PHC Chapter 18: Eye conditions

For many eye conditions early specialist consultation and advice is required.
To mitigate delays in referral it is recommended that electronic consultation methods are utilised with transmission of appropriate images so that appropiate treament can be initiated before referral.

18.1 CONJUNCTIVITIS

An inflammatory condition of the conjunctiva, possibly caused by:

» allergies
» bacterial or viral (pink eye) infections

Likely cause	Conjunctival	Itching	Discharge	Lymphadenopathy	Fever & sore throat
Viral (adenoviral, HSV, VZV)	Follicular***	Minimal	Watery	Common	Common
Bacterial	Papillary**	Minimal	Purulent*	Uncommon	Occasionally
Chlamydial	Follicular***	Minimal	Purulent*	Common	No
Allergic	Papillary with chemosis (blister-like swelling of the conjunctiva)	Severe	Watery Mucoid	None	No

*Mucopurulent for nongonococcal and chlamydial infections and hyperpurulent for gonococcal infections.
**PAPILLARY CONJUNCTIVITIS: Papillae are elevations of the conjunctival tissue so there is usually a red central vascular core to the lesions which appear as distinct, well separated bumps.
***FOLLICULAR CONJUNCTIVITIS: Follicles have a larger appearance than papillae and have a white central core which is indicative of a local immune reaction i.e. accumulation of inflammatory agents (e.g. lymphocytes, macrophages) at a cellular level

Adapted from Yeu E et al. A review of the differential diagnosis of acute conjunctivitis: implications for treatment and management. Clinical Ophthalmology 2020

Table 1: Clinical features of suspected acute conjunctivitis *LoE:IVb*[1]

18.1.1 CONJUNCTIVITIS, ALLERGIC

H10.1

DESCRIPTION

An inflammatory condition of the conjunctivae caused by allergy to pollen, grass, animal fur, medication, cosmetics, etc. Often associated with allergic rhinitis or hay fever. Common features include:

» Itching, watery eyes and photophobia
» Slightly red or normal conjunctiva
» Conjunctival swelling in severe cases
» Normal cornea, iris and pupil
» Normal visual acuity

In cases of vernal keratoconjunctivitis (VKC), there may be brown discolouration of the conjunctivae or cobblestone elevations of the upper tarsal conjunctivae.

GENERAL MEASURES

Relieve symptoms with cold compresses, i.e. a clean moistened cloth over the eyes for 10 minutes.

MEDICINE TREATMENT

Adults and children > 6 years of age

- Oxymetazoline 0.025%, eye drops, instil 1 drop 6 hourly for a maximum of 7 days.

If no response within 7 days or history of recurrent (seasonal)/chronic allergic conjunctivitis, change to:

- Anti-allergic eye drops, e.g.:
- Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly (Doctor initiated).
  - Use may be seasonal (1–3 months) or long-term.

LoE:II[2]

If symptoms not controlled, add cetirizine/chlorphenamine:

- Cetirizine, oral, 10 mg once daily.
  - Use may be seasonal (1–3 months) or long-term.

Children: 2–6 years of age

- Chlorphenamine, oral, 0.1 mg/kg/dose 6–8 hourly. See dosing table, pg 23.3.

If no response within 7 days or history of recurrent (seasonal)/chronic allergic conjunctivitis, change to:

- Anti-allergic eye drops, e.g.:
- Sodium cromoglycate, 2 % eye drops, instil 1 drop 6 hourly (Doctor initiated).
  - Use may be seasonal (1–3 months) or long-term.

LoE:II[3]

If symptoms not controlled, add cetirizine:

- Cetirizine, oral, 5 mg once daily. See dosing table, pg 23.3.
  - Use may be seasonal (1–3 months) or long-term.

REFERRAL

» No response to treatment.
» Persons wearing contact lenses.
» Children < 2 years of age.

18.1.2 CONJUNCTIVITIS, BACTERIAL (EXCLUDING CONJUNCTIVITIS OF THE NEWBORN)

H10.0

DESCRIPTION

An inflammatory purulent condition of the conjunctivae caused by bacterial infection and characterised by:

» Sore, gritty or scratchy eyes and swollen lids
» Mucopurulent discharge from one or both eyes
» Redness especially of conjunctival angles (fornices)

GENERAL MEASURES

» Educate patient on personal hygiene to avoid spread e.g. do not use the same face-cloth or towels as others.
» Do not use contaminated cosmetics.
» Practise good contact lens hygiene.
» Avoid chronic use topical medications.

» Educate patient on correct application of ophthalmic ointment.
» Advise patient:
- to wash hands thoroughly before and after applying ophthalmic ointment.
- not to share ophthalmic ointments or drops.
- not to rub eyes.
- never to use urine or milk to wash the eyes.

