Uveitis
The middle vascular layer of eye, uvea, consists of 3 structures:
- Iris (11 – 13 mm) and Pupil (3 – 4 mm)
- Ciliary Bodies & Zonules
- Choroid
Iris & pupil

- **Function**: Control the amount of light entering the eye by adjusting the pupil size.

- **Circular shaped diaphragm containing 2 sets of muscles to control the pupil size.** (circular & radial muscles)

- **With pigment & non-pigmented cells.**
  - Many pigments = 'brown eyes';
  - some pigments = 'green eyes';
  - very few pigments = 'blue eyes'

- The pupil should be equally big & round and respond both to light & accommodation.
Uvea: Choroid

- Thin, spongy, highly vascular, dark brown, layer.
- Function: Important to provide nutrition to the inner eye (retina)
• Function: Increase refractive power to help focusing at near (accommodation); produce aqueous humour

• Contraction of ring shape ciliary muscle causes the ciliary body to move anteriorly.
• **Uvea**: is the vascular middle layer of the eye.

• **The prime functions of the uveal tract:**
  
  1. nutrition and gas exchange. Uveal vessels directly perfuse the ciliary body and iris, to support their metabolic needs, and indirectly supply diffusible nutrients to the outer retina, cornea & lens, which lack any intrinsic blood supply.

  2. light absorption. The uvea improves the contrast of the retinal image by reducing reflected light within the eye (analogous to the black paint inside a camera).

  3. secretion of the aqueous humour by the ciliary processes, control of accommodation by the ciliary body, and optimization of retinal illumination by the iris's control over the pupil.
UVEITIS

• The normal uvea consists of immune competent cells, particularly lymphocytes, and is prone to respond to inflammation by developing lymphocytic infiltrates.
• Inflammation of the uveal tract; which is made up of three parts:
  1. The iris (the colored part of the eye that surrounds the pupil)
  2. The ciliary body (the part of the eye that makes aqueous humour); contains 2 parts: pars plicata (anterior) and pars plana (posterior).
  3. The choroid (the layer of tissue just under the retina at the back of the eye)
Anatomical classification of uveitis:

* Anterior (iris and pars plicata); from two-thirds to 90% of uveitis cases are anterior in location. (iritis, or iridocyclitis).
* Intermediate (pars planitis, vitreous body); is termed cyclitis.
* Posterior uveitis (Choroid and retina)
* Panuveitis (in all layers of the uvea)
• Different types are then further classified by cause:
  * Autoimmune (when associated with an autoimmune disease in the body)
  * Infectious (when caused by a bacteria, virus, fungus, or parasite),
  * Traumatic (after trauma to either eye)
  * Idiopathic (no identifiable cause)
Acute versus chronic

- In acute uveitis symptoms and signs occur suddenly and typically lasts up to 6 weeks.
- In chronic uveitis the onset is usually gradual and the inflammation lasts longer than three months.
Epidemiology

