The Acute Eye & it's Management

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Acute eye conditions

- What are they?
- Red flags
- Assessment
  - History
  - Examination
- Management/Referral
- Resources

Ocular emergencies

- Trauma
  - Chemical, thermal, penetrating, blunt
- Red eye
- Vision loss
  - Ophthalmic cause
  - Systemic cause
- Neurological (no time!)

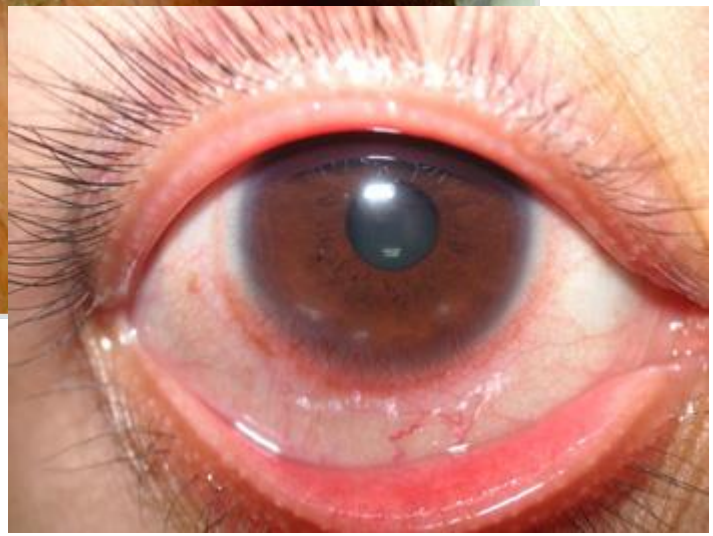
Last 6/12 data: 7,641 patient visits

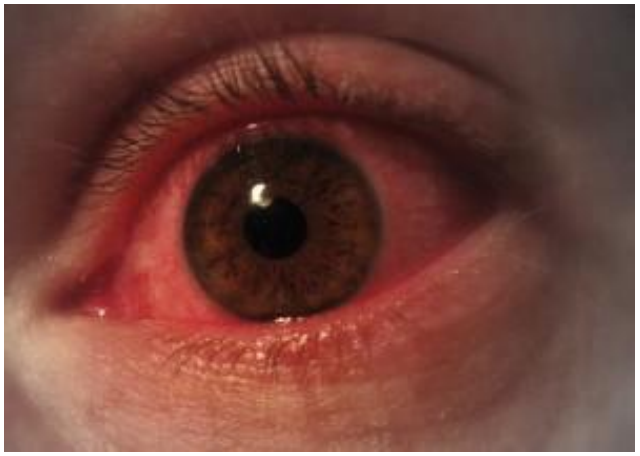
- Ophthalmic emergencies
  - Chemical injury 1.88% (n.123) - 2 required admission
  - Acute angle closure crisis 0.11% (n.7)
  - Orbital cellulitis 0.06% (n.4)
  - Endophthalmitis/hypopyon 0.03% (n.2)
  - Penetrating eye injury/globe rupture 0.015% (n.1)
  - Sudden loss of vision – multiple causes: ocular & systemic
- Urgent ophthalmic conditions
  - Uveitis 13.3% (n.871)
  - Blunt trauma 10.49% (n.687)
  - Keratitis 9.32% (n.610)
  - Pre-septal cellulitis 2.21% (n.145)
  - Retinal detachment 0.52% (n.34)
- Vision loss due to systemic/vascular cause 4.17% (n.273)

Red flags trauma

- Trauma
  - Chemical injury
  - History suggestive of PEI
  - Distorted pupil
  - Poor vision

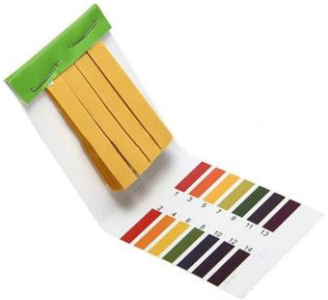
Chemical injury





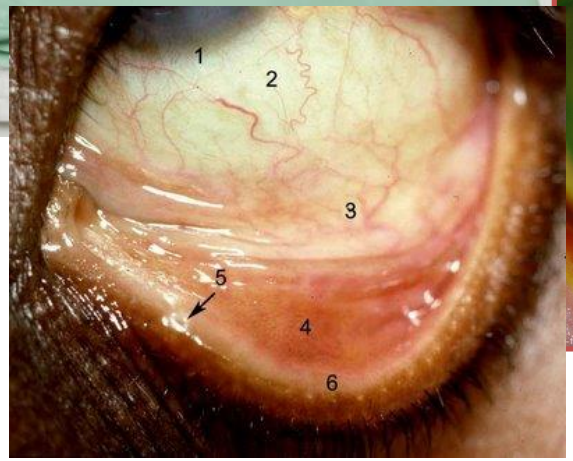
- Eye wash stations
  - Suitable for emergency 1st aid
  - Often patient managed
  - Full irrigation & assessment required

- pH testing strips
  - Recommended in literature
  - Difficult to find suitable agent in NZ
  - Pre-irrigation
    - Confirms acid vs alkali & exposure
  - Post-irrigation
    - 5-10 minute delay required to ensure testing of tear film



- Morgan lens
  - Marketed to aid irrigation
  - We do not use or support use of this product
  - Feedback from patients unfavourable
    - Severe discomfort
    - Left unsupervised
    - Obstruction of particles

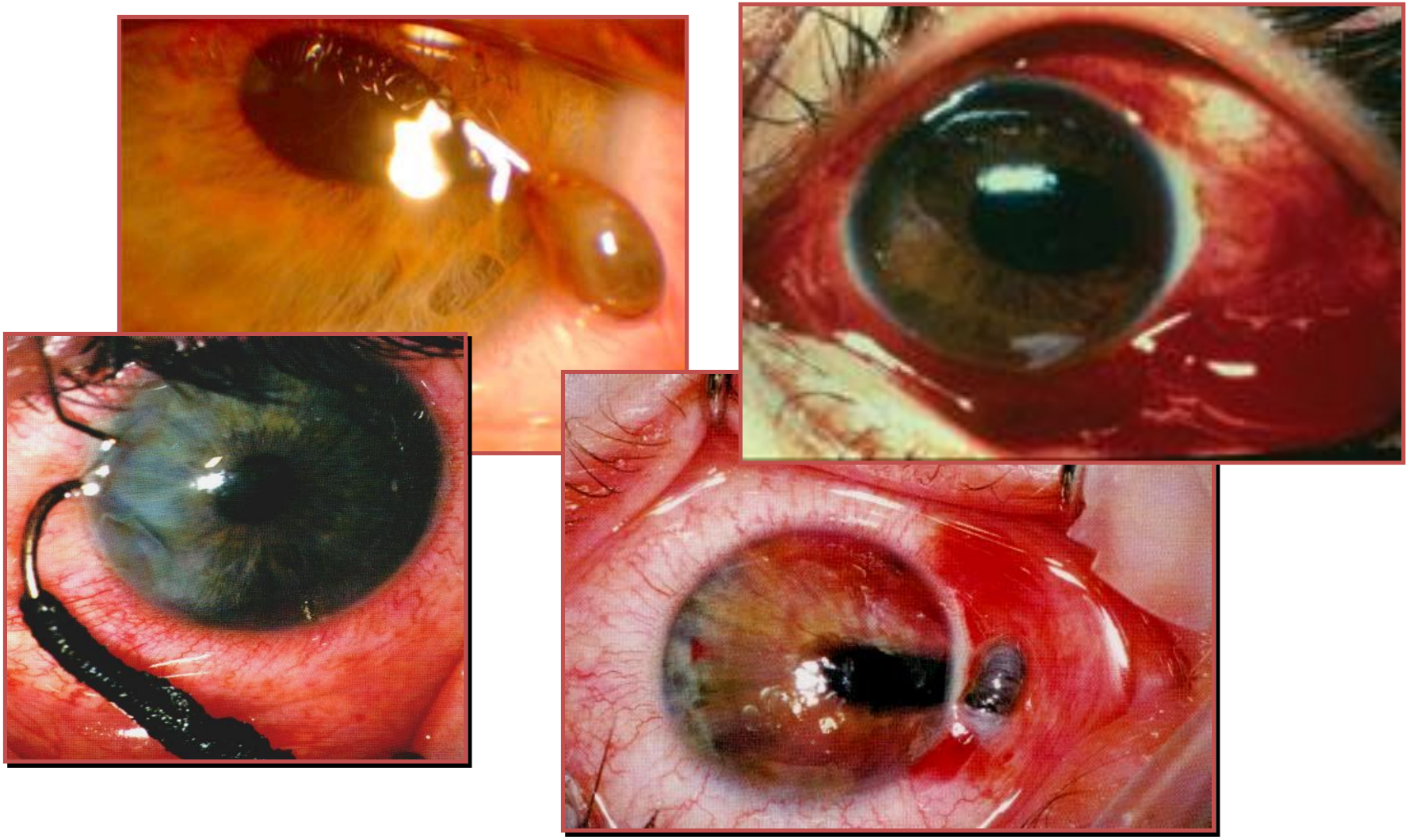
Ocular irrigation equipment



Penetrating ocular trauma

- Due to sharp object entering eye or blunt force causing a rupture
- Signs & symptoms: bleeding, distortion of globe, marked loss of vision, ± irregular pupil, iris prolapse or tears, hyphaema, ± intraocular FB
- Defer further examination until in OR
- Protect eye with shield
- Tettox, systemic antibiotics, antiemetics, NBM status, CT/XR

Penetrating Ocular Trauma

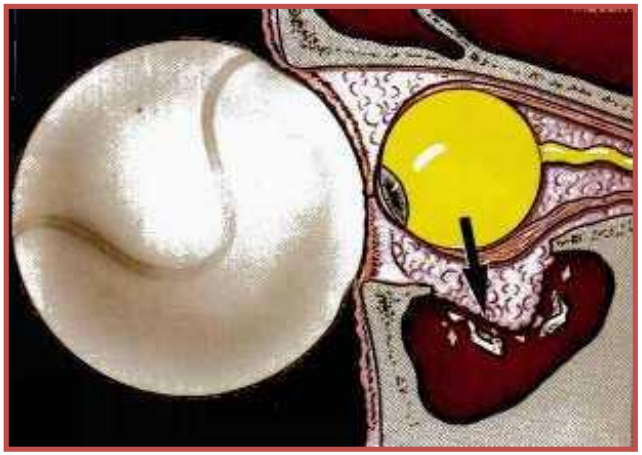


Clear shield - NO PRESSURE DRESSING!

- Avoid pressure on globe in PEI
  - Expulsion of ocular contents
- Secure with tape
- Alternative- paper/polystyrene cup
- Provides protection & reminder to patient

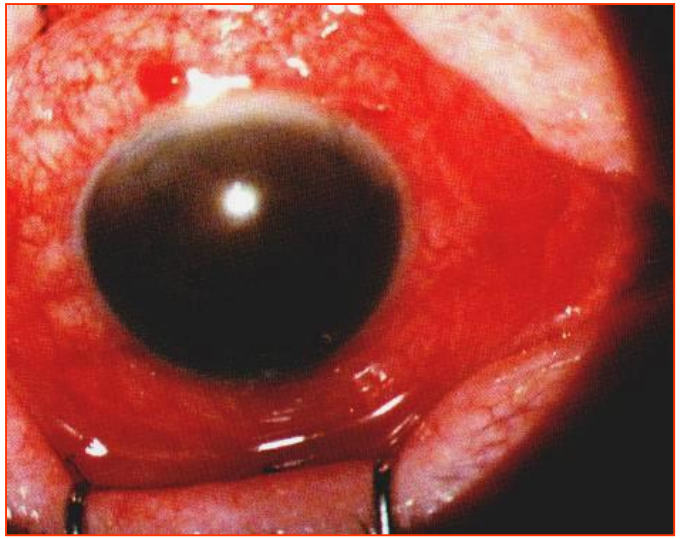
Blunt ocular trauma

- Squash balls/racquet, golf balls/shuttle cocks, elastic luggage straps, fists/feet/elbows
- Eye pushed back into socket
- Contusion, rupture, blow out #
- Damage to cornea, sclera, iris, ocular drainage angle, lens, retina, muscles



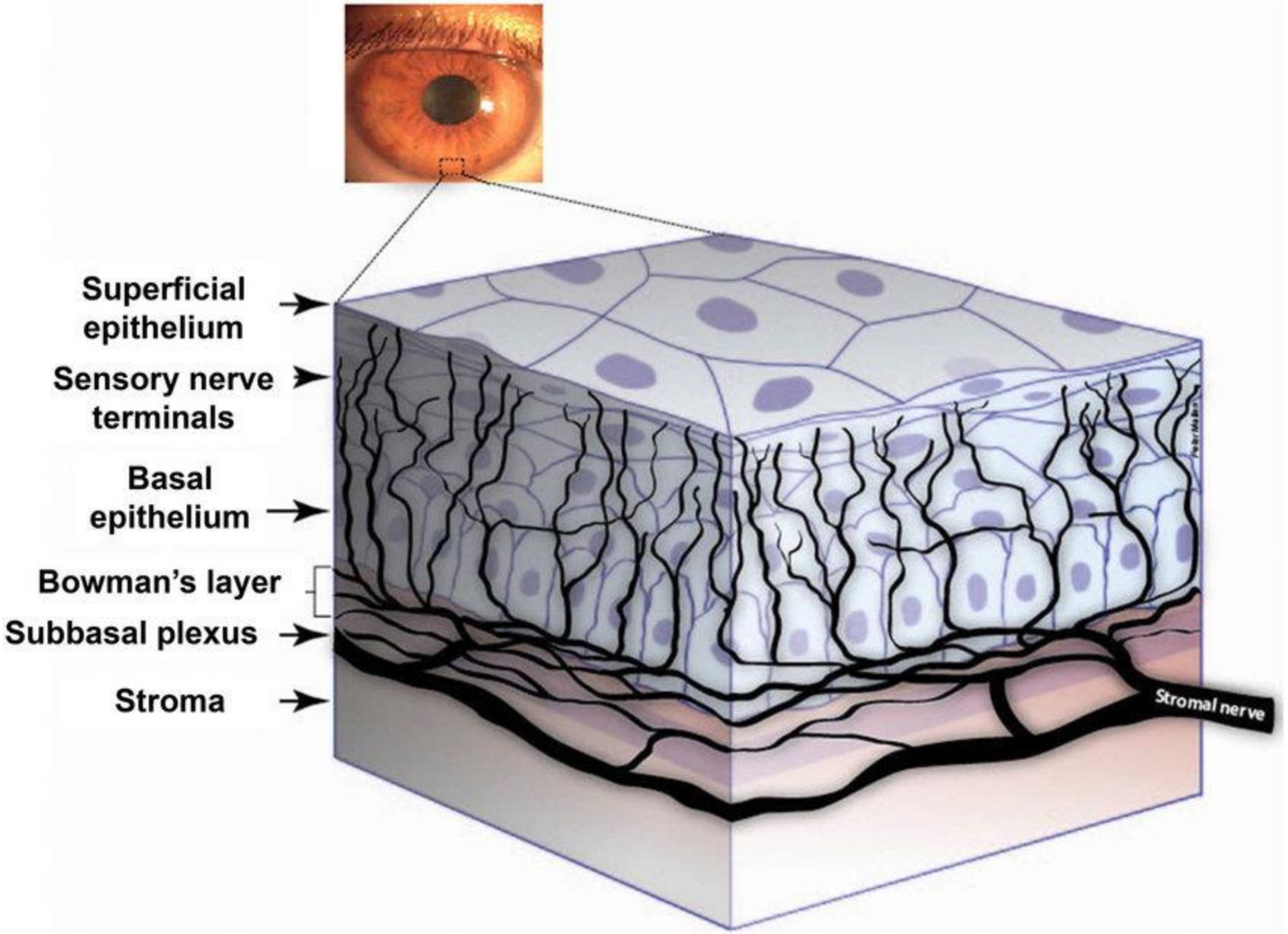
Hyphaema

- Sign of significant ocular trauma
- 20% risk of rebleed
- Acute elevation of IOP
- Corneal blood staining
- Possible damage to angle/iris/lens/retina
- In severe cases 5-10% risk of glaucoma
- **Bed rest with head elevated**

