The Acute Eye & it’s Management

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Nurse Practitioner
Ophthalmology, ADHB
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
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
- Entropion
- 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
- Endophthalmitis
- 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

<table>
<thead>
<tr>
<th>Eye Findings</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual acuity</td>
<td>Normal</td>
</tr>
<tr>
<td>Pain</td>
<td>Mild irritation, may be asymptomatic</td>
</tr>
<tr>
<td>Discharge/watering</td>
<td>Not usually</td>
</tr>
<tr>
<td>Hyperaemia</td>
<td>Deep red under conj, usually sectorial</td>
</tr>
<tr>
<td>Cornea</td>
<td>Clear</td>
</tr>
<tr>
<td>AC</td>
<td>Deep &amp; quiet</td>
</tr>
<tr>
<td>Iris</td>
<td>Normal</td>
</tr>
<tr>
<td>Pupils</td>
<td>Normal</td>
</tr>
<tr>
<td>Pupillary response</td>
<td>Normal</td>
</tr>
<tr>
<td>IOP</td>
<td>Normal</td>
</tr>
</tbody>
</table>
# Conjunctivitis

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Visual acuity</td>
<td>Usually normal</td>
</tr>
<tr>
<td>Pain</td>
<td>Burning, itching, irritation</td>
</tr>
<tr>
<td>Discharge/watering</td>
<td>Mucous or purulent</td>
</tr>
<tr>
<td>Hyperaemia</td>
<td>Superficial &amp; diffuse of conj and eyelids</td>
</tr>
<tr>
<td>Cornea</td>
<td>Usually clear, +/- PEES</td>
</tr>
<tr>
<td>AC</td>
<td>Deep &amp; quiet</td>
</tr>
<tr>
<td>Iris</td>
<td>Normal</td>
</tr>
<tr>
<td>Pupils</td>
<td>Normal</td>
</tr>
<tr>
<td>Pupillary response</td>
<td>Normal</td>
</tr>
<tr>
<td>IOP</td>
<td>Normal</td>
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</table>
## Episcleritis

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<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Visual acuity</strong></td>
<td>Usually normal</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>Sometimes irritation/mild pain</td>
</tr>
<tr>
<td><strong>Discharge/watering</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Hyperaemia</strong></td>
<td>Sectoral redness, engorgement of episcleral vessels</td>
</tr>
<tr>
<td><strong>Cornea</strong></td>
<td>Clear</td>
</tr>
<tr>
<td><strong>AC</strong></td>
<td>Deep &amp; quiet</td>
</tr>
<tr>
<td><strong>Iris</strong></td>
<td>Normal</td>
</tr>
<tr>
<td><strong>Pupils</strong></td>
<td>Normal</td>
</tr>
<tr>
<td><strong>Pupillary response</strong></td>
<td>Normal</td>
</tr>
<tr>
<td><strong>IOP</strong></td>
<td>Normal</td>
</tr>
</tbody>
</table>
# Scleritis

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td><strong>Visual acuity</strong></td>
<td>May have insidious decrease</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>Severe/boring, tender to touch, wakes from sleep</td>
</tr>
<tr>
<td><strong>Discharge/watering</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Hyphaema</strong></td>
<td>Intensive injection of scerla, episcleral &amp; conj vessels. May have blueish hue. May have nodules</td>
</tr>
<tr>
<td><strong>Cornea</strong></td>
<td>May have peripheral keratitis</td>
</tr>
<tr>
<td><strong>AC</strong></td>
<td>May have inflammatory cells</td>
</tr>
<tr>
<td><strong>Iris</strong></td>
<td>Usually normal</td>
</tr>
<tr>
<td><strong>Pupils</strong></td>
<td>Usually normal</td>
</tr>
<tr>
<td><strong>Pupillary response</strong></td>
<td>Usually normal</td>
</tr>
<tr>
<td><strong>IOP</strong></td>
<td>Normal but may be elevated</td>
</tr>
</tbody>
</table>
**HSV Keratitis**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Visual acuity</td>
<td>May be reduced</td>
</tr>
<tr>
<td>Pain</td>
<td>Mild to moderate</td>
</tr>
<tr>
<td>Discharge/watering</td>
<td>Watery</td>
</tr>
<tr>
<td>Hyperaemia</td>
<td>Mild to moderate, diffuse, may be perilimbal</td>
</tr>
<tr>
<td>Cornea</td>
<td>Area of corneal ulceration with fluorescein staining</td>
</tr>
<tr>
<td>AC</td>
<td>Deep &amp; usually quiet</td>
</tr>
<tr>
<td>Iris</td>
<td>Normal</td>
</tr>
<tr>
<td>Pupils</td>
<td>Normal</td>
</tr>
<tr>
<td>Pupillary response</td>
<td>Normal</td>
</tr>
<tr>
<td>IOP</td>
<td>Usually normal</td>
</tr>
</tbody>
</table>
# Corneal ulcer

