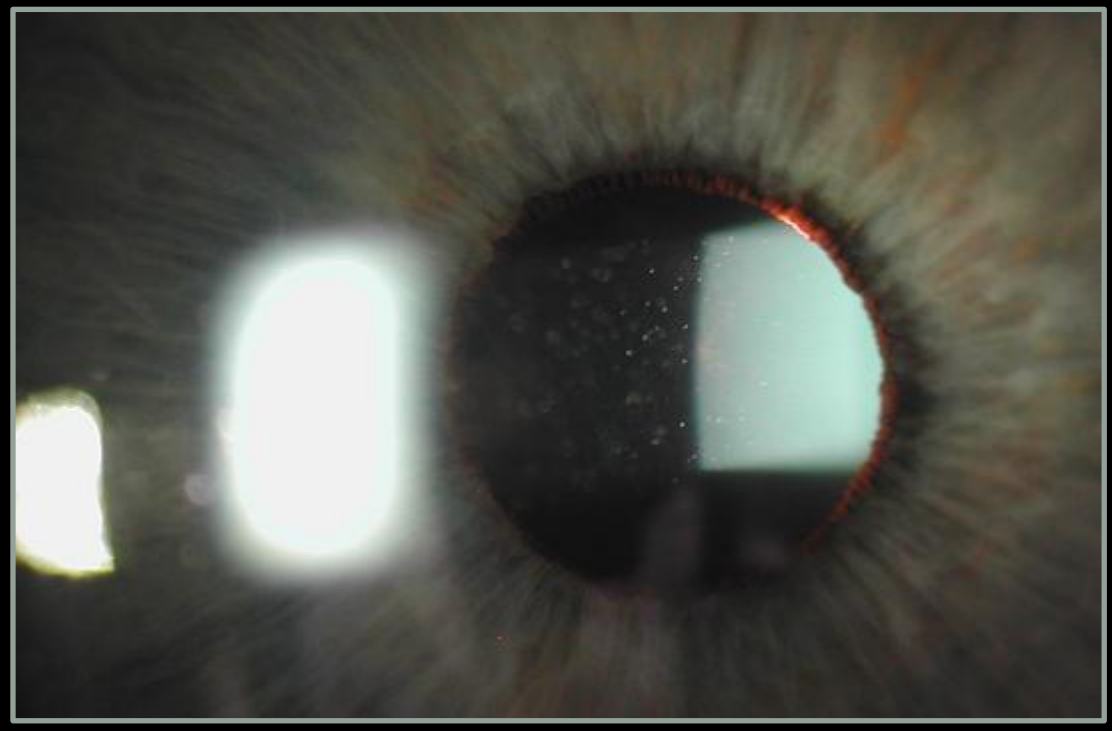
IRITIS



EXAMINATION TIPS & TREATMENT PEARLS

Rick Trevino, OD

Indiana University School of Optometry

rctrevin@iu.edu

richardtrevino.net

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

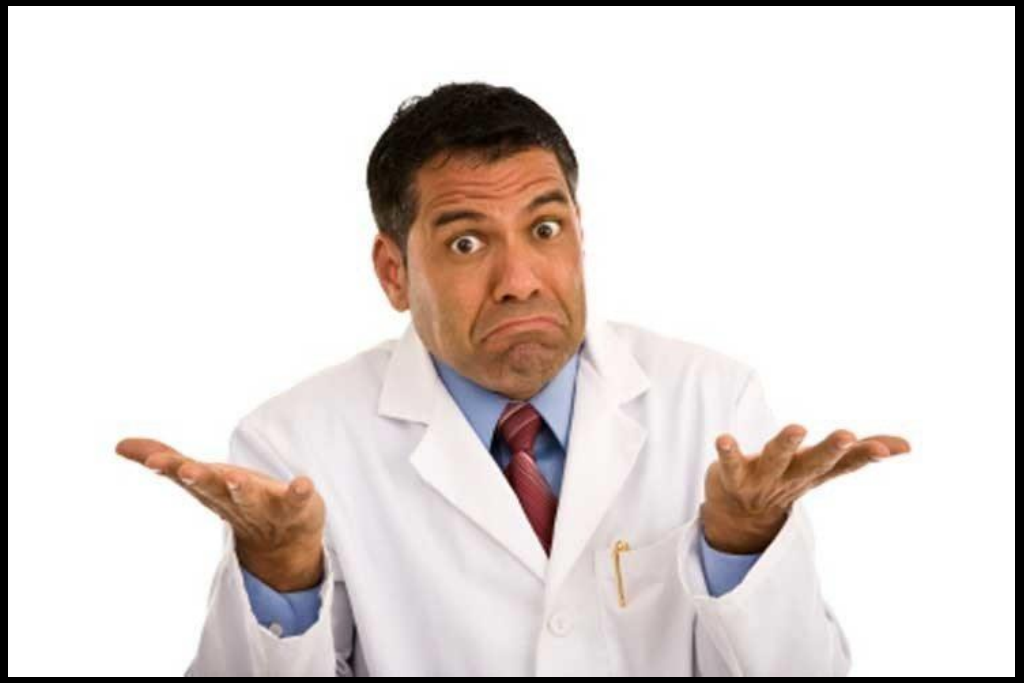
Retinitis

Angle closure

Ocular ischemia

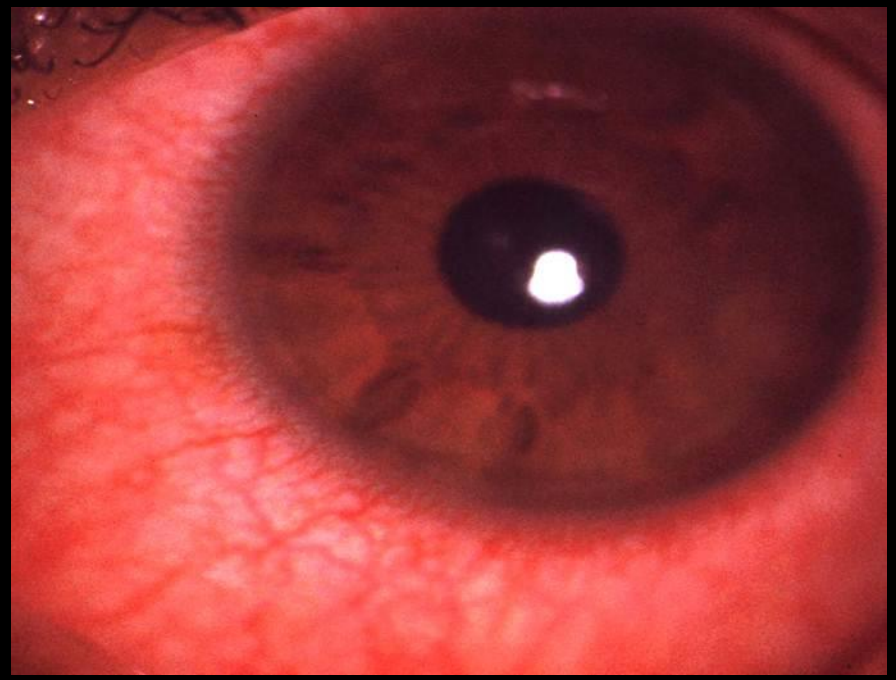
Idiopathic vs Traumatic Iritis

Traumatic
Self-limiting
Tends to resolve without sequelae

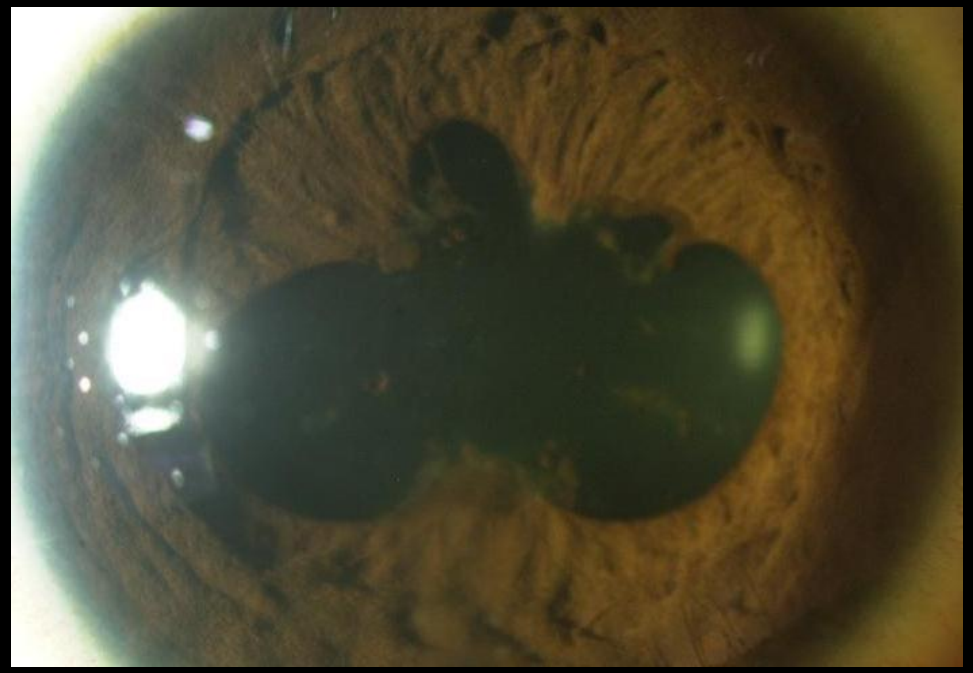


Idiopathic
May become chronic / recurrent / severe
Complications common

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

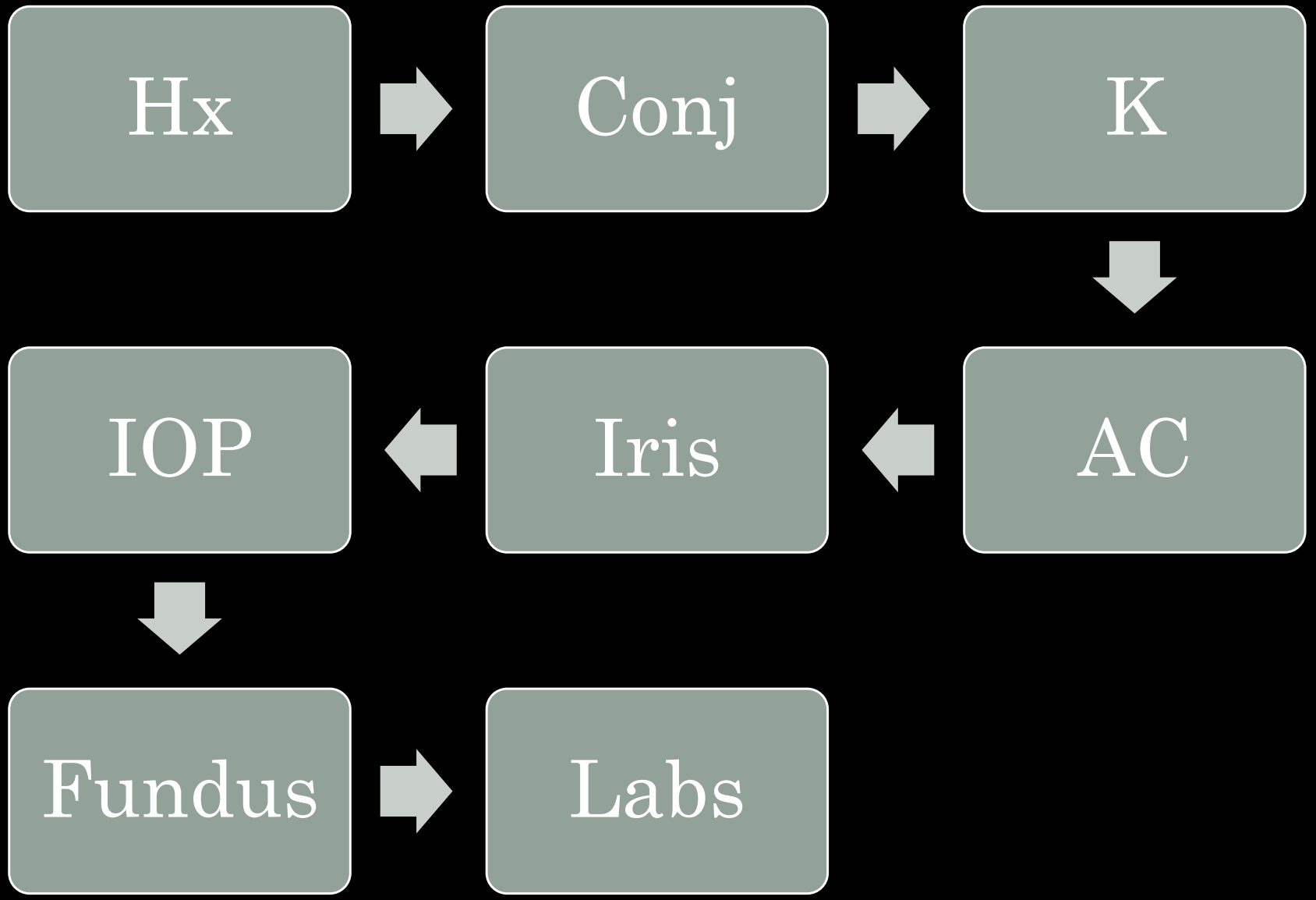
- R/O masqueraders
- Determine type of iritis
- Stage severity

Control inflammation as quickly as possible

Treatment

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

Examination



History

Prior Episodes	Recent ocular surgery	General health
Recurrence warrants search for cause	R/O endophthalmitis, TASS, Rebound inflammation (Durezol)	HLA-B27: arthritic, derm, GI dx Others: Sarcoid, syphilis, TB, Lyme