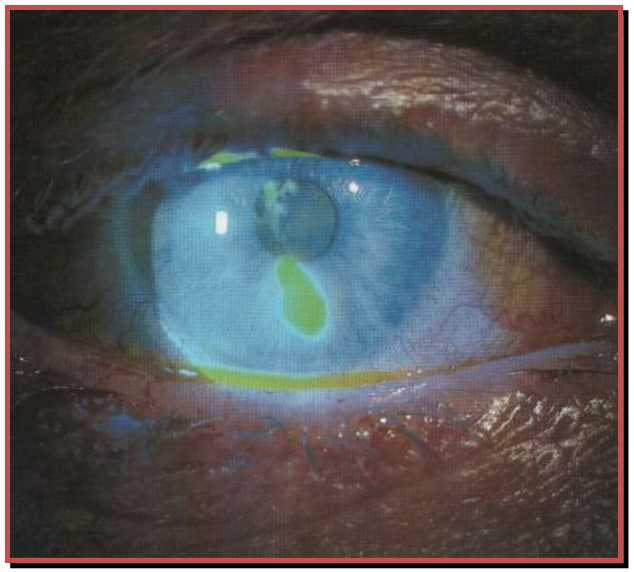


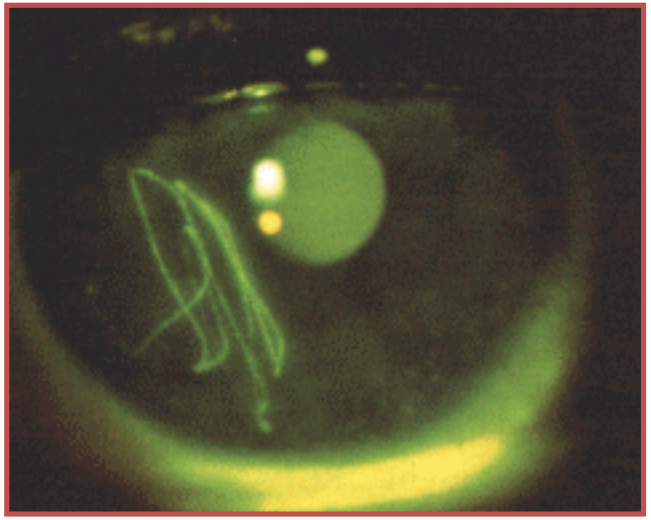
Corneal abrasion

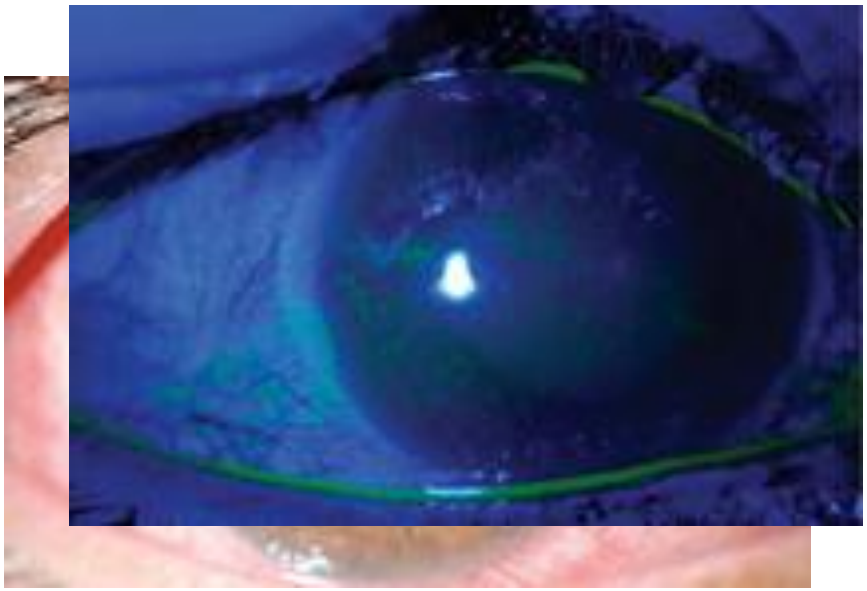
- Common superficial trauma
- Typically caused by finger nails/leaves/twigs/corners of paper
- Significant pain, watery, photophobic
- VA reduced if abrasion in visual axis
- Oc/gut chloramphenicol
- +/- eye pad
- Generally resolves 1-3/7
- Refer if not resolved within 72hrs/suspicion of more extensive injury

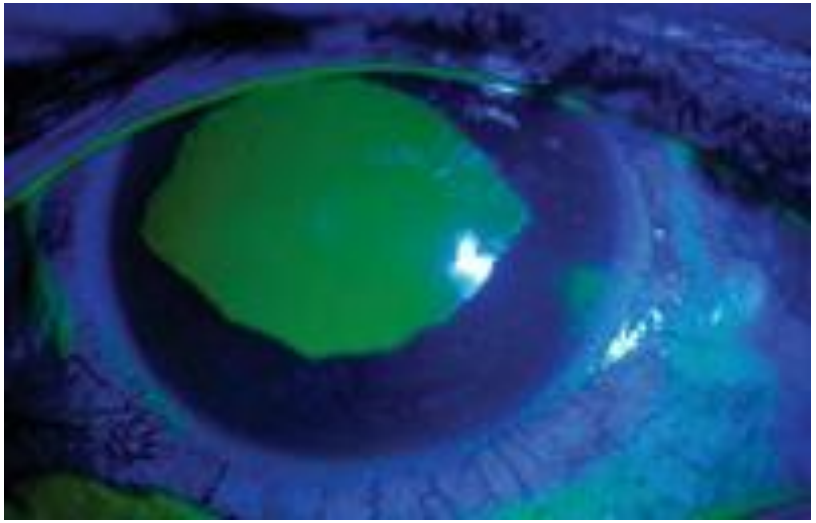

Superficial epithelium
Sensory nerve terminals
Basal epithelium
Bowman's layer
Subbasal plexus
Stroma
Stromal nerve

Corneal Abrasion





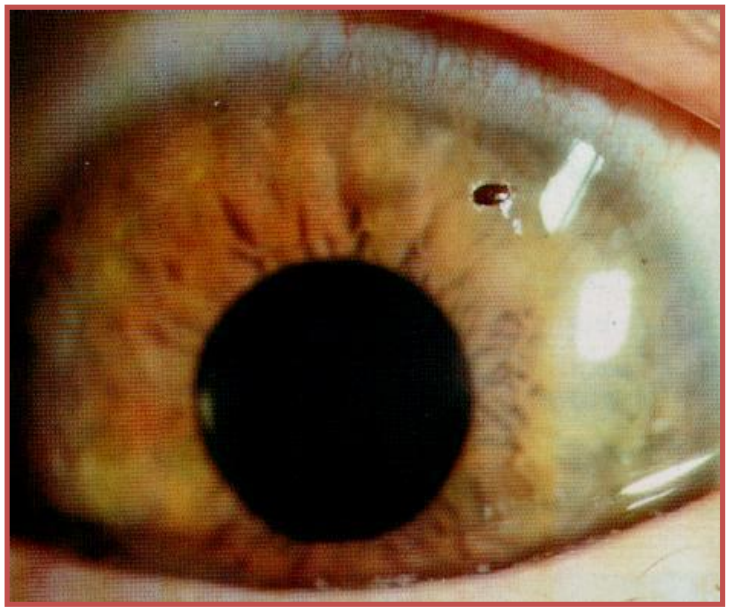


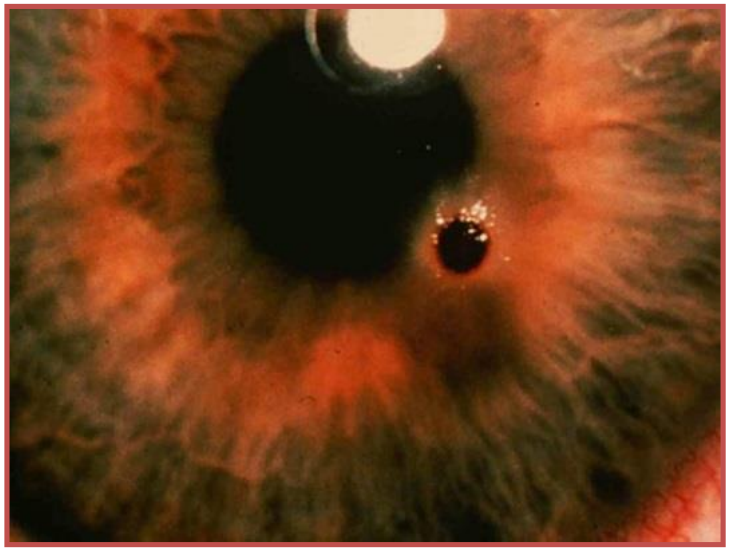


Eye pad

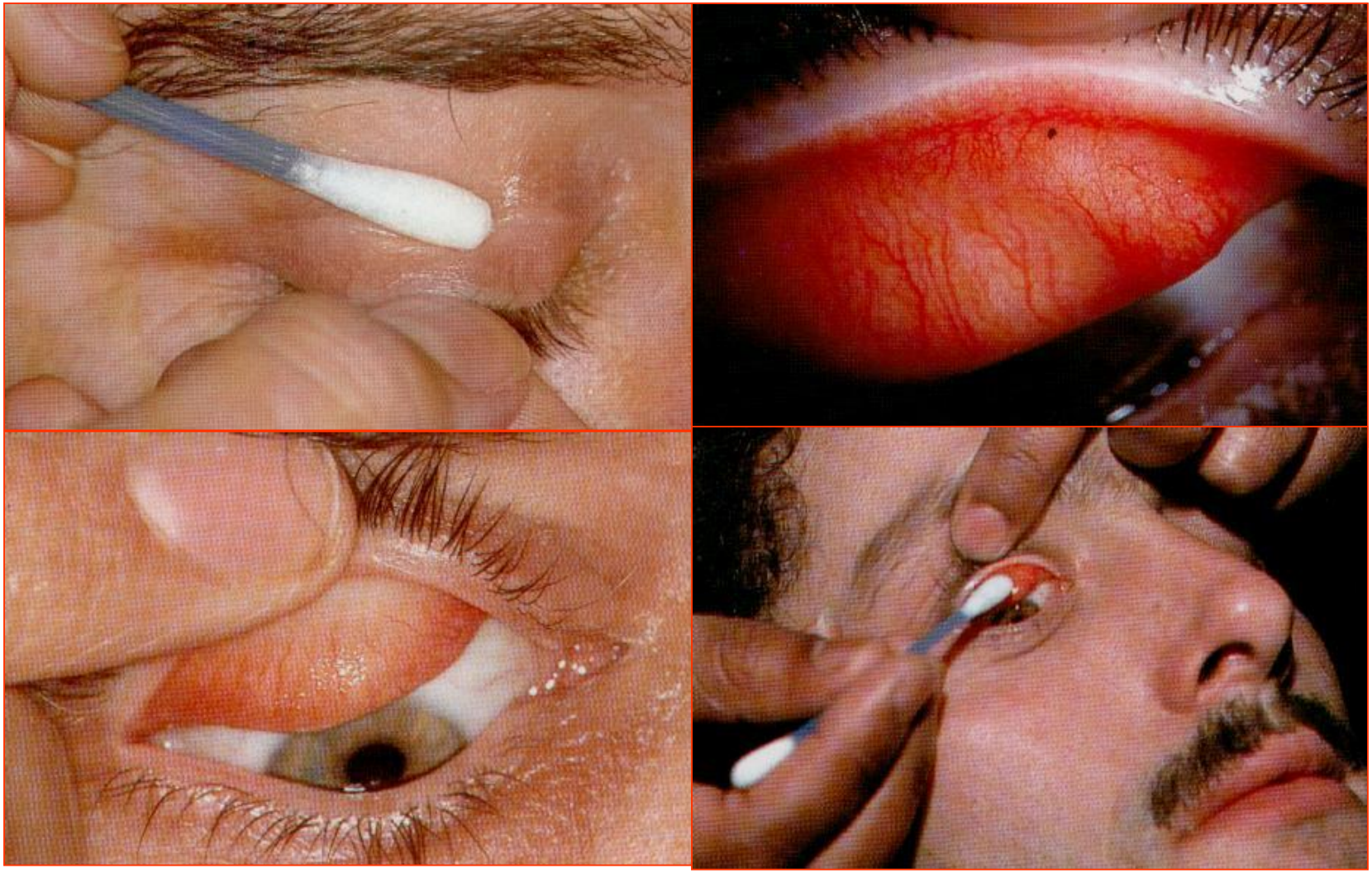
- Benefit debateable in minor trauma
  - Large abrasion, pain+++
  - Advise patient to remove if causes discomfort
- Ensure eye remains closed under pad
  - Corneal abrasion could result
- Secure with tape
- ???jelonet

Corneal FB





Lid eversion for sub-tarsal foreign body



Red Flags Red Eye

- Red eye
  - Reduced vision on snellen chart
  - Moderate/Severe pain (>/= 5/10)
  - Marked redness
  - Abnormal cornea
  - Aching, constant pain
  - Significant photophobia
  - Contact lens wear
  - Trauma: Chemical injury; potential PEI

What causes a red eye?

- Conjunctivitis
- Trichiasis
- Blepharitis
- Entorpion
- Ectropion
- Meibomianitis
- Dacryocystitis
- Lagophthalmos
- Canaliculitis
- Pharmacological
- Pingueculae/pterygium
- Episcleritis/scleritis
- Rosacea keratitis
- Subconjunctival heamorrhage
- Keratoconjunctivitis
- Conjunctival/corneal FB
- Keratitis
- CL-relatated problems
- Trauma ie: burns/abrasions
- Post-op
- Uveitis
- AACC/G
- Endopthalmitis
- Recurrent corneal erosion…..

Red eye

- Sight-threatening causes of red eye almost always present with reduced vision.
- Most patients with a red eye have relatively minor problems that rarely affect vision significantly.
- Bilateral red eyes are common and seldom have sight-threatening causes.
- What to look for- what is acute eg pain but white eye, pupil NAD etc, HZO but no ocular symptoms, simple corneal abrasion, viral conjunctivitis with no VA loss/sig chemosis

RED EYE - RED FLAGS

Moderate / Severe Eye Pain

Photophobia

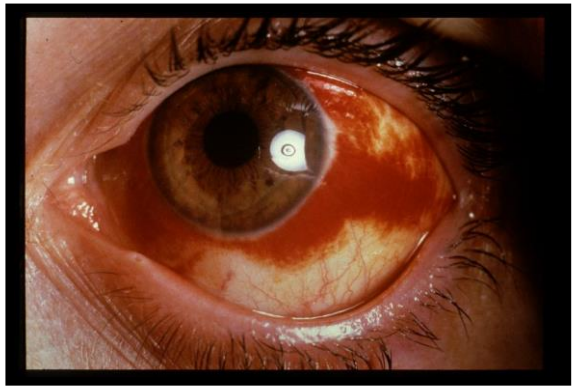
Marked Redness Of Eye

Reduced Visual Acuity
On Snellen Chart

Foreign Body Or
Penetrating Eye Trauma

ONE OF THE ABOVE SYMPTOMS REQUIRES A SAME-DAY REFERRAL TO SPECIALIST OPHTHALMOLOGY SERVICES

Subconjunctival haemorrhage



Visual acuity	Normal
Pain	Mild irritation, may be asymptomatic
Discharge/watering	Not usually
Hyperaemia	Deep red under conj, usually sectorial
Cornea	Clear
AC	Deep & quiet
Iris	Normal
Pupils	Normal
Pupillary response	Normal
IOP	Normal

Conjunctivitis

Visual acuity	Usually normal
Pain	Burning, itching, irritation
Discharge/watering	Mucous or purulent
Hyperaemia	Superficial & diffuse of conj and eyelids
Cornea	Usually clear, +/- PEES
AC	Deep & quiet
Iris	Normal
Pupils	Normal
Pupillary response	Normal
IOP	Normal

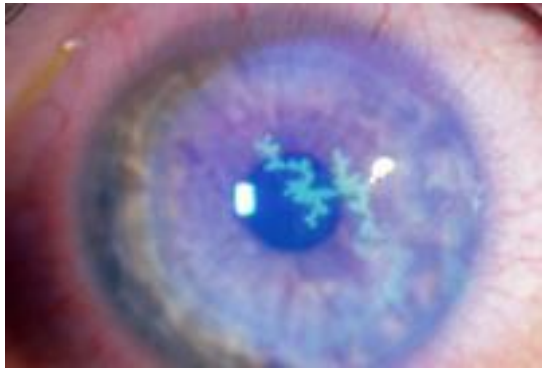
Episcleritis

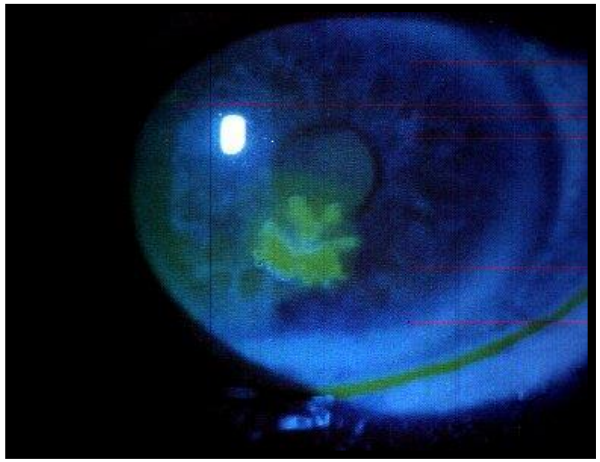
Visual acuity	Usually normal
Pain	Sometimes irritation/mild pain
Discharge/watering	No
Hyperaemia	Sectoral redness, engorgement of episcleral vessles
Cornea	Clear
AC	Deep & quiet
Iris	Normal
Pupils	Normal
Pupillary response	Normal
IOP	Normal

Scleritis

Visual acuity	May have insideous decrease
Pain	Severe/boring, tender to touch, wakes from sleep
Discharge/watering	No
Hyperaemia	Intensive injection of scerla, episcleral & conj vessels. May have blueish hue. May have nodules
Cornea	May have peripheral keratitis
AC	May have inflammatory cells
Iris	Usually normal
Pupils	Usually normal
Pupillary response	Usually normal
IOP	Normal but may be elevated

