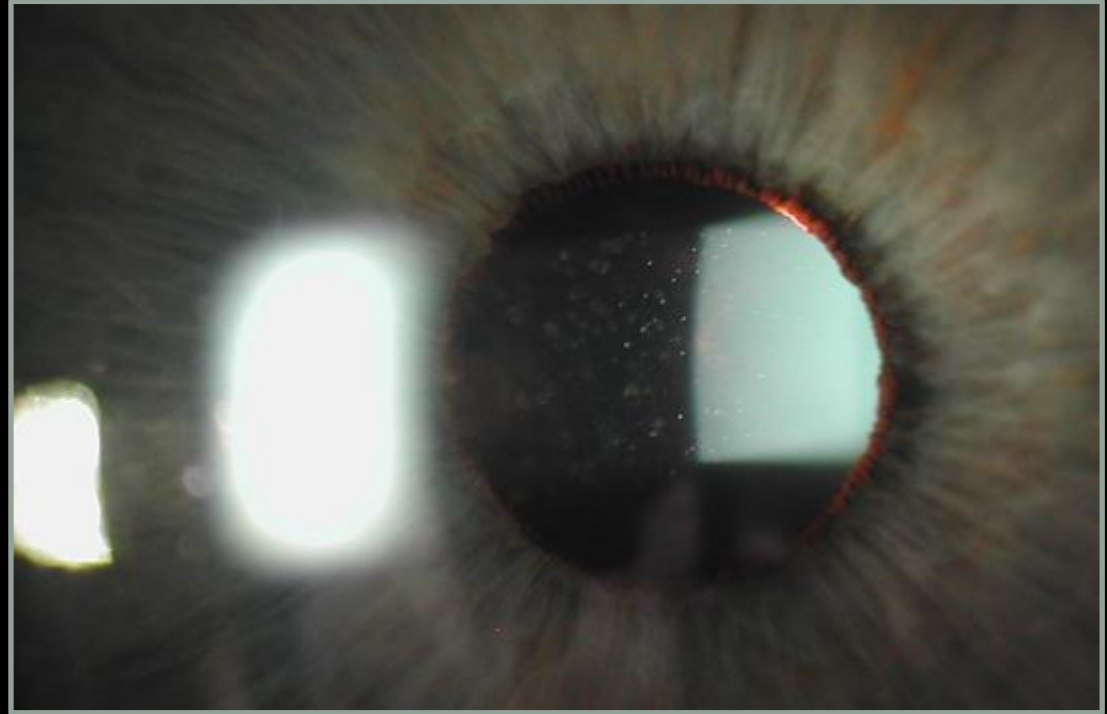


# IRITIS



EXAMINATION TIPS & TREATMENT PEARLS

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No disclosures

*Care of the Patient with*  
**Anterior Uveitis**



American Optometric Association

## Diagnosis and treatment of anterior uveitis: optometric management

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**Abstract:** Anterior uveitis encompasses inflammation of the iris and/or ciliary body and is one of the most common types of ocular inflammation that primary eye care practitioners will encounter. Anterior uveitis may be caused by a variety of etiologies, including infectious, non-infectious, and masquerade diseases. The short-term and long-term treatment of uveitis should include the evaluation of location, duration, pathology, and laterality, in addition to presenting signs and symptoms of the disease. A complete review of systems, thorough examination, and laboratory testing, may assist the practitioner in narrowing the list of possible causes for the uveitis. This is imperative as once a list of diagnoses has been made, a targeted approach to treatment can be pursued.

**Keywords:** anterior uveitis, iritis, inflammation

### Introduction

Uveitis, or inflammation of the uvea (which consists of the iris, ciliary body, and choroid), may be caused by a number of different etiologies.<sup>1,2</sup> Anterior uveitis is defined by the presence of cells or cellular aggregates that are visible in the anterior chamber during examination.<sup>3</sup> Anterior uveitis is one of the most common types of ocular inflammation that eye care practitioners will encounter.<sup>1-4</sup> It may present as

