

# Emergency Ophthalmology

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## Introduction and Contacts

Eye problems represent around 6% of presentations to the department, i.e. around 6000 patients/year. The majority of cases can be dealt with using the facilities available in the emergency department. Help with more complex cases is available from:

- Emergency Eye Clinic [office hours] – extension: 5141
- Ophthalmology SHO on-call – bleep

Many thanks to the Ophthalmology Department for helping us with this guidance.

## Hot Tips!

- **Measure visual acuity (VA) first** – VA is the key to ophthalmological examination. **Failure to document VA may constitute negligence.**

VA should be recorded prior to any intervention excepting irrigation of chemical injury and instillation of local anaesthetic (a process which is sometimes necessary in order to assess acuity). Test the “bad eye” first as the patient may remember the order of letters. Use a Snellen chart, read at 6m, for each eye separately. Allow patients to use spectacles if they have them, if not use a pinhole. VA is expressed as:

Distance from the chart (m) / No. of line on the chart (Normal vision is 6/6)

- **Eye drops** – Although anaesthetic eye drops are an invaluable tool in treatment and examination, you should never give patient a supply to take home as their repeated use inhibits the healing of the epithelial layer of the eye thus doing the patient a disservice.
- **Eye Pads** – Evidence shows that these are of no benefit in the treatment of simple corneal abrasions. If an eye pad is used it is imperative that patients are warned not to drive whilst wearing the pad as this is illegal and invalidates their insurance.
- **Indicators of potentially serious eye problems** – these include:
  - Chemical injuries to the eye
  - Penetrating eye injuries
  - Sudden visual loss
  - Significant reduction in visual acuity

## Chemical Injuries

These constitute a serious threat to vision and demand urgent attention.

### **Alkali**

An alkali will rapidly penetrate to the anterior chamber and can affect the iris, ciliary body, lens and trabecular meshwork. It can remain active for up to 24 hours after initial injury.

Irrigate immediately on arrival with a minimum of 1 litre of normal saline.

Check pH with indicator paper. If pH greater than 7 then continue the irrigation. Stop irrigation once pH returns to neutral, 5 mins after irrigation stopped. Do not instil any ointment (as this hinders slit lamp examination).

Do not pad eye (as eye should be allowed to lacrimate freely).

Refer to Ophthalmology

### **Lime Burns**

These include wet or dry cement and wet plaster.

Treat as for alkali burns. Remove any visible cement or plaster using a cotton bud.

Refer to Ophthalmology

### **Acid Burns**

Acids generally tend to cause limited damage as acids form insoluble protein complexes.

The exception is hydrofluoric acid which damages in a similar manner to alkali.

Irrigate on arrival with 1 to 2 litres of normal saline. Check pH, continue irrigation if pH less than 7. Stop irrigating once pH returns to neutral. Instil fluorescein eye drops. Use blue filter or ophthalmoscope to detect any corneal staining.

If no staining and eye now comfortable send home with chloramphenicol eye ointment 3 - 4 times a day for 5 days.

If there is a small amount of corneal staining, instil stat dose of chloramphenicol eye ointment.

## **Sub-conjunctival Haemorrhage**

A sub-conjunctival haemorrhage may occur spontaneously often following coughing and straining. If no history of trauma:

Check blood pressure and urinalysis to exclude hypertension and blood in the urine.

Ensure patient is not taking warfarin or aspirin. (If patient has had several sub-conjunctival haemorrhage blood tests for clotting etc. may be necessary)

No treatment required.

Reassure patient that eye is not at risk and that the haemorrhage will reabsorb over the next 1-2 weeks. If history of trauma: Check that posterior extent of haemorrhage is visible by getting patient to move eye around. If posterior border is not visible then consider the possibility of significant trauma to the eyeball.

## **Corneal Abrasions**

The cornea is highly susceptible to superficial injury due to the delicacy of the epithelium. An abrasion causes:

- \* Immediate and often severe pain.
- \* Redness of the conjunctiva
- \* Intense lacrimation

The abrasion can be seen by instilling fluorescein eye drops.

Use blue light to detect any corneal staining. The abrasion will glow yellow/green under the light.

If no evidence of perforating injury (a small area of staining will be seen and the fluorescein can often be seen draining into it), treat with stat dose of chloramphenicol eye ointment. The patient should be advised not to drive or operate machinery for 24h.

Send home with chloramphenicol eye ointment 4 times a day for 5 days

Advise patient to return if no improvement after 24 hours or eye feels worse.

## **Super-Glue In Eye**

This causes little problems in the eye as it detaches itself in time (approximately 48 hours). If the eyelashes are stuck together cut the eyelashes with a sharp pair of scissors.

