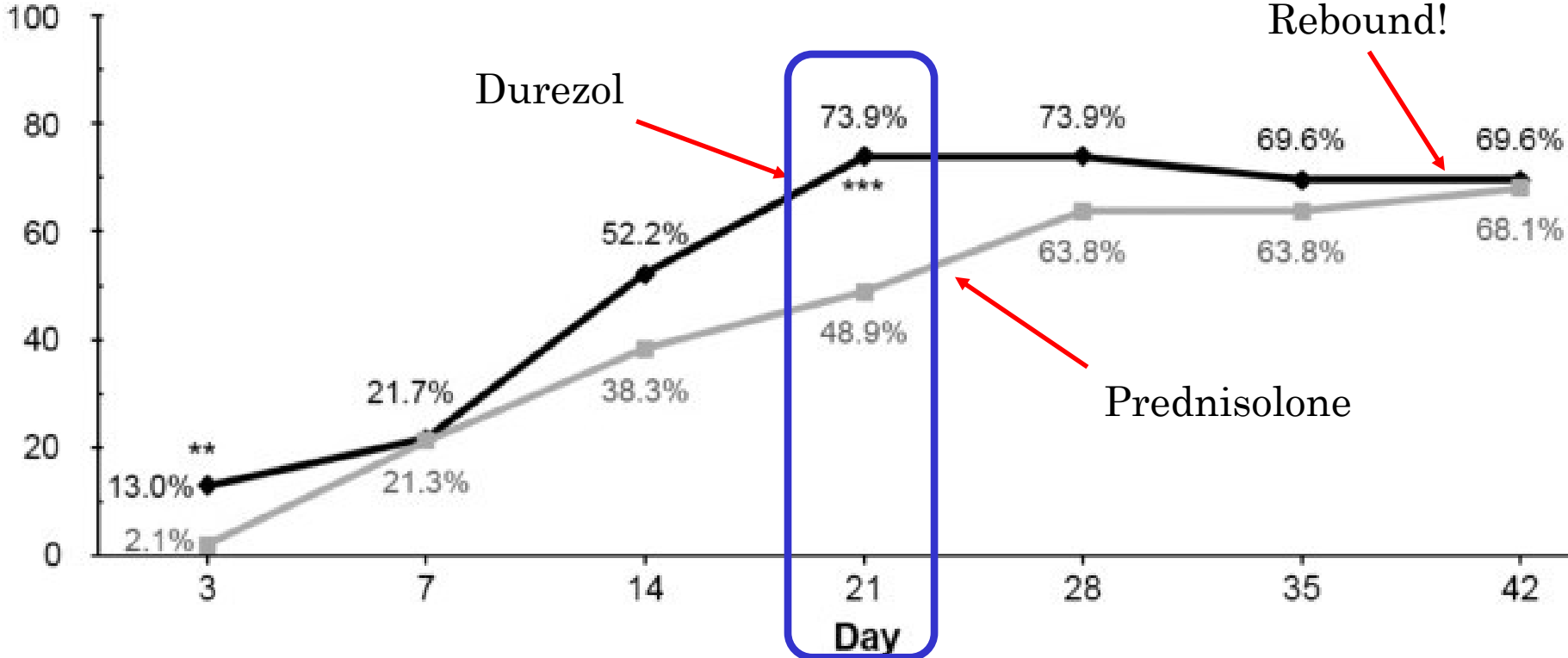
Rebound inflam common

Good for...

- (1) Mod-severe iritis cases
- (2) Trouble shaking bottle

Significantly more iritis patients achieve complete resolution at 3 weeks with Durezol than PF

B. Complete clearing of anterior chamber cells



Cycloplegia

- Muscle relaxant for pain management
- Mydriasis for posterior synechia prevention
- Any long-acting agent is suitable
- When to stop?



Intraocular Pressure

- May initially be low but can rise due to trabecular obstruction or steroids
- Perform tonometry at every visit
- Start IOP lowering medication at first sign of IOP elevation
- **Do not reduce steroid dosage in response to \uparrow IOP**
- **Avoid prostaglandins!**



Additional Considerations

Nighttime
coverage

Systemic
pain meds

Maintenance
therapy

OPEN

Triggering factors associated with a new episode of recurrent acute anterior uveitis

Nutnicha Neti, Anchisa Pimsri, Sutasinee Boonsopon, Nattaporn Tesavibul & Pitipol Choopong[✉]

Stress and inadequate sleep may lead to the future episode of acute anterior uveitis in RAAU. Both physical and emotional stress management should be advised to RAAU patients to minimize recurrences and further complications.

Knowing When to Refer



Failure to
improve

Bilateral

Hypopyon

Plasmoid
aqueous

Chronic

Glaucoma

Key Points

- Hallmarks of iritis: Redness, pain and AC cells
- Beware masqueraders!
- Check the fundus at presentation
- Check the IOP at every visit
- Enough of the right medication long enough
- Know when to refer



Thank you!