Tattoo-Associated Uveitis

Simultaneous onset of uveitis and inflammation of tattooed skin

Onset >6 months after tattoo was created

Bilateral and recurrent iritis

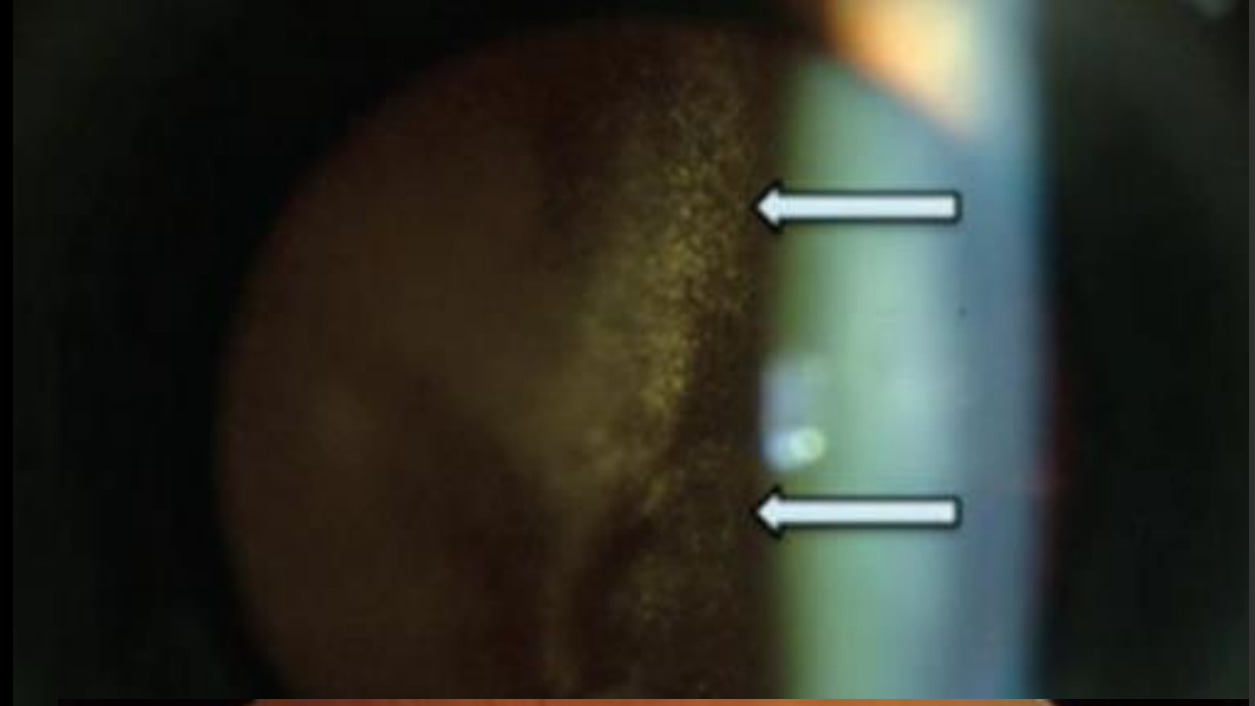
Tattoo removal decreases risk of recurrence

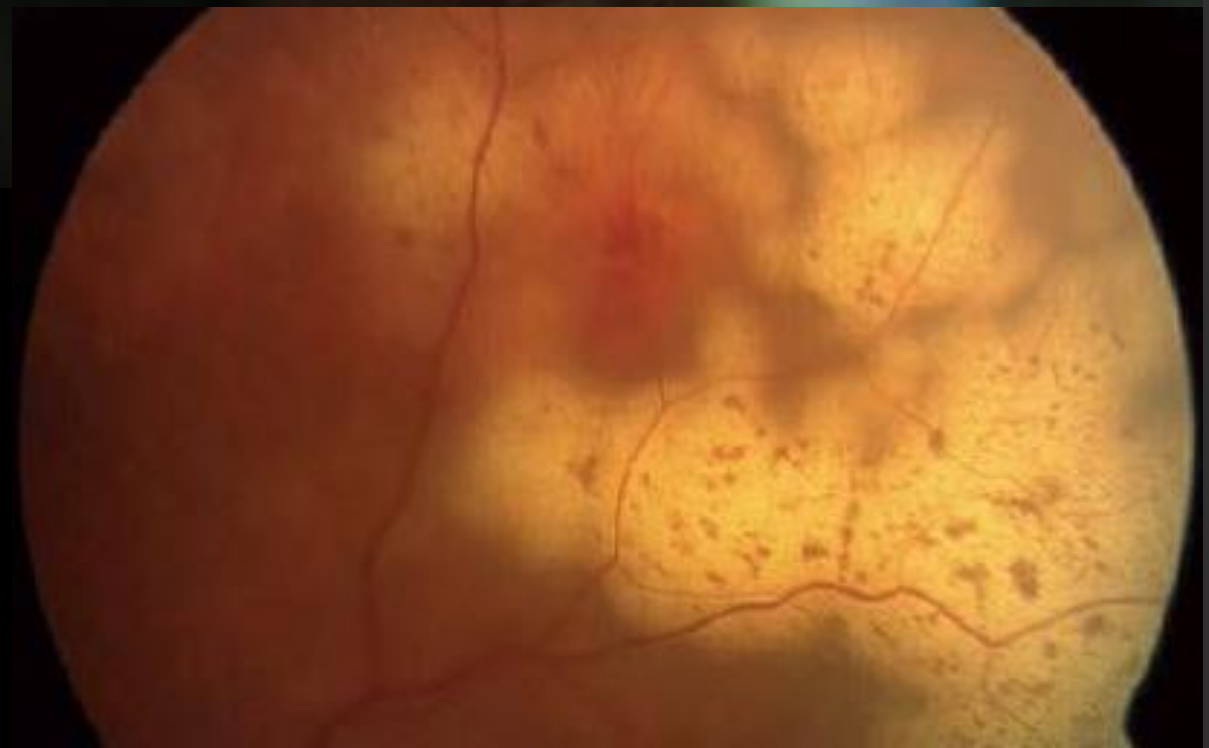
Symptoms: Pain

Painful Masqueraders	Non-Painful Masqueraders
• Corneal abrasions • Corneal ulcers • Angle-closure glaucoma • Posner-Schlossman	• Lymphoma • Ocular ischemic syndrome • Posterior uveitis • Juvenile rheumatoid arthritis