Harthan 2016, PMID: 30214346

# 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

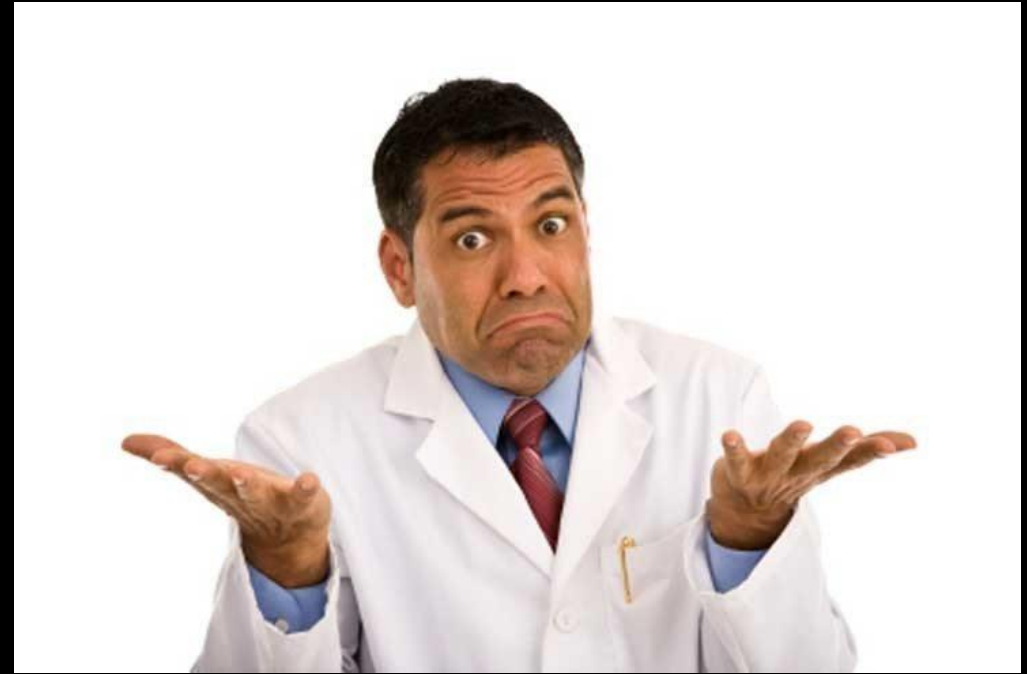
Angle  
closure

Ocular  
ischemia

# Idiopathic vs Traumatic Iritis

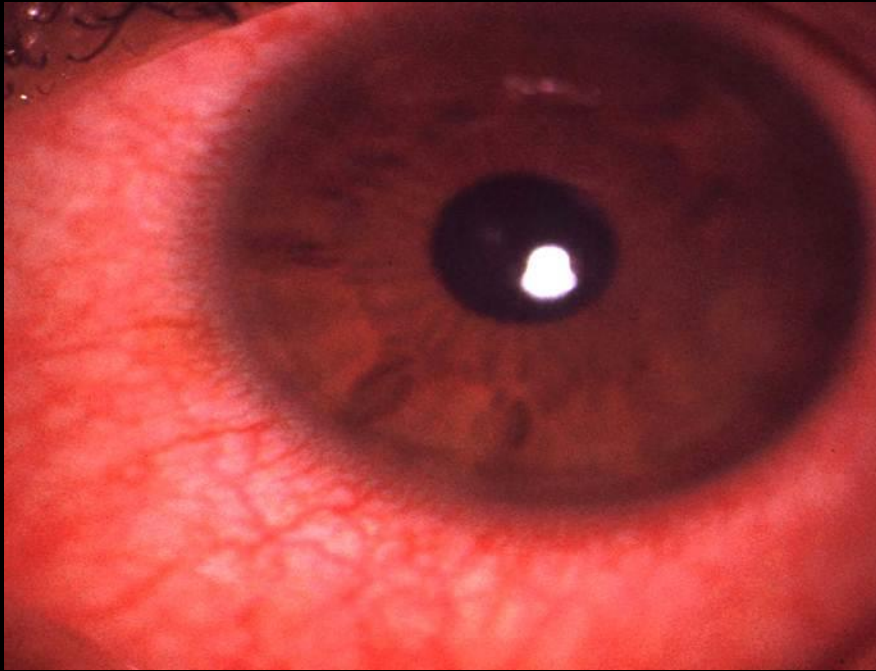


Traumatic  
Self-limiting  
Tends to resolve without sequelae

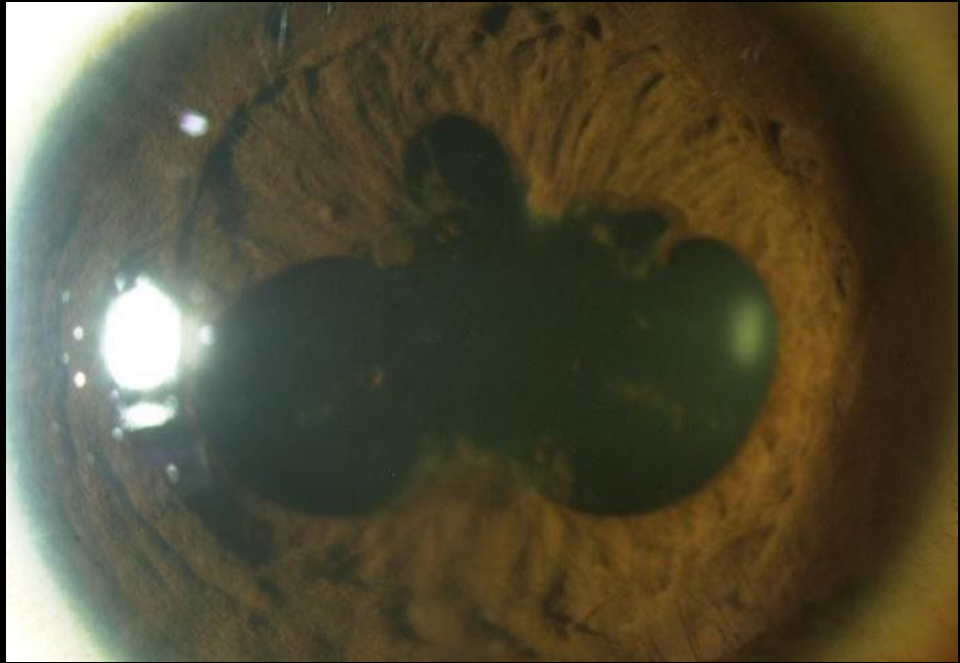


Idiopathic  
May become chronic / recurrent / severe  
Complications common

# 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

Control inflammation  
as quickly as possible



Treatment



# History

## Prior Episodes

Recurrence  
warrants  
search for  
cause

## Recent ocular sx

R/O  
endophthalmitis,  
TASS

## General health

Ask about:  
arthritic, dermatologic,  
GI dx, etc

Always consider:  
Sarcoid, syphilis,  
TB, Lyme

# Symptoms: Pain

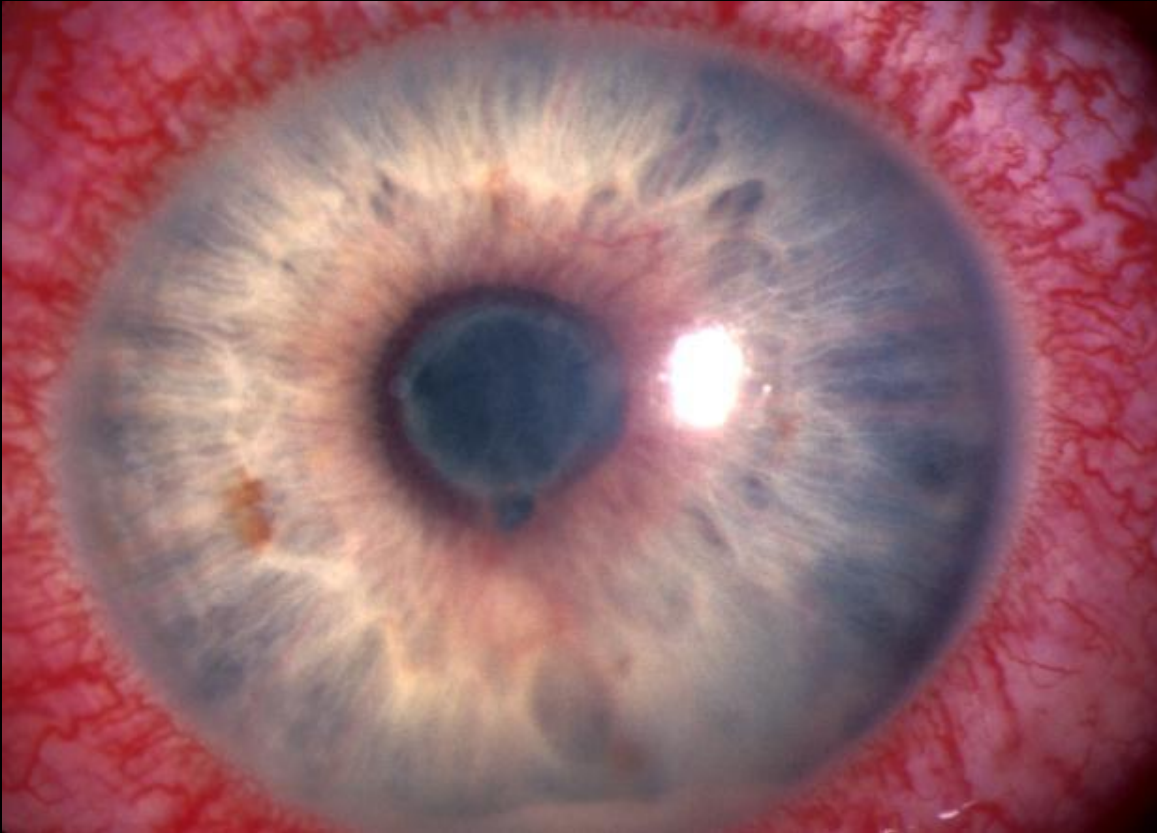
## Painful Masqueraders

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

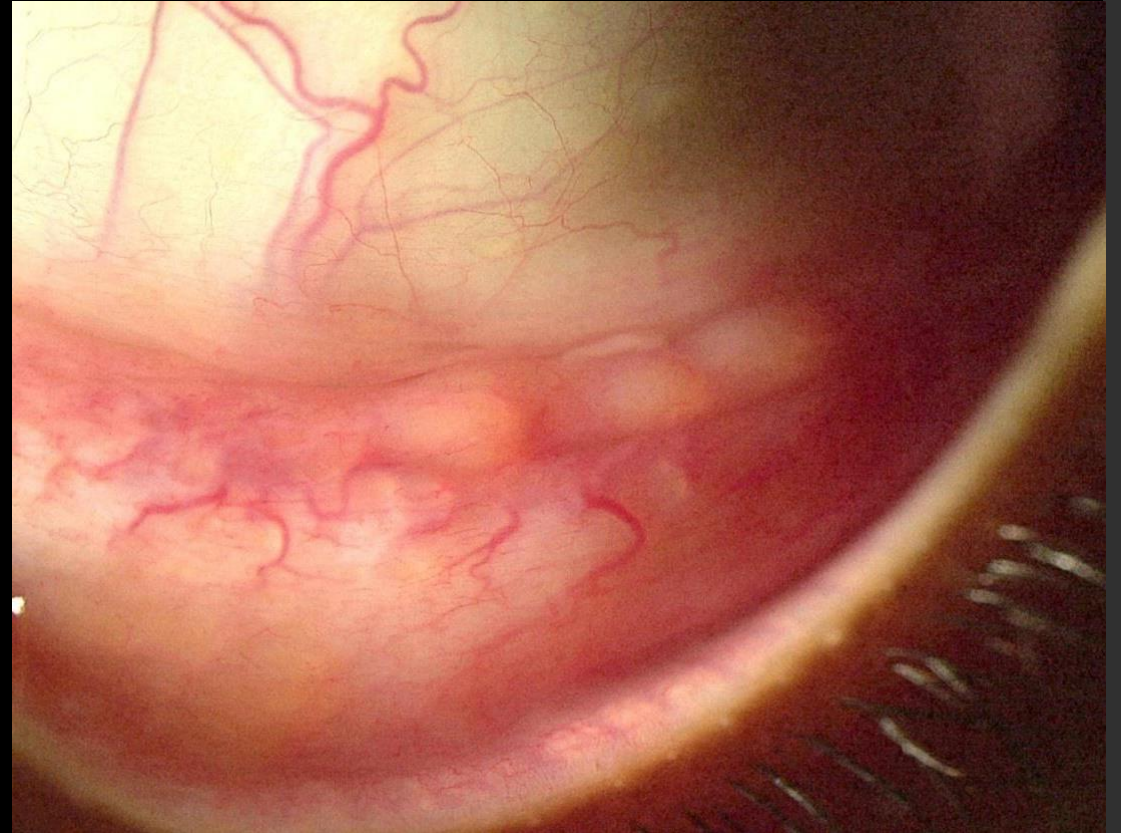
## Non-Painful Masqueraders

- Lymphoma
- Ocular ischemic syndrome
- Posterior uveitis
- Juvenile rheumatoid arthritis