If the eye can close reassure the patient that the glue will detach itself

Give chloramphenicol eye ointment 4 times a day for 5 days.

## Blunt Trauma

Blunt trauma may cause damage to various parts of the eye

### Hyphaema

This is bleeding in the anterior chamber. Can sometimes be seen with naked eye and patients will usually give appropriate history. Usually causes pain and reduced visual acuity.

Always refer to Ophthalmology.

Orbital x-rays

Patient does not need to lie flat.

### Fixed Pupil

Refer to Ophthalmology urgently.

### Any complaints of Visual Problems

- e.g. Blurred vision
- Double vision
- Flashing lights
- Floaters

Refer to Ophthalmology with x-rays

## Corneal Foreign Body

Always check mechanism of injury, was FB after chiselling or use of high power machine. The FB may perforate the eye - see below. Other FBs can be treated in the ED:-

Instil anaesthetic drops. Remove foreign body if easy to do so. Always check under upper lid. FBs under upper lid produce a characteristic pattern of staining with multiple fine vertical scratches.

Ensure foreign body is not full thickness before attempting removal. The removal should be done with needle under visual guidance from slit lamp in order to magnify proceedings. If in doubt ask for senior help the first couple of times.

Instil fluorescein. Use blue filter to examine cornea for staining.

If an abrasion seen instil chloramphenicol ointment.

Send home with chloramphenicol ointment 4 times a day for 5 days.

If unable to remove foreign body or rust remains, refer to Ophthalmology with photocopy of notes. Removal is eased if the appointment to remove remaining rust is for 48hrs hence and the patient is told to use the chloramphenicol regularly to soften surface of the eye.

## Perforating Eye Injury

The cornea or sclera may be perforated in different ways.

1. Directly by a sharp, pointed instrument e.g. knife, scissors.

2. Directly by small particles e.g. glass or metal from high powered machinery or hammering and chiselling.
3. Indirectly - by a severe contusion leading to rupture of the globe.

If a perforating injury is suspected:-

Do not instil any drops or ointment.

Orbital x-rays – if intraocular FB is suspected

Keep patient nil-by-mouth

Refer to Ophthalmology with x-rays and photocopy of notes.

### **Intra-Ocular Foreign Body**

This should be considered if there is a history of hammering and chiselling, high velocity power tools e.g. shot blasting.

Check visual acuity carefully

Orbital x-rays for foreign body. One view is taken initially with eyes looking up. If an FB is seen the radiographer will then do an eyes down view to confirm the FB is in the eyeball.

Keep patient nil-by-mouth

Refer to Ophthalmology with x-rays and photocopy of notes.

## The Red Eye

### Conjunctivitis

Usually presents as a red, irritating, sticky eye, often bilateral. Prescribe chloramphenicol drops (2 hourly initially) and ointment at night.

[N.B. The vision should be normal and cornea bright. The iris will react to light.]

Allergic conjunctivitis is often unilateral with papillae and follicles appearing as bumpy elevations on the tarsal surface of the conjunctiva. Usually self-limiting.

[N.B. Never give local steroids as herpetic conjunctivitis or keratitis may be exacerbated, and destruction of the surface of the eye may follow.]

### Acute glaucoma

This causes a red, intensely painful, hard eye with a hazy cornea and fixed oval dilated pupil. The vision will be reduced.

Look for a shallow anterior chamber (in both eyes) and history of periodic attacks of blurred vision and haloes to confirm diagnosis. There may also be positive family history.

Refer urgently for confirmation of the diagnosis and treatment with –  
Diamox 500 mg IV and intensive pilocarpine drops followed by a peripheral iridectomy

### Iritis/Uveitis

May be confused with conjunctivitis, but look for these signs and symptoms

- 1 Ciliary injection.
- 2 Photophobia and blurring vision.
- 3 Keratic precipitates or hypopyon if severe.
- 4 Posterior synechiae.

Initial treatment is with local steroids and atropine, so refer to ophthalmology.

### Keratitis

An opacity on the cornea with ciliary injection needs accurate diagnosis before treatment.

## Sudden Loss of Vision

### Central Retinal Artery Occlusion

Causes complete painless loss of vision. The posterior pole is pale and oedematous, the macula looking like a red spot. Absent pupil reflex.

Urgent referral. Treatment within hours may re-establish the circulation.

### Giant Cell Arteritis

GCA may present as a central retinal artery occlusion or ischaemic optic neuropathy.

Suspect in elderly patients with a high ESR and temporal pain. Refer urgently to rheumatology or MAU, as systemic steroids may prevent blindness in the second eye.