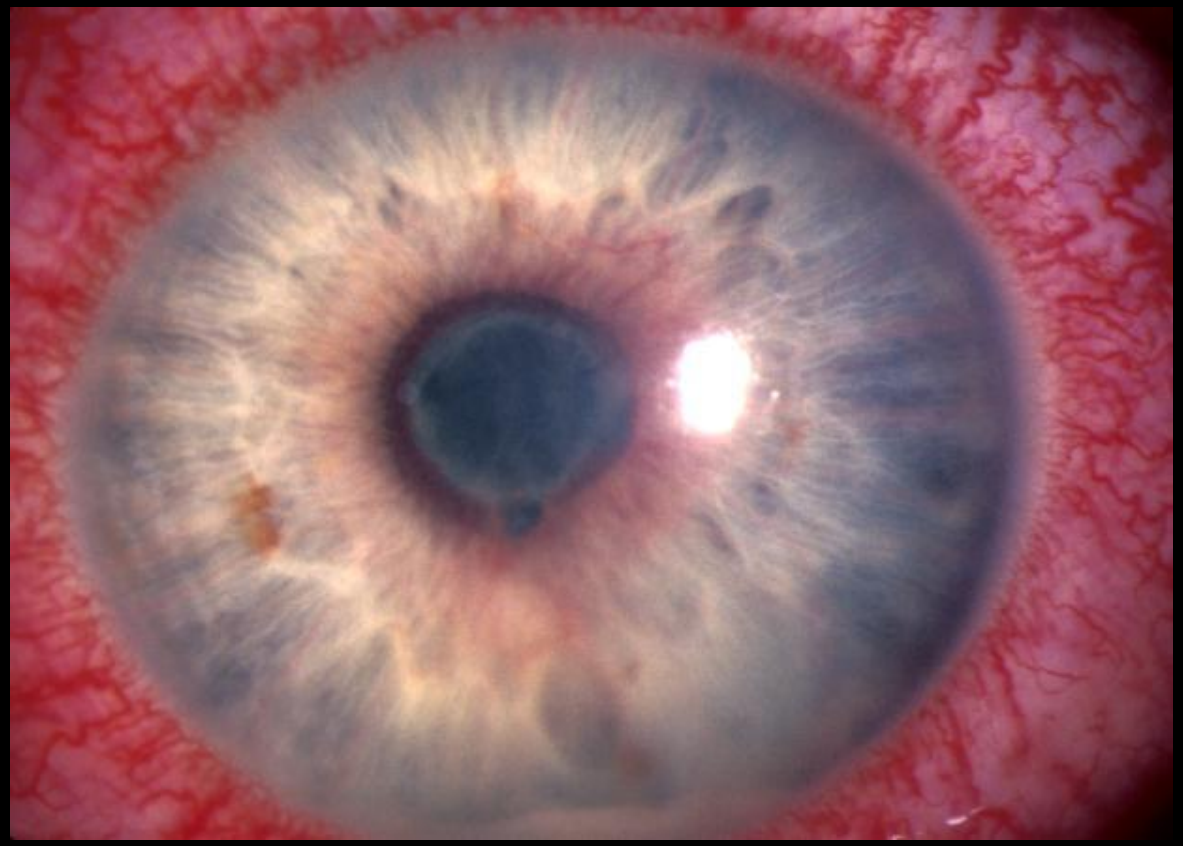
Lymphoma

- 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

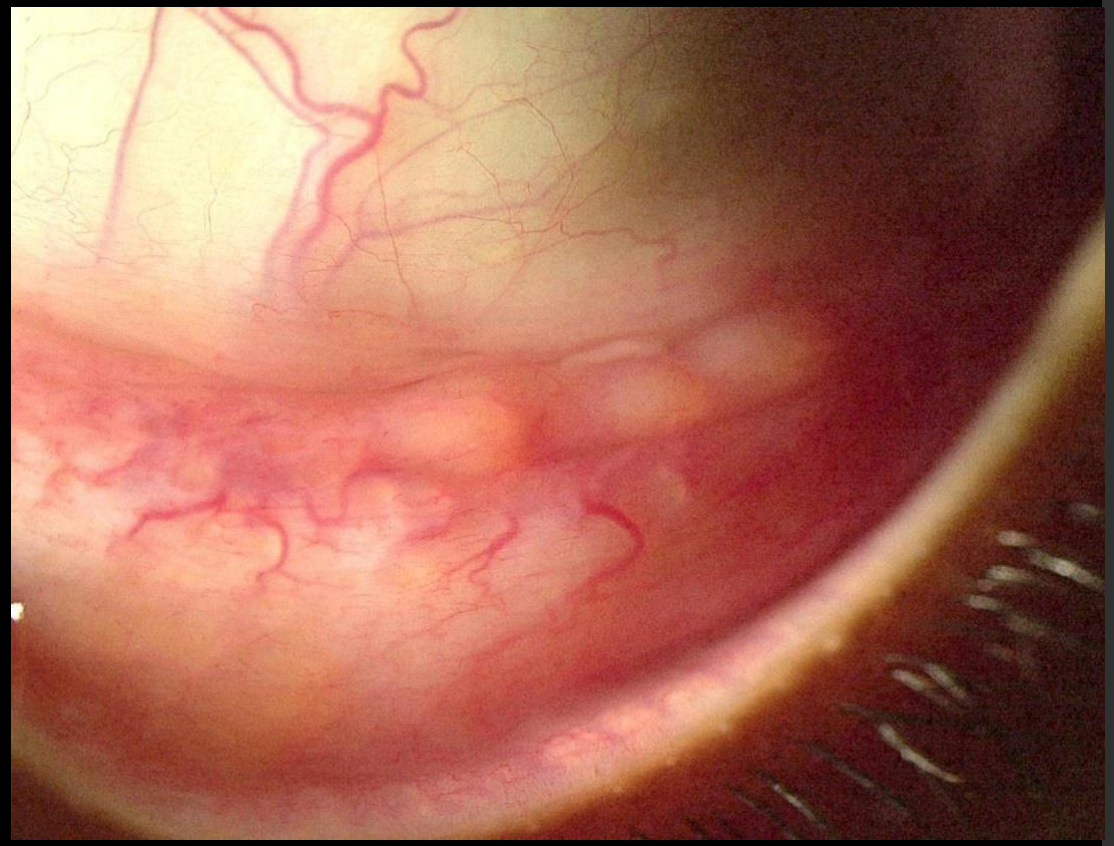




Conjunctiva



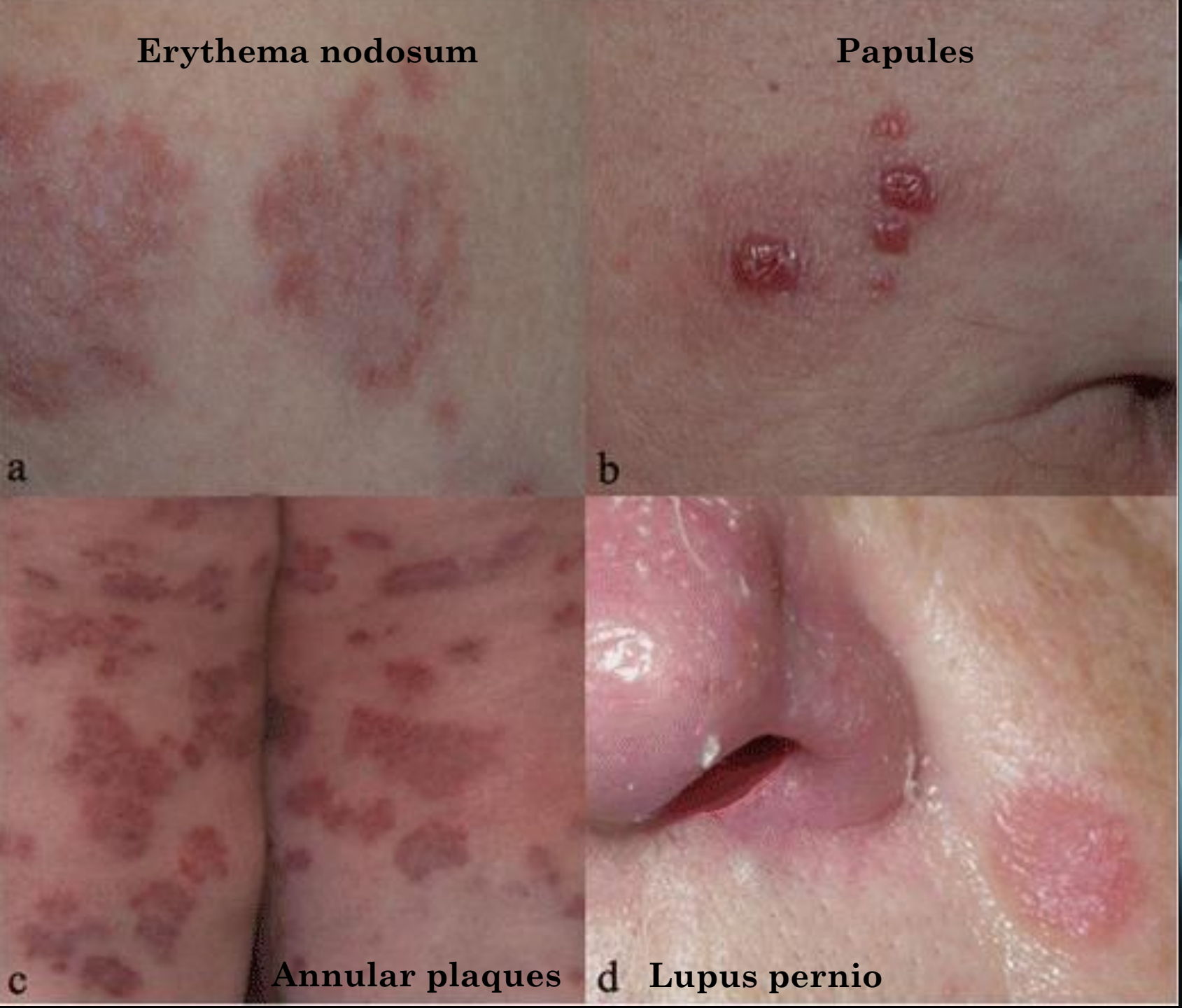
Ciliary flush

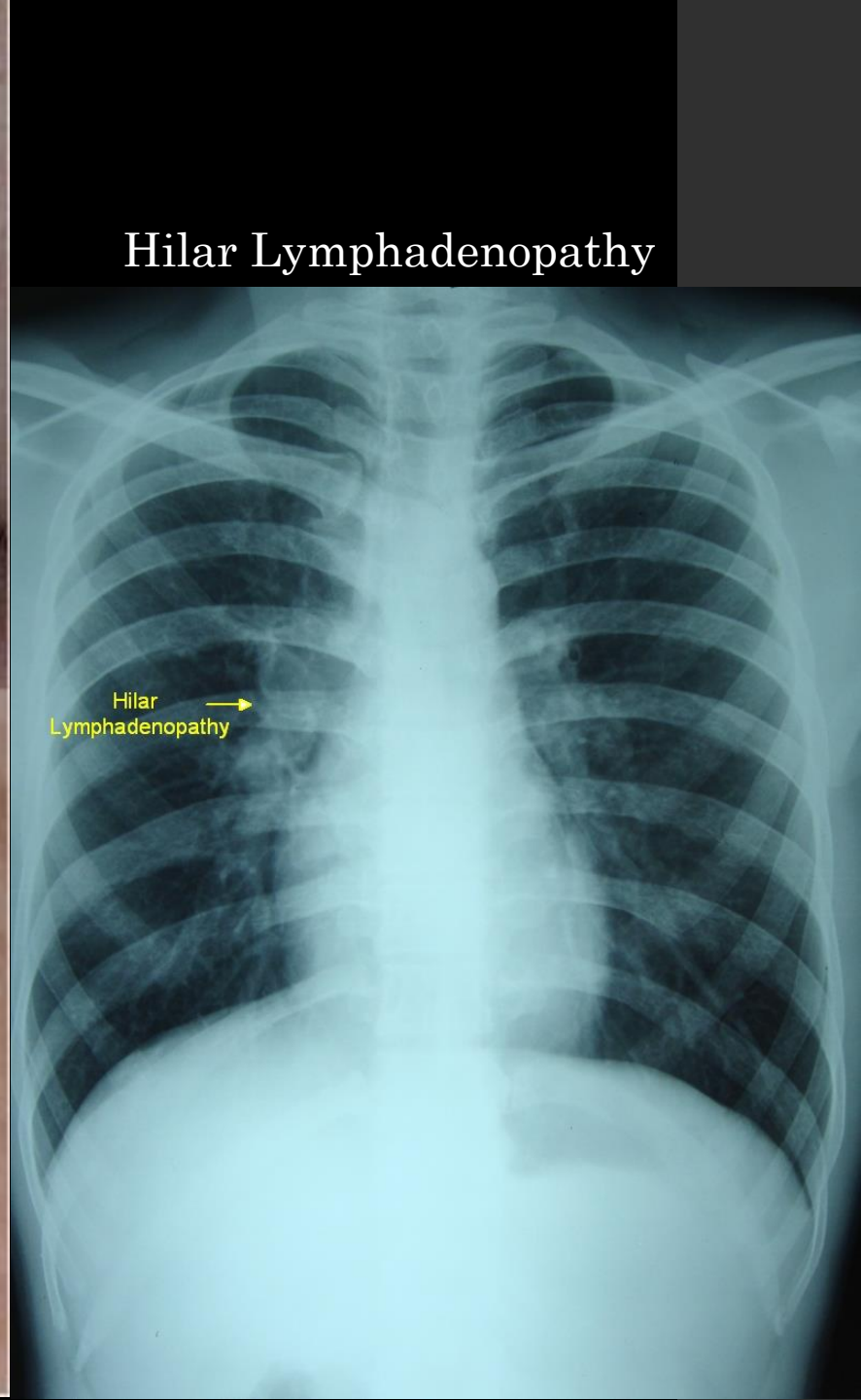


Sarcoid granulomas

Sarcoid

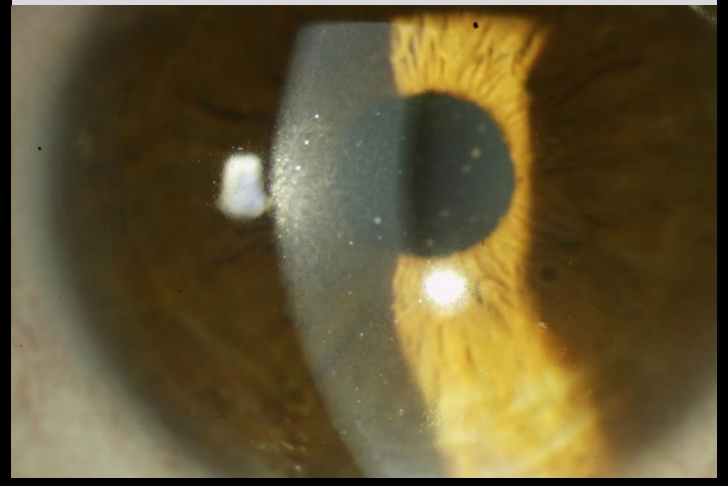
- Chronic, idiopathic granulomatous disorder
- In the differential diagnosis of any ocular inflammatory dx
- Noncaseating granulomas
- Chest x-ray: hilar adenopathy
- Labs: Angiotensin converting enzyme, serum lysozyme

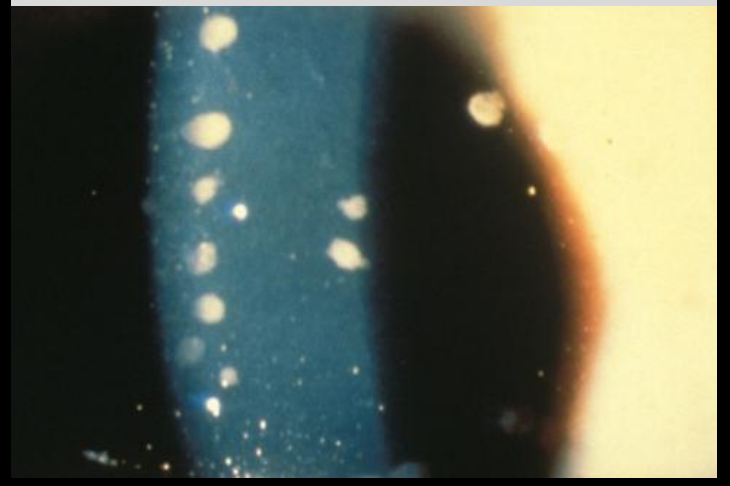

Erythema nodosum
Papules
a
b
c
Annular plaques
d
Lupus pernio


Hilar Lymphadenopathy
Hilar
Lymphadenopathy

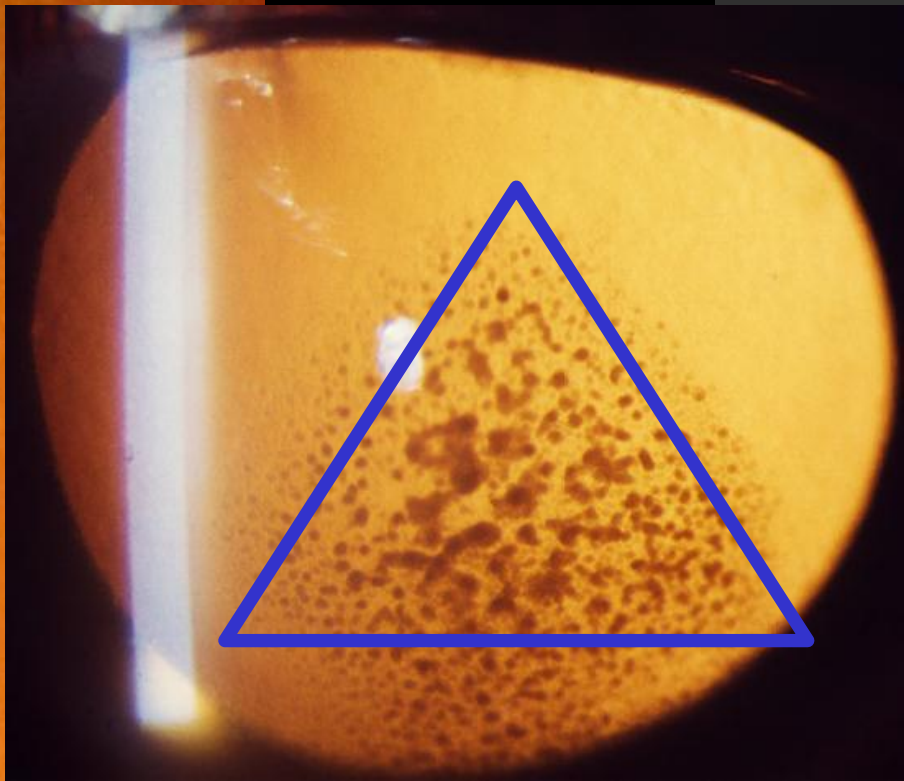
Cornea: Keratic Precipitates

Fine KPs	Mutton-Fat KPs	Pigmented KPs
Acute Nongranulomatous	Chronic Granulomatous	Chronic Prior episode

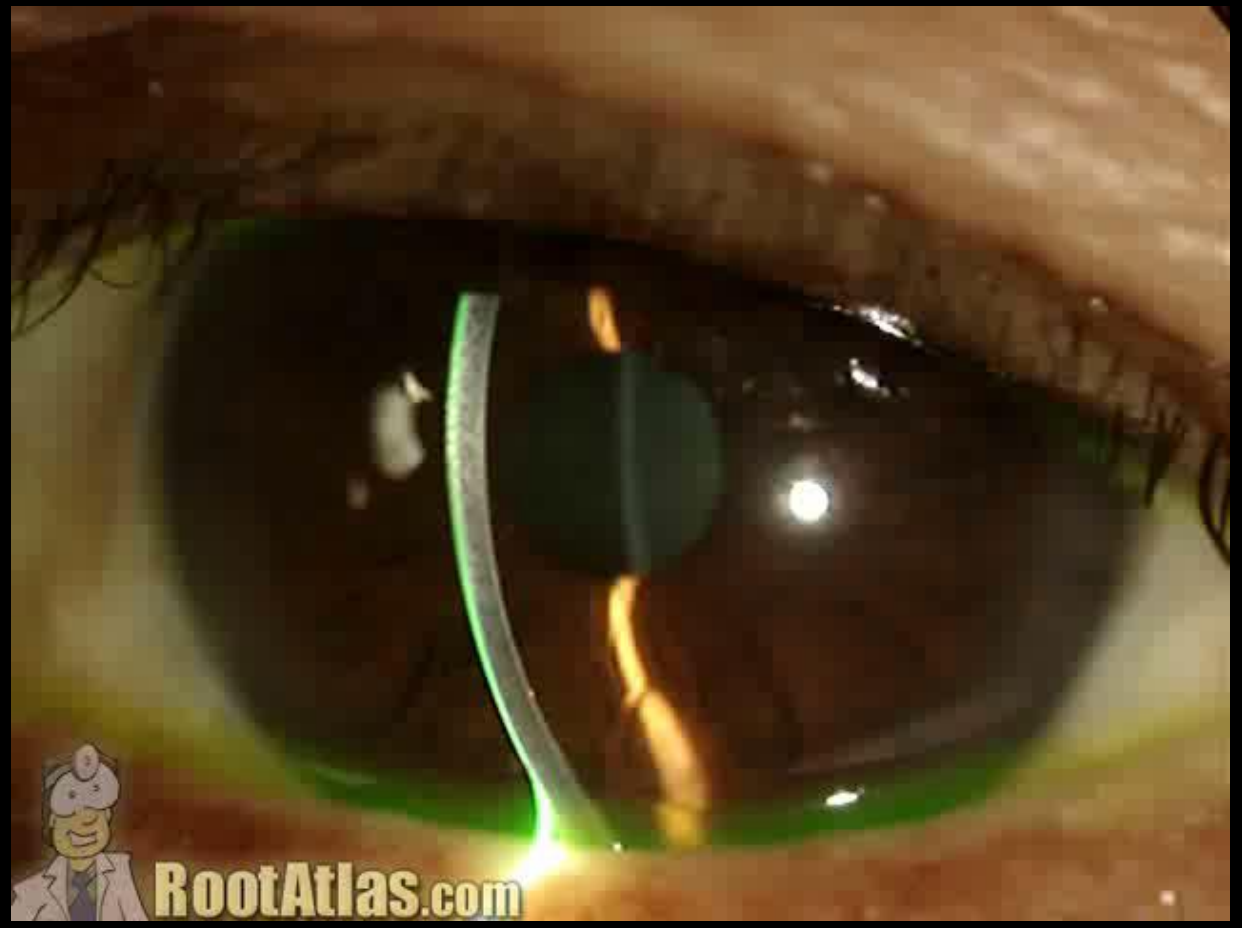




Arlt's Triangle



AC: Examination Technique



AC: Flare vs Cells

Flare	Cells
Aqueous haziness Protein + fibrin	Discrete white dots White blood cells