# Conjunctiva



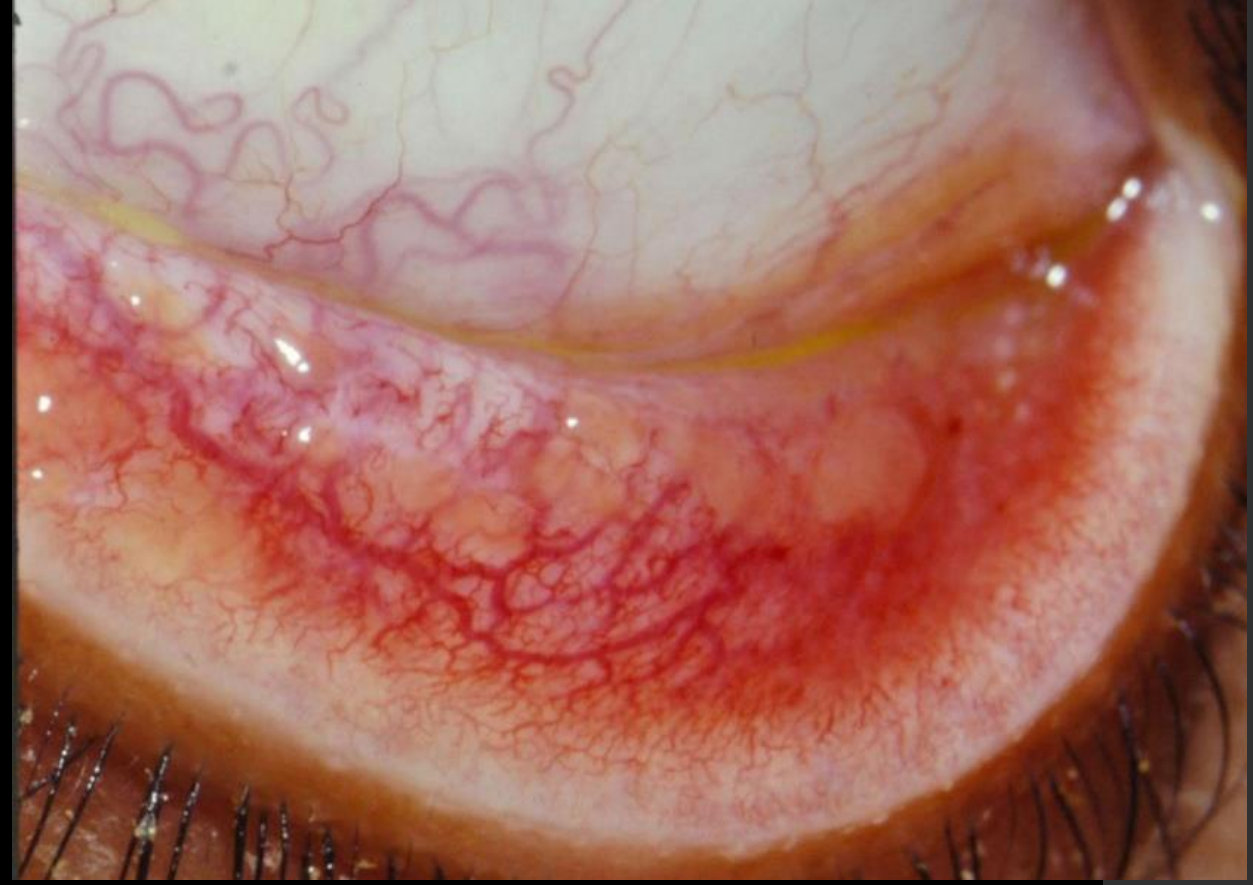
Ciliary flush



Sarcoid granulomas

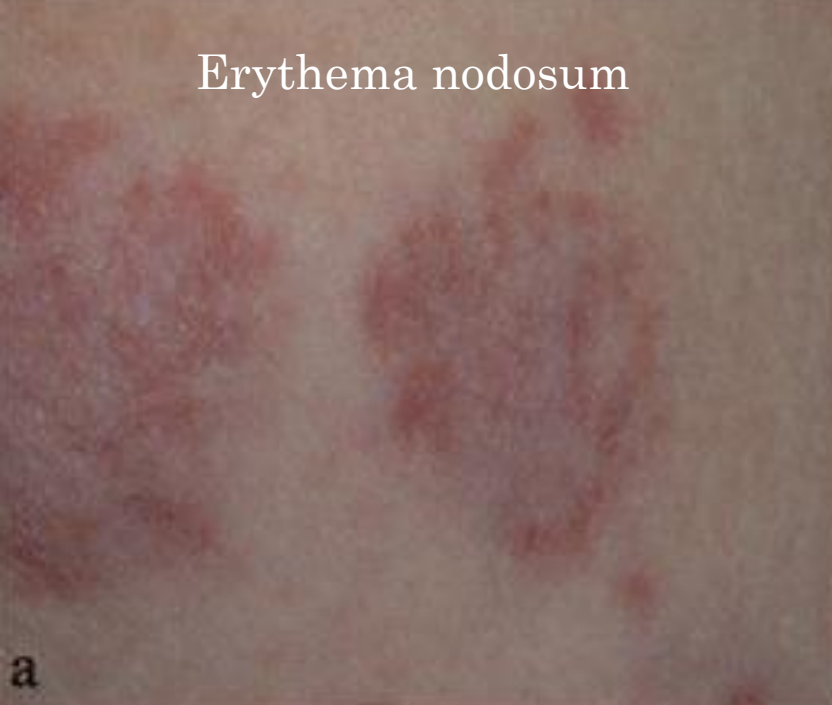
# Sarcoid

- 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 lysozoma





Erythema nodosum



a

Papules



b



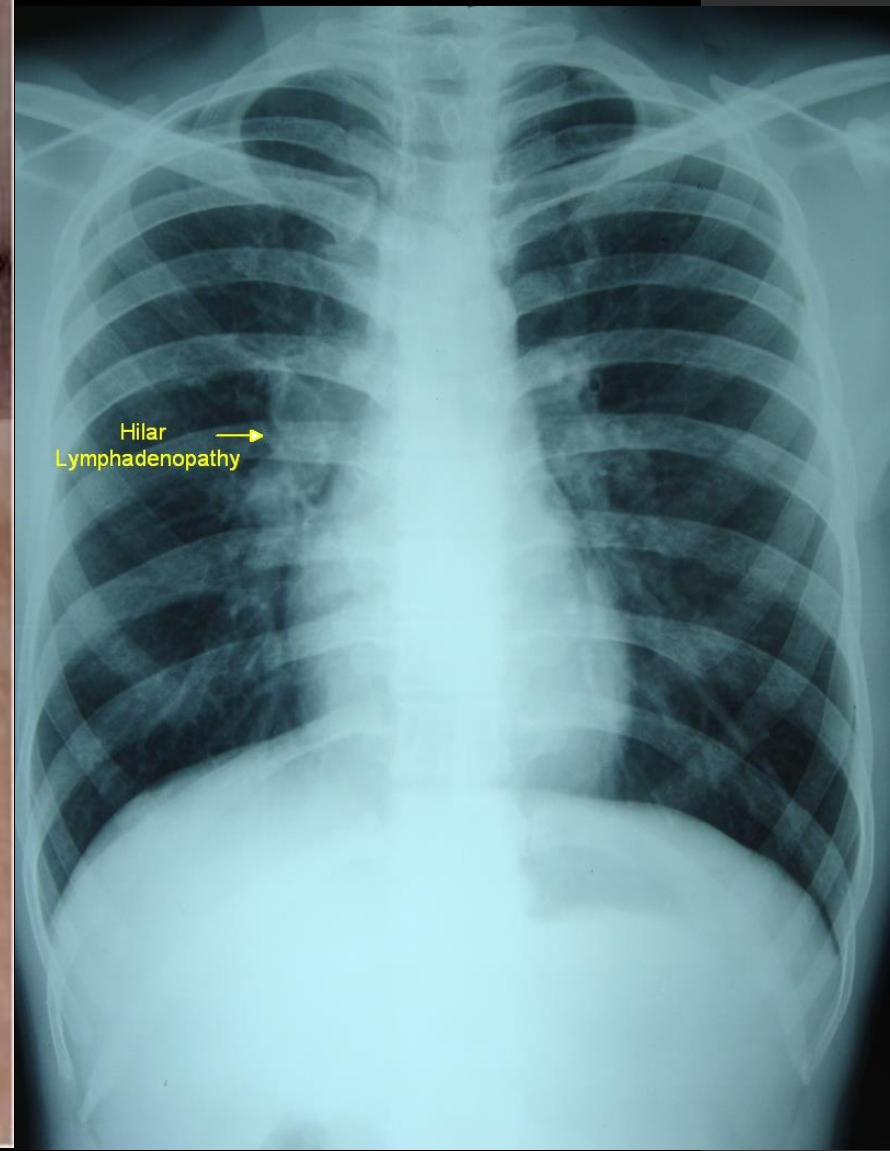
c

Annular plaques



d

Lupus pernio

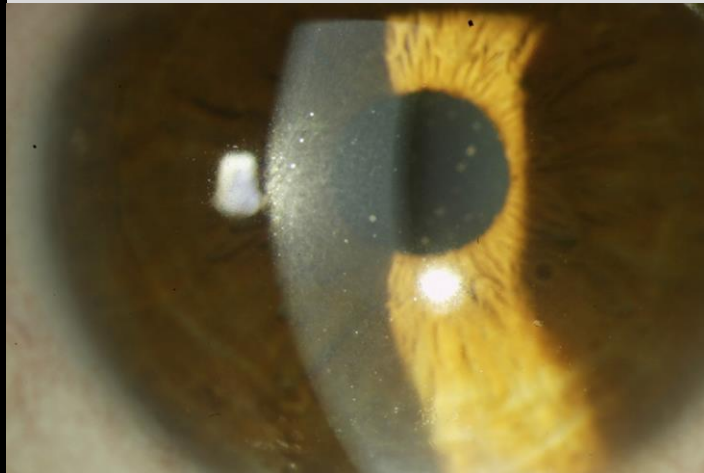


Hilar  
Lymphadenopathy →

# Cornea: Keratic Precipitates

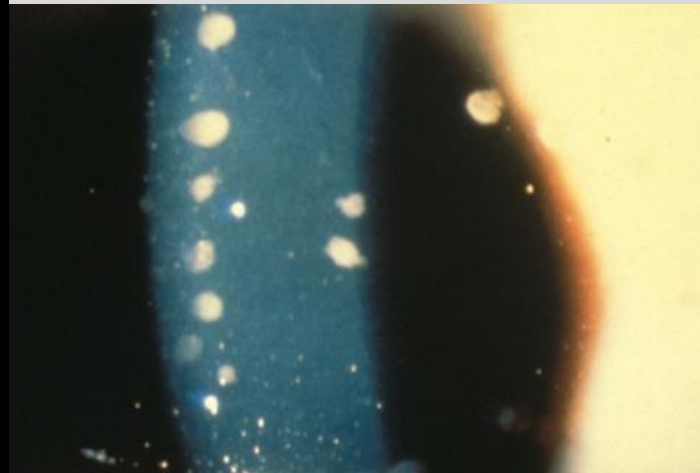
Fine KPs

Acute  
Nongranulomatous



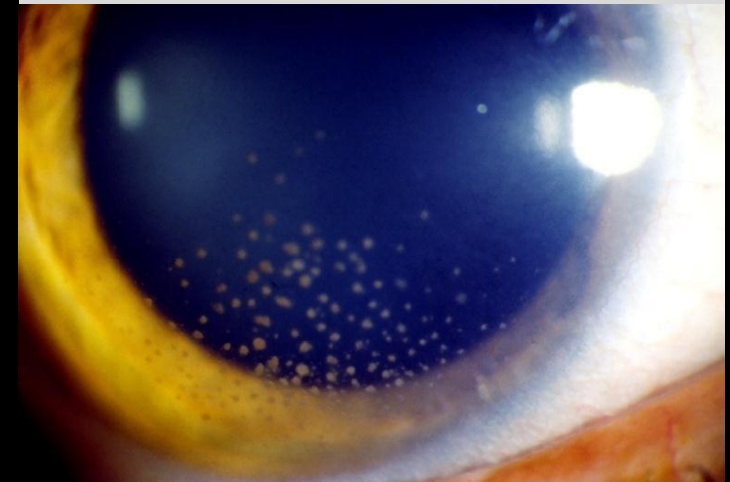
Mutton-Fat KPs

Chronic  
Granulomatous

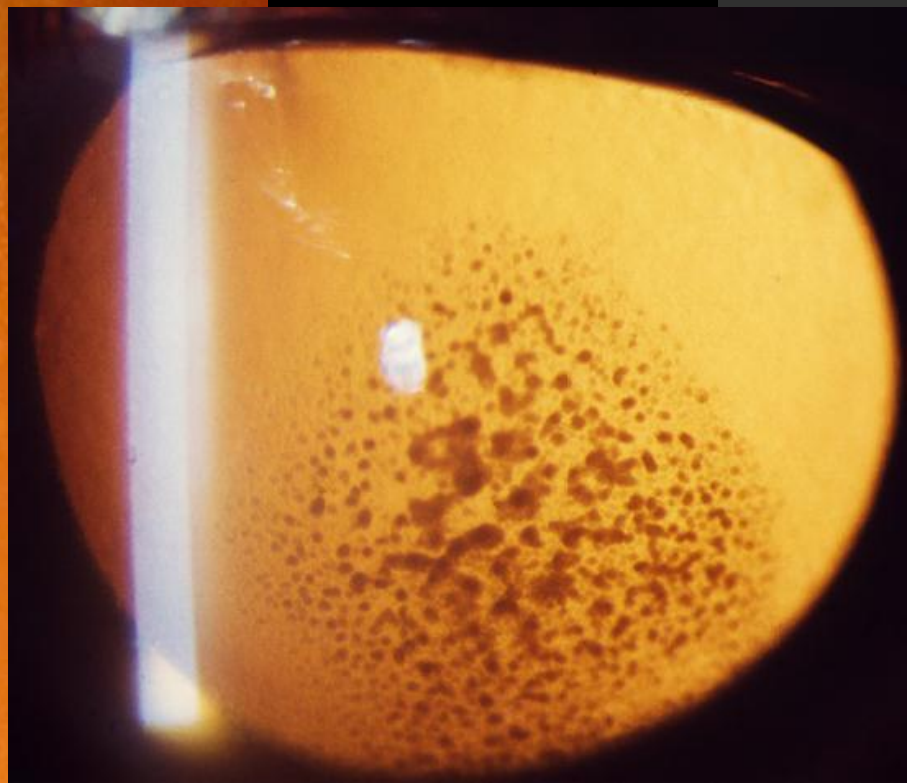


Pigmented KPs

Chronic  
Prior episode







# AC: Examination Technique





# AC: Flare vs Cells

## Flare

Aqueous haziness  
Serum + 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  
inflammation

## Cells

Infiltration of the  
anterior chamber by  
white blood cells

Usually a reliable indicator  
of 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 1  
Grading of Flare and Cells\*

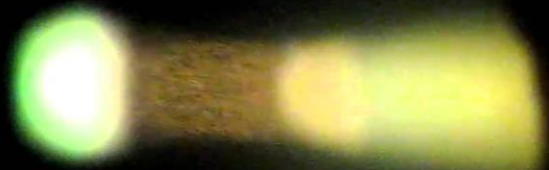
Grade	Flare	Cells
0	Complete absence	No cells
1+	Faint flare (barely detectable)	5 to 10 cells per field
2+	Moderate flare (iris and lens details clear)	10 to 20 cells per field
3+	Marked flare (iris and lens details hazy)	20 to 50 cells per field
4+	Intense flare (fixed, coagulated aqueous humor with considerable fibrin)	50+ cells per field