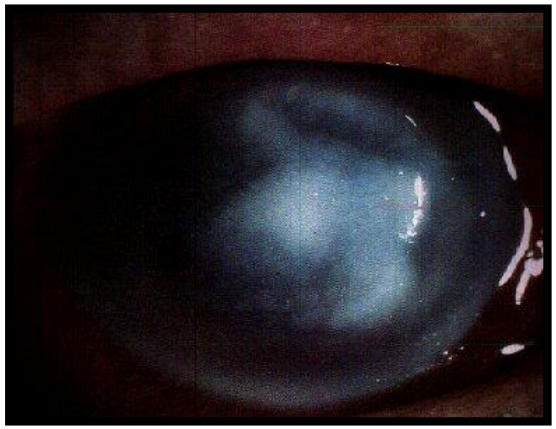
HSV Keratitis

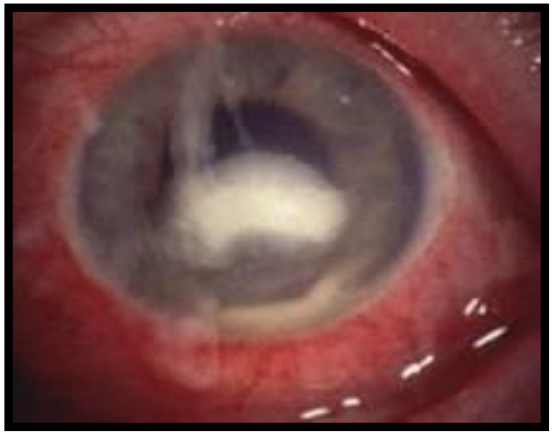




Visual acuity	May be reduced
Pain	Mild to moderate
Discharge/watering	Watery
Hyperaemia	Mild to moderate, diffuse, may be perilimbal
Cornea	Area of corneal ulceration with fluorescein staining
AC	Deep & usually quiet
Iris	Normal
Pupils	Normal
Pupillary response	Normal
IOP	Usually normal

Corneal ulcer





Visual acuity	May be markedly reduced
Pain	Can be severe
Discharge/watering	May be purulent
Hyperaemia	Diffuse
Cornea	Infiltrate with overlying epithelial defect
AC	Deep, may have inflammatory cells/hypopyon
Iris	Normal
Pupils	Usually normal
Pupillary response	Usually normal
IOP	Usually normal

Acute anterior uveitis

Visual acuity	May be decreased
Pain	Moderate to severe ache & photophobia
Discharge/watering	Watery
Hyperaemia	Circumcorneal
Cornea	KP's may be present
AC	Normal depth, white blood cells
Iris	May appear muddy coloured
Pupils	Often small & irregular
Pupillary response	May have sluggish reaction to light
IOP	Normal, low, may be elevated

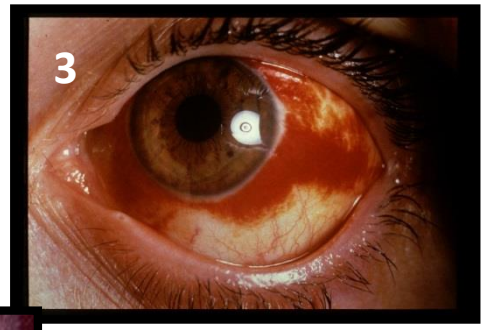
Acute angle closure crisis/glaucoma

Visual acuity	Markedly reduced, 6/60 or below
Pain	Severe with headache, nausea, vomiting
Discharge/watering	Watery
Hyperaemia	Marked circumcorneal & episcleral
Cornea	May be cloudy
AC	Shallow or flat
Iris	View may be difficult
Pupils	Semi-dilated, fixed
Pupillary response	Non-reactive or minimal reaction
IOP	Very high, over 40mmHg

The red eye

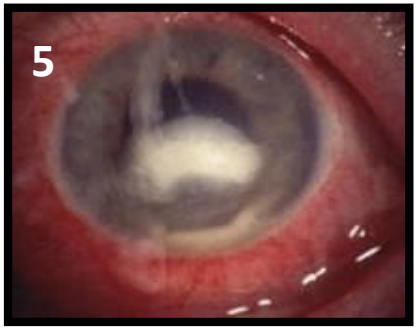
AACG

AAU

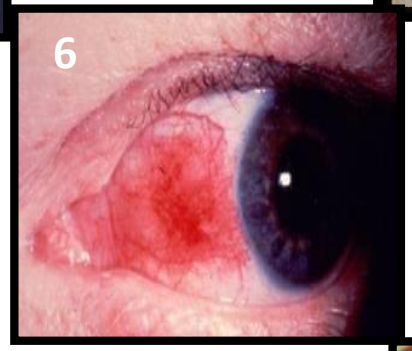


Subconjunctival haemorrhage

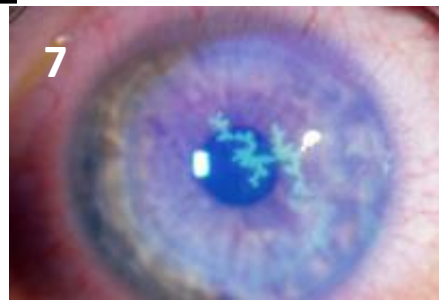
Conjunctivitis



Corneal ulcer



Episcleritis



HSV keratitis

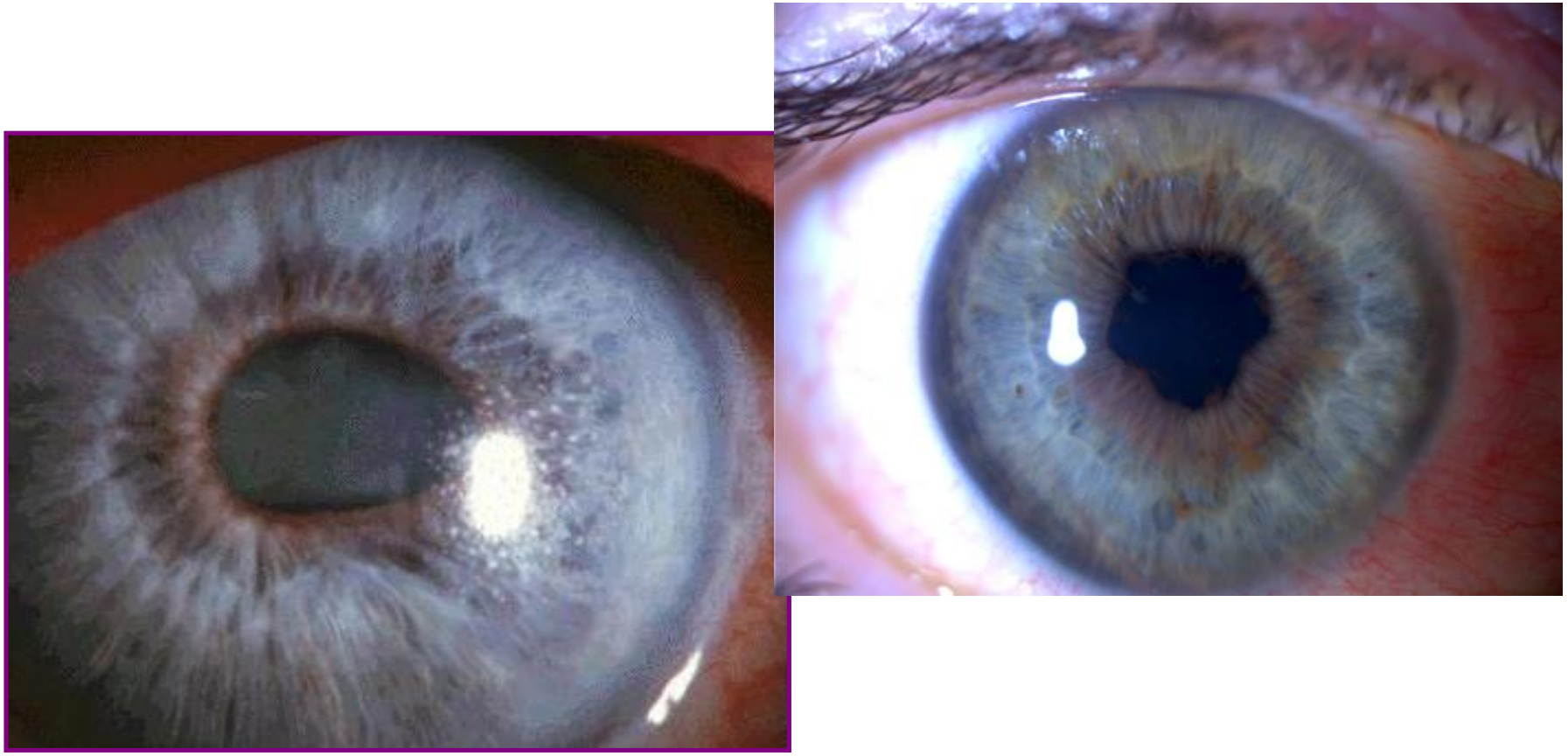
Scleritis

Other associated findings

- Anterior chamber abnormalities

Other associated findings

- Pupil abnormalities

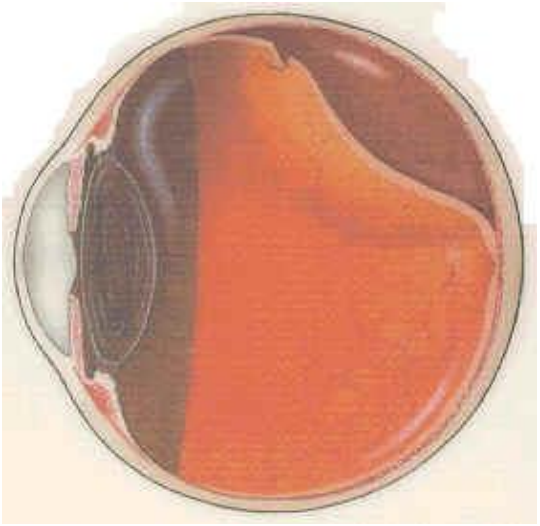


Red flags: Vision loss

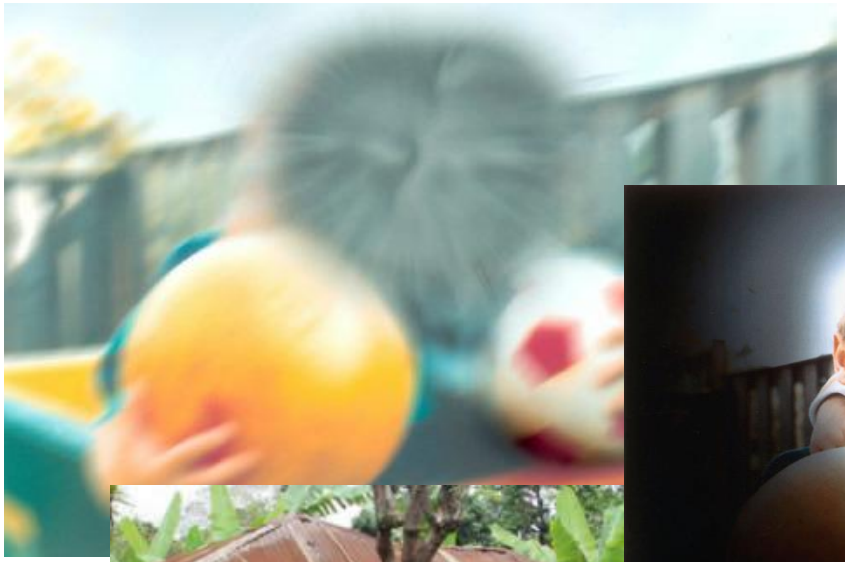
- Sudden or recent vision loss
  - Recent profound vision loss with APD
  - Sudden & profound vision loss in last 2 hours
  - VF defects affecting both eyes
  - Patients older than 50yrs
  - Recent ↓central vision
  - Recent distortion of vision
- Transient monocular vision loss
  - May be early manifestation of GCA
- Flashes, floaters, retinal detachment
  - Significant floaters of recent onset
  - VA↓ or VF defect when tested
  - Flashes of light during the day
  - Significant short sightedness (>5D) or previous Ret Det

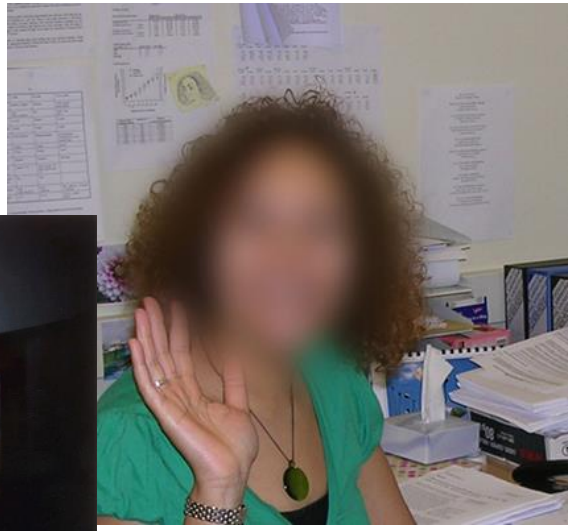
Sudden loss of vision: +/- pain

- Painless
  - Retinal artery/vein occlusion
  - Retinal detachment
  - Vitreous haemorrhage
  - Functional
- Painful
  - Acute angle closure glaucoma
  - Iritis/uveitis
  - Optic neuritis
  - Giant cell arteritis/temporal arteritis
  - Trauma/infection



Pattern of vision loss





Assessment

- History
- Examination
  - BCVA incl pinhole
  - Red reflex
  - RAPD: swinging light test (https://www.youtube.com/watch?v=HSYo7LhfV3A)
  - VF to confrontation
  - External lids, conjunctiva, cornea, iris/AC

History taking

- Symptoms: vision loss, pain, photophobia, discharge
  - Visual loss? Sudden/gradual; blur/marked
  - Pain? Severe/mild – pain scale; gritty/FB sensation/ache; photophobia
  - Discharge? Watery/mucoid/purulent/sticky, worse at certain time of day
- Duration of symptoms
  - Onset? Length of time; sudden/gradual; constant/intermittent/1 or both eyes, or sequential.
- Relieving or exacerbating factors
- Exposure to chemicals, other irritants, or eye drops.
- Previous eye problems, history of trauma, contact lens wear, previous eye surgery
- Definite trauma from a pointed object, or projectile (even if very small), e.g. pain while hammering without safety goggles, may require referral.

History taking…

- Many patients with unrelated diagnoses attribute their symptoms to a coincidental minor trauma, so if the event sounds minor or there is no sign of an abrasion, look for other diagnoses.
- Medical history: recent cold/URTI, autoimmune conditions
- Medications
- Age
- Severe, constant, aching pain is typical of serious problems. Associated photophobia supports the likelihood of an important cause.
- Sharp, brief, "gritty" pain indicates surface irritation. If this is marked then the pain can be constant and the patient may be mildly photophobic.

Assessment

- History
- Examination
  - BCVA incl pinhole
  - Red reflex
  - Pupil assessment
  - RAPD: swinging light test (https://www.youtube.com/watch?v=HSYo7LhfV3A)
  - VF to confrontation
  - External exam
    - May need to reply on identifying key features to know when ophthalmology referral required