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual acuity</td>
<td>May be markedly reduced</td>
</tr>
<tr>
<td>Pain</td>
<td>Can be severe</td>
</tr>
<tr>
<td>Discharge/watering</td>
<td>May be purulent</td>
</tr>
<tr>
<td>Hyperaemia</td>
<td>Diffuse</td>
</tr>
<tr>
<td>Cornea</td>
<td>Infiltrate with overlying epithelial defect</td>
</tr>
<tr>
<td>AC</td>
<td>Deep, may have inflammatory cells/hypopyon</td>
</tr>
<tr>
<td>Iris</td>
<td>Normal</td>
</tr>
<tr>
<td>Pupils</td>
<td>Usually normal</td>
</tr>
<tr>
<td>Pupillary response</td>
<td>Usually normal</td>
</tr>
<tr>
<td>IOP</td>
<td>Usually normal</td>
</tr>
</tbody>
</table>
# Acute anterior uveitis

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visual acuity</strong></td>
<td>May be decreased</td>
</tr>
<tr>
<td><strong>Pain</strong></td>
<td>Moderate to severe ache &amp; photophobia</td>
</tr>
<tr>
<td><strong>Discharge/watering</strong></td>
<td>Watery</td>
</tr>
<tr>
<td><strong>Hyperaemia</strong></td>
<td>Circumcorneal</td>
</tr>
<tr>
<td><strong>Cornea</strong></td>
<td>KP’s may be present</td>
</tr>
<tr>
<td><strong>AC</strong></td>
<td>Normal depth, white blood cells</td>
</tr>
<tr>
<td><strong>Iris</strong></td>
<td>May appear muddy coloured</td>
</tr>
<tr>
<td><strong>Pupils</strong></td>
<td>Often small &amp; irregular</td>
</tr>
<tr>
<td><strong>Pupillary response</strong></td>
<td>May have sluggish reaction to light</td>
</tr>
<tr>
<td><strong>IOP</strong></td>
<td>Normal, low, may be elevated</td>
</tr>
</tbody>
</table>
### Acute angle closure crisis/glaucoma

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual acuity</td>
<td>Markedly reduced, 6/60 or below</td>
</tr>
<tr>
<td>Pain</td>
<td>Severe with headache, nausea, vomiting</td>
</tr>
<tr>
<td>Discharge/watering</td>
<td>Watery</td>
</tr>
<tr>
<td>Hyphaema</td>
<td>Marked circumcorneal &amp; episcleral</td>
</tr>
<tr>
<td>Cornea</td>
<td>May be cloudy</td>
</tr>
<tr>
<td>AC</td>
<td>Shallow or flat</td>
</tr>
<tr>
<td>Iris</td>
<td>View may be difficult</td>
</tr>
<tr>
<td>Pupils</td>
<td>Semi-dilated, fixed</td>
</tr>
<tr>
<td>Pupillary response</td>
<td>Non-reactive or minimal reaction</td>
</tr>
<tr>
<td>IOP</td>
<td>Very high, over 40mmHg</td>
</tr>
</tbody>
</table>
The red eye

1. AACG
2. AAU
3. Subconjunctival haemorrhage
4. Conjunctivitis
5. Corneal ulcer
6. Episcleritis
7. HSV keratitis
8. 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
- International Organisation for Standardisation (ISO) provides standardised conditions for visual acuity testing
Pinhole assessment VA<6/9
Useful resources

EYE EMERGENCY MANUAL

An Illustrated Guide

Second Edition
**Corneal foreign body**

ATS CATEGORY 4 (START TREATMENT WITHIN 0 MIN)

- 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 corneal trauma) and require urgent treatment.

**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 analgesia 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.
Auckland Eye Manual: free app for Android & Apple Smart Phones
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 (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.
- Flickering 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.
Regional pathways

This section links to the clinical pathways within each main region of New Zealand.

Regional pathways

Access for the following regional pathways is localised for each region and access is limited to health providers. If you do not know the login details, contact your DHB or PHO for more information:

- Northland
- Auckland
- Midlands
- Midcentral DHB & Central PHO
- Wellington, Wairarapa, Hutt (3D HealthPathways)
- Canterbury
- Nelson Marlborough
- Southern

Related topics

- Assessments, guidelines, pathways
- Continuing professional development
Health System News

21 Jan  

Pediatric medication dose calculators

Calculating medication doses for children can be tricky and time-consuming in a busy practice. Health Navigator has launched pediatric dose calculators for commonly prescribed medicines, e.g.:

- Amoxicillin
- Cefadroxil
- Co-trimoxazole
- Ibuprofen
- Paracetamol

Enter your patient's age and/or weight parameters, and the calculator expresses the dose in milligrams and milliliters 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 to 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 SCATS

ACC has implemented funding for a Sport Concussion Assessment Tool (SCATS) to be completed following a positive ACE screen. Funding is available under ACC cost of treatment regulations, billing code GFSC. Read more...