Source: AOA Clinical Practice Guideline

# AC: Red, White & Who?

Red Blood Cells

Hyphema  
Trauma



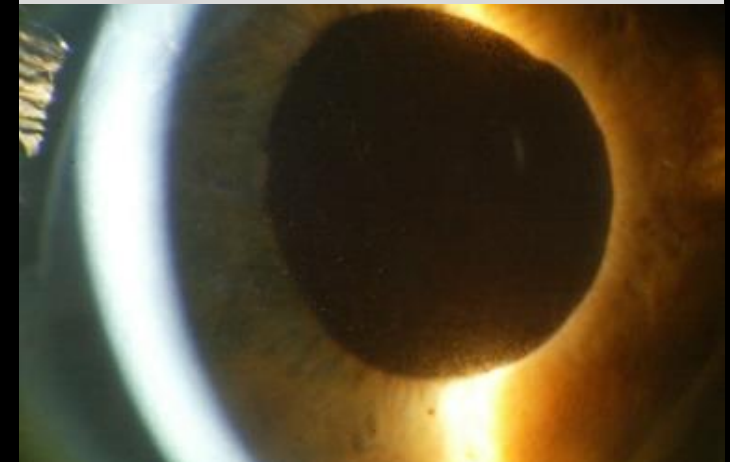
White Blood Cells

Inflammation  
Infiltration



Pigment Cells

Surgery / Trauma  
PDS



# AC: Hyphema, Hypopyon & Fakers

Red Blood Cells

Hyphema



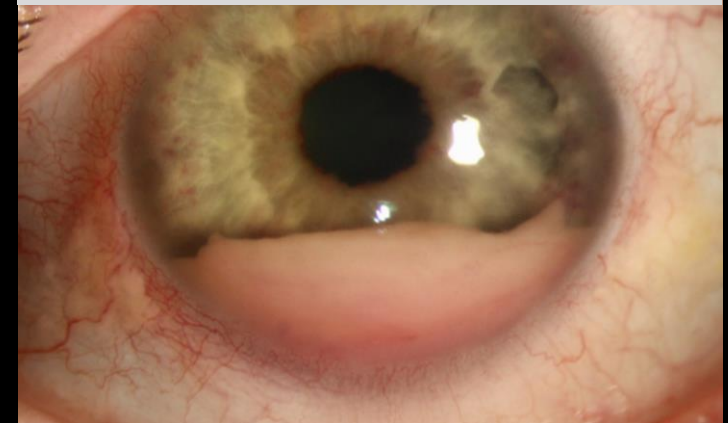
White Blood Cells

Inflammation  
Hypopyon



Neoplastic Cells

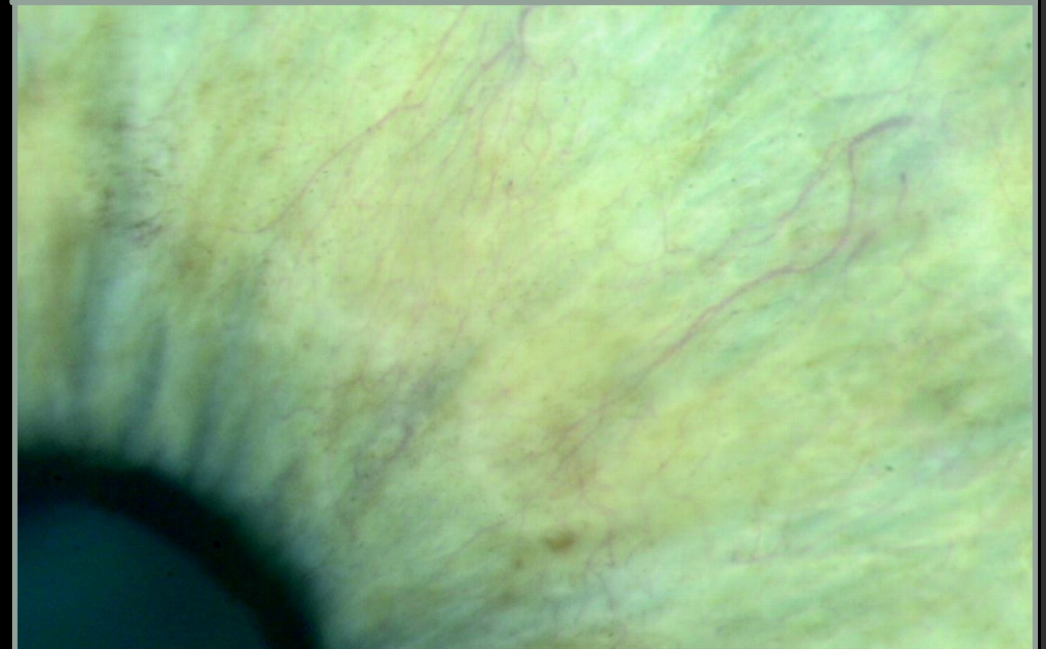
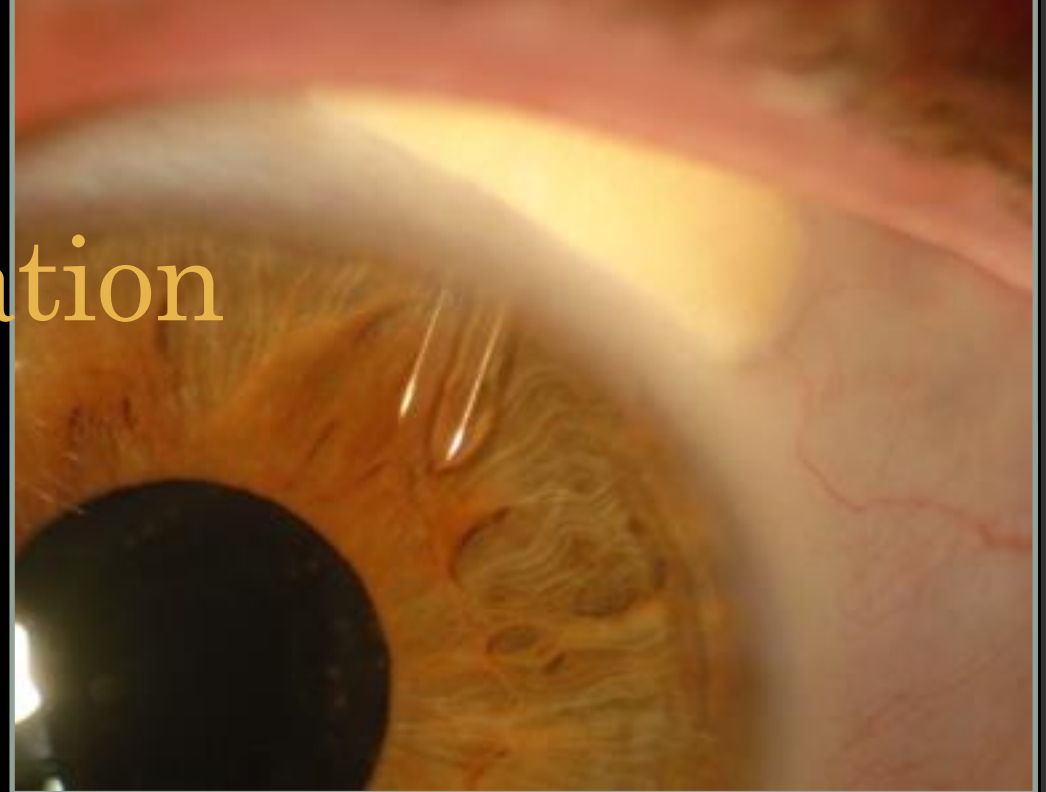
Infiltration  
Pseudo-hypopyon



Source: Eyerounds.org

# Iris: Neovascularization

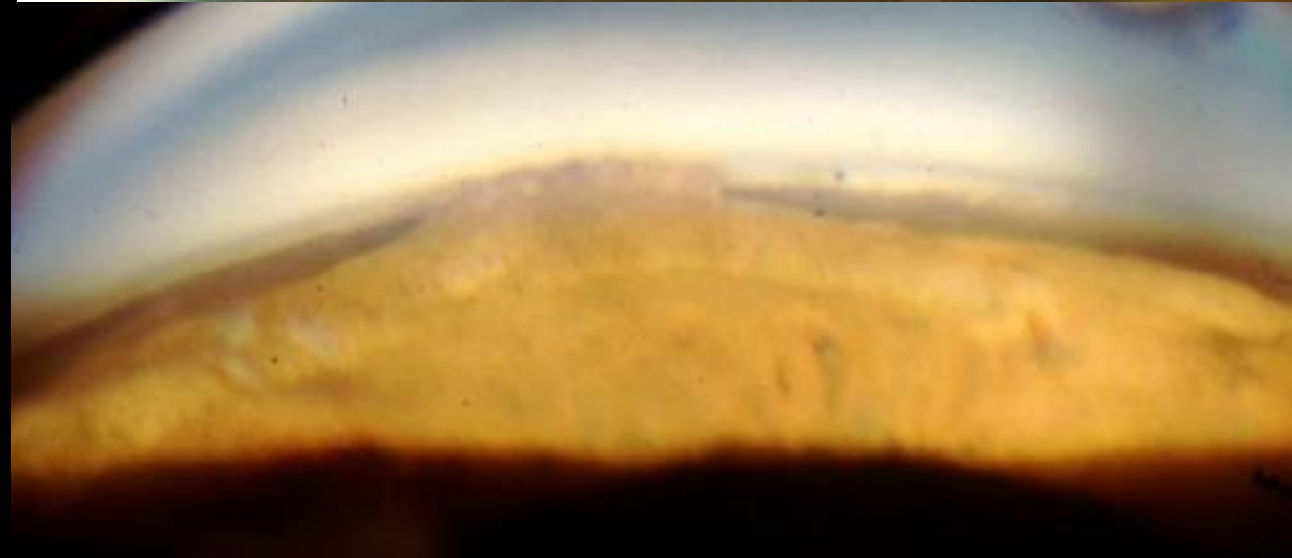
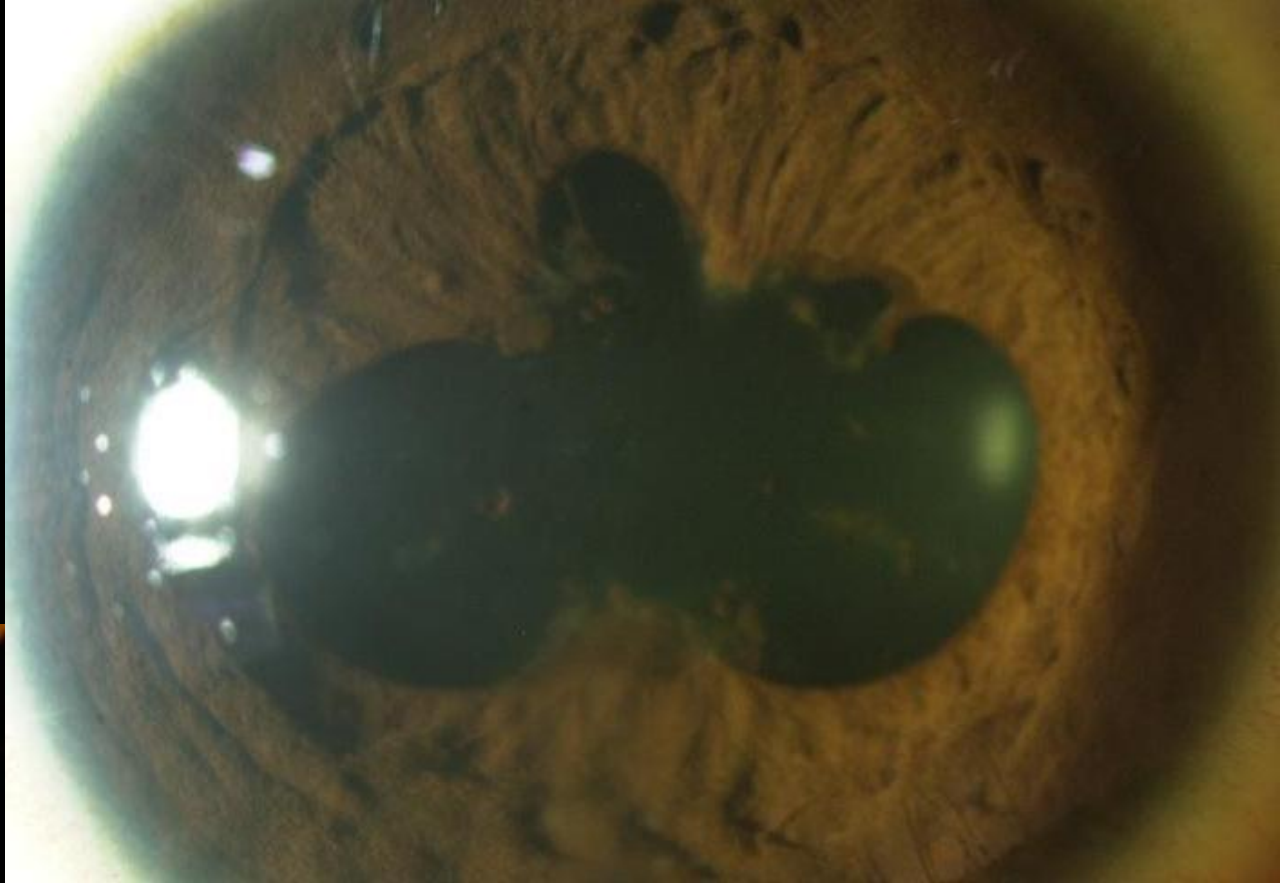
- Inflammation can upregulate VEGF and trigger neovascularization
- This would be a sign of **chronic or recurrent iritis**
- Search closely for fine vessels in pupillary region
- Neovascular glaucoma