Visual acuity

- ALWAYS check: include Best Corrected VA
  - Patients don't always notice vision loss
  - Patients perception of vision loss maybe inconsistent with testing
- Record any anomalies: head tilt, peripheral
- It is estimated that 10% of all patients present to their GP with eye-related conditions, and 2% of 'Accident and Emergency' admittance involves the eyes.
- Vision has medicolegal implications
  - Suitability for surgery eg cataract
  - Fitness to drive (significant impact on quality of life)
  - Marker of fitness eg Maritime NZ, Police, Immigration
- Check appropriate distance from chart marked out
- Check appropriate lighting
  - Minimise glare: non-reflective charts, close window blinds
- http://nzta.govt.nz/resources/medical-aspects/6.html#62
- International Organisation for Standardisation (ISO) provides standardised conditions for visual acuity testing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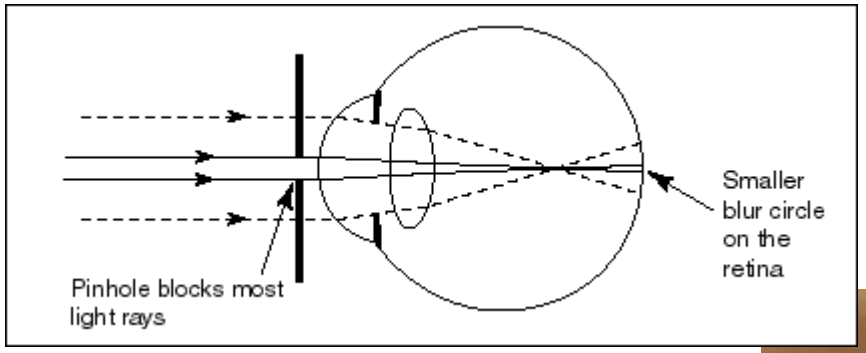
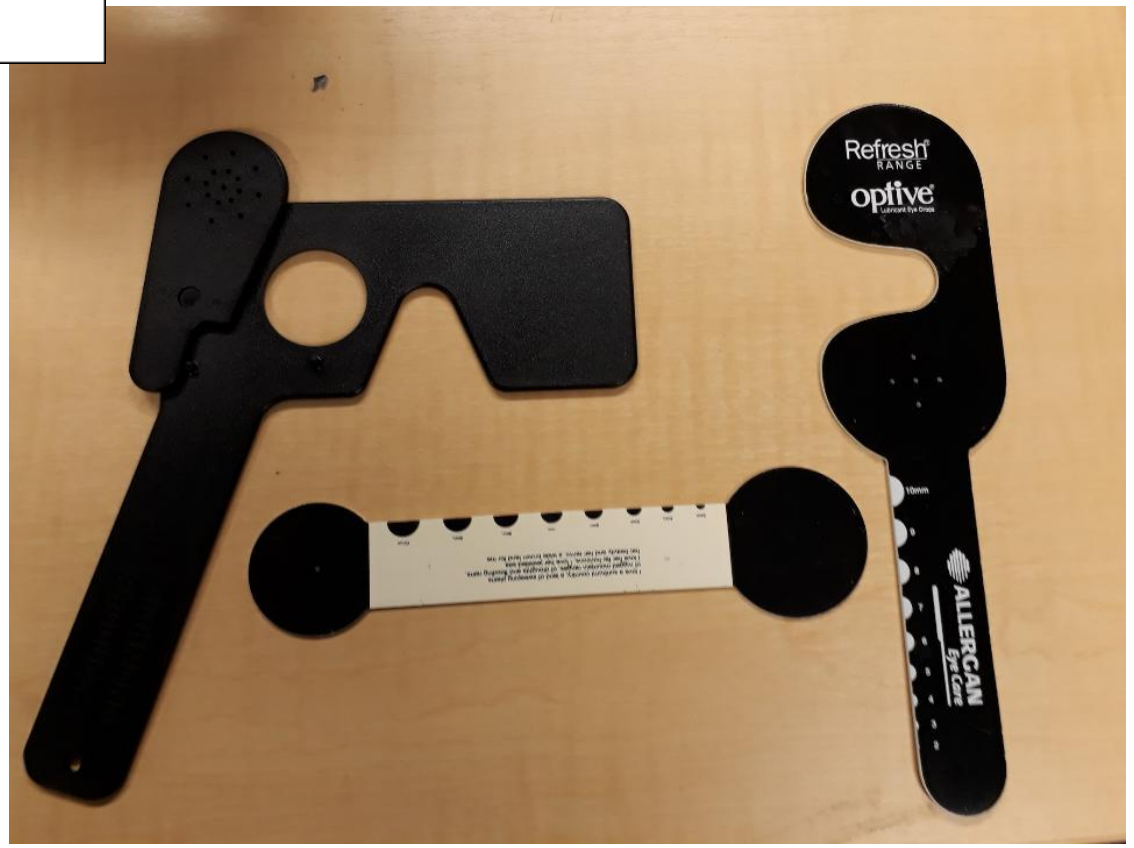
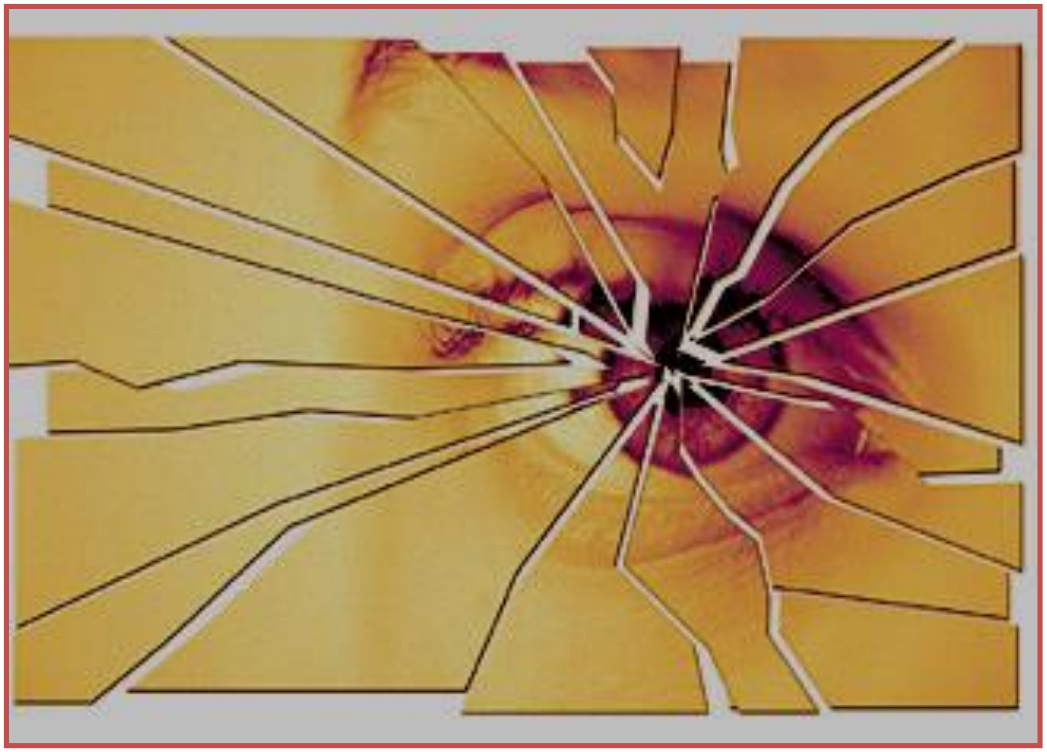
4m
6m
equivalent
Testing distance: 4m (13 feet)
Ophthalmology Department
Medical School
Dunedin

Pinhole assessment VA<6/9

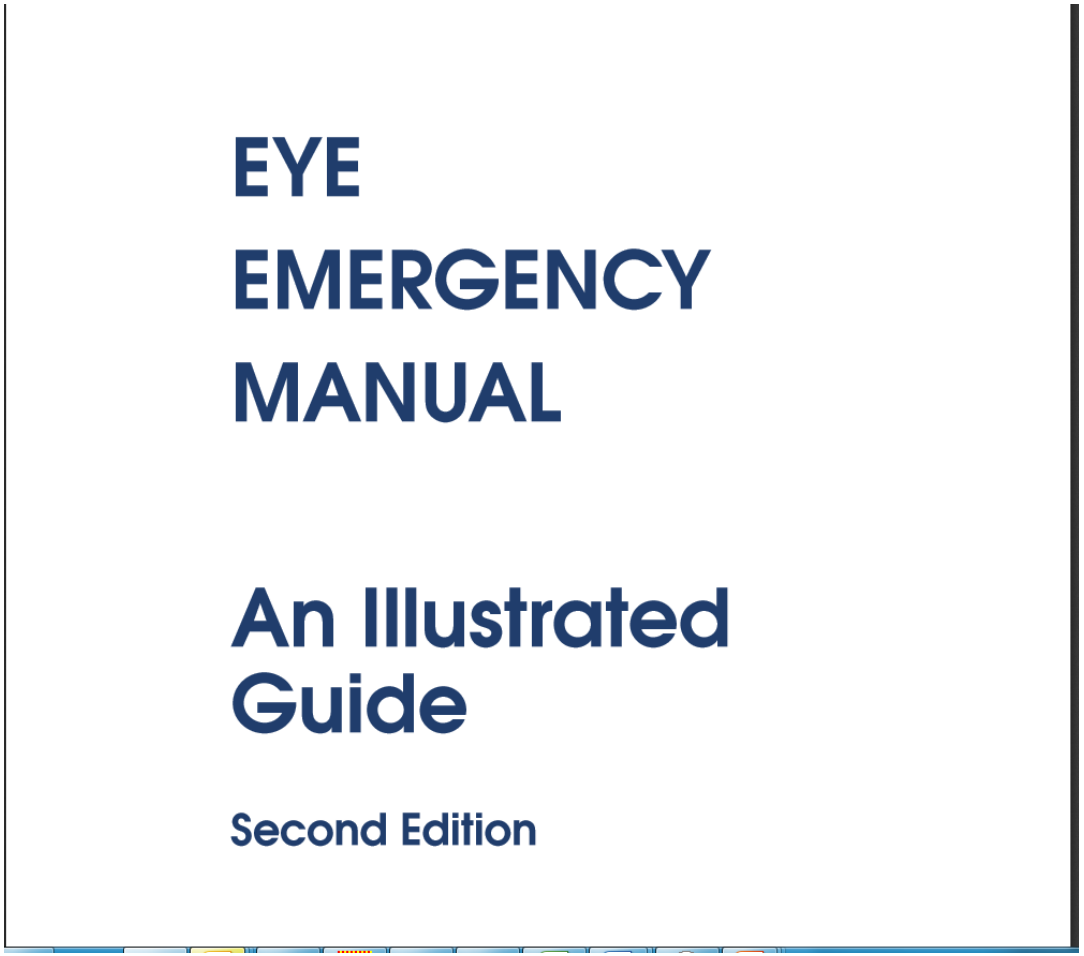




Useful resources



Eye Emergency Manual; Sydney Eye Hospital: free download: http://www.cena.org.au/wp-content/uploads/2014/10/eye_manual.pdf



The New Zealand Formulary | Microsoft Word - DEMODE... | eye_manual.pdf
https://www.aci.health.nsw.gov.au/__data/assets/pdf_file/0013/155011/eye_manual.pdf
vasaline demodex
Page: 36 of 56 Automatic Zoom

Corneal foreign body

ATS CATEGORY 4 (START TREATMENT WITHIN 60 MINS)

Any foreign body penetration of the cornea or retained foreign body will require urgent referral to ophthalmologist - immediate consult by phone.

History

- What is the likely foreign body?
- Examples include dirt, glass, metal and inorganic material. *(see Figs 1 & 2).*

Retained organic material may lead to infection; retained metallic foreign bodies may lead to the formation of rust rings that produce persistent inflammation and corneal epithelial defect.

- Velocity of impact?

High speed motor drilling without eye protection may lead to a penetrating corneal/scleral injury.

Examination

- Visual acuity
- Slit lamp - assess for the size, site/s and nature of foreign body and the depth of penetration.

Examine the cornea, anterior chamber, iris, pupil and lens for any distortion that may indicate ocular penetration (see p35, penetrating

Treatment/Investigation

- Use topical anaesthesia.
- Foreign body removal under slit lamp as directed *(see p37).* If you are attempting the procedure for the first time, guidance and supervision are advised.
- Rust rings in the visual axis should be removed by an ophthalmologist, or suitably experienced emergency physician.
- Use Fluorescein to assess and measure the size of epithelial defect.
- Topical antibiotic (qid) and cycloplegic agent (such as Homatropine 2% bd) for comfort. Drops are often preferred and are equally as effective as ointment in a healing corneal wound. Oral analgaesia as required.
- NB It is not necessary to pad an eye *(see section on eye padding, p27).* The advantage of not padding is that the patient is able to see with both eyes.
- There are no indications for continued use of topical anaesthetic drops.
- Daily visual acuity and slit lamp review until complete healing of defect. The

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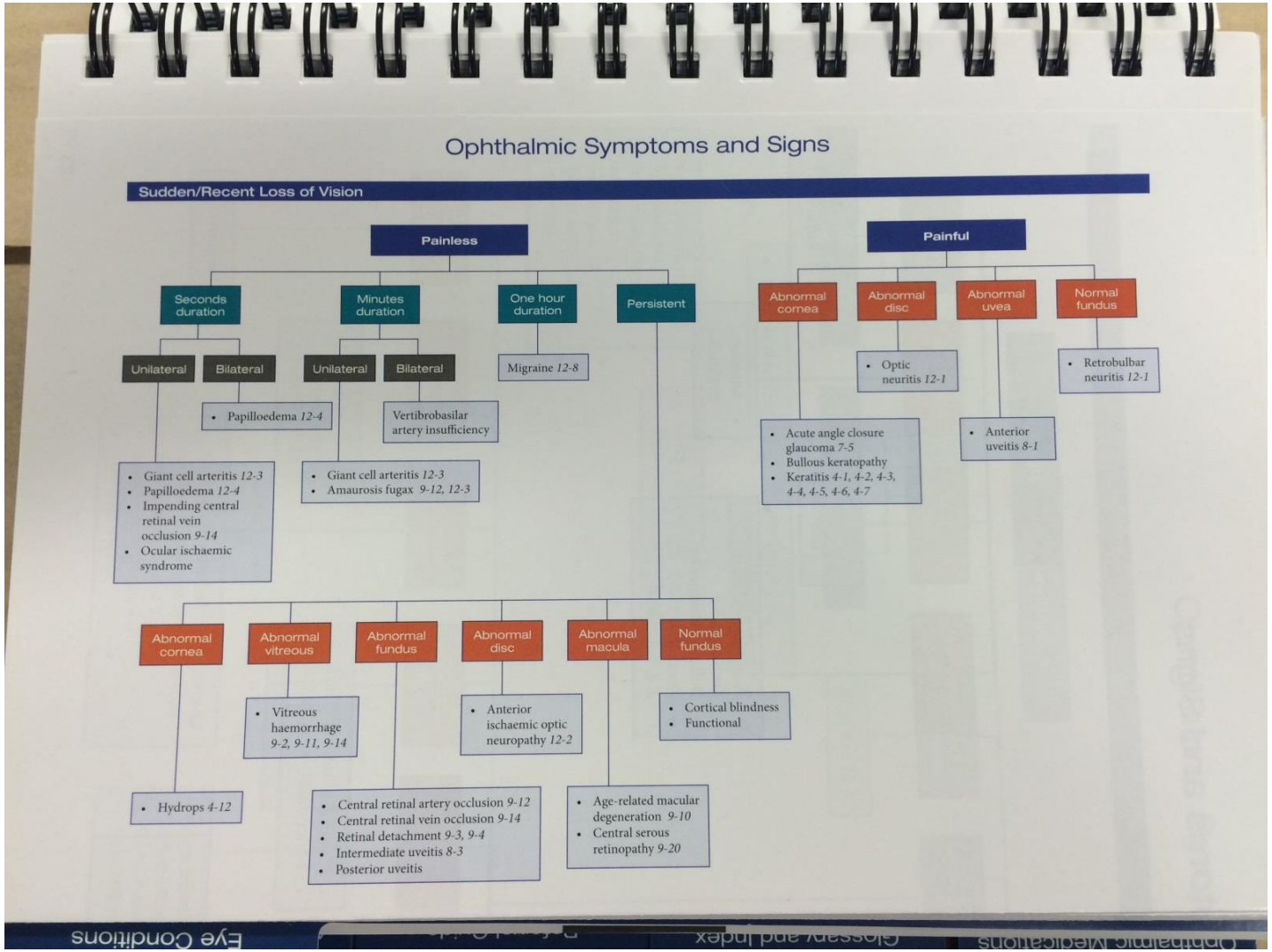
Auckland Eye Manual: free app for Android & Apple Smart Phones



12-3 Giant Cell Arteritis

General description

Giant cell arteritis (GCA), also known as temporal arteritis is an inflammatory disease of medium sized arteries most commonly in the head and neck though may occur throughout the body. This is a vision-threatening condition due to ischaemic optic neuropathy, also known as arteritic ischaemic optic neuropathy (AION). It can result in permanent loss of vision, mainly affecting elderly patients, and is rarely seen in patients less than 60 years of age.

It often presents asymmetrically and prompt recognition of the disease and aggressive treatment with steroids is required to potentially save vision in the fellow eye.

Differential diagnosis:

- Non arteritic ischaemic optic neuropathy – see *12-2*.
- Central retinal artery occlusion – see *10-3*.
- Carotid occlusive disease with ocular ischaemia.

Symptoms

- Headache/temporal pain or tenderness/pain with hair-brushing.
- Fleeting loss of vision (amaurosis fugax).
- Jaw claudication (pain on chewing).
- Intermittent diplopia.
- Generally feeling unwell, fever, malaise and poor appetite.
- History of polymyalgia rheumatica.

Swollen nerve with flame haemorrhage.

Signs

- Reduced visual acuity not improving with pinhole.
- Relative afferent pupillary defect (RAPD).
- May have restricted ocular motility.
- Usually normal anterior segment.
- Swelling of the optic disc with pallor and haemorrhages.
- Can have central artery occlusion.

Slit lamp signs

- Disc appearance as above.
- Potential to have ocular ischaemia signs with anterior chamber inflammation (flare and cells – see *8-1–8-15*).

Immediate management

- Request urgent blood test – FBC, ESR, CRP.
- If diagnosis of GCA is highly suspected based on clinical and systems assessment, administer high dose oral steroids immediately (don't wait on blood test results).
- Inpatient management: intravenous Methylprednisolone 1000mg/day.
- Temporal artery biopsy to confirm diagnosis.

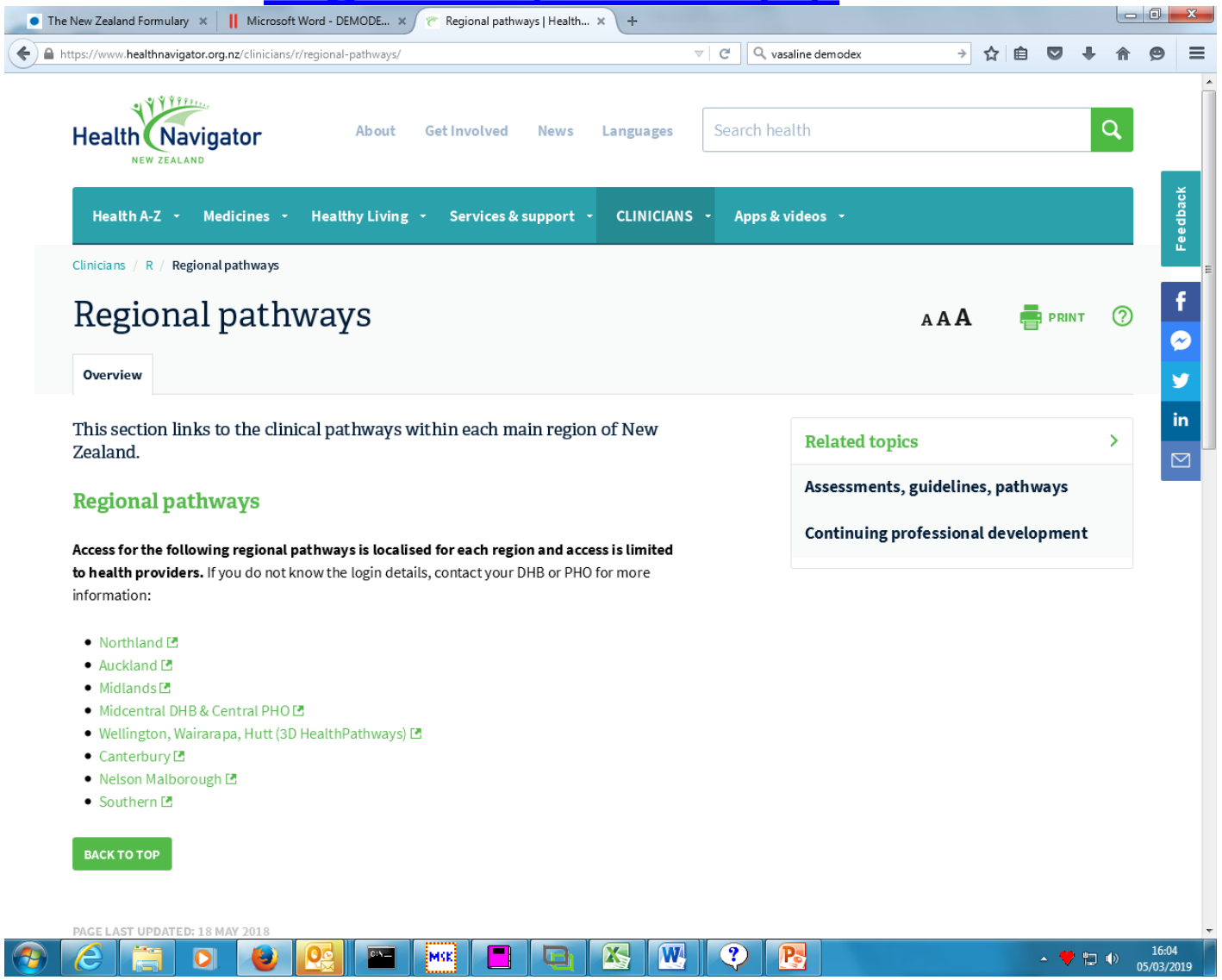
Long-term management

- Oral prednisone after three days of intravenous methylprednisolone.
- Taper dose of oral prednisone according to ESR/CRP results. Up to 12 months of therapy required.
- Management of steroid-induced side effects especially osteoporosis.