MEDICINE TREATMENT

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 500mg -1 g 4–6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

Gonococcal conjunctivitis:

Hyperacute bacterial conjunctivitis involves rapid onset and progression of conjunctivitis with a hyperpurulent discharge, and is often caused by *N.gonorrhoeae*. Gonococcal conjunctivitis requires immediate treatment and referral to an ophthalmologist to prevent corneal involvement and potential perforation.

Neonates

Refer to Section 18.1.3 Conjunctivitis of the newborn

Children 1 month to 11 years:

- Ceftriaxone, IM,
  - < 45 kg: 125 mg, IM, as a single dose
  - ≥ 45 kg: 250 mg, IM, as a single dose

Adults and children 12 years and older

- Ceftriaxone, IM, 250 mg as a single dose.
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

AND

- Azithromycin, oral, 1 g as a single dose.
  Refer to Section 12.3 Sexually transmitted infections for further detail.

REFERRAL

» No response after 5 days.
» All cases of unilateral conjunctivitis, as this may be caused by a foreign body.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.
» Suspected or confirmed gonococcal conjunctivitis.

18.1.3 CONJUNCTIVITIS OF THE NEWBORN

P39.1

DESCRIPTION

Inflammation of the conjunctivae in the neonatal period, presenting with a picture that may range from mildly sticky eyes to an abundant purulent discharge and eyelid oedema.

Common infectious agents include *N. gonorrhoeae*, *S. aureus*, and *Chlamydia*.

Generally, conjunctivitis of the newborn is either mild (small amount of sticky exudates) or severe (profuse pus and swollen eyelids).
The latter is often *N. gonorrhoeae* and threatens damage to the cornea, while the former is often *S. aureus* or undefined.

CAUTION
Treat conjunctivitis with abundant pus immediately to prevent damage to the cornea that may lead to blindness.
Treat parents of a neonate with purulent discharge appropriately.

GENERAL MEASURES

» Cleanse or wipe eyes of all newborn babies with a clean cloth, cotton wool or swab, taking care not to touch or injure the eye.

MEDICINE TREATMENT

Prevention

Routine administration for every newborn baby:

- Chloramphenicol 1%, ophthalmic ointment, applied as soon as possible after birth.

Treatment

Sticky eye(s) without purulent discharge**:**

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 7 days.

Purulent discharge:
i.e. mild discharge without swollen eyelids and no corneal haziness

- Sodium chloride 0.9%, eye washes, immediately then 2–3 hourly, until discharge clears.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose.

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI):**		**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	
>2–2.5 kg	100 mg	0.8 mL	0.4 mL	>34–36 weeks
>2.5–3.5 kg	150 mg	1.2 mL	0.6 mL	>36 weeks–1 month
>3.5–5.5 kg	200 mg	1.6 mL	0.8 mL	>1–3 months

Follow up in one day.

Abundant purulent discharge and/or swollen eyelids and/or corneal haziness:

- Sodium chloride 0.9%, eye washes, immediately then hourly until referral.

AND

- Ceftriaxone, IM, 50 mg/kg immediately as a single dose, and refer.

Weight kg	**Dose** mg	**Use one of the following injections mixed with water for injection (WFI):**		**Age** Months/years
		250 mg/2 mL (250 mg diluted in 2 mL WFI)	500 mg/2 mL (500 mg diluted in 2 mL WFI)	
>2–2.5 kg	100 mg	0.8 mL	0.4 mL	>34–36 weeks
>2.5–3.5 kg	150 mg	1.2 mL	0.6 mL	>36 weeks–1 month
>3.5–5.5 kg	200 mg	1.6 mL	0.8 mL	>1–3 months

CAUTION
USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.
» Always include dose and route of administration of ceftriaxone in the referral letter.

Treat both parents of newborn babies who develop purulent conjunctivitis after 24 hours of birth for *N. gonorrhoeae* and Chlamydia.

Parents:

- Ceftriaxone, IM, 250 mg as a single dose.
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

AND

- Azithromycin, oral, 1 g as a single dose.

REFERRAL

Urgent

» All neonates with abundant purulent discharge and/ or swollen eyelids and/or corneal haziness.
» Neonate unresponsive to treatment within 2 days.

18.1.4 CONJUNCTIVITIS, VIRAL (PINK EYE)

B30.1/B30.9 + (H13.1)

DESCRIPTION

A highly contagious, viral infection, which is spread by contact with:

» hands
» face cloths
» towels

It may start in one eye, spreading to the other. More commonly both eyes are infected. Viral conjunctivitis may be associated with an upper respiratory tract infection.

Common symptoms include:

» A burning, itching, sandy, or gritty feeling in the eyes, often described as being painful.