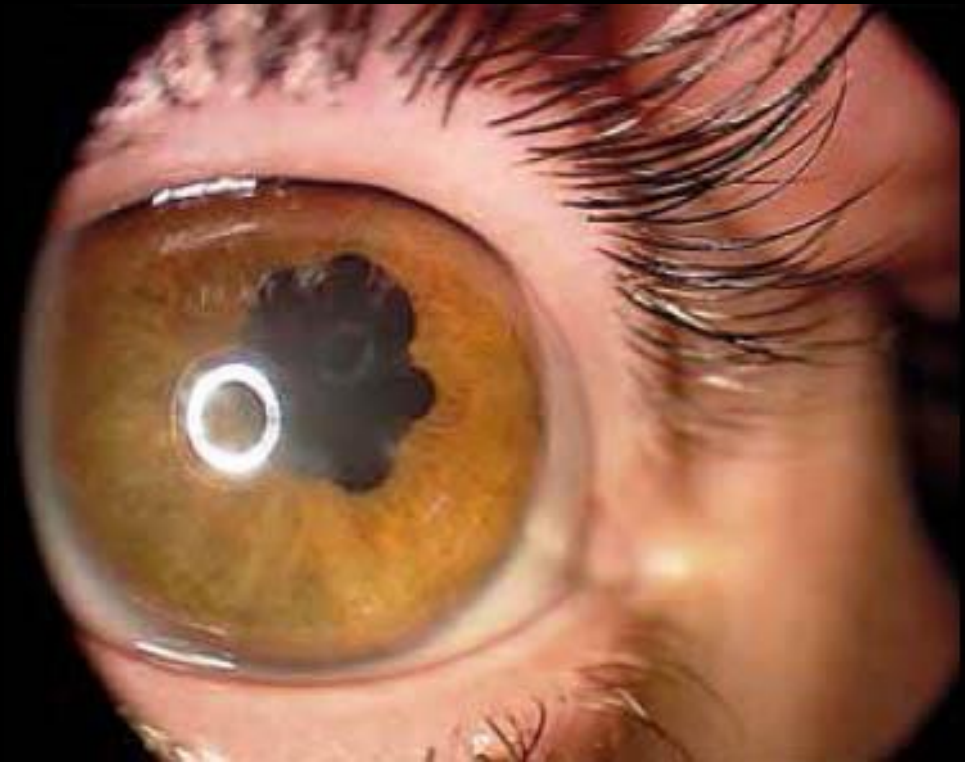
# Iris: Synechia

- **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

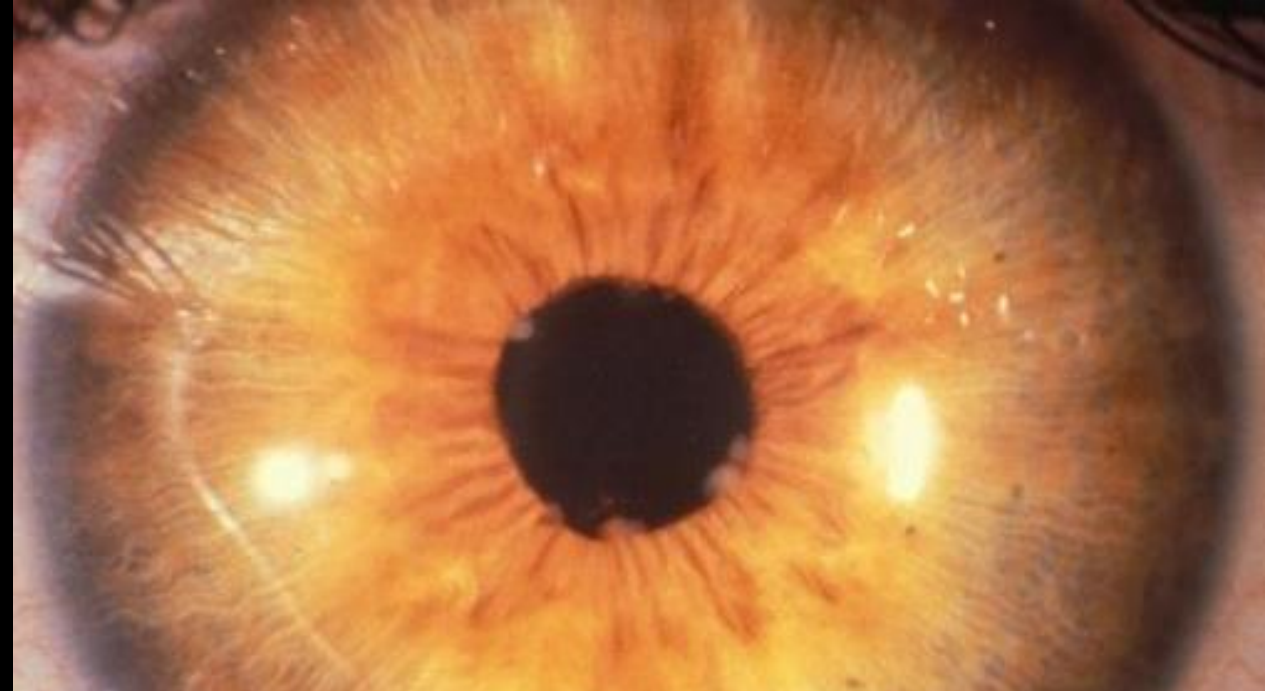
- Fresh, newly formed posterior synechia can be broken by dilating the pupil (but not established synechia)
- If they fail to break after 1-2 wk of homatropine + steroid, instill 1-2gtt of 10% phenylephrine in office