18 Dec  

Suicide Prevention Resource for Chinese People
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

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.
Page not yet adapted for Auckland Region.

Background

- 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. 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/
Search results for 'optometry' – 70 found

**BY KEYWORDS**
- optometry

**BY LOCATION**
- Select a region...
- Enter your address...
- Use your current location

**BY SERVICE**
- Select a service...

**SHOW**
- People
- Services
- Open now

---

**Optometry**

**Grace Lang Optometry**
- Optometry
  - All Saints Centre, Ponsonby

**The University of Auckland Clinics - Optometry**
- Optometry
  - University of Auckland Grafton Campus

**Albany Optometrists**
- Optometry
  - 44 Corinthian Drive, Albany, Auckland
Other Outline Resources

- Printable Snellen VA Chart:  
- Dry eye & meibomian gland disease video (lipiflow)  
  - https://www.youtube.com/watch?v=Jplf9dMviukn
- Macular Degeneration NZ  http://www.mdnz.org.nz/
- Retina NZ  http://www.retina.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)
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
Endophthalmitis

• 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; ±↑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
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

<table>
<thead>
<tr>
<th>Sub conjunctival haemorrhage</th>
<th>Conjunctivitis</th>
<th>Episcleritis</th>
<th>Scleritis</th>
<th>HSV keratitis</th>
<th>Corneal Ulcer</th>
<th>Anterior Uveitis</th>
<th>Acute angle closure glaucoma</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA</td>
<td>Normal</td>
<td>Usually normal</td>
<td>Can have insidious ↓</td>
<td>May be reduced</td>
<td>May be markedly reduced</td>
<td>May be decreased</td>
<td>Markedly reduced 6/60 and below</td>
</tr>
<tr>
<td>Pain</td>
<td>Usually asymptomatic</td>
<td>Burning, itching, irritation</td>
<td>Sometimes irritation</td>
<td>Severe and boring pain, Tender to touch</td>
<td>Mild to moderate</td>
<td>Can be severe</td>
<td>Severe with headache, nausea, vomiting</td>
</tr>
<tr>
<td>Discharge/ Lacrimation</td>
<td>No</td>
<td>Mucous or mucopurulent</td>
<td>No</td>
<td>Lacrimation sometimes</td>
<td>May be purulent</td>
<td>Lacrimation</td>
<td>Lacrimation</td>
</tr>
<tr>
<td>Hyperaemia</td>
<td>Deep red area under conj. Often sectorial</td>
<td>Superficial/ diffuse of eye and eyelids conjunctiva</td>
<td>Sectorial redness-engorgement of episcleral vessels</td>
<td>Intensive injection of scleral, episcleral and conjunctival vessels. May have bluish hue</td>
<td>Mild to moderate injection</td>
<td>Diffuse</td>
<td>Circum corneal</td>
</tr>
<tr>
<td>Cornea</td>
<td>Clear</td>
<td>Usually clear but punctate staining at times</td>
<td>Clear</td>
<td>Usually clear but may have peripheral keratitis</td>
<td>Usually area of corneal ulceration with fluorescein staining but not always</td>
<td>Infiltrate with overlying epithelial defect</td>
<td>Precipitates may be present posterior surface</td>
</tr>
<tr>
<td>Anterior chamber</td>
<td>Deep and quiet</td>
<td>Deep and quiet</td>
<td>Quiet</td>
<td>May have associated inflammation</td>
<td>Deep and usually quiet</td>
<td>Deep. May have inflammatory cells/hypopyon</td>
<td>Normal depth/ white blood cells</td>
</tr>
<tr>
<td>Iris</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Usually normal</td>
<td>Normal</td>
<td>Normal</td>
<td>May appear muddy coloured</td>
</tr>
<tr>
<td>Pupils</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Usually normal</td>
<td>Normal</td>
<td>Usually normal</td>
<td>May be small and irregular</td>
</tr>
<tr>
<td>Pupillary response</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Usually normal</td>
<td>Normal</td>
<td>Usually normal</td>
<td>May have sluggish reaction to light</td>
</tr>
<tr>
<td>Intraocular pressure</td>
<td>Normal</td>
<td>Normal</td>
<td>Normal</td>
<td>Usually normal but may be ↑</td>
<td>Usually normal but may be ↑</td>
<td>Usually normal</td>
<td>May be normal or ↓ or occ.↑</td>
</tr>
</tbody>
</table>
Where is the redness?

- Lids vs globe
Conjunctiva

- palpebral conjunctiva
- cornea
- iris
- bulbar conjunctiva
- lens
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