- The incidence of uveitis is about 15 per 100,000.
- 75% of these are anterior uveitis
- 50% of patients with uveitis have an associated systemic disease
<table>
<thead>
<tr>
<th>Anterior Uveitis</th>
<th>Intermediate Uveitis</th>
<th>Posterior Uveitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Photophobia (spasm of iris muscle)</td>
<td>1. Vitrous Floaters (random spots in the visual field)</td>
<td>1. Floaters</td>
</tr>
<tr>
<td>2. Pain (spasm of ciliary muscle)</td>
<td>2. Blurred vision.</td>
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<tr>
<td>3. Lacrimation (teary eye)</td>
<td></td>
<td>3. Loss of peripheral vision</td>
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<tr>
<td>4. Redness (ciliary flush = perilimbal/central conjunctival injection)</td>
<td></td>
<td>4. Seeing flashing lights</td>
</tr>
<tr>
<td>5. Headache.</td>
<td></td>
<td>5. Painless</td>
</tr>
<tr>
<td>6. Decrease VA (hypopyon).</td>
<td></td>
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<tr>
<td>1. Vitreous Floaters (random spots in the visual field)</td>
<td>1. Snowballs (vitreous aggregates of inflammatory cells)</td>
<td>1. Hypopyon.</td>
</tr>
<tr>
<td>2. Blurred vision.</td>
<td>2. Post-segment snowbanking (grey white fibrovascular plaque)</td>
<td>2. Vitreous cells and opacities.</td>
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<td>3. Loss of peripheral vision.</td>
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<td>5. Painless.</td>
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<tr>
<td>1. Flare (protein precipitation in the anterior champer)</td>
<td>1. Snowballs (vitreous aggregates of inflammatory cells)</td>
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<tr>
<td>2. Hypopyon (collection of neutrophilic exudates inferiorly in the ant. champer)</td>
<td>2. Post-segment snowbanking (grey white fibrovascular plaque)</td>
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<tr>
<td>3. Keratic precipitate (clumps of cells on corneal endothelium)</td>
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<tr>
<td>4. Inflammatory WBCs cells maybe seen in ant. champer.</td>
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<td>5. Iritis cause decrease in IOP, but if severe as in case of herpetic uveitis it may causes inflammatory glaucoma.</td>
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<td>Complication</td>
<td>Anterior uveitis</td>
<td>Intermediate uveitis</td>
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<td>--------------</td>
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<tr>
<td></td>
<td>Posterior synechiae &gt; irregular pupil, cataract, glaucoma, chronic iritis.</td>
<td>Cystoid maculae oedema, cataract, cyclitis membrane formation.</td>
</tr>
<tr>
<td>Treatment</td>
<td>Topical steroids (eye drops)</td>
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</table>
Iritis - note increased redness around the outer ring of the iris

Here; because of this redness, our DDx. >> 1. keratitis. 2. uveitis …
Signs of uveitis:

- The visual acuity may be reduced
- The eye will be inflamed in acute anterior disease, mostly around the limbus.
- Inflammatory cells may be visible clumped together on the endothelium of the cornea particularly inferiorly (keratitic precipitates the 1st pic in slide 12)
- Slit lamp examination will reveal aqueous cells and flare, if the inflammation is severe there may be sufficient white cells to collect as a mass inferiorly (hypopyon the 2nd pic in slide 11)
- Dilated vessels in the iris
- The iris may be adhere to the lens (posterior synechiae pics in slide 13)
- Elevated IOP
- Macular edema may be present
# Uveitis and systemic disease:

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<td>1. HLA positive or seronegative group:</td>
<td>1. Infections: Toxoplasmosis*, TB, Candidiasis, CMV…</td>
</tr>
<tr>
<td>A - Ankylosing spondylitis*</td>
<td>2. Sarcoidosis, Behçet's disease</td>
</tr>
<tr>
<td>B - Reiter’s syndrome</td>
<td>3. Idiopathic (less common)</td>
</tr>
<tr>
<td>C - IBD</td>
<td></td>
</tr>
<tr>
<td>D - Psoriatic arthritis</td>
<td></td>
</tr>
<tr>
<td>2. Systemic Infections “TB, HIV and syphilis”</td>
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<tr>
<td>3. Sarcoidosis, Behçet's disease, juvenile chronic arthritis.</td>
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<td>4. Idiopathic (common)</td>
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Associated systemic diseases

- Respiratory disease: TB, Sarcoidosis.
- Skin problems: EN, psoriasis, Behcet, disease {oral ulcer, genital ulcer, thrombophlebitis}.
- Joint disease: AS, Rieters {urethritis, conjunctivitis, arthritis of large joint}.
- Bowel disease {UC, crohn’s}
- Infectious disease: syphilis, herpes, CMV, toxoplasmosis.
Ankylosing spondylitis

- 90% of patients with Uveitis have the tissue type HLA B27 although the prevalence of the disease in people in general with HLA B27 is only 1%.
- 20 - 40% of patients with A.S will develop acute anterior Uveitis.
- Males are affected more frequently than females (3:1)
- Acute anterior Uveitis lasting 2-6 weeks, good prognosis.
Symptoms:

- Backache
- Stiffness at rest
- The pain is usually dull and diffuse, rather than localized. This pain and stiffness is usually worse in the mornings and during the night, but may be improved by a warm shower or light exercise. Also, in the early stages of AS, there may be mild fever, loss of appetite and general discomfort
- Anterior Uveitis
Investigation

- HLA typing
- Sacroilliac spinal x-ray
Toxoplasmosis

- May be congenital or acquired (often during a glandular fever-like illness)
- Most ocular toxoplasmosis was thought to be congenital with the resulting retinochoroiditis being reactivated in adult life.
- The retina is the principle structure involved (secondary inflammation occurring in the choroid)
• Active lesion is often located at the posterior ball appearing as creamy focus of inflammatory cells at the margin of old chorioretinal scar (atrophic with pigmented edge).