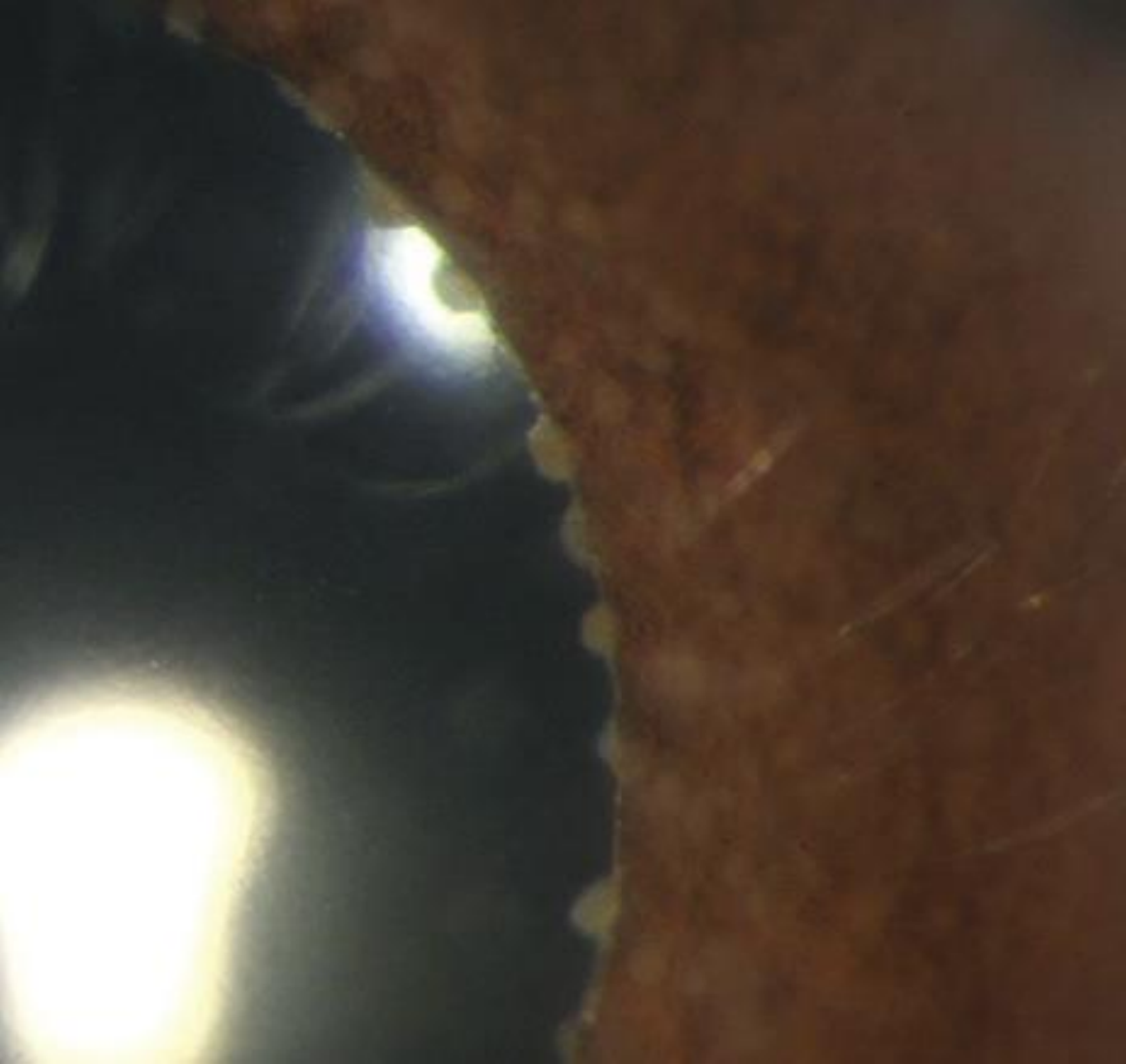




# Iris: Granulomas

- **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

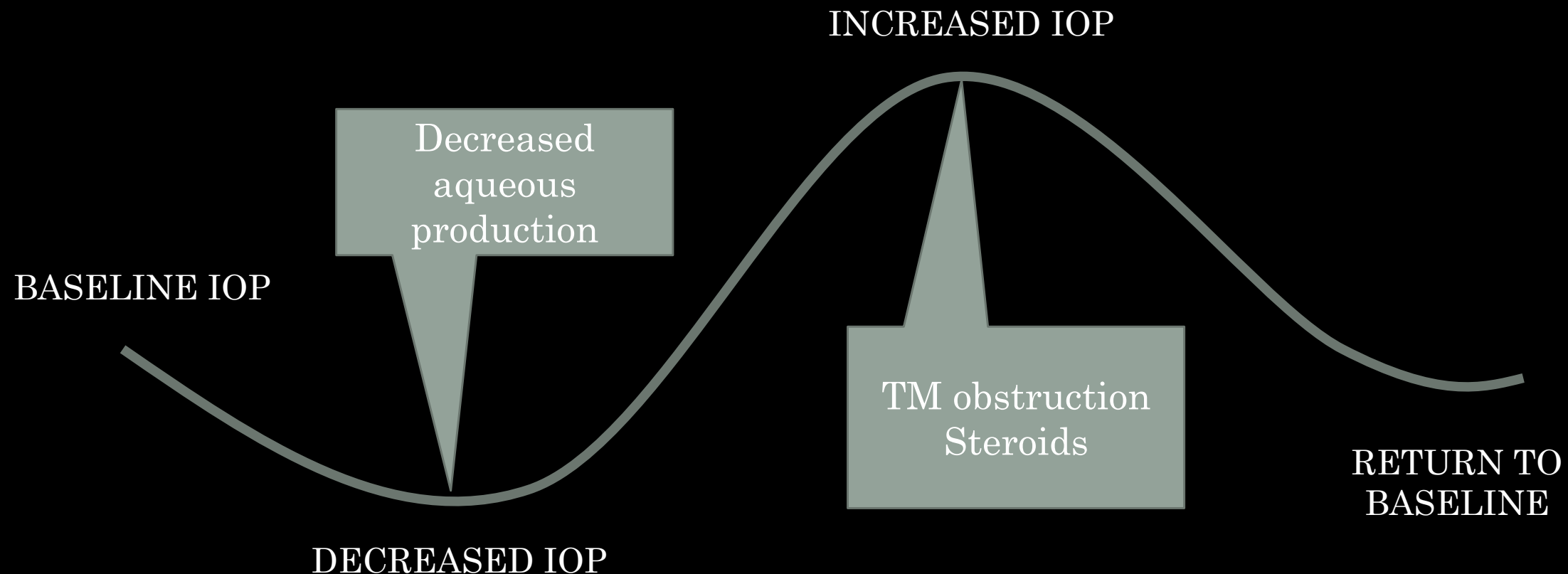
Decreased aqueous  
production due to  
ciliary body dysfunction

**EARLY STAGE**

## High IOP

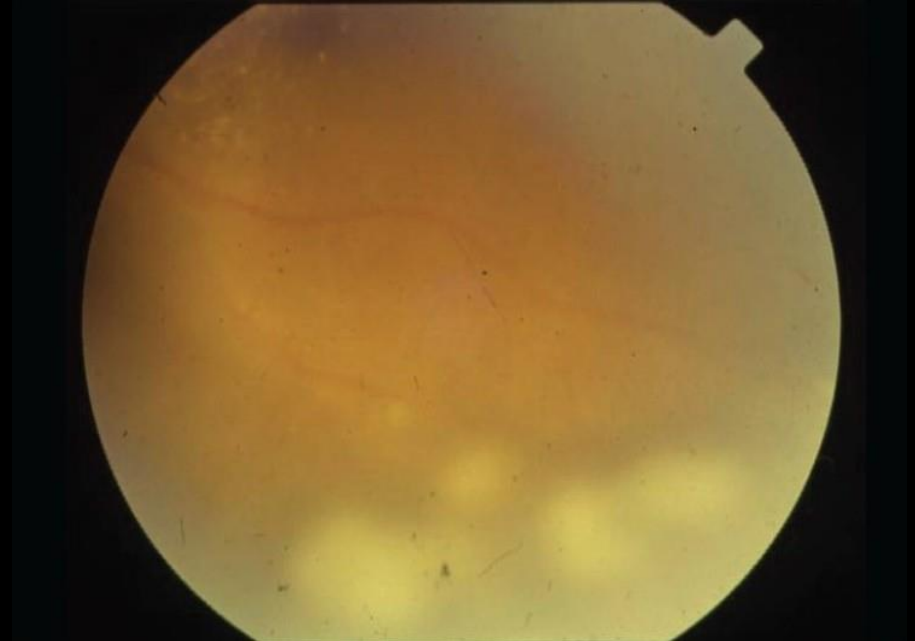
Synechia  
TM obstruction  
Steroid response

**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

## When to Order

Recurrent  
Chronic  
Bilateral  
Severe



## 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

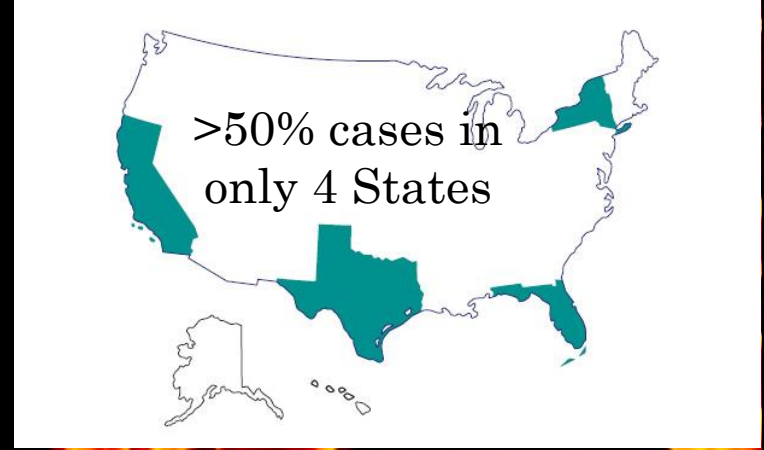
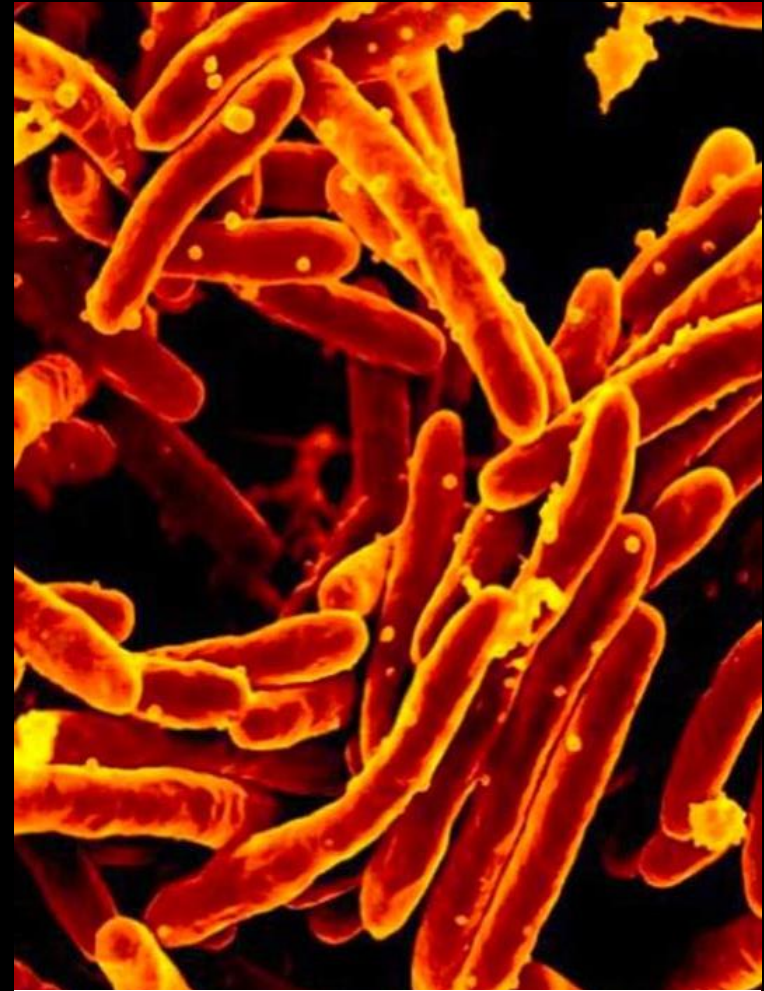




# Tuberculosis

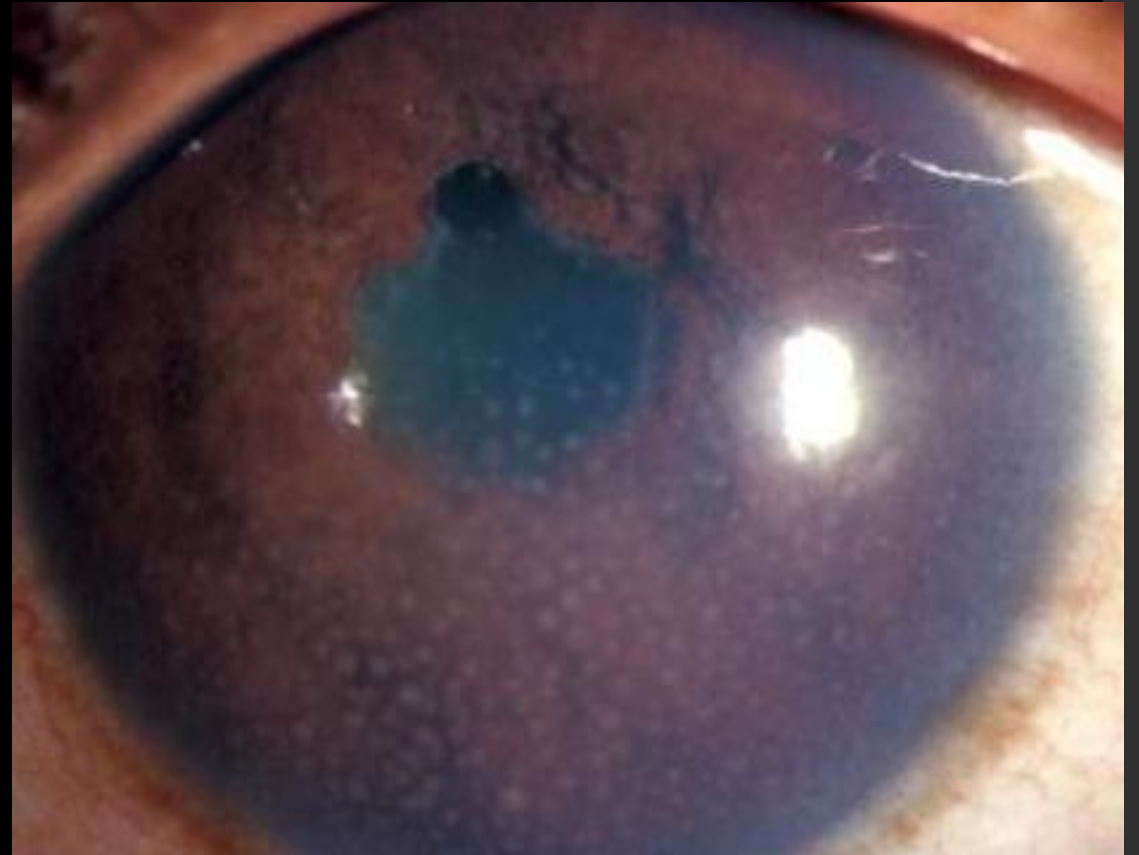
- In the differential of any ocular inflammatory disease
- Screening tests include tuberculosis skin test (PPD) and chest x-ray
- Most common in developing countries, immigrant populations and immunocompromised patients