AC: Flare vs Cells

Flare	Cells
Breakdown of blood-aqueous barrier from *any* cause	Infiltration of the anterior chamber by white blood cells
Not a reliable indicator of active inflammation	**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

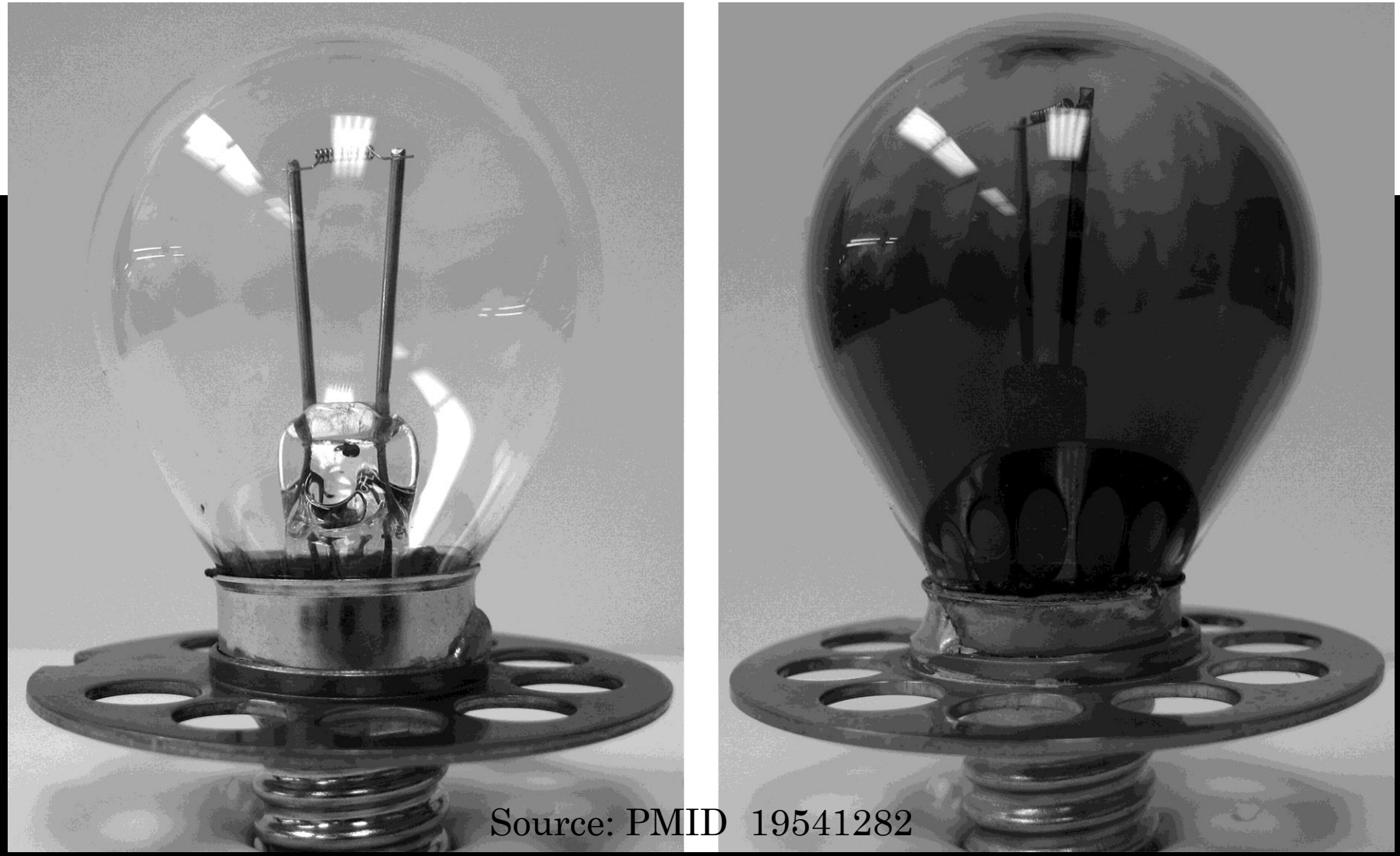
TABLE 3. The SUN* Working Group Grading Scheme for Anterior Chamber Cells

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

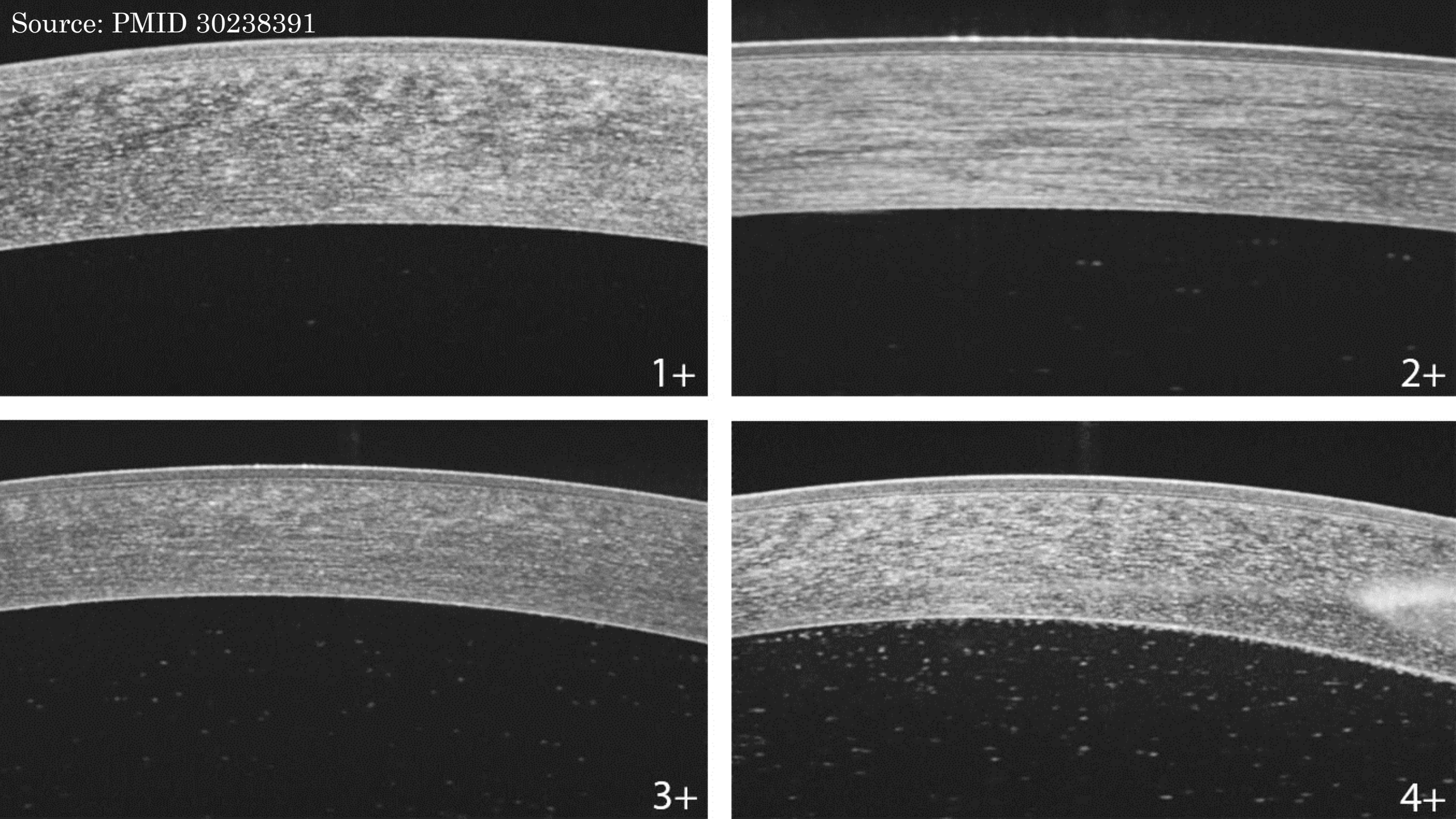
*SUN = Standardization of uveitis nomenclature.
†Field size is a 1 mm by 1 mm slit beam.

Source: PMID 16196117

The Effect of Biomicroscope Illumination System on Grading Anterior Chamber Inflammation

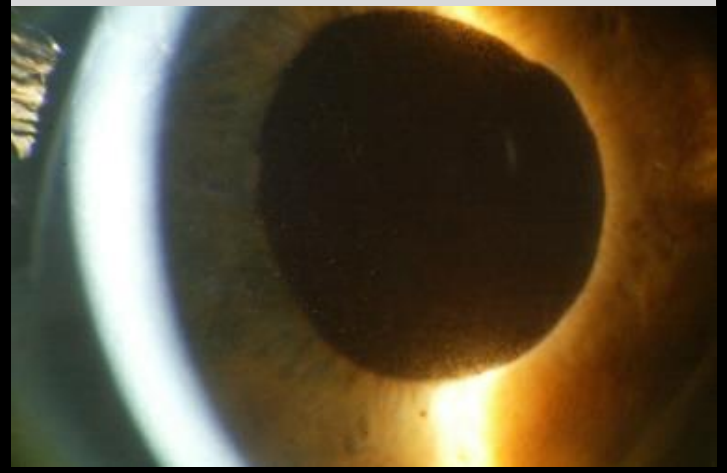


Source: PMID 19541282


Source: PMID 30238391
1+
2+
3+
4+

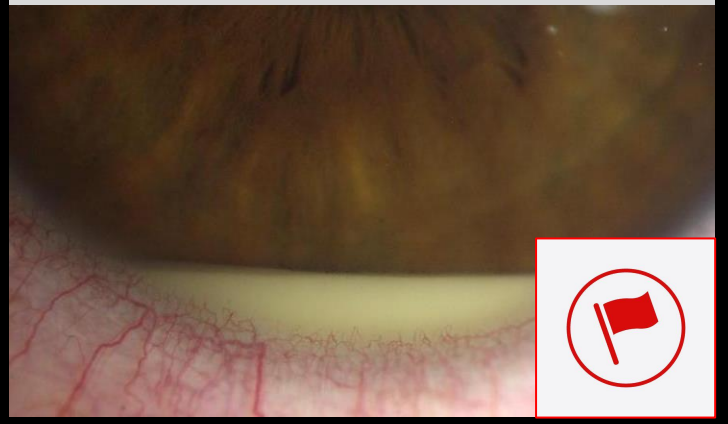
AC: Red, White & Who?

Red Blood Cells	White Blood Cells	Pigment Cells
Hyphema Trauma	Inflammation Infiltration	Surgery / Trauma PDS



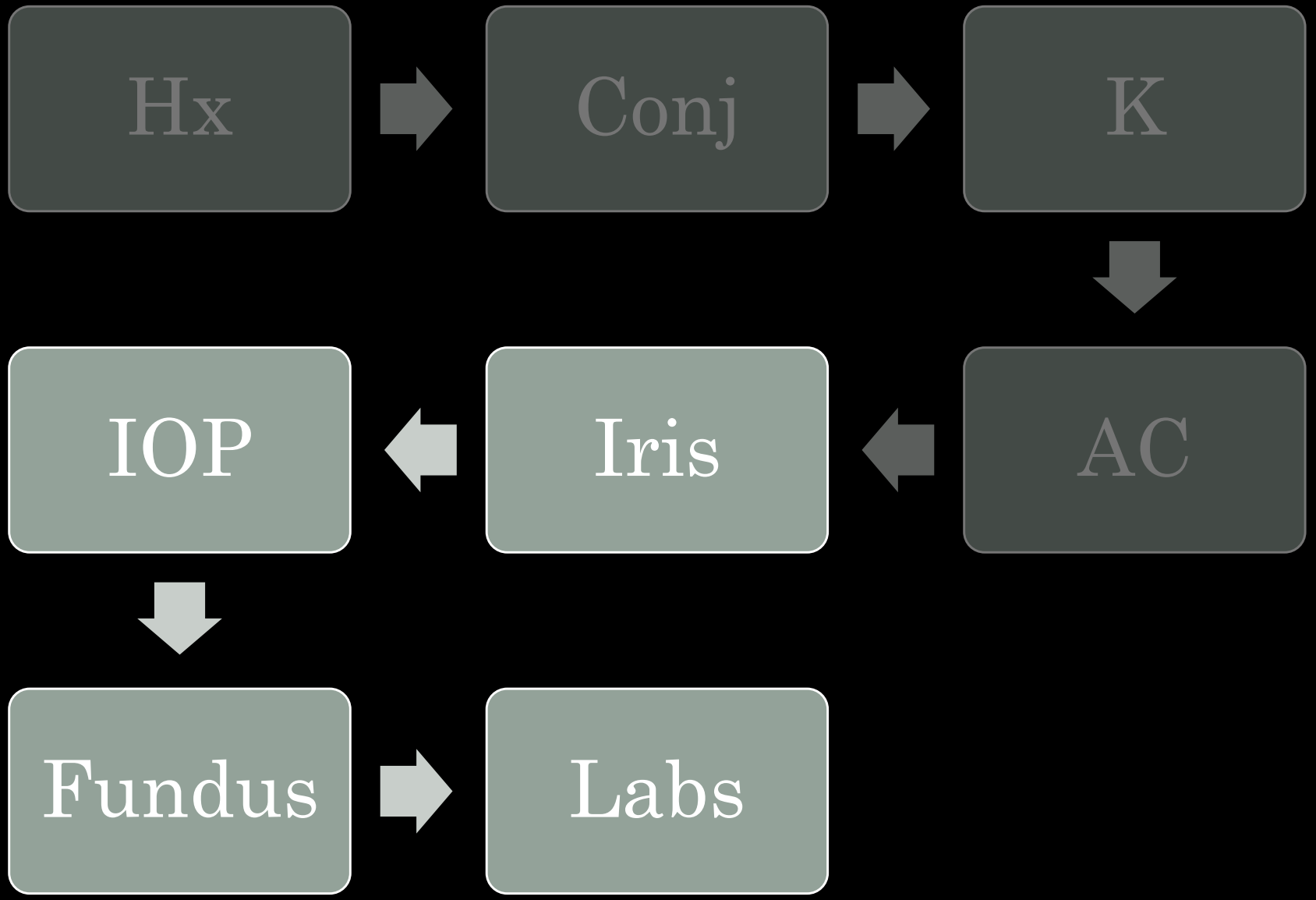
AC: Hyphema, Hypopyon & Fakers

Red Blood Cells	White Blood Cells	Neoplastic Cells
Hyphema	Inflammation Hypopyon	Infiltration Pseudo-hypopyon