Referral guidelines

Immediate urgent referral to ophthalmology.

https://www.healthnavigator.org.nz/clinicians/r/regional-pathways/

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21 Jan
Paediatric medication dose calculators
Calculating medication doses for children can be tricky and time-consuming in a busy practice. Health Navigator has launched paediatric dose calculators for commonly prescribed medicines, e.g.:
Amoxicillin
Cefaclor
Co-trimoxazole
Ibuprofen
Paracetamol
Enter your patient's age and/or weight parameters, and the calculator expresses the dose in milligrams and millilitres of liquid.
These are proving very popular. Let us know what you think. You can provide feedback to editor@healthnavigator.org.nz
23 Dec
Mental Health and Addiction Service Changes for Counties
Counties Manukau Health has made some changes to its Mental Health and Addiction Services, aiming to work collaboratively with GPs and other community health services. This includes a new team structure and some new names. Some service users will experience changes staff involved in their care.
If you have any questions or are unsure of who to contact with a referral see HealthPoint or call (09) 261-3700.
19 Dec
ACC Funding for SCAT5
ACC has implemented funding for a Sport Concussion Assessment Tool (SCAT5) to be completed following a positive ACE screen. Funding is available under ACC cost of treatment regulations, billing code GPSC. Read more...
18 Dec
Suicide Prevention Resource for Chinese People
About HealthPathways
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Meet the Team
Our Health System
Education, Events and CPD
Pharmacology
Laboratory Information
New and Updated Pathways
01 Feb
Chronic Hepatitis C
UPDATED
29 Jan
Certification of Death
NEW
29 Jan
Bartholin's Cyst or Abscess
NEW
29 Jan
Mastitis and Breast Abscess
NEW
29 Jan
Skin and Soft Tissue Abscesses in Adults
NEW
View more changes...
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14/02/2019

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  - Wound Care
  - Other Surgical Services
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Infectious Keratitis

This pathway is for patients with bacterial keratitis.

See also Herpes Simplex Keratitis / Dendritic Ulcer.

Red Flags

- Increasingly painful red eye in a contact lens wearer
- Painful red eye with white lesion visible on the cornea

Background

About keratitis

About keratitis

Inflammation of the corneal epithelium caused by infection (e.g. herpes simplex virus, bacteria, fungi, or protozoa) or auto-immune processes.

Microbial keratitis is usually precipitated by a change to normal corneal epithelial health, e.g. by trauma, contact lens use, tear film and/or eyelid pathology:

- *Neisseria gonorrhoea* and *Haemophilus influenzae* are able to penetrate intact epithelium.
- Contact lens wearers may have colonisation with *Pseudomonas aeruginosa* secondary to epithelial defects.

Assessment

1. History:
   - 1 to 3 day acute history, initially with sharp pain, redness, and photophobia which progresses to severe pain and often decreasing vision.
   - Check for:
     - Contact lens wear or history of corneal trauma.

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      - Floaters, Flashes, Retinal Detachment
      - Glaucoma
      - Macular Disease
      - **Sudden or Recent Vision Loss**
        - Sudden or Recent Vision Loss Flowc
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About sudden or recent vision loss

Assessment

1. History:
   - Symptoms of long duration or uncertain onset usually indicate a non-acute problem (e.g. cataract) and may be discovered by chance when one eye is covered.
   - Recent profound vision loss (e.g. of hand movements, light perception or worse) with an afferent pupillary defect indicates serious damage to the retina or optic nerve.
   - Consider associated visual symptoms, e.g. floaters or flashes.
   - If recovery of vision after a few minutes, or even a second or two, assess as per Transient Monocular Vision Loss pathway.
2. Perform an eye assessment, including vision loss examination.

Vision loss examination

1. Test vision with usual glasses and pinhole. If pinhole vision is good, refer to private provider for glasses or cataract assessment.
2. Look for red reflex and cataract.
3. Test for relative afferent pupillary defect (RAPD) – swinging flashlight test. See How to Examine RAPD (2:29).
4. Visual field to confrontation.
5. Examine fundus – optic discs, vessels, peripheral retina, macula.

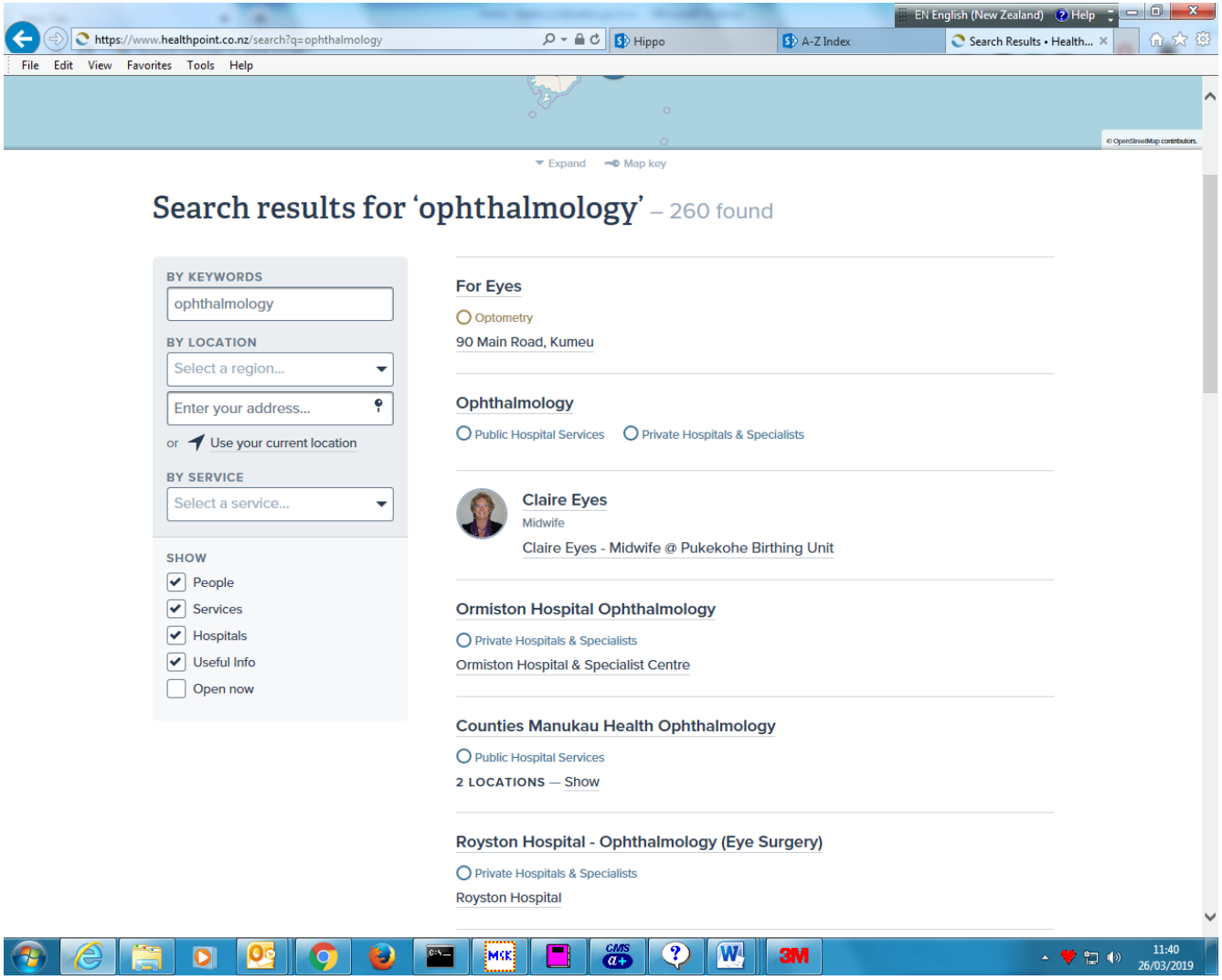
3. Consider the differential diagnosis:
   - Vascular occlusion:
     - Giant cell arteritis where the vasculitis or arteritis causes arterial occlusion – consider in any patient older than 50 years.

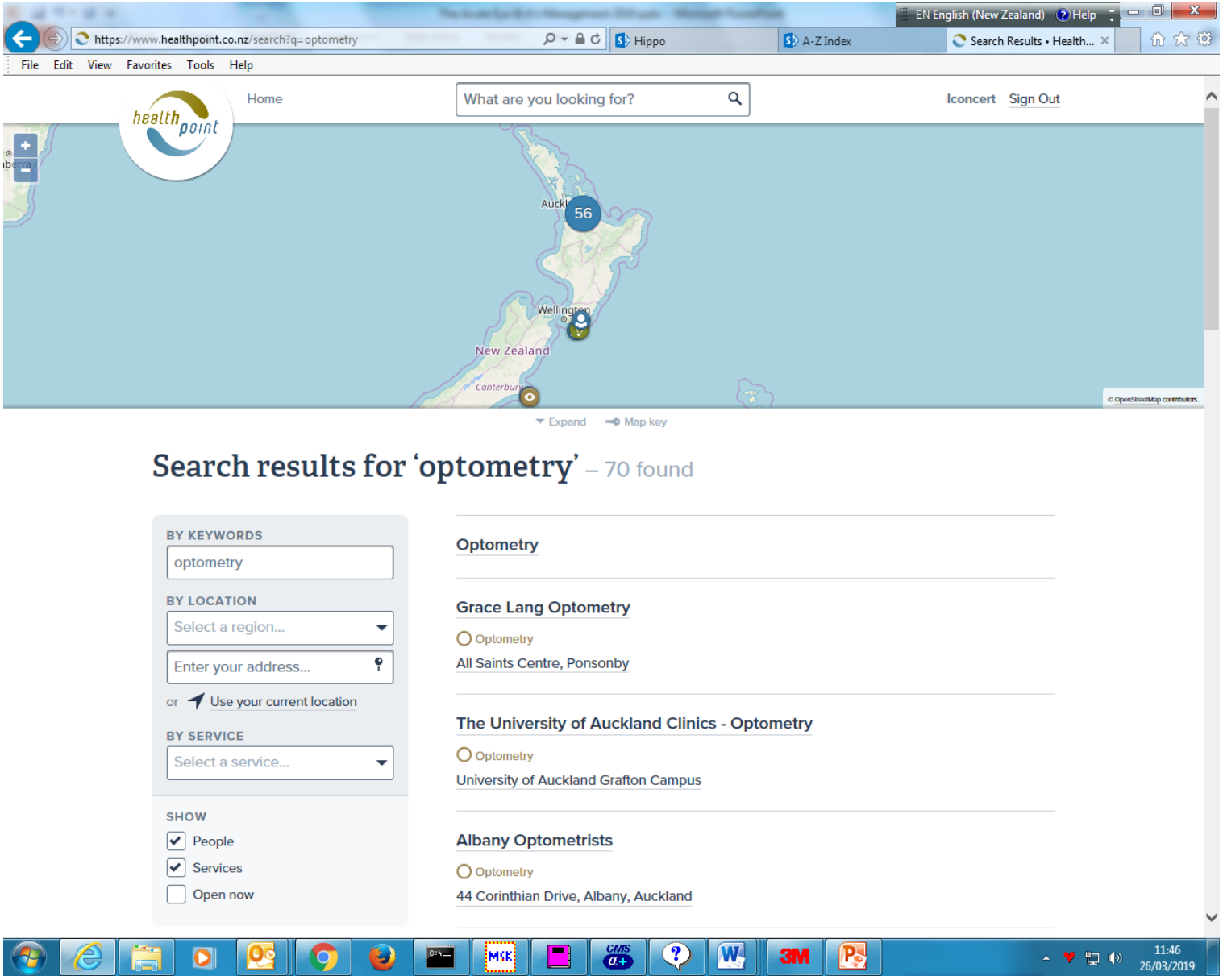
Features suggestive of giant cell arteritis (GCA)

- Headache
- Jaw claudication
- Scalp tenderness
- Past history of GCA or polymyalgia rheumatica (PMR)
- Older than 50 years

See Giant Cell Arteritis.

https://www.healthpoint.co.nz/

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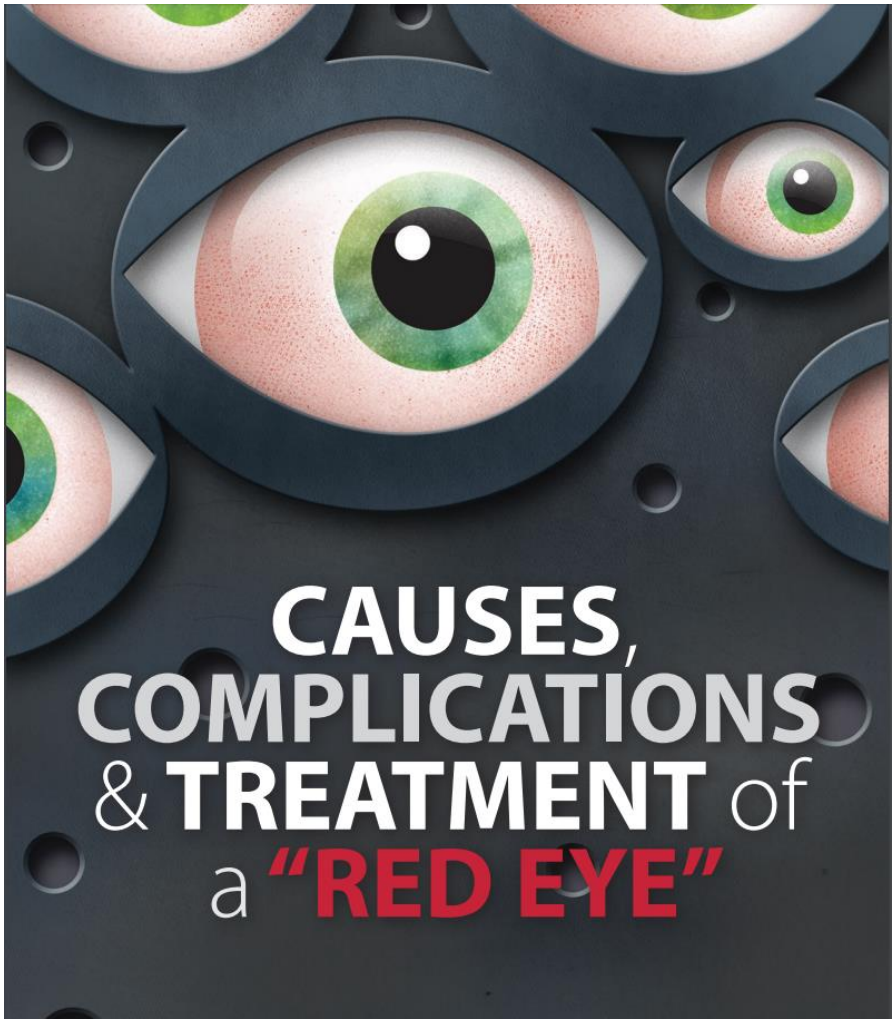
https://bpac.org.nz/bpj/2013/august/docs/BPJ54-pages8-21.pdf



Other Outline Resources

- Printable Snellen VA Chart:
  - https://www.provisu.ch/images/PDF/Snellenchart_en.pdf
- Dry eye & meibomian gland disease video (lipiflow)
  - https://www.youtube.com/watch?v=JpIf9dMviukn
- Macular Degeneration NZ http://www.mdnz.org.nz/
- Retina NZ http://www.retina.org.nz/
- NZ Blind Foundation https://blindfoundation.org.nz/
- NZ Association of Optometrists https://www.nzao.co.nz/

Quick tips for contact lens wearers

- Red/sore eye? REMOVE CL
- DO NOT over wear CL- wear for recommended time
- DO NOT sleep in CL- even extended wear CL
- DO NOT wear CL in swimming/spa pools
- DO NOT use tap water or saliva to clean CL/cases & dry hands before handling
- DO NOT share CL- even cosmetic ones

Prevention is better than cure

- Protective eye wear
- Sun protection
- General health factors- stop smoking, hydration, fruits & vegetables
- Regular checks- to detect early signs of Glaucoma, ARMD etc
- Manage blepharitis/dry eye
- Good contact lens hygiene & wear

Referral

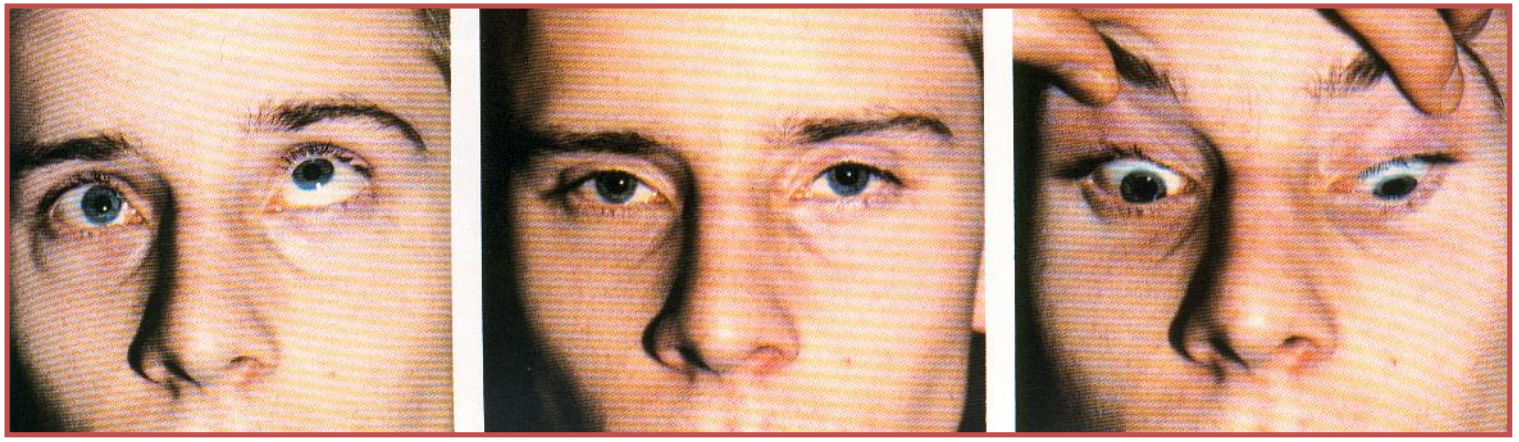
- VA incl pinhole
- As much detail as possible
- Chemical injury/PEI/corneal opacity/sudden loss of vision: immediate referral
- Include photographs where able- picture worth a 100 words!
  - Send them encrypted- electronic referral system, WhatsApp
- Make friends with your local optometrist!