N.B. This is one of very few indications for urgent ESR.

### Central Retinal Vein Occlusion

CRVO is more common in hypertension or diabetics. The fundus looks totally haemorrhagic 'stormy sunset'. Refer.

### Vitreous Haemorrhage

May cause a shower of "floaters" before loss of vision. The two most important causes needing urgent referral are:

- Retinal tear, which may lead to detachment if untreated.
- Diabetic vitreous haemorrhage

### Retinal Detachment

Warning signs are flashes of light followed by floaters. When partially detached a curtain partially obscures vision. RD is commoner after trauma or in myopes. Diagnosis is by direct observation with an ophthalmoscope or partial / total loss of red reflex.

## Gradual Loss of Vision

Caused for example by cataracts or senile macular degeneration and needs clinic follow up only. Evidence of chronic open angle glaucoma (pale cupped discs and raised intraocular pressure) needs early clinic referral.

## ABC guide to Ophthalmology referrals – 2006

### Key:

**NOW** = Discuss with Emergency Eye Clinic (tel: 5141)  
OR SHO 'on call'

**SOS**= give patient contact telephone number for Emergency Eye Clinic

Problem	Referral Pathway	Comments
<b>Abrasion – corneal</b>	Discharge with written advice / SOS for Eye Casualty Clinic	Refer if large area of corneal staining
<b>'Arc' Eye</b>	Discharge / SOS	If not resolved within 24/36 hrs
<b>Bi-temporal /Homonymous Hemianopia</b>	Medical Assessment Unit(MAU) / Neurology	Consider CT brain [Not an Eye problem]
<b>Blepharitis –No corneal staining</b>	Discharge with written advice	Back to GP
<b>Blepharitis – Corneal staining</b>	24/48 hrs	Next Emergency Eye Clinic
<b>Blind Painful Eye</b>	within 24hrs	Next Emergency Eye Clinic
<b>BURNS Chemical</b> (N.B. Alkaline -causes sustained/deep damage. Acid- tends to cause immediate superficial damage)	NOW Especially If corneal staining and/or signs of ischemia	After – Checking pH Instilling Local anaesthetic Irrigating with 1 litre Normal saline over 20mins Re-check pH if pH not 7/8 then irrigated until achieved Test vision 5minutes after final irrigation
<b>Conjunctivitis</b>	Discharge or SOS for Emergency Eye Clinic	Discharge if diagnosis is secure and visual acuity unchanged If allergic remove allergen e.g. topical medication
<b>Corneal Ulcer /Keratitis</b>	Within 24hrs	Exclude recent eye trauma / previous corneal abrasions /herpetic disease /contact lens wear

<b>Corneal staining in Contact Lens wearer</b>	NOW	Danger of permanent corneal damage if left. Remove contact lens Patient to retain Contact lens and case for microbiology
<b>Children with loss of Vision</b>	NOW	
<b>Corneal suture protruding</b>	48/72 hrs	Usually h/o Cataract extraction, no vision loss
<b>Diabetic Retinopathy-chronic disease</b>	Discharge unless sudden drop in vision then 24/48hrs	Suggest refer GP to refer to COPD
<b>Blow out fracture</b>	Within 24 hours	Refer for assessment of any additional injury to globe plus refer to Max – Fax.
<b>Traumatic optic neuropathy</b>	NOW	May require High dose IV steroids according to protocol
<b>Diplopia Unilateral(rare) /Binocular Sudden onset</b>	Within 24hrs	Exclude Trauma (“blow out” fracture) Consider Max –Fax Referral if VA- ok. MAU /Neurology
<b>Diplopia - long standing</b>	Discharge	Refer back to Optician or GP, if no history of Trauma
<b>Entropion / Ectropion</b>	Discharge	Back to GP Unless corneal ulceration or unable to tape lid back in position (entropion)
<b>Scleritis</b>	48/72 hrs	Refer to next Emergency Eye Clinic unless VA↓, nausea/vomiting + severe pain
<b>Exophthalmos ( Thyroid eye disease)</b>	NOW if →  Discharge	Exposure with Corneal Ulcer or VA↓ or Subluxated globe (apply cold compresses)  Irritation or diplopia. Refer back to GP for eye appt at COPD