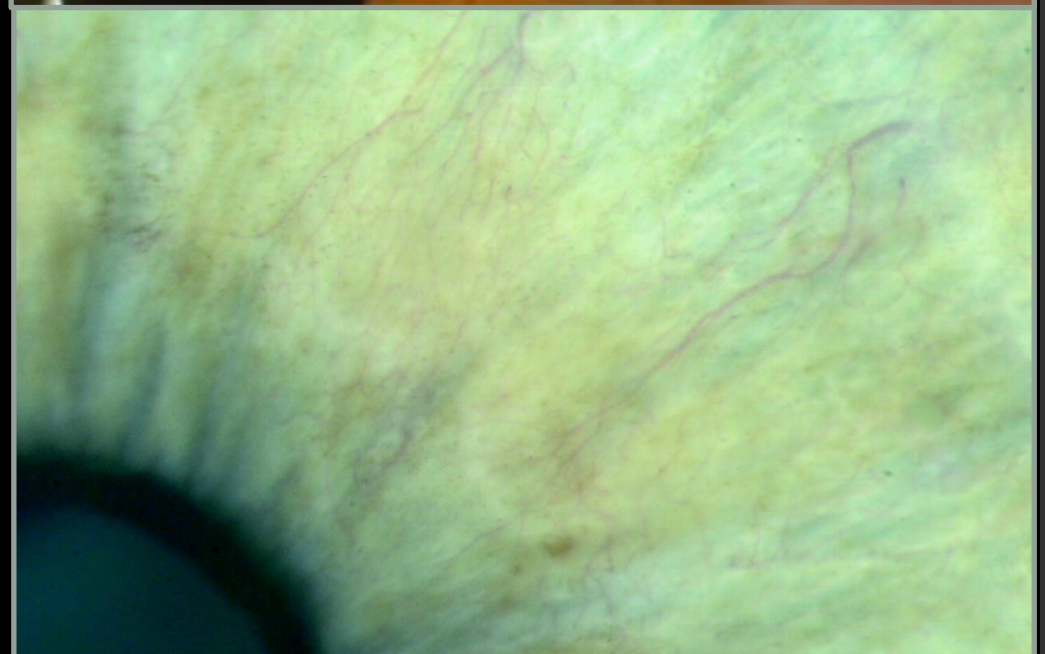
Source: Eyerounds.org

Examination



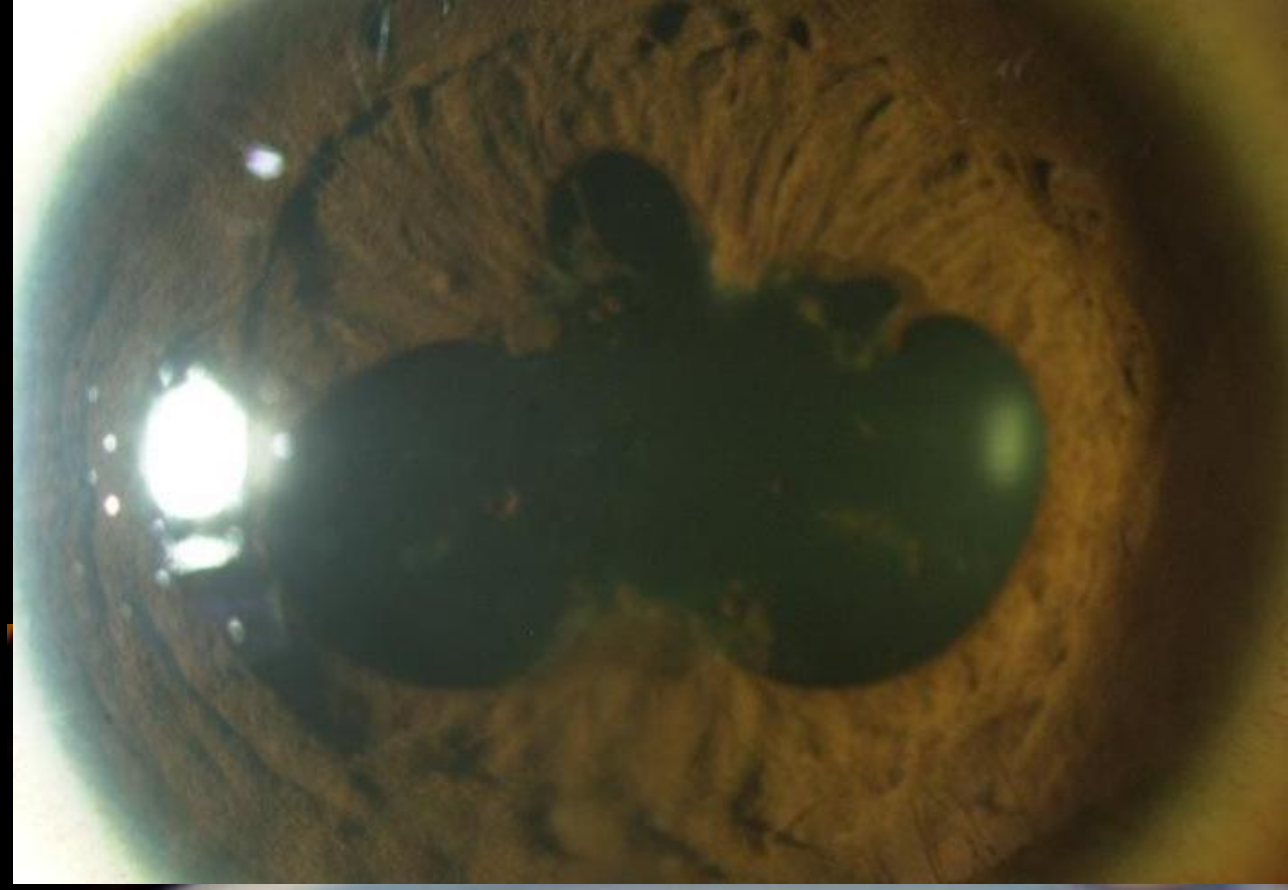
Iris: Neovascularization

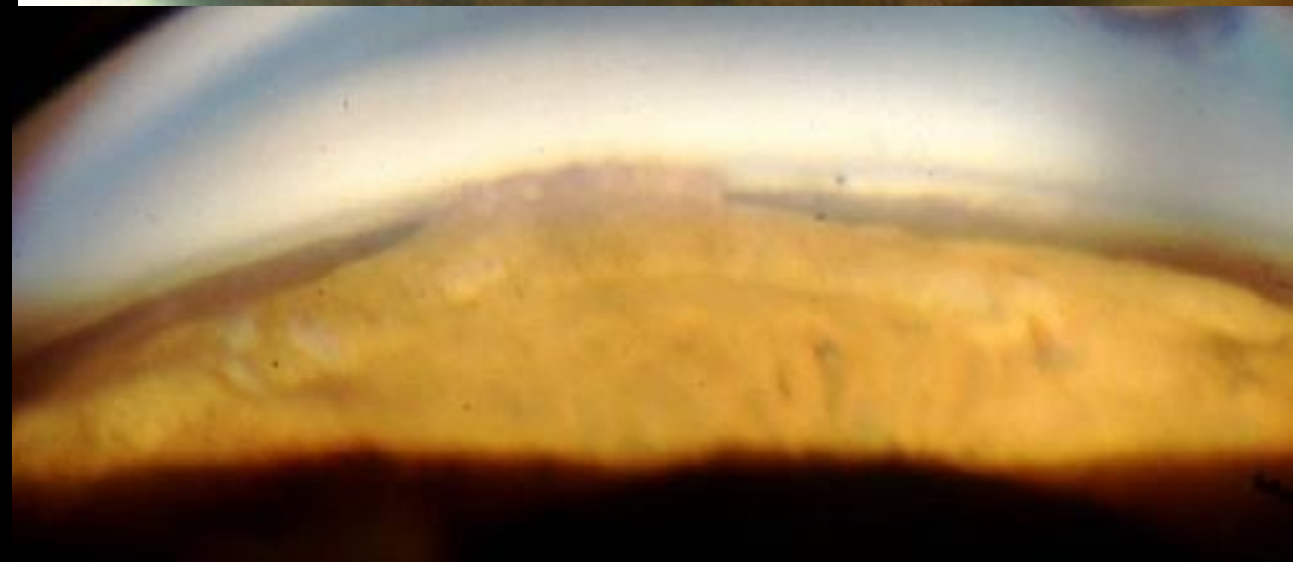
- Inflammation can upregulate VEGF and trigger neovascularization
- This would be a sign of chronic or recurrent iritis
- Search closely for fine vessels in pupillary region
- Neovascular glaucoma



Iris: Synechia

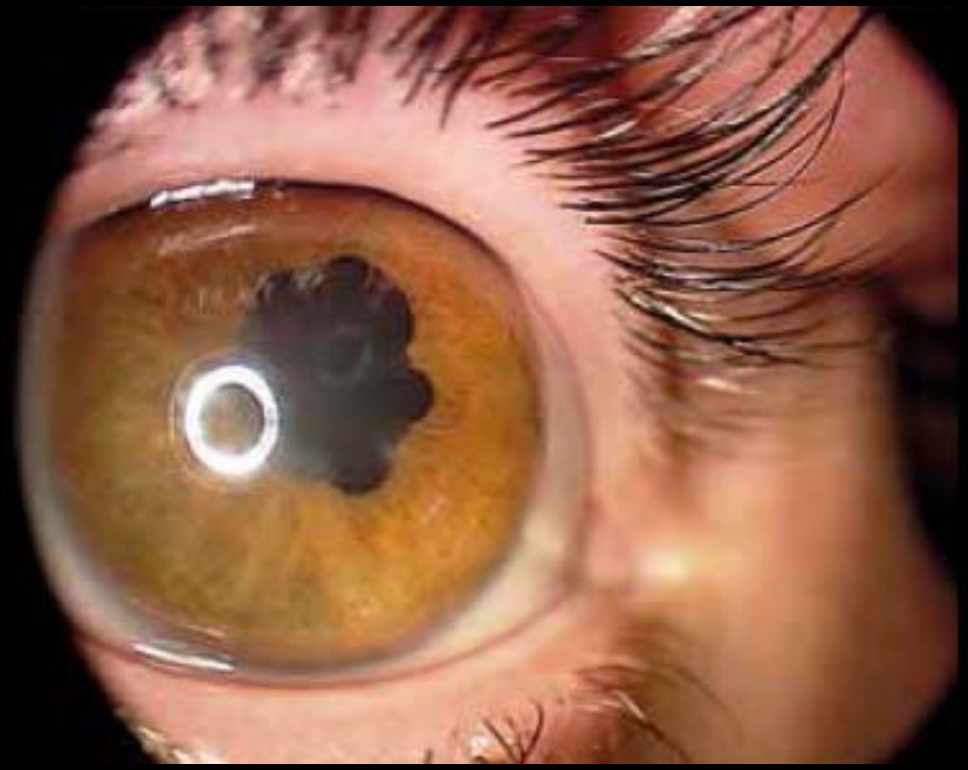
- Posterior synechia: Adhesions between the iris and anterior lens capsule
- Peripheral anterior synechia: Adhesions between the iris and peripheral cornea
- A sign of chronic or recurrent iritis