» Photophobia.
» Watery discharge (a yellow discharge indicates a secondary bacterial infection).
» Diffuse pink or red conjunctivae, which may become haemorrhagic.
» Enlarged pre-auricular lymph node.

The cornea, iris and pupil are completely normal with normal visual acuity.

The condition is self-limiting but eye irritation and discharge may get worse for the first week depending on the specific virus. Duration varies from 3-5 days to 2-3 weeks before resolution.

GENERAL MEASURES

» Advise on correct cleansing or rinsing of eyes with clean water.
» Cold compresses for symptomatic relief.

MEDICINE TREATMENT

Children >6 years of age and adults

- Oxymetazoline 0.025%, eye drops, instil 1drop 6 hourly for a maximum of 7 days to reduce redness of eyes.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 500 mg -1 g 4–6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL

» No response after 5 days.
» A unilateral red eye for more than one day.
» Suspected herpes conjunctivitis.
» Loss of vision.
» Irregularity of pupil.
» Haziness of the cornea.
» Persistent painful eye.

18.2 CORNEAL ULCER

H16.0

DESCRIPTION

Corneal ulcers may be caused by an infection, a foreign body, abrasions on the eye surface, severely dry eye or wearing contact lenses that are left in overnight.
Presents with:

» Blurring of vision.
» Photophobia.
» Very painful and watery eye.

» White patch/es on the cornea.
» Inflamed conjunctiva.

Herpes virus causes a branching (dendritic) ulcer which can recur and relapse over the lifetime of an individual.

GENERAL MEASURES

» Establish the cause, to determine likelihood of a foreign body.
» Remove any foreign body if visible on sclera or conjunctivae with cotton bud.
» Stain with fluorescein to reveal corneal foreign body or conditions such as abrasion or dendritic ulcer.
» Cover injured eye with eye pad, provided there is no pressure on the eye.

MEDICINE TREATMENT

If referral is deferred and a culture cannot be done within 12 hours:

- Chloramphenicol 1%, ophthalmic ointment applied 6 hourly. *LoE:III*[4]

REFERRAL

Urgent within 12 hours

All patients.

18.3 EYE INJURIES

18.3.1 EYE INJURY, CHEMICAL BURN

T26.9 + (X49.99)

This is a medical emergency.

DESCRIPTION

Damage to one or both eyes caused by contact with irritating chemical substances e.g. alkali or acid.

Presents with:

» pain
» inability to open eye
» blurred vision
» excessive teary and watery eye

GENERAL MEASURES

» Irrigate or wash the eye immediately and continuously with sterile water or sodium chloride 0.9% for at least 30 minutes (1-3 L of fluid) and until pH of the ocular surface has returned to approximately 7.4. A urine dipstick can be used to measure this when gently placed at the lateral canthus of the eye. Recheck the pH 5 minutes after completing irrigation to ensure it remains normal. Continue irrigation if the pH becomes abnormal again. If repeatedly abnormal after cessation of irrigation, check for retained debris and remove gently with a cotton bud.
» In severe alkaline burn cases, irrigation should be prolonged further.
» Ensure that eye is irrigated so that the fluid runs away from the unaffected side (ie. nasal to lateral).

LoE:III[5]

MEDICINE TREATMENT

Local anaesthetic if needed:

- Tetracaine 1% eye drops, instil 1 drop in the affected eye(s). Can be repeated if needed.
  - Repeat irrigation of the eye.
  - Evert upper eyelid and remove debris with cotton bud.
  - Never give anaesthetic drops to the patient to take home as they can cause blindness if used too often.
- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 500 mg - 1 g 4–6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

REFERRAL

All cases within 12 hours.

18.3.2 EYE INJURY, FOREIGN BODIES

S05.9+(Y34.99)

Many foreign objects that enter the conjunctiva are the result of mishaps that occur during everyday activities e.g. eyelashes, dust, dirt, sand.

Foreign objects that enter the eye at high rate of speed pose the highest risk of injury and may embed in the eye especially the cornea, or may penetrate into the eyeball. This often follows welding, grinding or hammering metal without wearing a protective eye visor or spectacles.

DESCRIPTION

» Disturbance of vision.
» Complaints of foreign body in the eye that may not be visible.
» Pain and lacrimation.
» Metallic foreign body embedded in the cornea appears as a cloudy spot with a dark speck (the metal splinter) in the centre.

GENERAL MEASURES

» If the foreign body is not embedded, irrigate eye with sterile water or sodium chloride 0.9%.
» Remove any foreign body if visible on sclera or conjunctivae with moist cotton bud.
» Stain with fluorescein to reveal corneal foreign body if it is not obvious.
» Consider X-ray of orbit (with frontal and lateral views) to exclude intra-ocular metallic foreign body if the mechanism is projectile in nature.