<p><b>FB / Rust Rings</b></p> <p>N.B. Do X-Ray to exclude IOFB if indicated (i.e. Hammering-“metal on metal”)</p>	<p>48/72hrs</p>	<p>Give Occ. Chloromycetin QDS for at least 36hrs Refer sooner – if unable to remove “FB” or if signs of infiltrates/traumatic iritis</p>
<p><b>Floater and Flashing lights/ Shadows/Curtain effect /Field defect - NO Pain</b></p>	<p>NOW</p>	<p>Retinal Detachment Refer esp. if vision is good as macular likely to be still on!!.</p>
<p><b>Floaters but NO Flashing Lights/Shadow No Pain</b></p>	<p>48/72hrs</p>	<p>Exclude Giant Cell (Temporal)Arteritis – measure ESR</p>
<p><b>Glaucoma – Acute</b></p>	<p>NOW</p>	<p>Raised intra-ocular pressure Semi-dilated fixed pupil Visual acuity ↓ Corneal Oedema Red Eye Nausea /Vomiting</p>
<p><b>Herpes Zoster Ophthalmicus (Shingles)</b></p>	<p>Discharge or if VA↓ then within 24hrs.</p>	<p>Discharge back to GP / ? commence oral acyclovir Refer sooner if corneal sensation ↓ / cornea staining / visual acuity ↓ or details obscured</p>
<p><b>Hyphaema – Traumatic</b></p>	<p>NOW</p>	<p>Now –if ocular damage likely and /or large bleed Or advise bed rest see next Emergency Eye Clinic</p>
<p><b>Iritis /Uveitis</b></p>	<p>ASAP -Within 24hrs</p>	<p>Visual acuity ↓ Pain ++ Photophobia ++ Small pupil Red Eye- Ciliary Injection</p>
<p><b>Lid Lacerations</b></p>	<p>NOW if →</p>	<p>Septum breached ie presence of preaponeurotic/orbital fat in wound or suspected history of penetrating injury. Risk of intraorbital FB. Eyelid margin crossed. Lateral canthal or medial canthal tendon injury. Canalicular trauma suspected ie medial canthal injury/eyelid margin breached medial to</p>

		punctum. Excessive loss of eyelid tissue. Any suspicion of any injury to globe.
<b>Lids – Lumps / Cysts</b>	Discharge	Consider oral antibiotics /"hot" spoon bathing Back to GP for letter referral to COPD for Minor op. (I & C)
<b>Pre-Septal /Orbital Cellulitis</b>	NOW	Refer -Children to Paediatric Assessment unit ASAP
<b>Dacryocystitis (Infected tear sac)</b>	48/72hrs	Meanwhile commence oral antibiotics, warm flannel bathing
<b>Retrobulbar haemorrhage</b>	NOW	If signs of a compressive optic neuropathy (decreased vision, loss colour vision, relative afferent pupillary defect) with clearly tense orbit, limitation of eye movements and proptosis needs; Urgent lateral canthotomy and cantholysis of lower lid (then upper lid if required) in A + E by A + E staff if ophthalmologist delayed
<b>Painful Eye With Unexplained loss of vision</b>	NOW or within 24hrs	Unknown aetiology
<b>Painless loss of vision - SUDDEN (&lt; 12 Hours)</b>	NOW	DO an urgent ESR if ? Temporal Arteritis suspect ( If ESR ↑↑ CRP↑↑ Consider direct referral to Rheumatology or MAU )
<b>Partial painless loss of vision ≥ 12hours Floaters but No Flashing Lights / shadows</b>	48/72	Consider 'TIA' attacks/vascular causes Exclude Temporal Arteritis
<b>Partial Painless loss of vision WITH Floaters and Flashing Lights / Shadow/Curtain Effects</b>	NOW	D/D Retinal Detachment Refer – Especially if Visual Acuity is good as the macular is likely to be still on!
<b>Post Operative Eye Patients Esp. [If recent intra-ocular Operation]</b>	NOW	Especially if Visual Acuity ↓↓ Pain ↑↑ Eye Discharge↑↑

<b>Post Operative Eye Patient extra-ocular Vision OK</b>	24/48hrs	If extra ocular – vision unchanged +no Pain
<b>Raised intra-ocular pressure (&lt; 35mm)-and no signs of angle closure</b>	Discharge	Often referred by Optician Back to GP for referral to COPD for glaucoma assessment
<b>Raised intra-ocular pressure (&gt; 35mm) and no signs of angle closure</b>	48/72hrs	Often referred by optician
<b>Sub-conjunctival Haemorrhage</b>	Discharge with written advice	Exclude underlying trauma/FB. Check B/P and ? clotting screen. +/-Refer back to GP
<b>Severe Trauma- Perforating injury / Ruptured Globe / Intra- Ocular FB (IOFB)</b>	NOW	Do X-Ray Especially if IOFB suspected
<b>Vitreous Floaters long standing (weeks to months)</b>	Discharge	If no shadows flashing lights