Summary

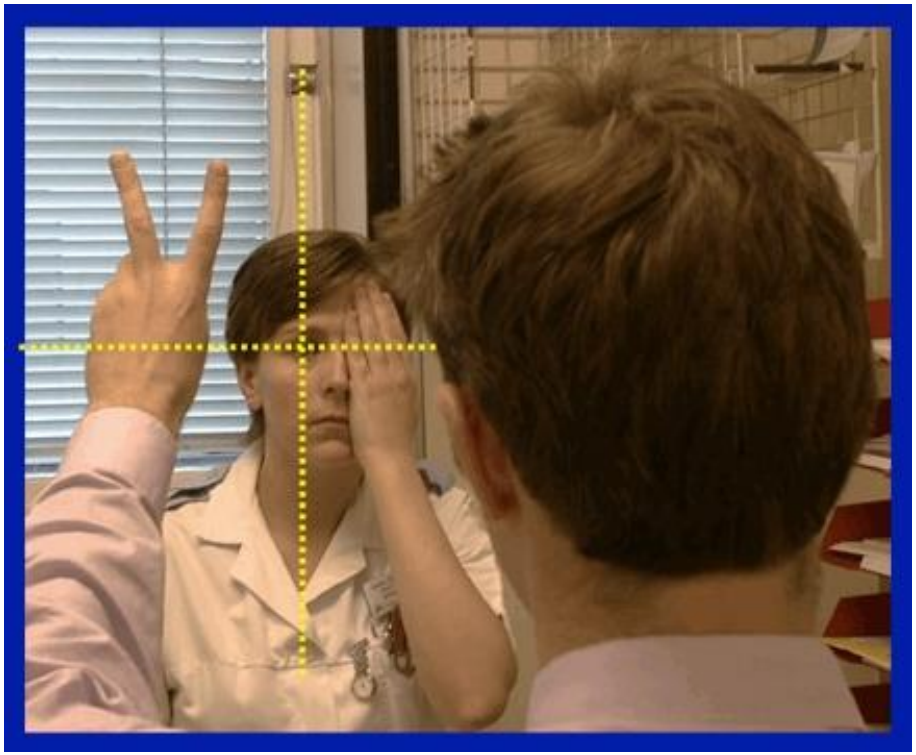
- IMMEDIATE irrigation for ocular burns
- TEST VISUAL ACUITY- Glasses/CL/pinhole
- ANY suspicion of penetrating injury or rupture
  - Avoid pressure on the globe
  - Protect the eye- clear shield, paper cup
  - Refer for assessment
- Blunt trauma
  - Rest with head elevated
  - Any sign of injury or vision loss- refer for assessment
- Sudden loss of vision- refer today
- CL wearer with red eye- remove CL & refer for assessment

Questions?

Extra ocular movements



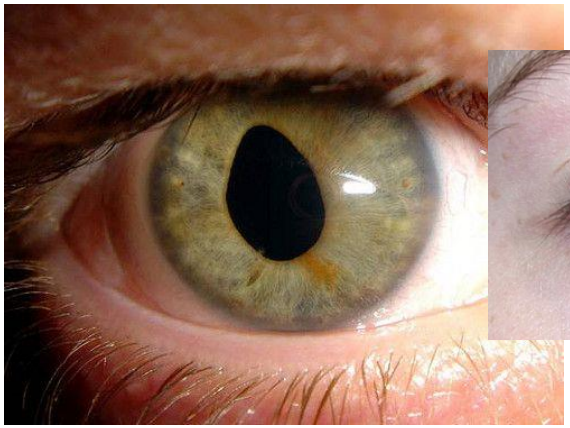
Visual fields to confrontation

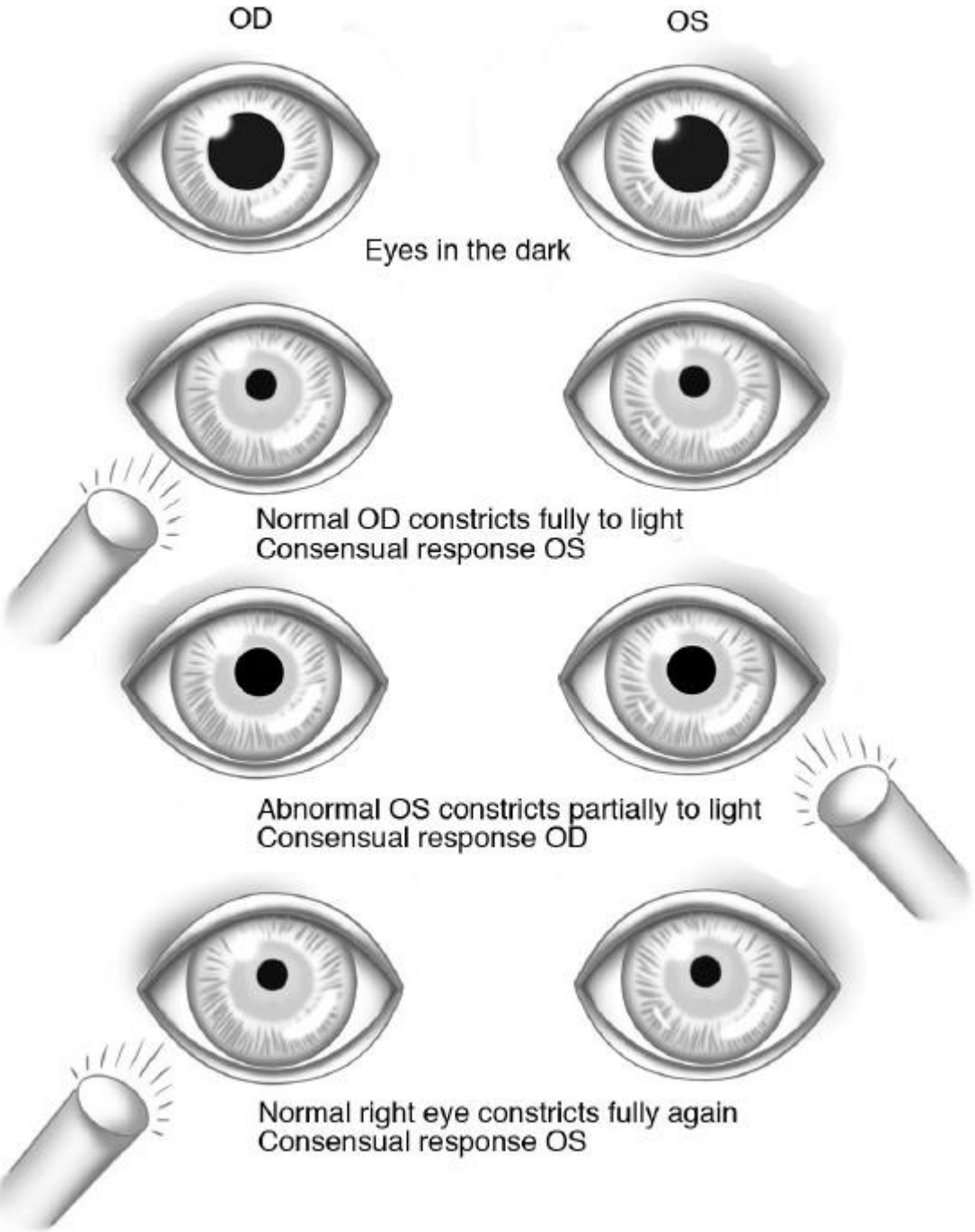


Pupil assessment

- Size & shape
- Reaction to light (direct & consensual)
- Red reflex
- Swinging light test

(https://www.youtube.com/watch?v=HSYo7LhfV3A)

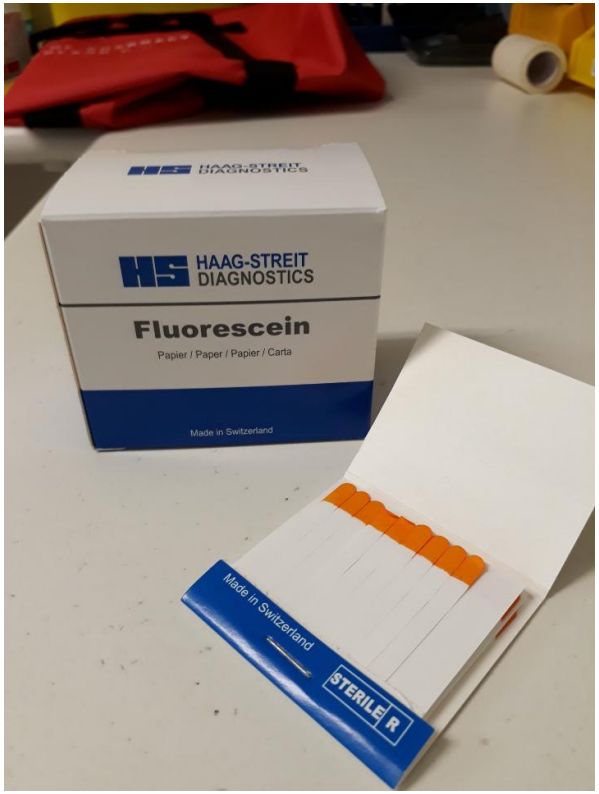


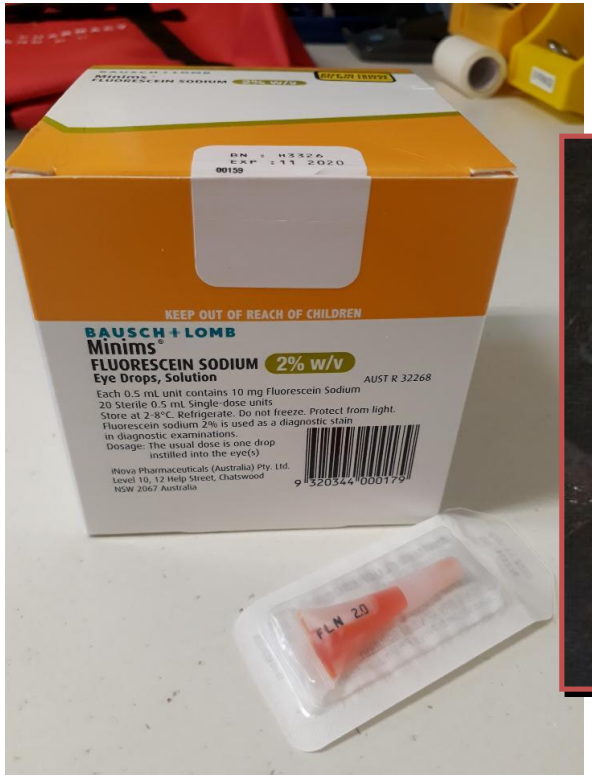

OD
OS
Eyes in the dark
Normal OD constricts fully to light
Consensual response OS
Abnormal OS constricts partially to light
Consensual response OD
Normal right eye constricts fully again
Consensual response OS