MEDICINE TREATMENT

Local anaesthetic if needed:

- Tetracaine 1% eye drops, instil 1 drop in the affected eye(s), before removal of the foreign body.
  - Apply an eye shield until the anaesthetic effect wears off.
  - Never give anaesthetic drops to the patient to take home.

LoE:III

Prophylactic antibiotics:

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 5 days.

LoE:III[6]

REFERRAL

» Any embedded or penetrating foreign body.
» Failure to remove a visible foreign body.
» Suspected intraocular foreign body.

18.3.3 EYE INJURY, BLUNT OR PENETRATING

S05.9+(Y34.99)

DESCRIPTION

Eye injuries can be caused by high speed flying objects e.g. pieces of wood, glass, stone and other materials or by blunt trauma e.g. sporting balls, blow from a fist, facial trauma in a MVA. Injuries include conjunctival/corneal lacerations, haematoma, orbital fracture and penetrating open-globe injuries with prolapse of eye contents.

Check for:

» Visual loss, hyphema, lacerations.
» Perforation e.g. teardrop-shaped pupil indicating uveal prolapse.
» Muscular entrapment associated with a fracture of the orbital bones limiting vision in one direction.

GENERAL MEASURES

» Apply an eye shield only. Avoid using pressure patching which increases the risk of intraocular infection.

MEDICINE TREATMENT

Deep corneal or scleral injuries:

Cover with an eye shield and refer immediately.

If immediate referral is not possible, while awaiting transfer:

- Atropine, 1%, drops, instilled immediately.
- Chloramphenicol 1%, ophthalmic ointment applied immediately.

Pain:

Children

- Paracetamol, oral, 10–15 mg/kg/dose 6 hourly when required. See dosing table, pg 23.8.

Adults

- Paracetamol, oral, 500 mg - 1 g 4–6 hourly when required (to a maximum of 4 g in 24 hours).
  - Maximum dose: 15 mg/kg/dose.

CAUTION
Review the problem daily.
Do not use an eye pad if there is ecchymosis, lid oedema or bleeding.

REFERRAL

Immediately:

» If the foreign body cannot be removed or an intraocular foreign body is suspected.
» Laceration, perforation or diffuse damage to the cornea or sclera.
» Damage to other structures of the eye, including the eyelid edge.
» Visual abnormalities or limitation of movement of the eye.

18.4 GLAUCOMA, ACUTE AND CLOSED ANGLE

H40.0-6/H40.8-9

DESCRIPTION

Acute closed angle glaucoma is damage to the optic nerve caused by raised intra-ocular pressure. This may result in loss of vision usually in one eye.
Clinical features:

» pupil is moderately dilated and may be oval in shape
» corneal haziness
» pericorneal conjunctival inflammation
» sudden onset of extremely severe, bursting pain and eye redness
» a unilateral, temporal headache, after being exposed to a period of darkness, e.g. in a cinema
» coloured haloes around lights (bright rings)
» eye feels hard, compared to the other eye, when measured with finger palpation (this is not an accurate test)
» severe pain in eye (acute)
» nausea and vomiting in severe cases

Note: The more common chronic open angle glaucoma is usually without symptoms.

Emergency medicine treatment before referral (Doctor prescribed)

- Acetazolamide, oral, 500 mg, immediately, followed by 250 mg 6 hourly until referred.

REFERRAL

Urgent

All patients to an ophthalmologist within 12 hours.

18.5 PAINFUL RED EYE

H57.1

DESCRIPTION

Pain and redness in one eye only, indicates inflammation of the anterior structures of the eye.

Exclude bacterial or viral conjunctivitis (often bilateral and associated with irritation, rather than pain).

Consider acute closed angle glaucoma and manage appropriately. See Section 18.4: Glaucoma, acute and closed angle.

REFERRAL

Urgent within 12–24 hours:

- All patients (excluding those with conjunctivitis):
  - Single painful red eye.
  - Corneal ulceration including herpes infection.
  - Sudden loss or change in vision, including blurred or reduced vision.
  - Sudden onset of visual problems, associated with dizziness, weakness on either one or both sides, difficulty speaking or swallowing (possible stroke; see Section 15.1: Stroke).
  - Foreign body associated with welding or grinding.
  - Chemical burn (see Section 18.3.1: Eye injury, chemical burn).
  - Whole eyelid swollen, red and painful (consider orbital cellulitis).
  - Coloured haloes around light, dilated oval pupil, headache, nausea, vomiting (possible glaucoma; see Section 18.4: Glaucoma, acute and closed angle).

18.6 STRUCTURAL ABNORMALITIES OF THE EYE

H02.0-1/H02.4/Q10.0-2

These include:

- eyelashes rubbing on the cornea (trichiasis)
- eyelids bent into the eye (entropion)
- eyelids bent out too much (ectropion)
- ptosis (drooping eyelid)

REFERRAL

All patients.