Source: CDC – Trends in Tuberculosis, 2018



# Tuberculosis & Iritis

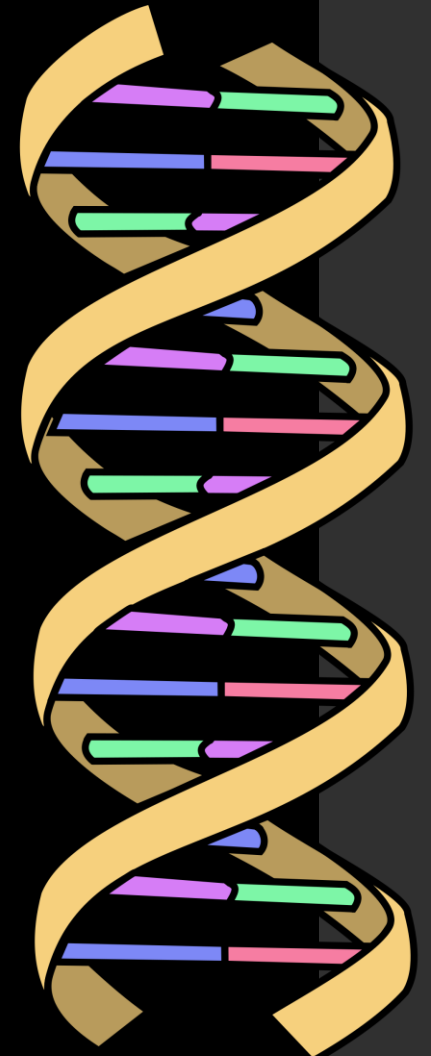
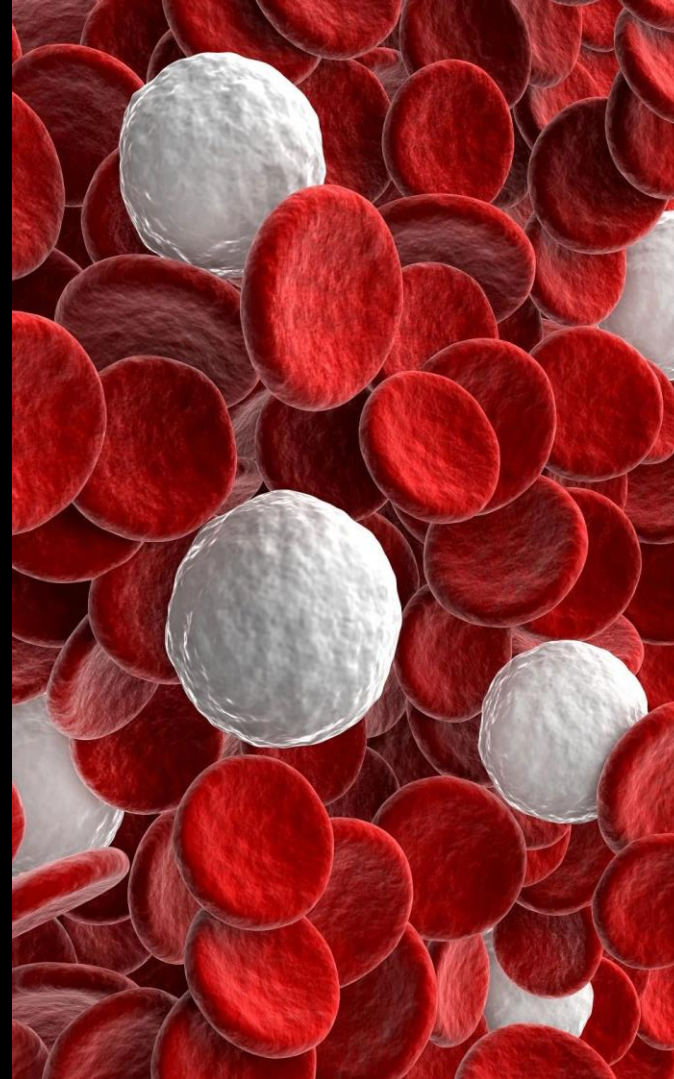
- Unilateral or bilateral
- Granulomatous
- Mutton-fat KPs
- May be chronic with periods of exacerbation and remission
- Frequently associated with chronic conjunctivitis, phlyctenosis, keratitis, or scleritis



# 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
- Associated with spondyloarthritis, but may be arthritis-free
- Ask about rheumatologic, dermatologic and GI symptoms