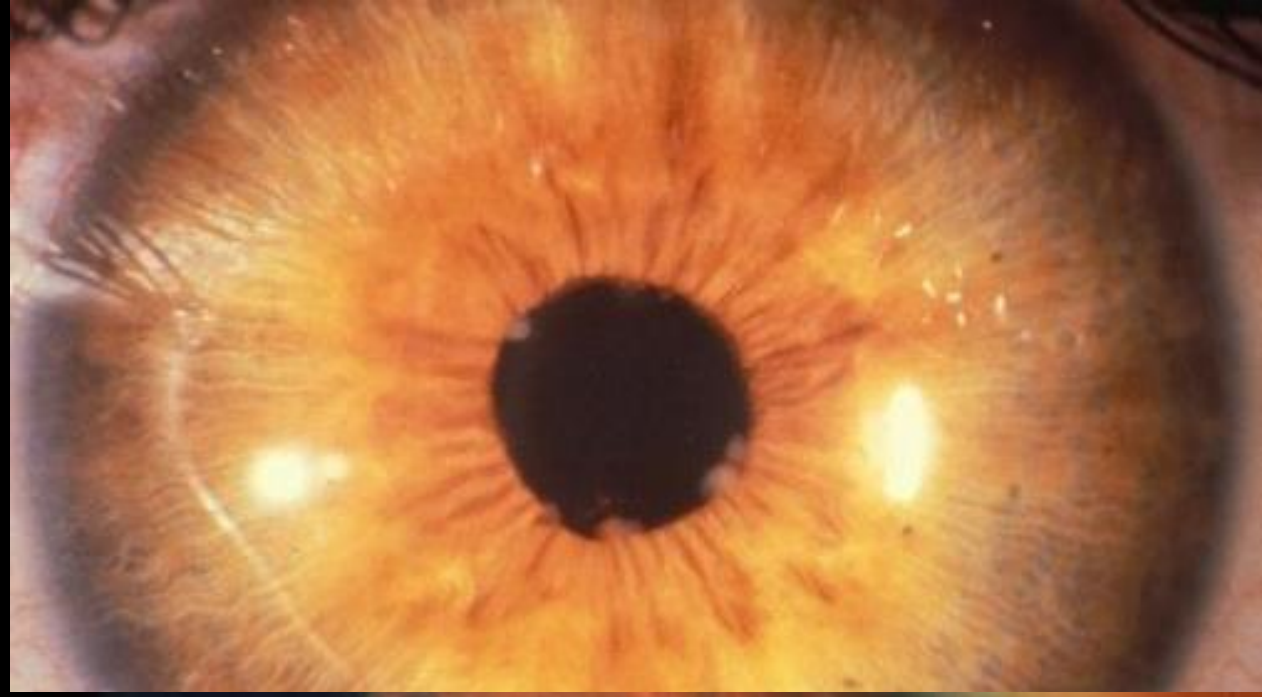
Iris: Breaking Posterior Synechia

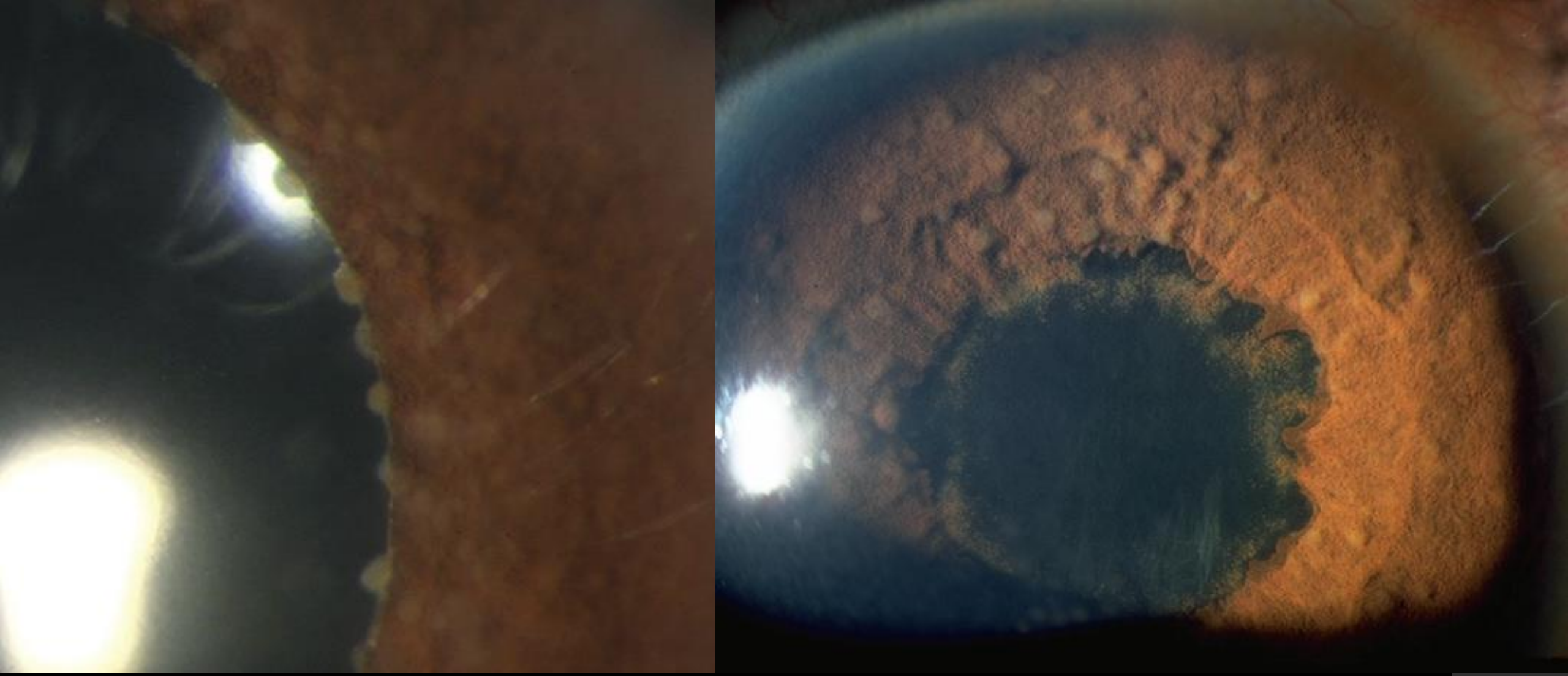
- Fresh, newly formed posterior synechia can be broken by dilating the pupil (but not established synechia)
- Tropicamide plus 1-2gtt of 10% phenylephrine in office can break fresh synechia



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



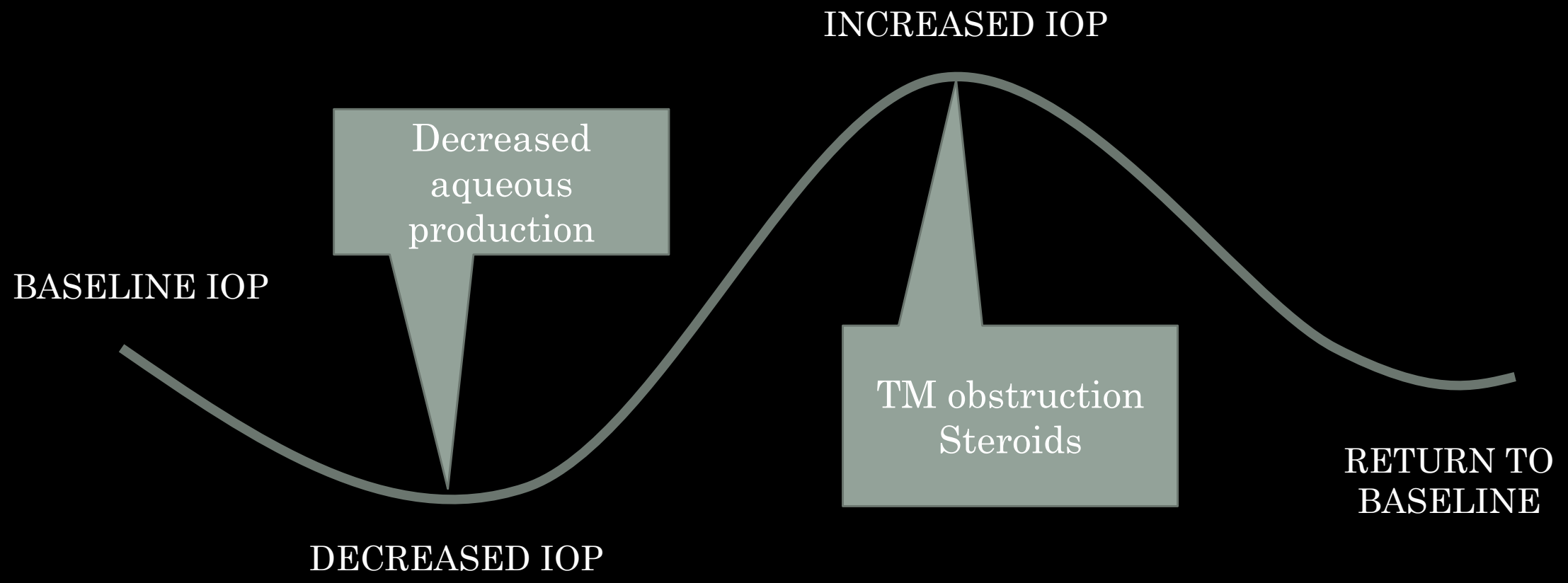


Koeppe nodules (left) are located on the pupillary border and are often the site of posterior synechia formation

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

Intraocular Pressure

Low IOP	High IOP
Decreased aqueous production due to ciliary body dysfunction	Synechia
	TM obstruction
	Steroid response
EARLY STAGE	**LATE STAGE**