18.7 VISUAL PROBLEMS

H53.0-6/H53.8-9/H54.0-7/H54.9

DESCRIPTION

Visual problems may be due to refractive errors, or damage to the eye or optic nerve. This may be an indication of underlying disease such as diabetes or hypertension.

Assessment

Look for abnormalities of the eye.

Determine visual acuity accurately in both eyes by using the Snellen chart.

If vision is diminished (less than 6/12) perform the following tests:

» Pin hole test
  - Make a hole of about 1 mm wide in a piece of dark/black paper– you can push a hole in paper or card with a pen tip.
  - Ask the patient to look through this hole at the Snellen chart.
  - If vision improves, this means that the patient has a refractive error.

» Red reflex test

The patient looks past the examiner's head focussing on a distant target.
  - With the ophthalmoscope at 0 (zero) the examiner keeps it close to his eye and then focuses the beam of light so that it falls on the pupillary area of the cornea.
  - The examiner stands about 60 cm away from the patient.
  - In normal individuals, the examiner should be able to see a red or pink colour (reflex) through the pupil which comes from the retina.

Significance of an absent red reflex.

If there is a history of trauma or diabetes the absence of a red reflex is probably due to:

» retinal detachment
» a vitreous or internal haemorrhage
» mature cataract

If there are cataracts one usually sees:

» black shadows against the red reflex in immature cataracts, or
» absence of red reflex in mature cataracts.

In a patient > 50 years of age with no history of trauma, diabetes or previous eye disease, an absent red reflex is often due to cataract formation, especially with decreased visual acuity.

Note: Associated diabetes or hypertension should be adequately managed with referral, as surgery can only be considered with appropriately managed disease.

REFERRAL

Urgent: within 12–24 hours

» Sudden visual loss in one or both eyes.
» Pain or redness in one eye only especially with visual and pupil abnormalities.
» Recent proptosis of one or both eyes or enlargement of the eye (buphthalmos/glaucoma) in children.
» Hazy cornea in children.
» Unilateral watery eye.

Within days

» Squint of recent onset.
» Suspected or previously diagnosed glaucoma.
» Double vision following recent injury might indicate orbital fracture.
» Leucokoria (white reflex from the pupil).
» Squint at any age if not previously investigated by ophthalmologist.
» Visual loss in patients with systemic disease such as diabetes.

Non-urgent referral

» Cataracts.
» Refractive errors.
» Long-standing blindness – first visit to health facility.

References:

[1] Yeu E, Hauswirth S. A Review of the Differential Diagnosis of Acute Infectious Conjunctivitis: Implications for Treatment and Management. Clin Ophthalmol. 2020 Mar 12;14:805-813. doi: 10.2147/OPTH.S236571. PMID: 32210533; PMCID: PMC7075432.

[2] Anti-allergic eye drops: Castillo M, Scott NW, Mustafa MZ, Mustafa MS, Azuara-Blanco A. Topical antihistamines and mast cell stabilisers for treating seasonal and perennial allergic conjunctivitis. Cochrane Database Syst Rev. 2015 Jun 1;(6):CD009566. https://www.ncbi.nlm.nih.gov/pubmed/26028608

Anti-allergic eye drops: Varu DM, Rhee MK, Akpek EK, Amescua G, Farid M, Garcia-Ferrer FJ, Lin A, Musch DC, Mah FS, Dunn SP; American Academy of Ophthalmology Preferred Practice Pattern Cornea and External Disease Panel. Conjunctivitis Preferred Practice Pattern®. Ophthalmology. 2019 Jan;126(1):P94-P169. https://www.ncbi.nlm.nih.gov/pubmed/30366797

[3] Anti-allergic eye drops: Castillo M, Scott NW, Mustafa MZ, Mustafa MS, Azuara-Blanco A. Topical antihistamines and mast cell stabilisers for treating seasonal and perennial allergic conjunctivitis. Cochrane Database Syst Rev. 2015 Jun 1;(6):CD009566. https://www.ncbi.nlm.nih.gov/pubmed/26028608

Anti-allergic eye drops: Varu DM, Rhee MK, Akpek EK, Amescua G, Farid M, Garcia-Ferrer FJ, Lin A, Musch DC, Mah FS, Dunn SP; American Academy of Ophthalmology Preferred Practice Pattern Cornea and External Disease Panel. Conjunctivitis Preferred Practice Pattern®. Ophthalmology. 2019 Jan;126(1):P94-P169. https://www.ncbi.nlm.nih.gov/pubmed/30366797

[4] Chloramphenicol, ophthalmic ointment: WHO Guidelines for the Management of Corneal Ulcer at Primary, Secondary and Tertiary Care Health Facilities in the South-East Asia Region, 2004. http://apps.searo.who.int/pds_docs/B3516.pdf

[5] Sharma, N., Kaur, M., Agarwal, T., Sangwan, V.S. and Vajpayee, R.B., 2018. Treatment of acute ocular chemical burns. *Survey of ophthalmology*, *63*(2), pp.214-235.