Colour vision

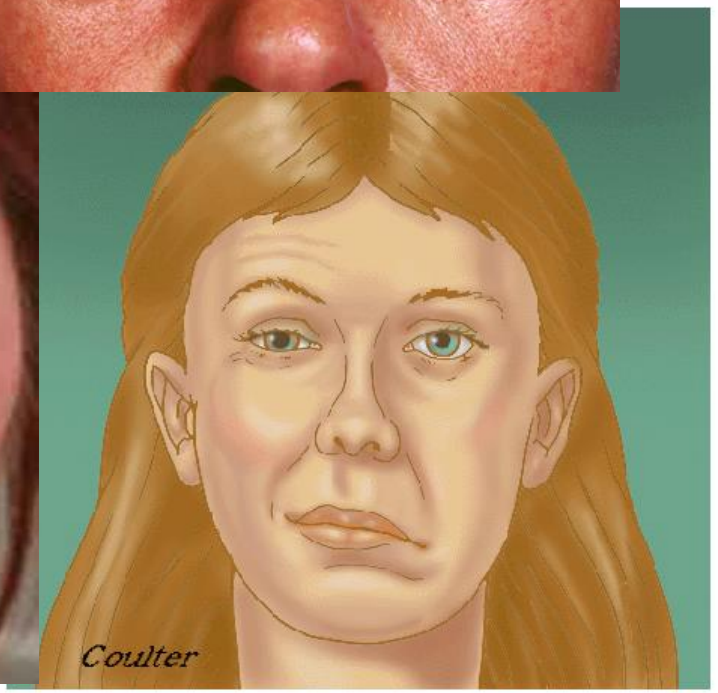
Red reflex

Fluorescein staining

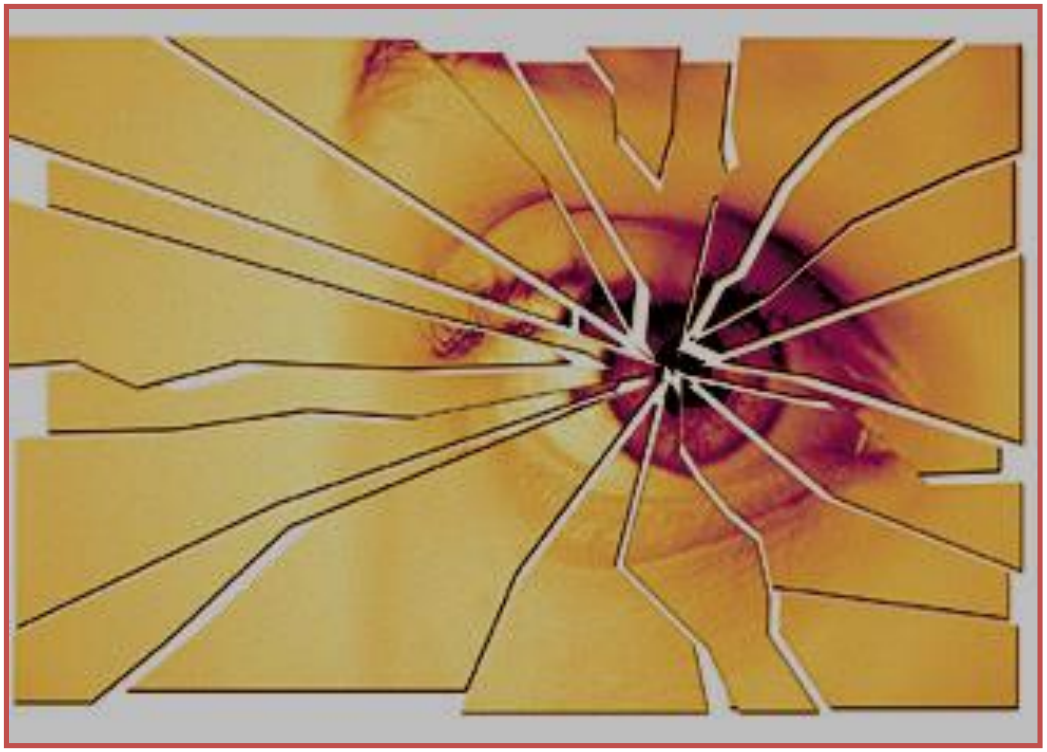




External exam

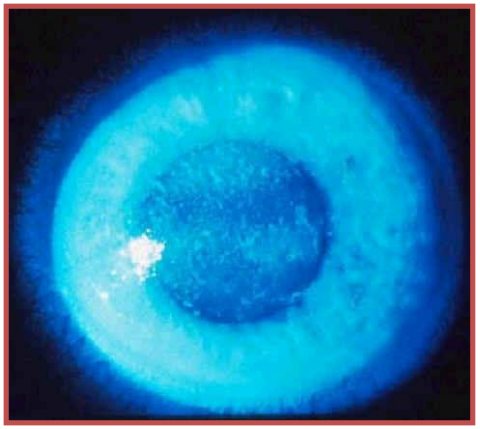


Trauma



Radiation & Thermal burns

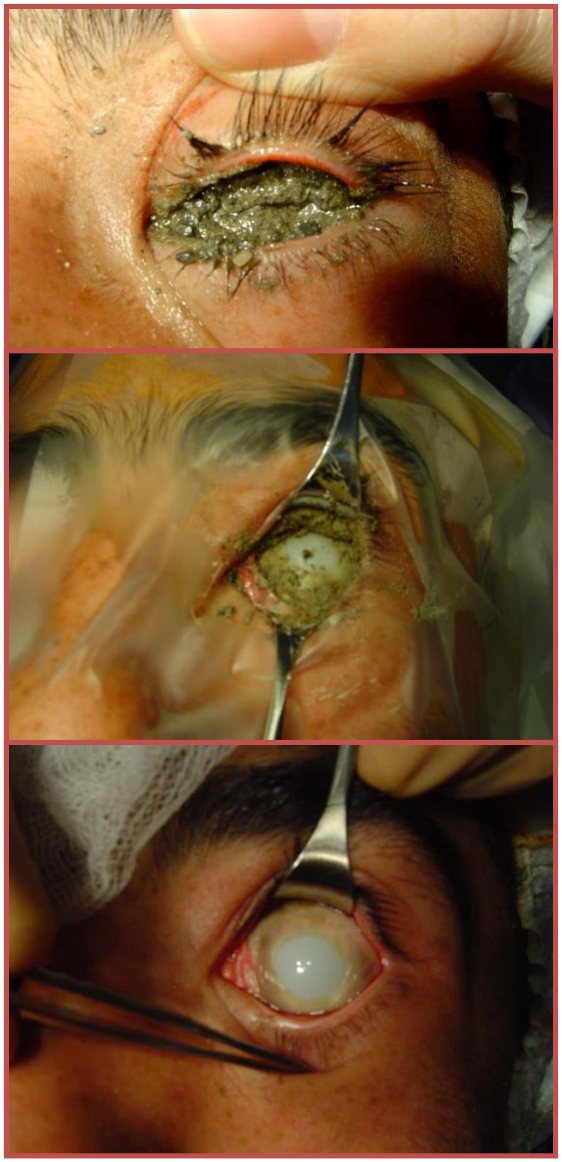
- UV (Photokeratitis)
  - Sun reflection from water/snow
  - Tanning bed/sunlamp without goggles
  - Arc welding without eye protection
  - Symptoms usually begin approx 6-12 hours after exposure
    - FB sensation, photophobia, tearing
- Thermal burns
  - Hot oil/cigarettes/curling tongs/microwaved egg
  - Less common
- Treatment dependant on mechanism & extent
  - Gutt/oc Chloramphenicol/ocular lubricants



Chemical injuries

- Frequently trivial (shampoo)
- Potentially blinding (cement)
- Acids vs Alkalis
  - Initial management the same

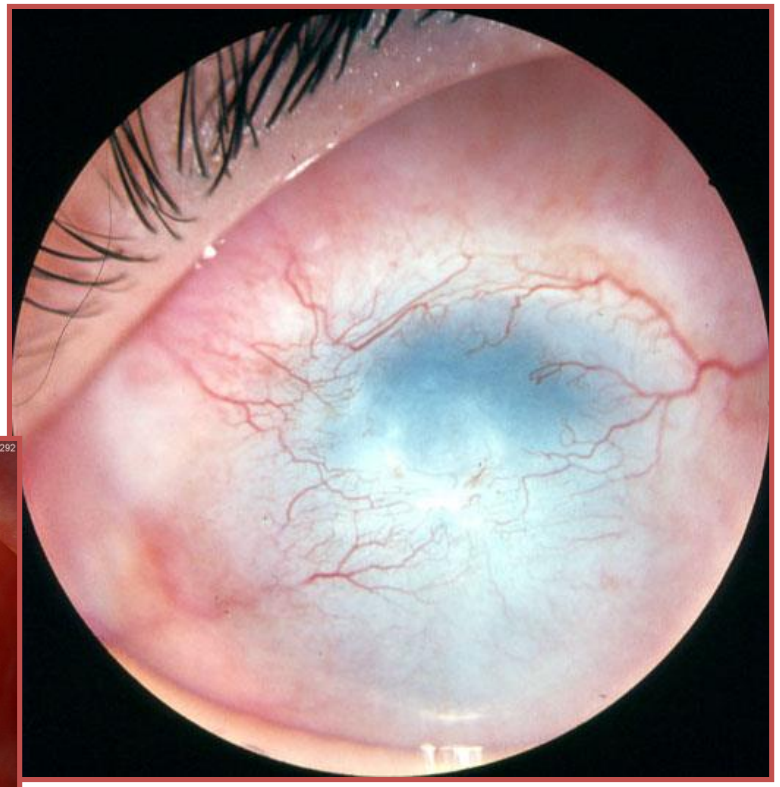
Only eye injury that requires immediate treatment without VA, history or examination



Chemical injuries

- Ophthalmic emergency
- IRRIGATE…IRRIGATE…IRRIGATE…
- Chemical substances cause maximum damage within first few minutes to hours
- The only eye injury where immediate treatment must be started even before VA, history or exam
- Outcome of chemical burn dependent on
  - Chemical to which patient exposed
  - Duration of exposure until irrigation
  - Duration of irrigation

Chemical injuries

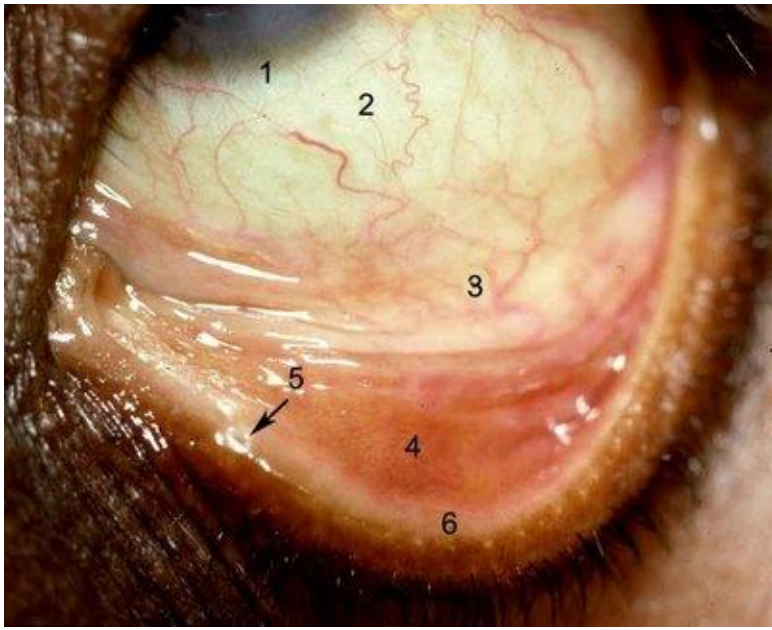


Positioning patient

- Ensure patient comfortable as possible
- Remove CL unless doing so would cause further injury
- Support head as much as possible
- Instill topical anaesthetic
- Position receptacle
- Tilt head toward side being irrigated
  - Aids flow of irrigation solution into receptacle
  - Prevents contamination of fellow eye
  - Reduces flow of irrigation into lacrimal system

Irrigation procedure

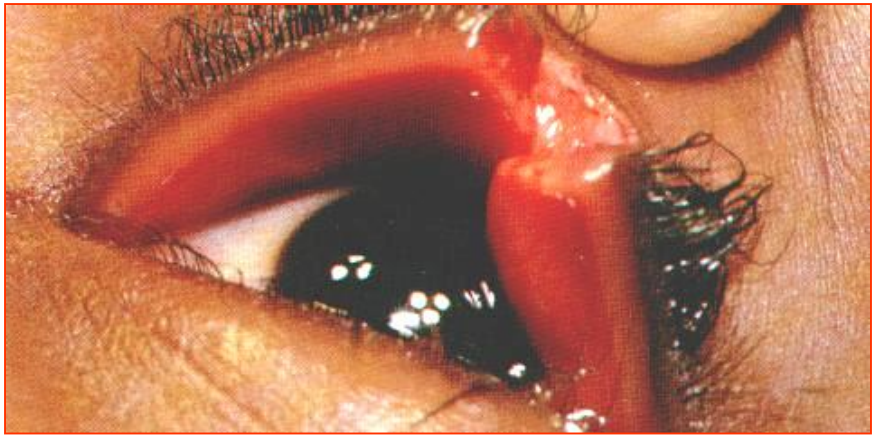
- Positioning patient limited by available equipment
- Ensure patient moves eye as much as possible while irrigating
- Irrigate fornices



Eyelid laceration

- Beware: Full thickness, lid margin, or lacrimal system

- Repair may be carried out as planned surgery



Red Eye

Endopthalmitis

- Acute or chronic inflammation of the eye, involving vitreous
- Most frequently due to penetrating trauma
- Signs & symptoms: reduced vision; deep,dull ocular pain; red eye; corneal oedema; hypopyon; $\pm\uparrow$IOP

Endophthalmitis

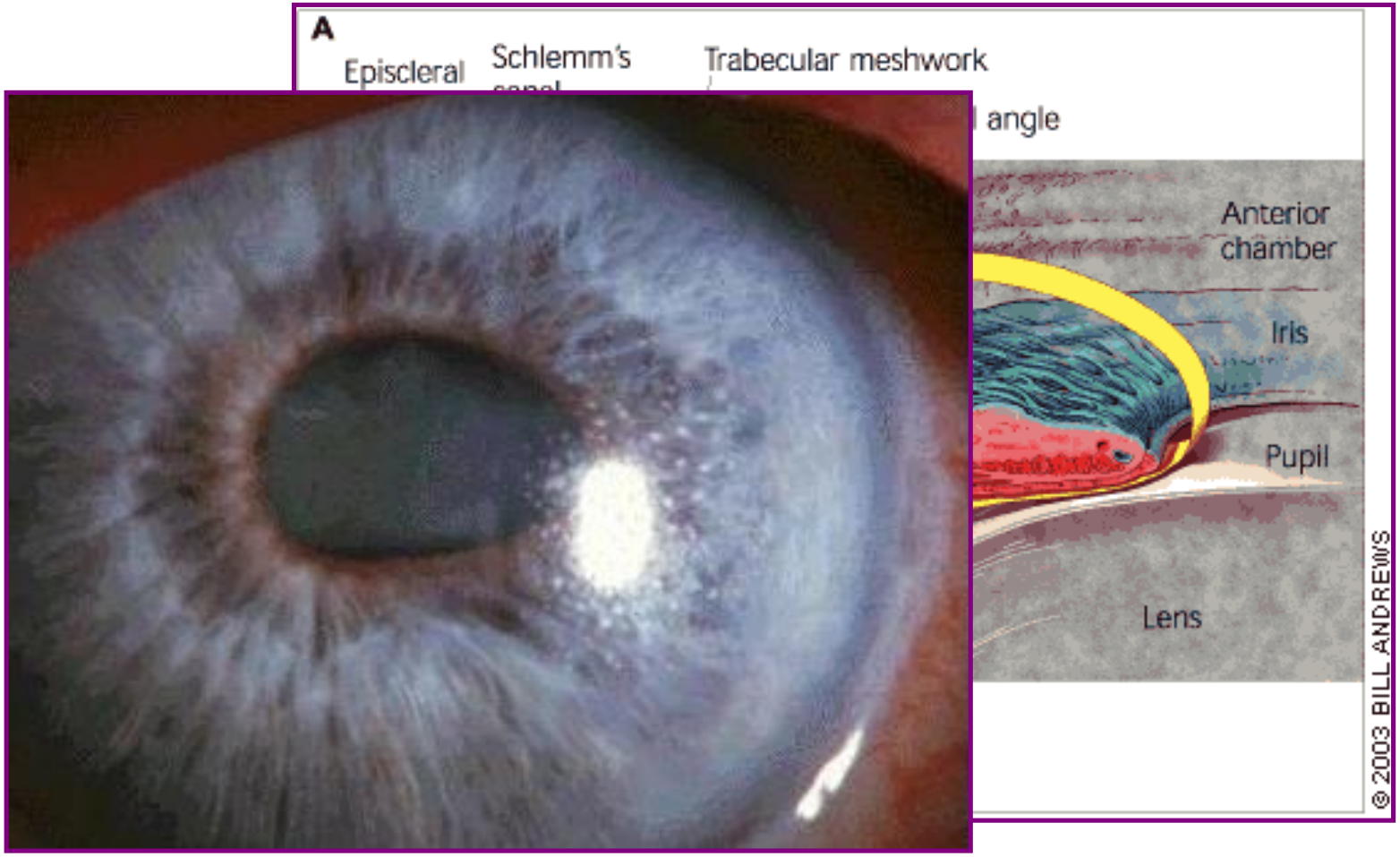
Acute angle closure crisis/glaucoma (AACC/G)

Glaucoma: many types

dx made by: optic disc cupping;
reduced visual field; usually ↑IOP

- AACG: acute blockage of drainage; 2-5% of glaucoma
- Primary/secondary
- Signs & symptoms: unilateral most common; severe pain; nausea; vomiting; decreased vision; halos; red eye; pupil fixed & dilated;
  ↑↑ IOP

AACG


A
Episcleral
Schlemm's
Trabecular meshwork
angle
Anterior chamber
Iris
Pupil
Lens
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Orbital & preseptal Cellulitis

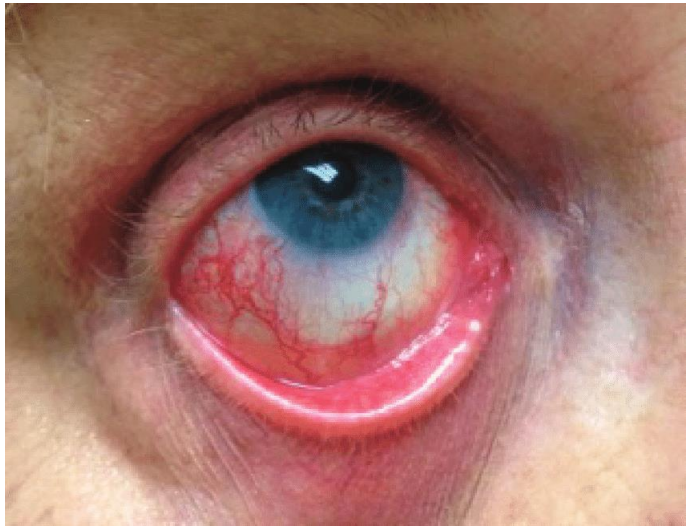
- Important to distinguish between preseptal & orbital infections
- Preseptal cellulitis most common presentation characterised by swelling and infection of the lid tissue
- Orbital cellulitis requires immediate treatment
- May have associated trauma/FB/stye
- ?MRI/CT
- Signs & symptoms: oedema; erythaema; hyperaemia; pain; leukocytosis, diplopia
- Chemosis, proptosis, ↓eye movement, ↓vision indicate deep orbital involvement