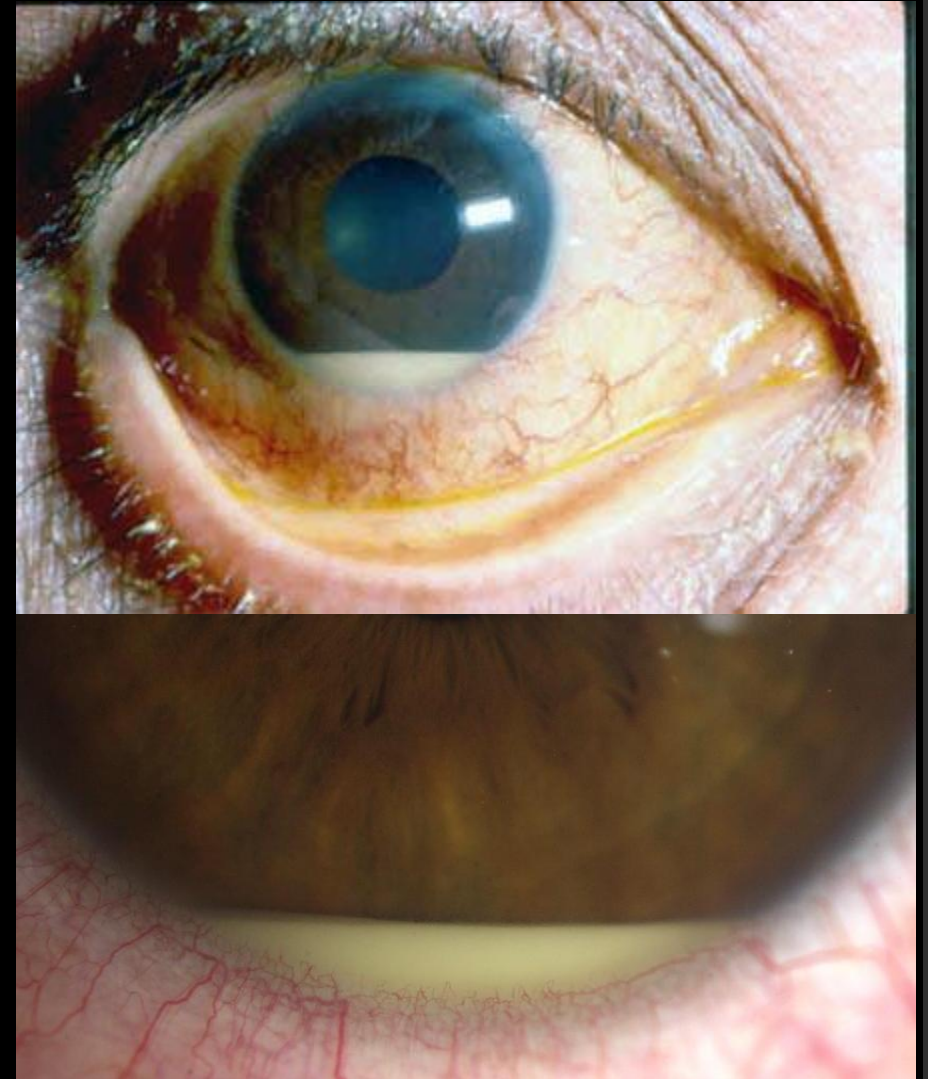
Source: PMID 30148724





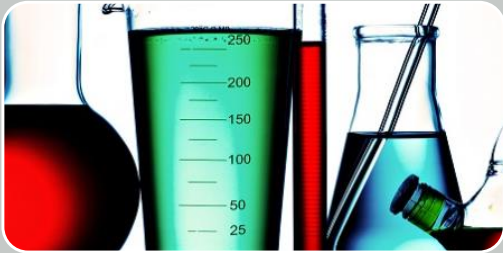
# HLA-B27 & Iritis

- 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



# Treatment of Iritis

## Keys to successful iritis management



Good  
workup and  
appropriate  
labs

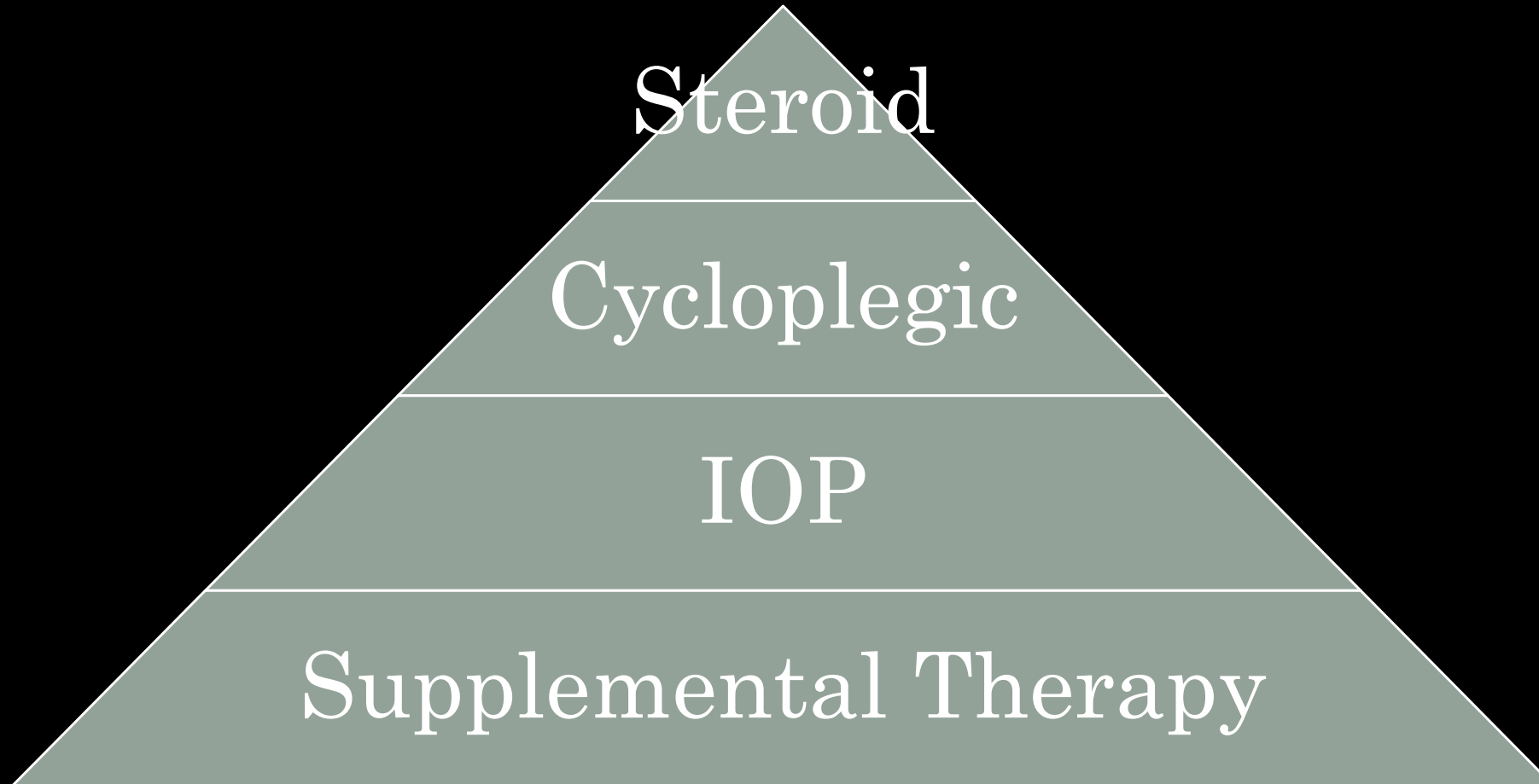


Enough of  
the right  
medication  
long enough



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

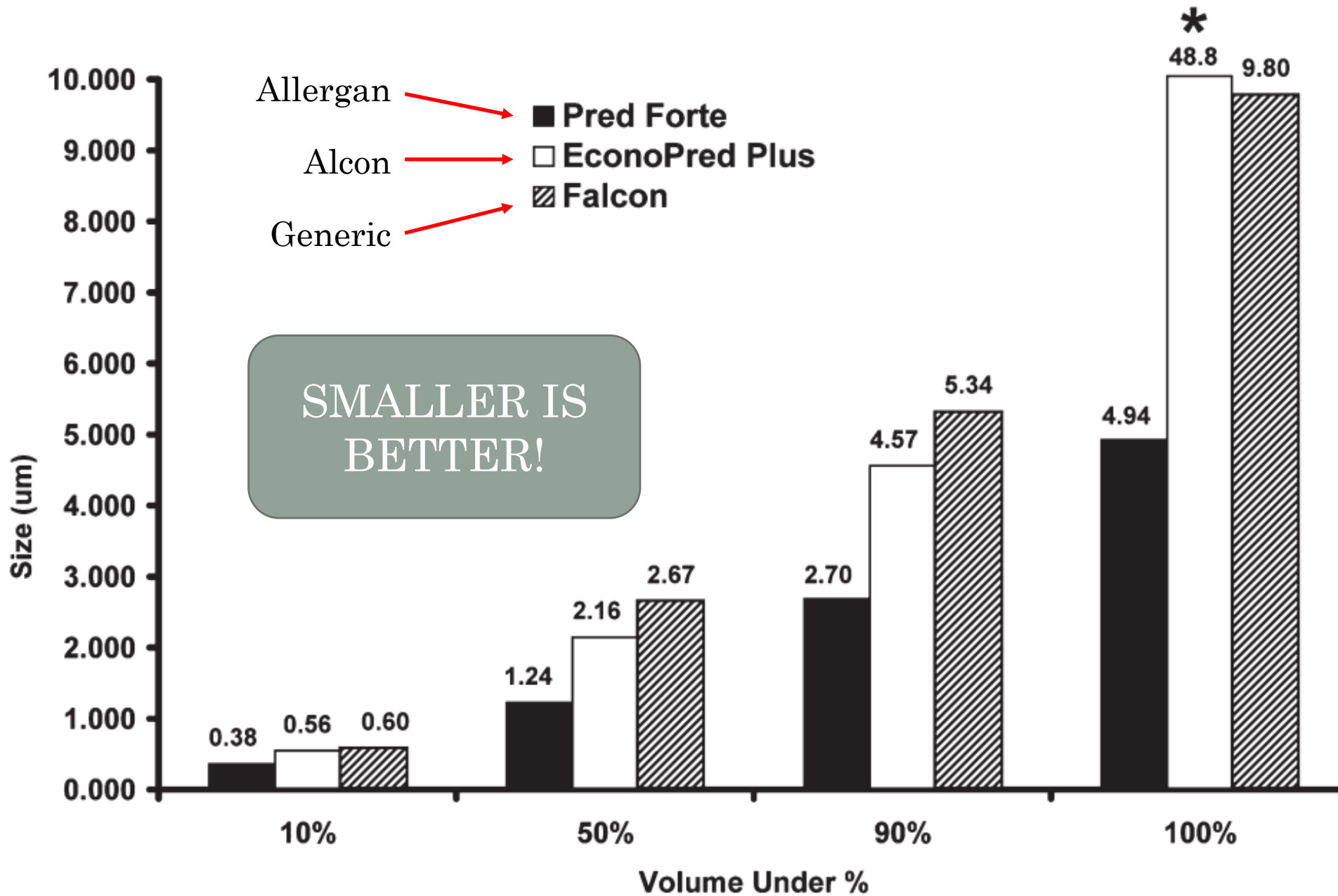
## Generics

Larger particles

Vigorous shaking required

Nozzle clogging possible

Less uniform dosing



\*This EconoPred Plus value is truncated in order to preserve the scale of the graph

PMID: 17444806



## Comparative Analysis of Prednisolone Acetate Suspensions

CALVIN W. ROBERTS<sup>1</sup> and PETER L. NELSON<sup>2</sup>

### 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

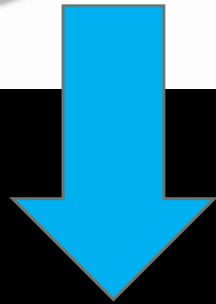
Taper

- 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

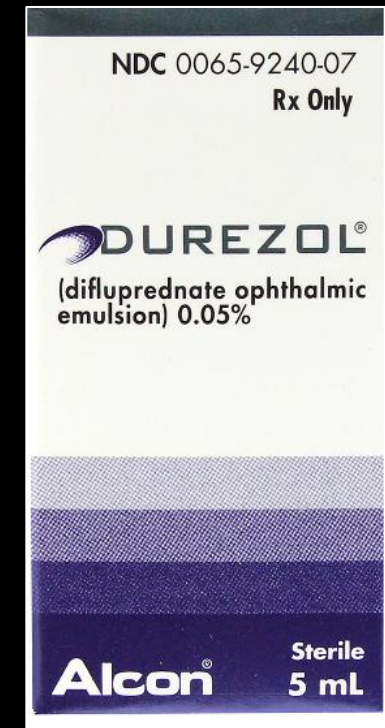




**LESS POTENT &  
FEWER ADVERSE  
EFFECTS**



**MORE POTENT &  
MORE ADVERSE  
EFFECTS**



**Lotemax**

loteprednol etabonate  
ophthalmic suspension 0.5%

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

 **DUREZOL**

(difluprednate ophthalmic  
emulsion) 0.05%

More potent than PF

Less frequent instillation

No shaking required!

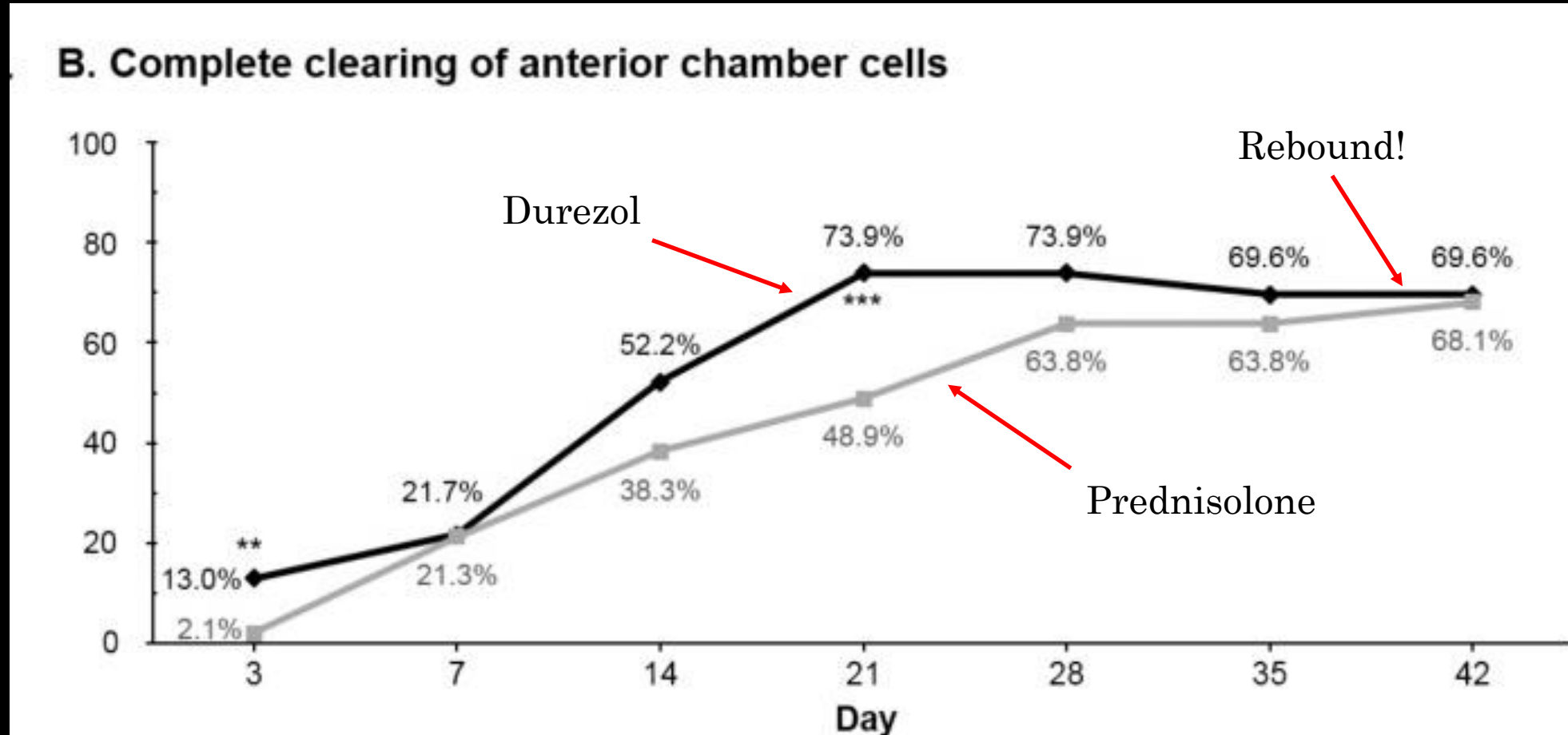
High risk of IOP elevation

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
- Mydriasis 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  $\uparrow$ IOP
- Avoid prostaglandins!



# Additional Considerations

Nighttime  
coverage

Systemic  
pain meds

Maintenance  
therapy

# 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!*