[6] Chloampenicol eye oint (Duration of treatment) : Product Information. Chloramphenicol 1% eye ointment. Martindale Pharmaceuticals Ltd. Last revised 29/03/2022 Chloramphenicol 1.0% w/w Antibiotic Eye Ointment - Summary of Product Characteristics (SmPC) - (emc) (medicines.org.uk).

Chapter 19

SOUTH AFRICAN PRIMARY HEALTHCARE LEVEL ESSENTIAL MEDICINES LIST
PHC CHAPTER 18: EYE CONDITIONS
NEMLC RECOMMEDATIONS FOR MEDICINE AMENDMENTS (2020-4 REVIEW CYCLE)

Medicine amendment recommendations, with supporting evidence and rationale are listed below.
Kindly review the medicine amendments in the context of the respective standard treatment guideline (STG).
All reviews and costing reports may be accessed at**:** https://www.health.gov.za/nhi-edp-stgs-eml/
Note that the associated EML chapter has been subjected to subsequent clinical editing. These editorial amendments may not be reflected in the report below.

A: MEDICINE AMENDMENTS

SECTION	MEDICINE/MANAGEMENT	ADDED/DELETED/AMENDED/NOT ADDED/RETAINED
Eye chapter	Consultation with specialists	Editorial guidance - ADDED
18.1 Conjunctivitis	Clinical features for differential diagnosis	ADDED
18.1.1 Conjunctivitis, allergic	Description	Editorial amendment
	Medicine treatment – oxymetazoline 0.025% eye drops	Dose amended
	Medicine treatment - Olopatidine eye drops:	Not added (on TI database)
	Medicine treatment – antihistamines	Caution in children <2yrs - DELETED
18.1.2 Conjunctivitis, bacterial (excluding conjunctivitis of the newborn)	Medicine treatment – paracetamol:	Guidance amended
	Gonococcal conjunctivitis	Guidance ADDED
	Referral	Criteria ADDED
18.1.3 Conjunctivitis of the newborn	Medicine treatment - ceftriaxone	Dose RETAINED
	Caution with IV administration	AMENDED
18.1.4 Conjunctivitis, viral (pink eye)	Description	Guidance – ADDED/AMENDED
	Medicine treatment – oxymetazoline eye drops	Indication clarified
	Medicine treatment – paracetamol	Guidance amended
18.3.1 Eye Injury, chemical burn	General measures	Guidance amended
	Medicine treatment – tetracaine 1% eye drop	Guidance amended
	Medicine treatment – paracetamol:	Guidance amended
	Medicine treatment – oxybuprocaine 0.4%	Retained
	Medicine treatment – tetracaine 1%:	Added to TI database
18.3.2 Eye Injury, foreign bodies	General measures	Guidance amended
	Medicine treatment – chloramphenicol:	Added
	Medicine treatment – oxybuprocaine 0.4%	Retained
	Medicine treatment – tetracaine 1% eye drop	Added to TI database

18. EYE CHAPTER

Consultation with specialists: *Guidance added*
The following guidance has been added to the chapter to mitigate delays with referring patients for specialist care:

For many eye conditions early specialist consultation and advice is required. To mitigate delays in referral it is recommended that electronic consultation methods are utilised with transmission of appropriate images so that appropiate treament can be initiated before referral.

18.1 CONJUNCTIVITIS

Clinical features for differential diagnosis: *Added*

The table below was added as an aid to the differential diagnosis of acute conjunctivitis:

Likely cause	Conjunctival	Itching	Discharge	Lymphadenopathy	Fever & sore throat
Viral (adenoviral, HSV, VZV)	Follicular***	Minimal	Watery	Common	Common
Bacterial	Papillary**	Minimal	Purulent*	Uncommon	Occasionally
Chlamydial	Follicular***	Minimal	Purulent*	Common	No
Allergic	Papillary with chemosis (blister-like swelling of the conjunctiva)	Severe	Watery Mucoid	None	No

*Mucopurulent for nongonococcal and chlamydial infections and hyperpurulent for gonococcal infections.
**PAPILLARY CONJUNCTIVITIS: Papillae are elevations of the conjunctival tissue so there is usually a red central vascular core to the lesions which appear as distinct, well separated bumps.
***FOLLICULAR CONJUNCTIVITIS: Follicles have a larger appearance than papillae and have a white central core which is indicative of a local immune reaction i.e. accumulation of inflammatory agents (e.g. lymphocytes, macrophages) at a cellular level

Adapted from Yeu E et al. A review of the differential diagnosis of acute conjunctivitis: implications for treatment and management. Clinical Ophthalmology 2020

Table 1: Clinical features of suspected acute conjunctivitis

18.1.1 CONJUNCTIVITIS, ALLERGIC

Description: *editorial amendments*

The following editorial amendments were made to the description:

In ~~chronic~~ cases of vernal keratoconjunctivitis (VKC), there may be brown discolouration of the conjunctivae or cobblestone elevations of the upper tarsal conjunctivae ~~(vernal keratoconjunctivitis)~~ .