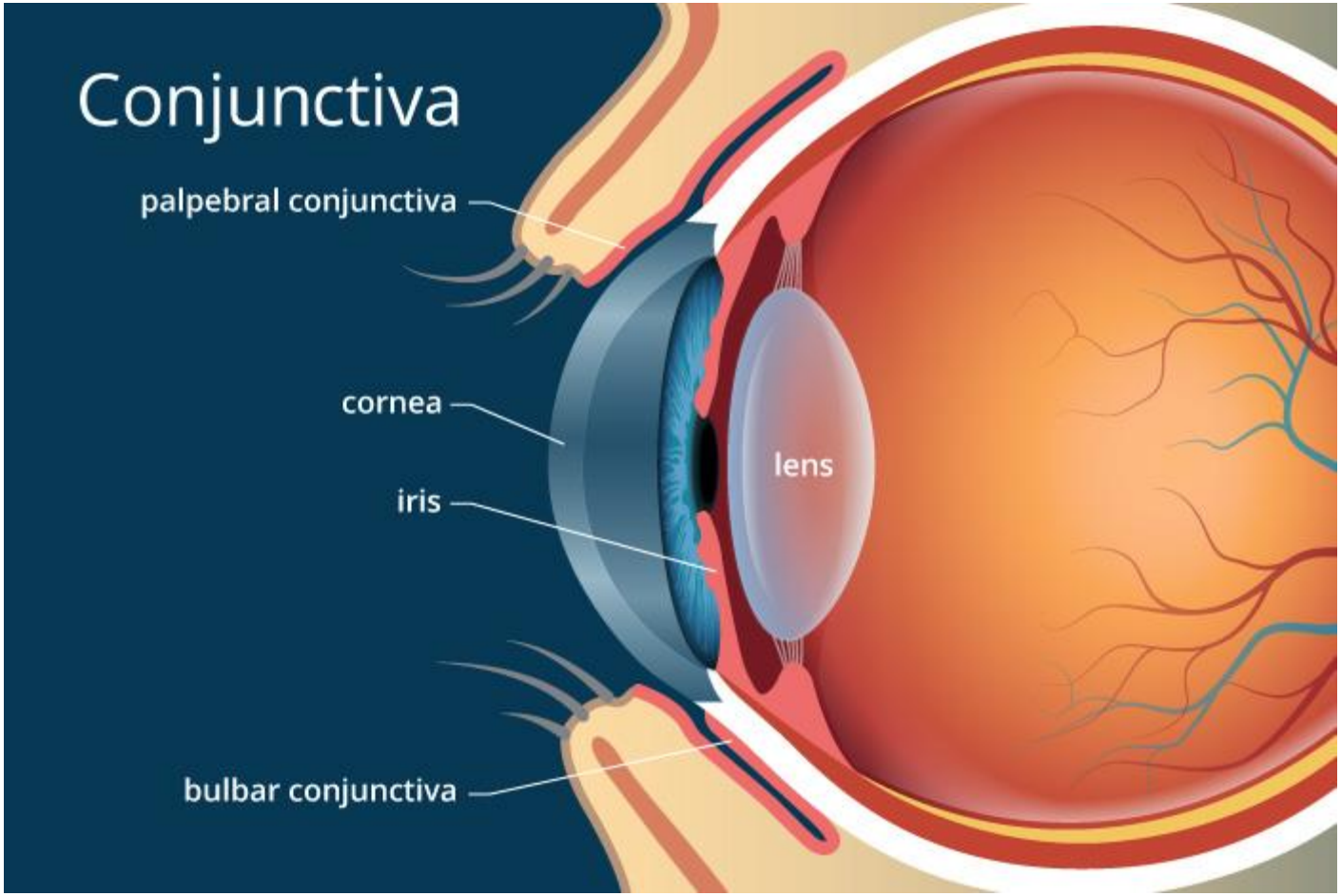
Differential Diagnosis of Red Eye

	Sub conjuntival haemorrhage	Conjunctivitis	Episcleritis	Scleritis	HSV keratitis	Corneal Ulcer	Anterior Uveitis	Acute angle closure glaucoma
VA	Normal	Usually normal	Usually normal	Can have insidious ↓	May be reduced	May be markedly reduced	May be decreased	Markedly reduced 6/60 and below
Pain	Usually aymptomatic	Burning, itching, irritation	Sometimes irritation	Severe and boring pain. Tender to touch	Mild to moderate	Can be severe	Moderately severe ache and photophobia	Severe with headache, nausea, vomiting
Discharge/ Lacrimation	No	Mucous or mucopurulent	No	No	Lacrimation sometimes	May be purulent	Lacrimation	Lacrimation
Hyperaemia	Deep red area under conj. Often sectorial	Superficial/ diffuse of eye and eyelids conjunctiva	Sectorial redness- engorgement of episcleral vessels	Intensive injection of scleral, episcleral and conjunctival vessels. May have bluish hue	Mild to moderate injection	Diffuse	Circum corneal	Marked circumcorneal
Cornea	Clear	Usually clear but punctate staining at times	Clear	Usually clear but may have peripheral keratitis	Usually area of corneal ulceration with fluorescein staining but not always	Infiltrate with overlying epithelial defect	Precipitates may be present posterior surface	Usually cloudy
Anterior chamber	Deep and quiet	Deep and quiet	Quiet	May have associated inflammation	Deep and usually quiet	Deep. May have inflammatory cells/hypopyon	Normal depth/ white blood cells	Shallow or flat
Iris	Normal	Normal	Normal	Usually normal	Normal	Normal	May appear muddy coloured	May be difficult to see
Pupils	Normal	Normal	Normal	Usually normal	Normal	Usually normal	May be small and irregular	Semi dilated fixed
Pupillary response	Normal	Normal	Normal	Usually normal	Normal	Usually normal	May have sluggish reaction to light	Non reactive or minimal reaction
Intraocular pressure	Normal	Normal	Normal	Usually normal but may be ↑	Usually normal but may be ↑	Usually normal	May be normal or ↓ or occ.↑	Very high over 40 mmHg

Where is the redness?

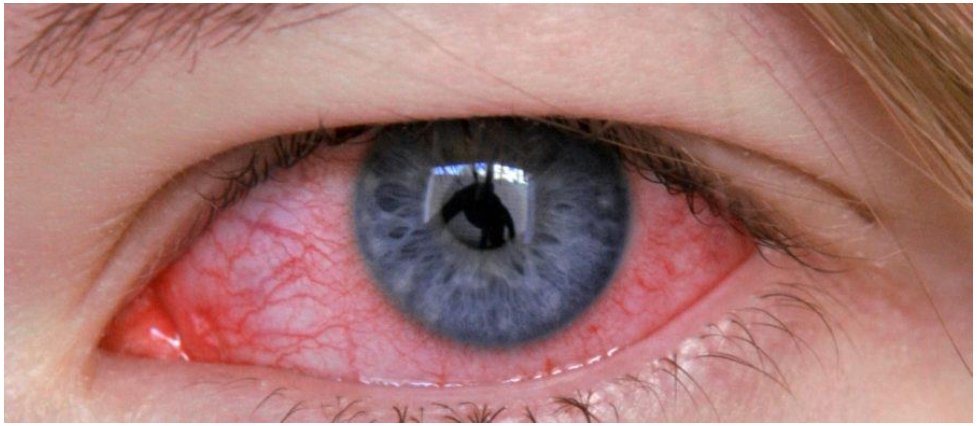
- Lids vs globe

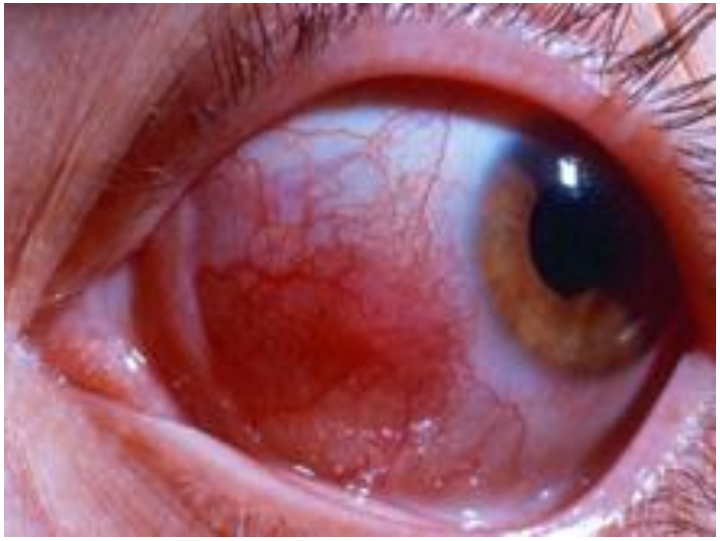



Conjunctiva
palpebral conjunctiva
cornea
iris
lens
bulbar conjunctiva

Where is the redness?

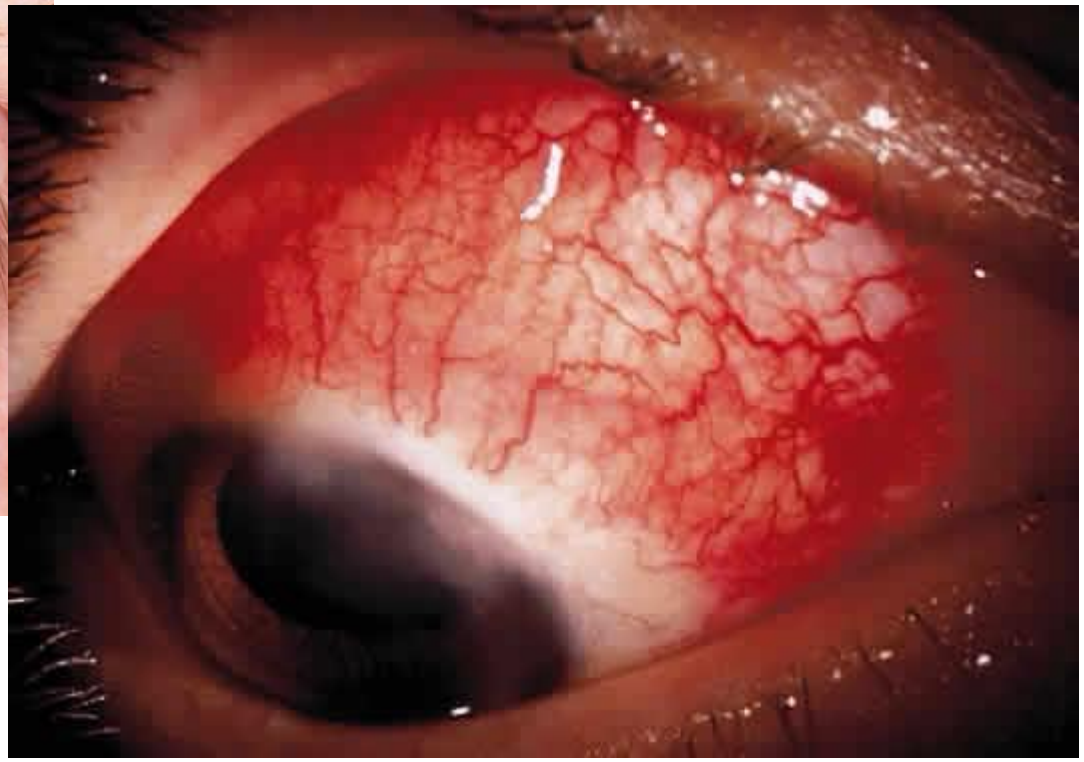
- Diffuse vs sectoral





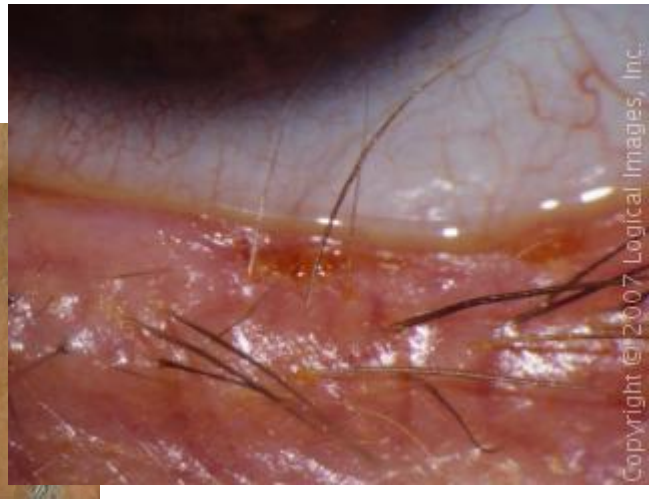
Pattern of redness

- Mild, moderate, severe



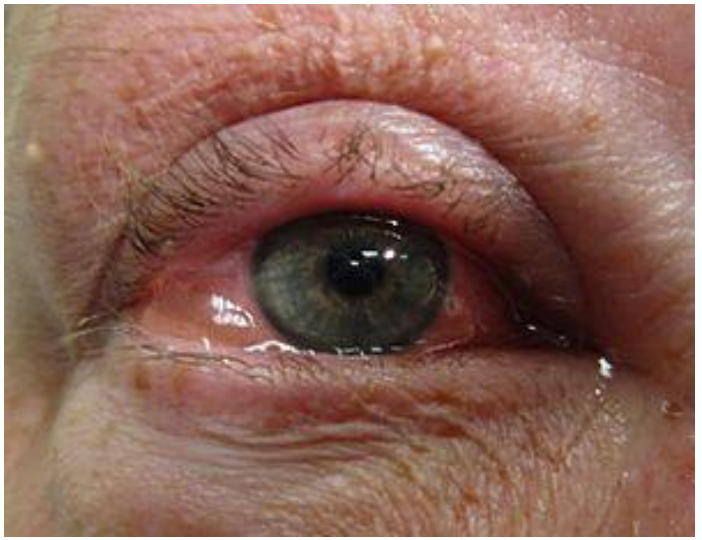
Other associated findings

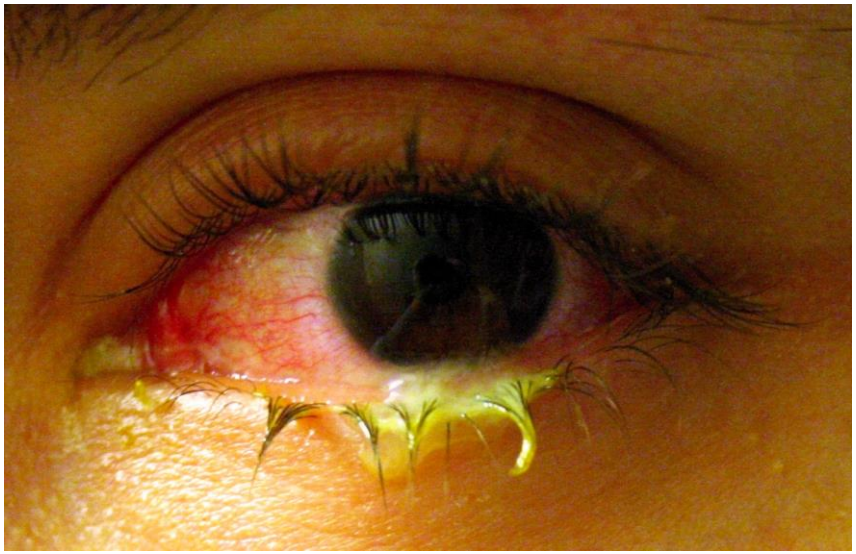
- Eye lid abnormalities



Other associated findings

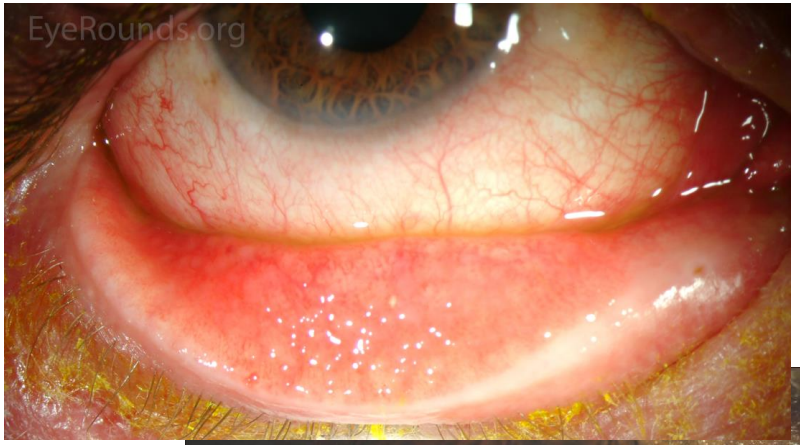
- Discharge

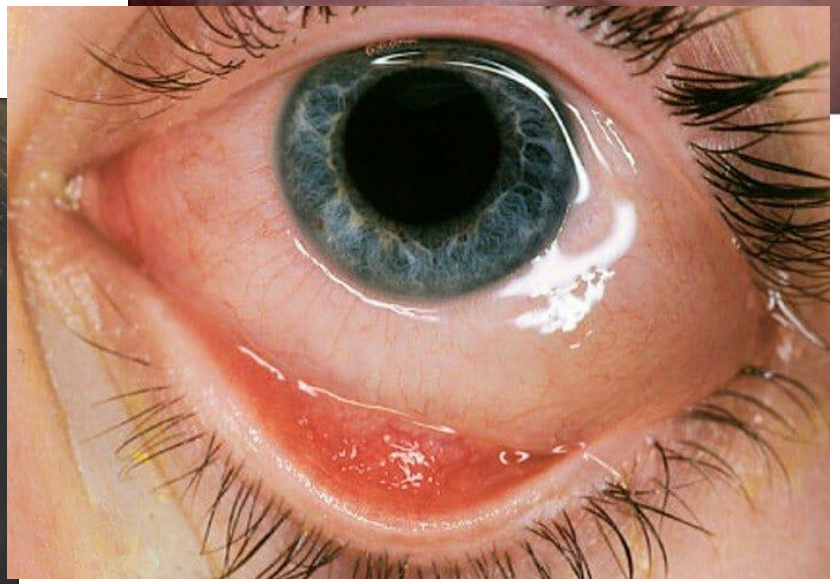


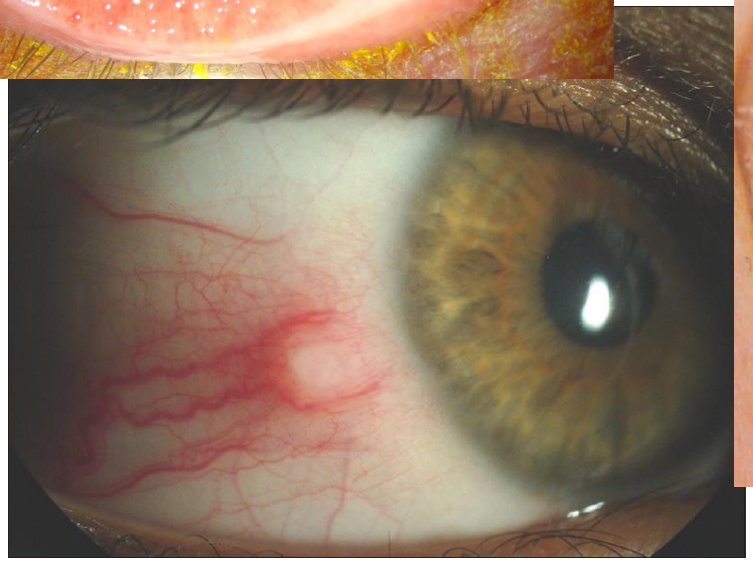


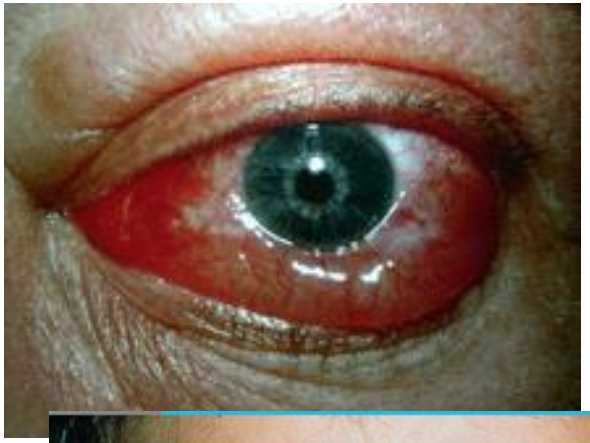
Other associated findings

- Conjunctival abnormalities









Other associated findings

- Corneal abnormalities