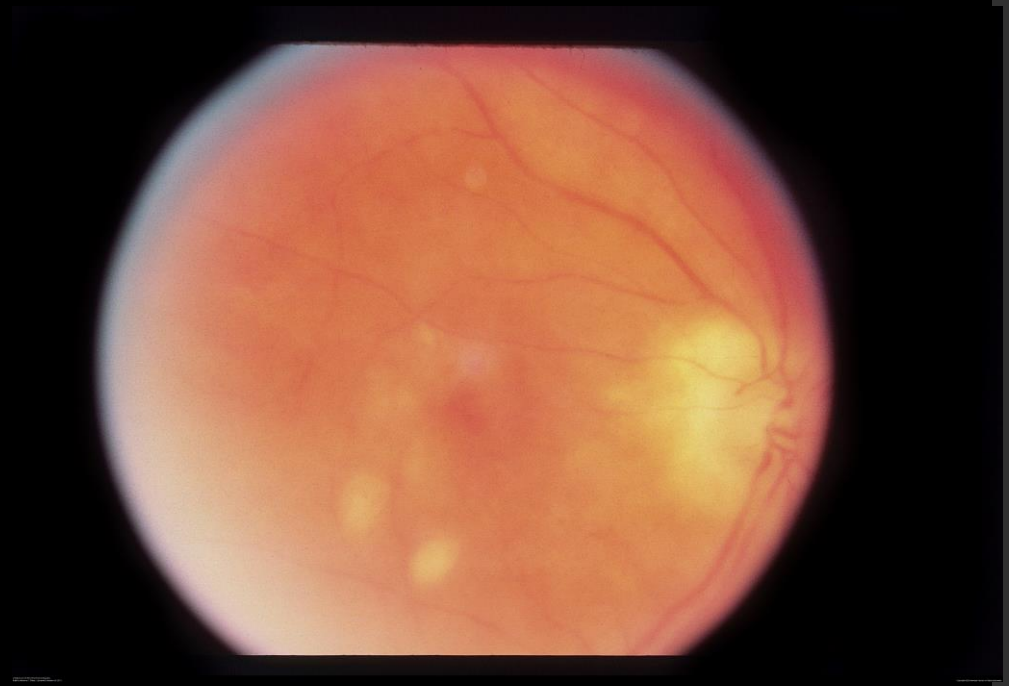
TIME

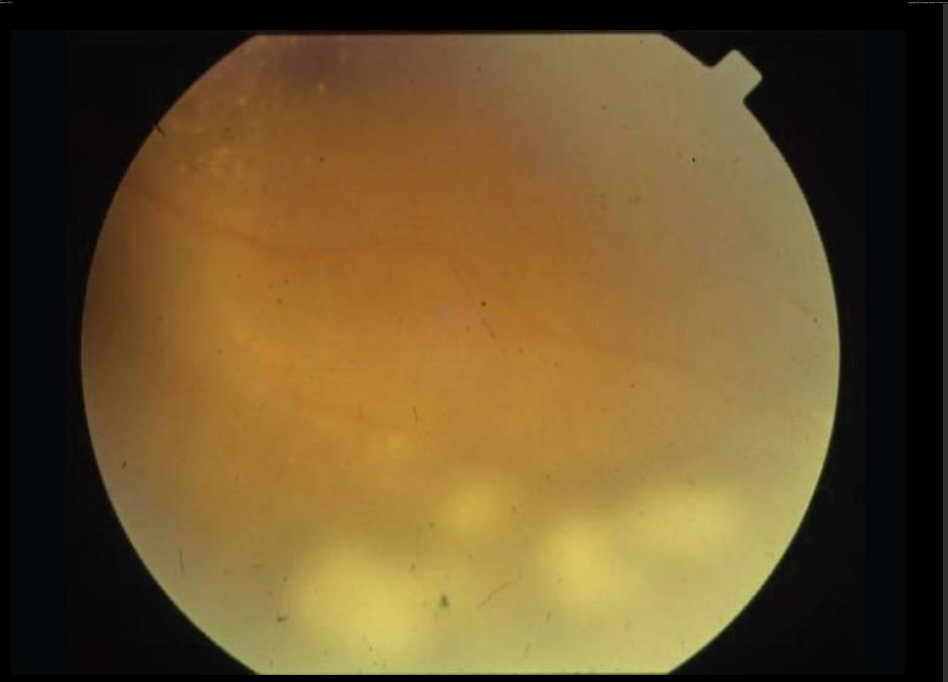
ONSET OF IRITIS

RESOLUTION OF IRITIS

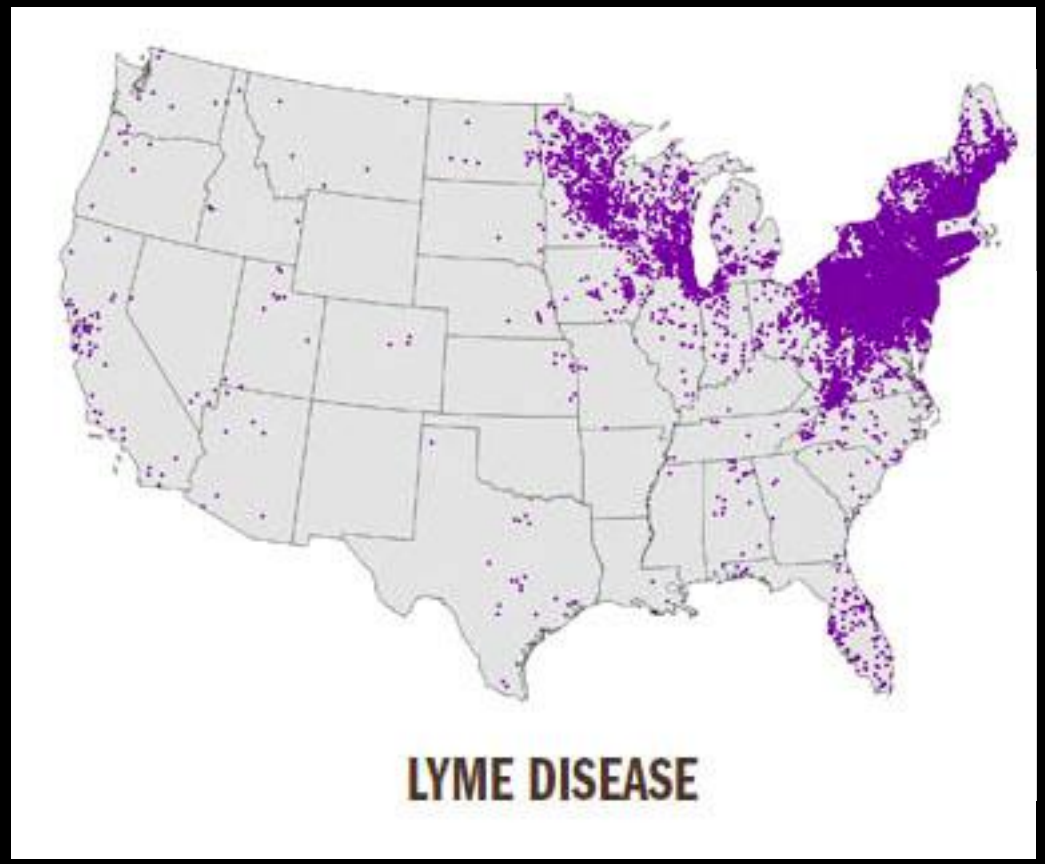
Posterior Segment

- 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

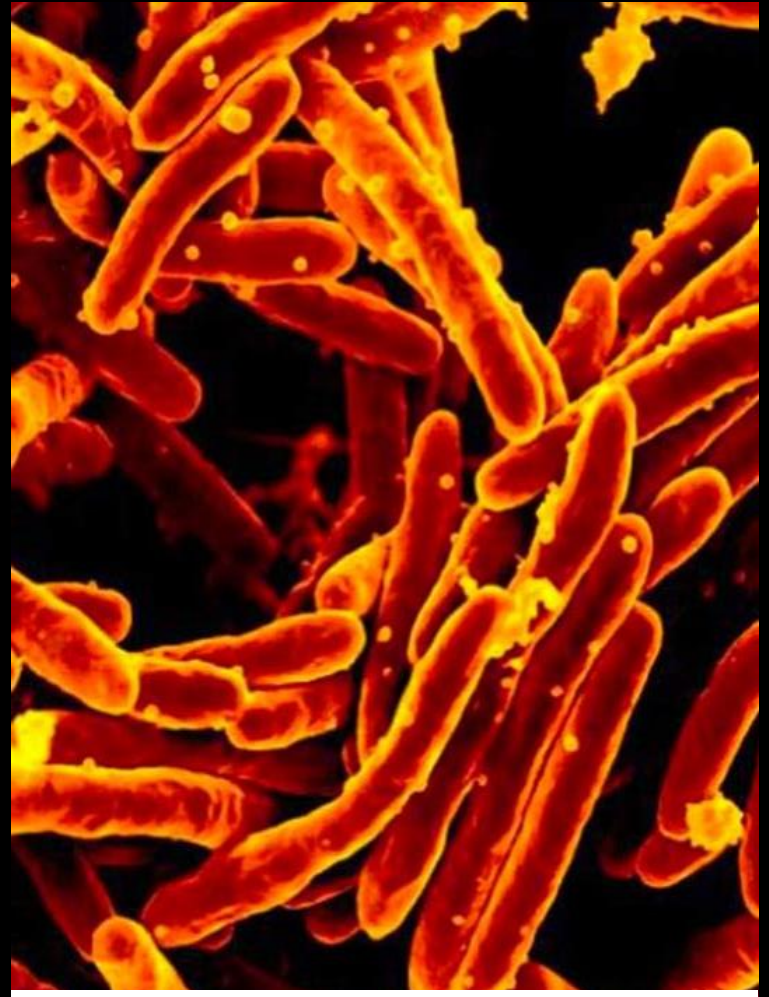
- Uveitis is the most common ocular manifestation
- Isolated anterior uveitis is the most common presentation of syphilitic uveitis
- Syphilitic anterior uveitis is 14.5 times more likely to be HIV-positive than HIV-neg
- IOP elevation common

Source: PMID 20447104

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

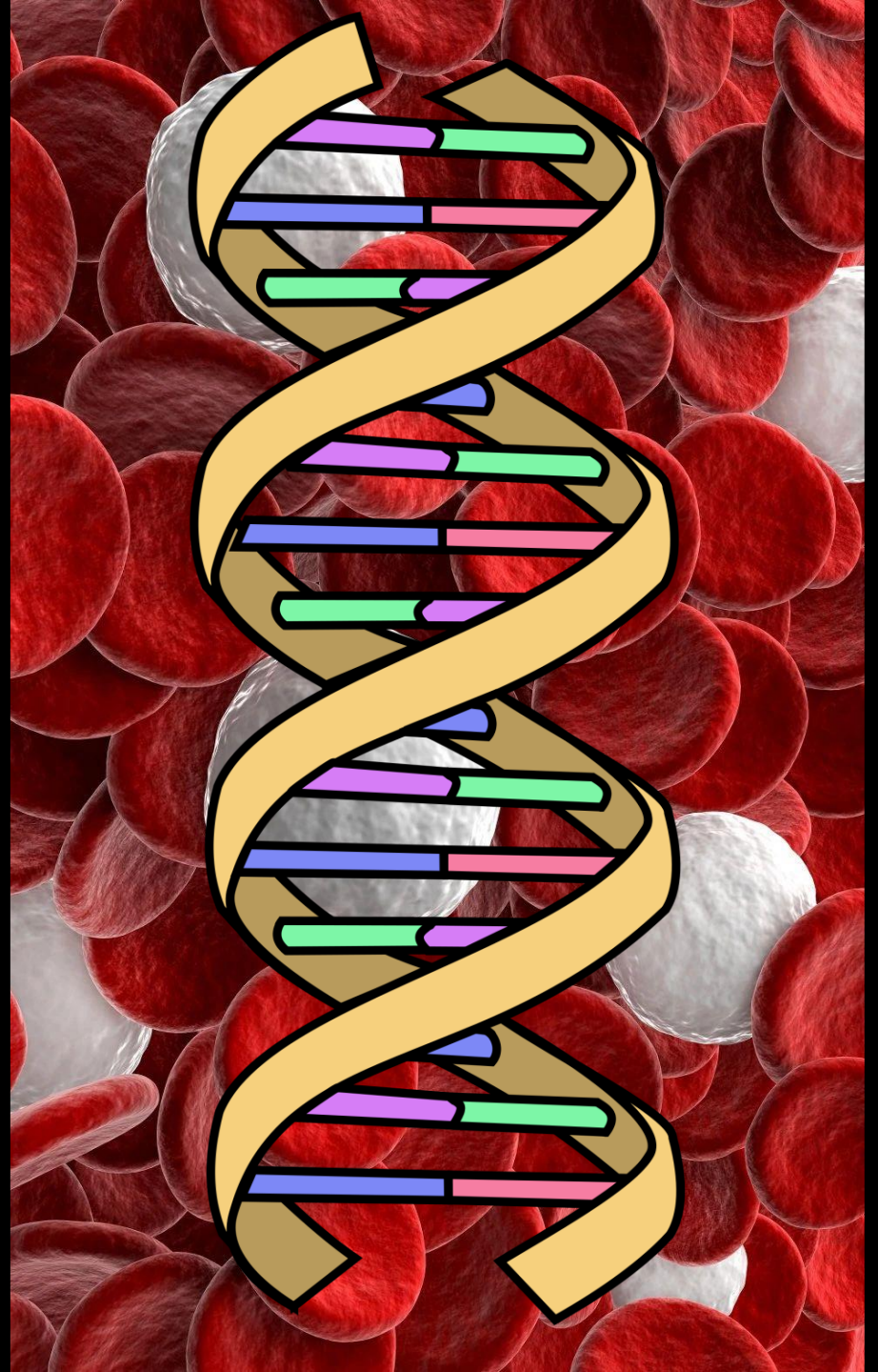
Source: CDC – Trends in Tuberculosis, 2018



HLA-B27

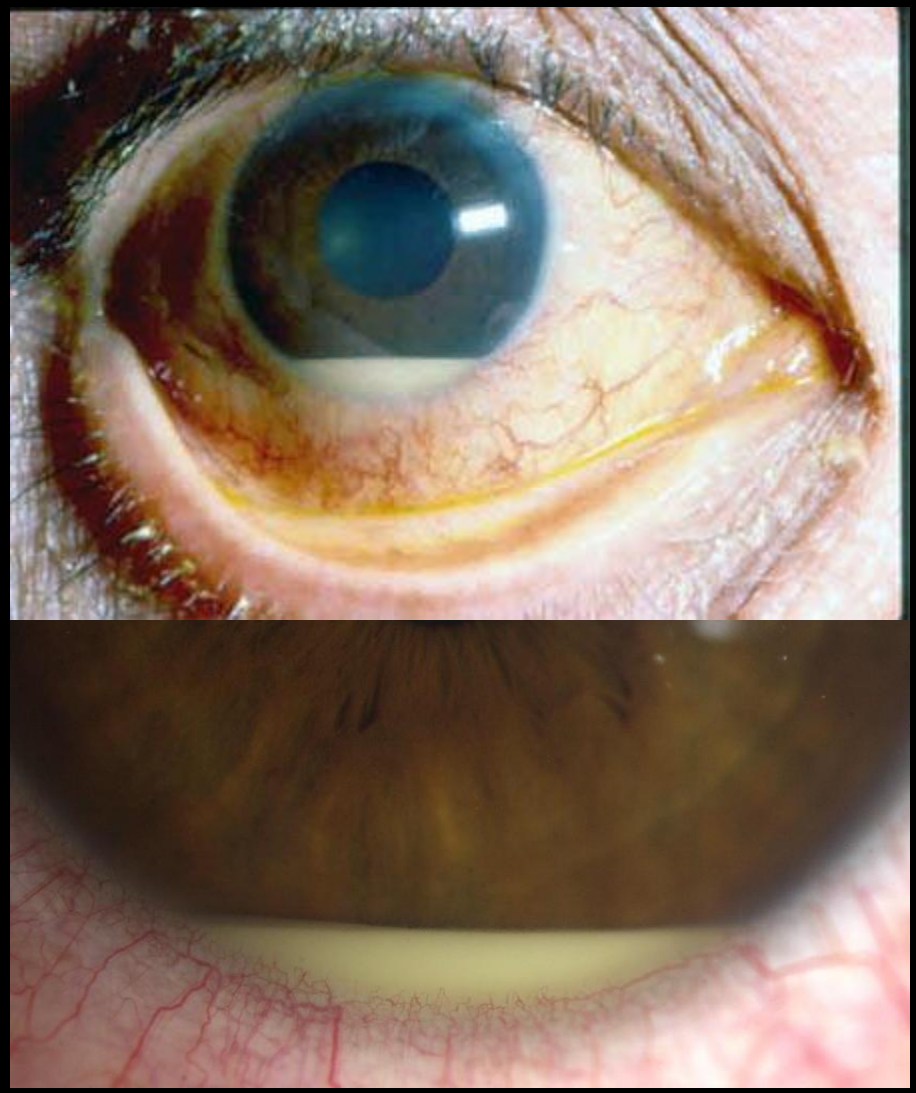
- Prevalence is 6-13% among whites and 2-4% among blacks
- In the US, 18-32% of acute anterior uveitis is associated with HLA-B27
- Inflammatory arthritis common
- Ask about rheumatologic, dermatologic and GI symptoms