Medicine treatment – oxymetazoline: *dose amended*

External comment received that the dose of oxymetazoline 0.025% eye drops be amended from 1-2 drops 6 hourly to 1 drop 6 hourly. This amended was supported by the Committee in accordance with general guidance on the administration of eye drops and the maximum volume that can be accommodated for in the eye in a single administration.

Medicine treatment - Olopatidine eye drops: *Not added*

Olopatidine has not been added to the EML. It is included on the TI database as an alternative to sodium cromoglycate for allergic conjunctivitis.

Medicine treatment - antihistamines*: caution in children <2 years deleted*

The caution against using oral antihistamines in children under 2 years of age was removed in alignment with other PHC chapters e.g. PHC Chapter 5 and the Paediatric EML.

~~**CAUTION**~~

~~Do not give an antihistamine to children < 2 years of age.~~

18.1.2 CONJUNCTIVITIS, BACTERIAL (EXCLUDING CONJUNCTIVITIS OF THE NEWBORN)

Medicine treatment - paracetamol: *Guidance amended*

The dosing guidance for paracetamol for pain management has been aligned to guidance included in the PHC and AH Pain chapters. The chapter has been updated where relevant as tabulated below:

AMENDED FROM:

For pain:

- Paracetamol, oral, 1 g 4–6 hourly when required.
  - Maximum dose: 15 mg/kg/dose.

- Maximum daily dose: 4 g in 24 hours.

AMENDED TO:

For pain:

Paracetamol, oral, 500mg -1 g 4–6 hourly when required (to a maximum of 4 g in 24 hours)

- Maximum dose: 15 mg/kg/dose.

Gonococcal conjunctivitis: *guidance added*

Guidance on the management of gonococcal conjunctivitis was added as tabulated below:

Gonococcal Conjunctivitis:

Hyperacute bacterial conjunctivitis involves rapid onset and progression of conjunctivitis with a hyperpurulent discharge, and is often caused by N.gonorrhoeae. Gonococcal conjunctivitis requires immediate treatment and referral to an ophthalmologist to prevent corneal involvement and potential perforation.

MEDICINE TREATMENT

Neonates

Refer to Section 18.1.3 Conjunctivitis of the newborn

Children 1 month to 11 years:

- Ceftriaxone, IM,
  - < 45 kg: 125 mg, IM, as a single dose:
  - ≥ 45 kg: 250 mg, IM, as a single dose

Adults and children 12 years and older

- Ceftriaxone, IM, 250 mg as a single dose.
  - For ceftriaxone IM injection: Dissolve ceftriaxone 250 mg in 0.9 mL lidocaine 1% without epinephrine (adrenaline).

AND

- Azithromycin, oral, 1 g as a single dose.

Refer to Section 12.3 Sexually transmitted infections for further detail

Referral: *criteria added*

The following statement was added to the referral criteria for bacterial conjunctivitis: *'Suspected or confirmed gonococcal conjunctivitis'*

18.1.3 CONJUNCTIVITIS OF THE NEWBORN

Medicine treatment - ceftriaxone: *doses retained*

Following consultation with the Paediatric ERC, it was agreed that the ceftriaxone dose of 50mg/kg IM stat, be retained for conjunctivitis of the newborn.

Medicine treatment – caution: *amended*

The cautions with using IV ceftriaxone in neonates and children has been amended as these cautions are not relevant to IM administration. The text has been amended editorially as tabulated below:

CAUTION: USE OF CEFTRIAXONE IN NEONATES AND CHILDREN

» If *SUSPECTING SERIOUS BACTERIAL INFECTION* in neonate, give ceftriaxone, even if jaundiced.

~~» Avoid giving calcium-containing IV fluids (e.g. Ringer Lactate) together with ceftriaxone:~~

- ~~If ≤ 28 days old, avoid calcium-containing IV fluids for 48 hours after ceftriaxone administered.~~
- ~~If > 28 days old, ceftriaxone and calcium-containing IV fluids may be given sequentially provided the giving set is flushed thoroughly with sodium chloride 0.9% before and after.~~

» ~~Preferably administer IV fluids without calcium contents~~

» Always include dose and route of administration of ceftriaxone in the referral letter.