• Inflammatory cells cause a vitreous haze and the anterior chamber may show evidence of inflammation.
A fetus may contract toxoplasmosis through the placental connection with its infected mother.

The mother may be infected by:

- Improper handling of cat litter
- Handling or ingesting contaminated meat
Symptoms

• Symptoms are often influenza-like: swollen lymph nodes, or muscle aches, fever, tiredness, sore throat, and nausea.
• Pains that last for a month or more.
• Posterior Uveitis
• A unilateral decrease in visual acuity is the most common symptom of toxoplasmosis.
The management of patient with Uveitis:

- History taking (ocular and general)
- Complete ocular examination
- General physical examination
- Investigations
- Specialist medical referral (for further evaluation)
Investigation:

- Aim – to determine a systemic association and directed by the uveitis type.
- Anterior uveitis > more likely associated with AS & HLA-typing confirm the Dx.
- Large KPs; suggest sarcoidosis, Chest radiograph, Serum calcium, Serum ACE levels are appropriate.
- Toxoplasmosis: retinochoroiditis occurs at the margin of an inflammatory choroidal scar. (retina whitening and scar).
- Posterior uveitis: mostly associated with systemic disease.
- AS: Sacroiliac joint X-Ray
Treatment:

Because uveitis is an inflammatory condition:

- In anterior Uveitis: topical steroid; eye drop & mydriatics agents (atropin”long action 14 days-strongest”, cyclopentolate 24 hrs, tropicamide “6hrs action”>> to relieve pain by decrease ciliary spasm, and prevent post, synechiae)

- In posterior Uveitis: systemic steroid or injected in or around the eye (in the Tenon’s layer which is a connective tissue layer that separates the conjunctiva from the sclera)

- If the cause is infectious; an anti-infective medication will also be used (for example antibiotic, antiviral, or antifungal) to combat the underlying infectious agent.
Surgery may be required for complications such as cataract, glaucoma, and vitreoretinal problems, but in emergency situations, it should be contemplated only once the uveitis is controlled, ideally for at least three months.

Intraocular surgery (cataract removal, vitrectomy, and retinal detachment surgery) is performed under the cover of systemic corticosteroids to prevent a relapse of uveitis.

Removal of the vitreous body (vitrectomy) may be helpful when there is substantial opacity but also may improve disease control, particularly in younger patients.
complications of uveitis

- Uveitis has many potentially serious complications that can lead to permanent, irreversible vision loss. For this reason, it is imperative that uveitis be treated rapidly and to the best extent possible.

- If the inflammation continues unchecked, complications may include sudden or chronic rises in eye pressure that can lead to permanent damage of the optic nerves, resulting in irreversible vision loss (glaucoma).

- The inflammation can also damage delicate cells on the cornea and retina, causing fluid buildup that blurs and damages the vision, sometimes irreversibly.
- Posterior synechiae indicated by irregular shaped pupil, and it leads to entrapping the aqueous in post champer so formation of closure angle glaucoma.
- Macular edema & chronic iritis.
Retinitis is considered as posterior uveitis.

Flare: scattering of light as a result of presence of proteinous particles in the anterior chamber (AC).

Fibrinous reaction (as the end result of flare) = fibrin + protein

Posterior synechia may cause closed angle glaucoma.

Dilator eye drops:
1. tropicamide.
2. cyclopentolate.
3. atropine.

Please read more about systemic diseases that are associated with Uveitis.
• **Floaters** are deposits of various size, shape, consistency, refractive index, and motility within the eye’s vitreous humour, which is normally transparent.

Floaters are visible because of the shadows they cast on the retina or their refraction of the light that passes through them, and can appear alone or together with several others in one's field of vision.

Note: smoking has approved association with uveitis

GOOD LUCK 😊