Source: 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

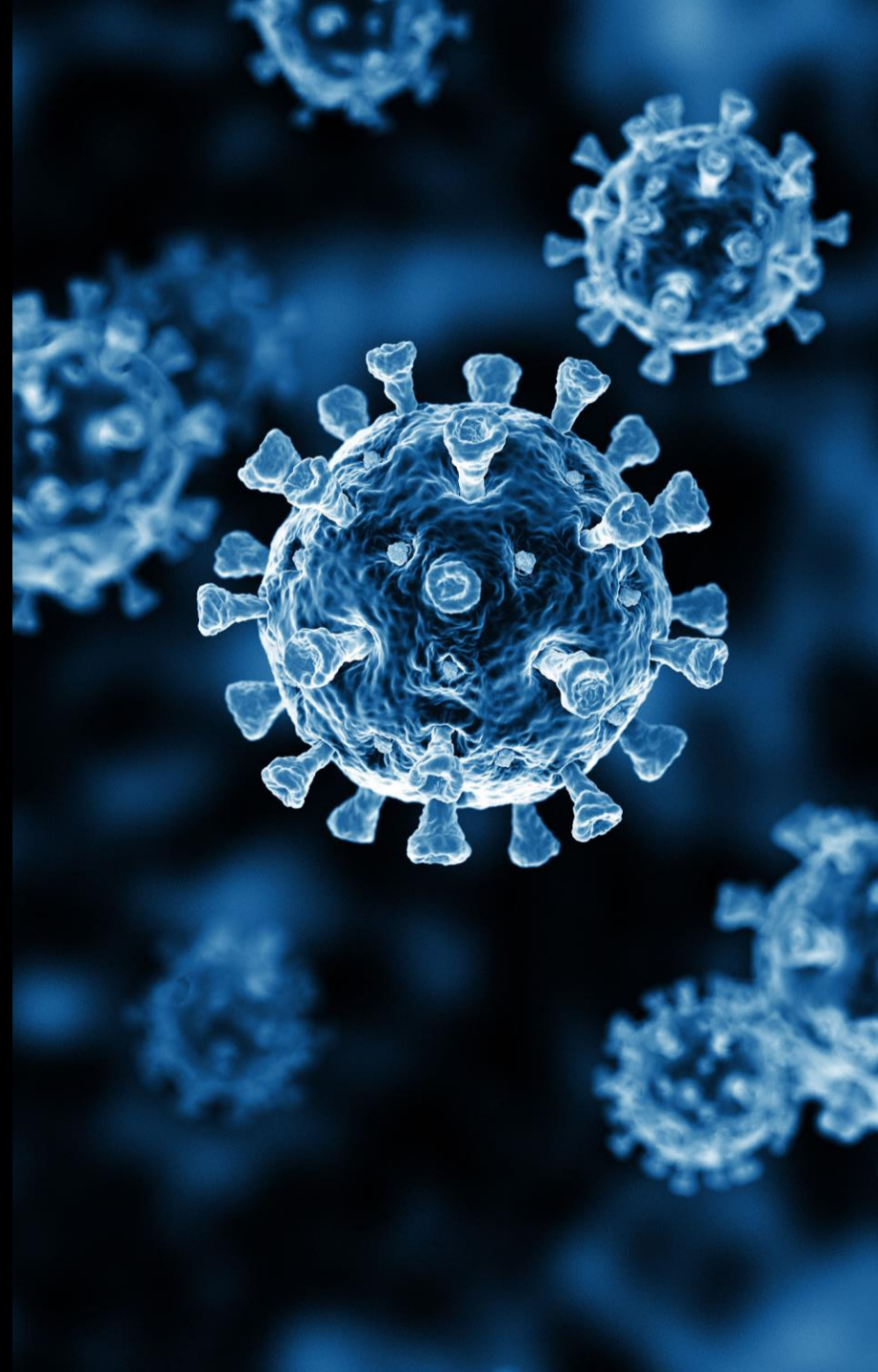


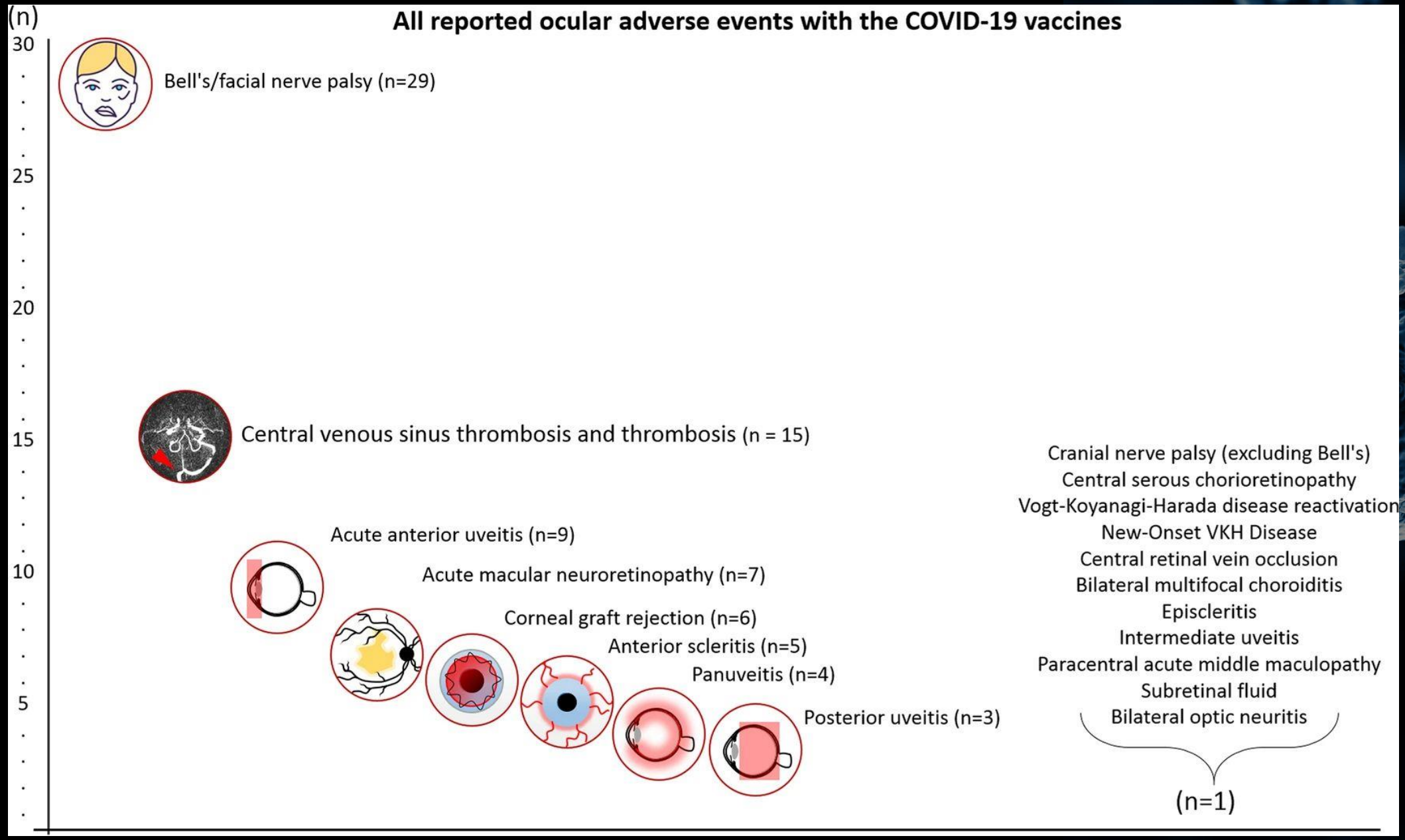
Source: PMID 30148724

COVID-19 & Iritis

- Viral conjunctivitis is the most common ocular manifestation of COVID-19 infection
- Only 2 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.

Source: PMID 32310553, 34914035





Source: PMID 34914035

EDITORIAL

Vitamin D and Ocular Inflammation

Emmett T. Cunningham Jr, MD, PhD, MPH[1,2,3], Lucia Sobrin, MD, MPH[4], Anthony J. Hall, MD[5,6], and Manfred Zierhut, MD[7]

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

Source: PMID 34343538

Treatment of Iritis

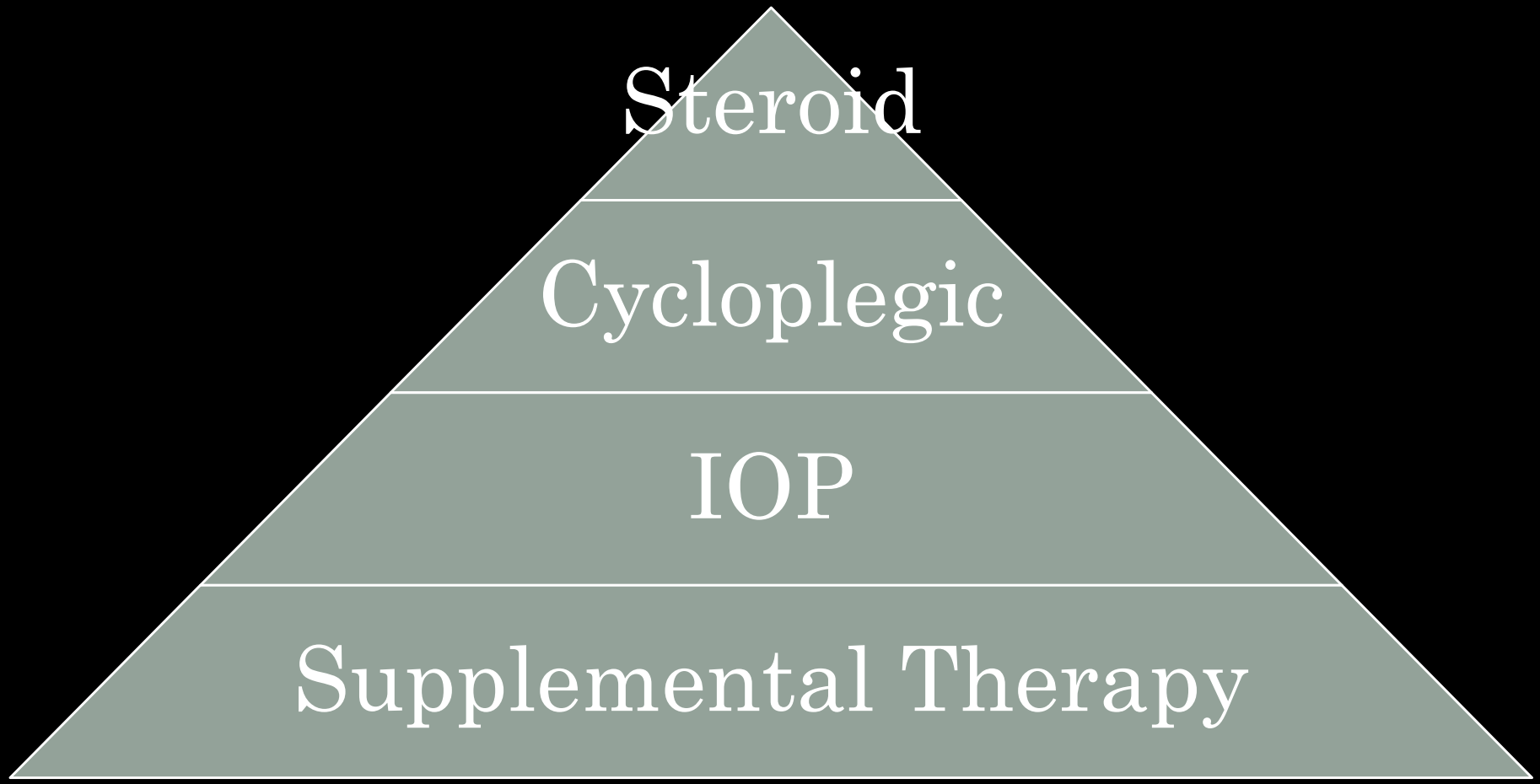
Keys to successful iritis management

Good workup and appropriate labs

Enough of the right medication long enough

Knowing when to refer

Treatment of Iritis



Prednisolone acetate suspension

Name Brand	Generics
Smaller, more uniform particle size	Larger particles
Easier to suspend, stays in suspension longer	Vigorous shaking required
More uniform dosing	Nozzle clogging possible
	Less uniform dosing

JOURNAL OF OCULAR PHARMACOLOGY AND THERAPEUTICS
Volume 23, Number 2, 2007

DOI: 10.1089/jop.2006.0070

Comparative Analysis of Prednisolone Acetate Suspensions

CALVIN W. ROBERTS[1] and PETER L. NELSON[2]

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.

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

LESS POTENT & FEWER ADVERSE EFFECTS

MORE POTENT & MORE ADVERSE EFFECTS

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

More potent than PF

Less frequent instillation

No shaking required!

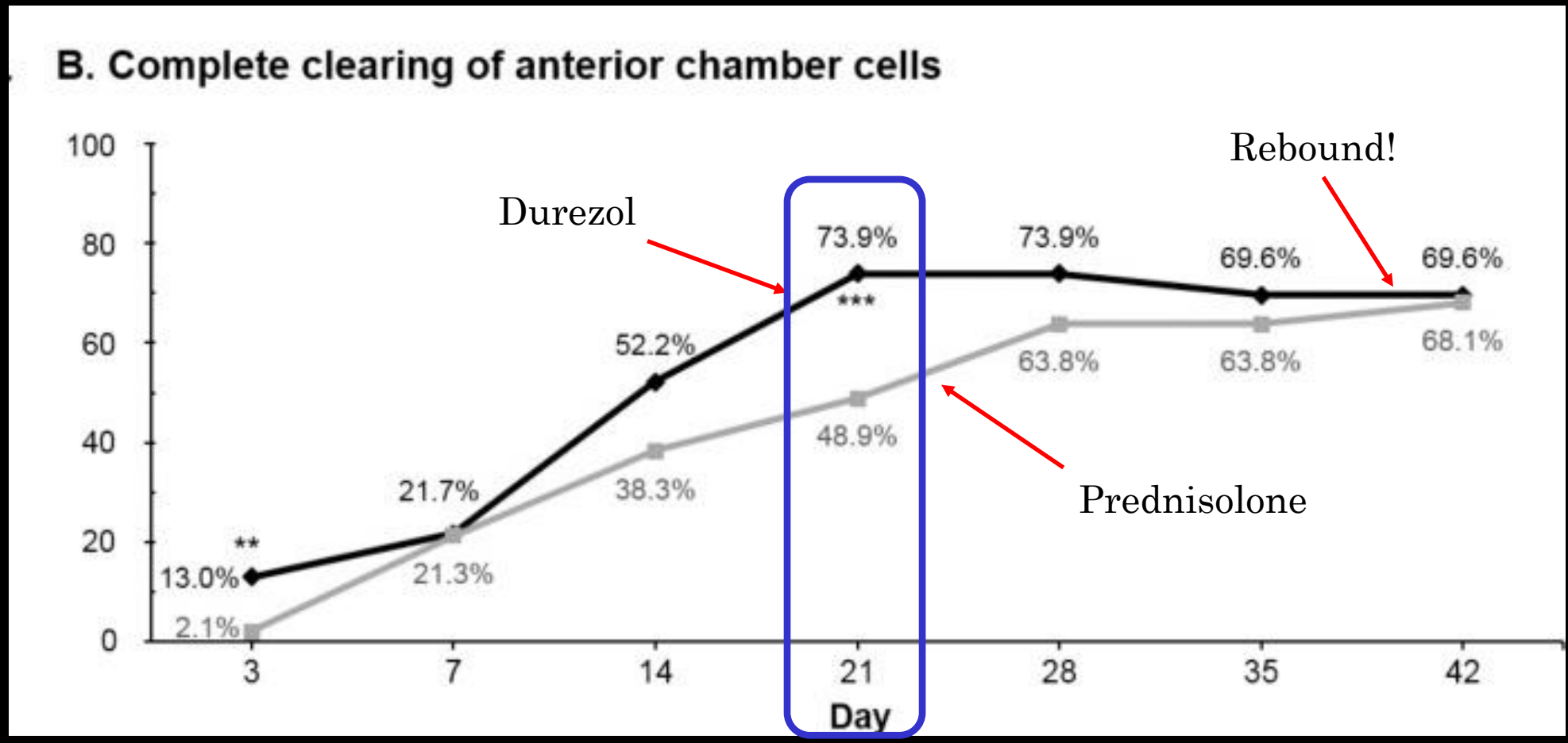
High risk of IOP elevation

Rebound inflam common

Good for…

(1) All iritis cases

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



Source: PMID: 24677110

Cycloplegia

- Muscle relaxant for pain management
- Mydryasis for posterior synechia prevention
- Any long-acting agent is suitable: Homatropine 5% BID
- 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 ↑IOP
- Avoid prostaglandins!

Additional Considerations

Nighttime coverage

Systemic pain meds

Maintenance therapy

scientific reports

OPEN

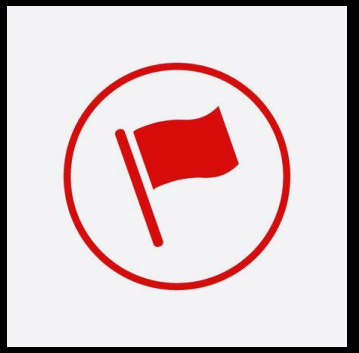
Triggering factors associated with a new episode of recurrent acute anterior uveitis

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.

Source: PMID 34108578

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!