18.1.4 CONJUNCTIVITIS, VIRAL (PINK EYE)

Description: *Guidance added/amended*

Guidance on the description and management of pink eye was amended as tabulated below:

DESCRIPTION

A highly contagious, viral infection, which is spread by contact with:

- hands
- face cloths
- towels

It may start in one eye, spreading to the other. More commonly both eyes are infected.
Viral conjunctivitis may be associated with an upper respiratory tract infection.

Common symptoms include

» A burning, itching, sandy, or gritty feeling in the eyes, often described as being painful

~~» sore eyes, feeling of itching or burning, often described as being painful~~

» Photophobia

» Watery discharge (a yellow discharge indicates a secondary bacterial infection)

» Diffuse pink or red conjunctivae, which may become haemorrhagic

» Enlarged pre-auricular lymph node

The cornea, iris and pupil are completely normal with normal visual acuity.

The condition is self-limiting but eye irritation and discharge may get worse for the first week depending on the specific virus. Duration varies from 3-5 days to 2-3 weeks before resolution.

Medicine treatment - oxymetazoline: *indication clarified*

The following statement was amended to clarify that the use of oxymetazoline (a vasoconstrictor), is intended as symptomatic management of redness of the eye only and the dose amended to 1 drop: *"Oxymetazoline 0.025%, eye drops, instil 1 drop 6 hourly for a maximum of 7 days to reduce redness of eyes.'*

Medicine treatment – paracetamol: *Guidance amended*

Dosing guidance on the administration of paracetamol in adults has been updated in alignment with the PHC and AH Pain chapters as tabulated below:

Amended from:

Adults
Paracetamol, oral, 1 g 4–6 hourly when required.

- Maximum dose: 15 mg/kg/dose.
- Maximum dose: 4 g in 24 hours.

Amended to:

Adults
Paracetamol, oral, 500 mg - 1 g 4–6 hourly when required (to a maximum of 4 g in 24 hours).

- Maximum dose: 15 mg/kg/dose.

18.3 EYE INJURIES

18.3.1 EYE INJURY, CHEMICAL BURN

General measures: *Guidance amended*

External comment received on guidance for eye irrigation following chemical burns. This updated guidance was supported by the Committee with updates to the EMLC as tabulated below:

AMENDED FROM:

GENERAL MEASURES

Irrigate or wash the eye immediately and continuously with clean water or sodium chloride 0.9% for at least 20 minutes.
In severe alkaline burn cases, irrigation should be prolonged further.

AMENDED TO:

GENERAL MEASURES

- » Irrigate or wash the eye immediately and continuously with sterile water or sodium chloride 0.9% for at least 30 minutes (1-3L of fluid) and until pH of the ocular surface has returned to approximately 7.4. A urine dipstick can be used to measure this when gently placed at the lateral canthus of the eye. Recheck the pH 5 minutes after completing irrigation to ensure it remains normal. Continue irrigation if the pH becomes abnormal again. If repeatedly abnormal after cessation of irrigation, check for retained debris and remove gently with a cotton bud.
- » In severe alkaline burn cases, irrigation should be prolonged further.
- » Ensure that eye is irrigated so that the fluid runs away from the unaffected side (ie. Nasal to lateral).

Medicine treatment – tetracaine 1% eye drop: *Guidance amended*

Guidance on the administration of tetracaine eye drops 1% has been amended to indicate that administration can be repeated if required.

Medicine treatment – paracetamol: *Guidance amended*

Dosing guidance on the administration of paracetamol in adults has been updated in alignment with the PHC and AH Pain chapters and Section 18.1.4 above.

Medicine treatment – oxybuprocaine 0.4%: *Retained*

Medicine treatment – tetracaine 1%: *Added to TI database*

The Committee support the addition of oxybuprocaine to the PHC therapeutic interchange (TI) database in alignment with the AH TI database.

AH Chp 18 Eye: NEMLC report 2019-19 Review Cycle[1]

Local anaesthetics

Oxybuprocaine 0.4% ophthalmic solution: *retained*

Tetracaine 1%, ophthalmic solution: *therapeutic alternative added to Adult Hospital Level therapeutic class spreadsheet*

Available evidence of very low quality (n=14) showed that there was no significant difference in anaesthesia was found between the agents at each time point over 30 minutes[28]. These agents included:

- oxybuprocaine (benoxinate) - *available on South African market*
- proxymetacaine
- amethocaine (tetracaine) – *available on South African market*

18.3.2 EYE INJURY, FOREIGN BODIES

General measures: *Guidance amended*

Editorial amendments have been made as tabulated below in response to external comments received:

Amended from:

GENERAL MEASURES

- » If the foreign body is not embedded, irrigate eye with clean water or sodium chloride 0.9%.
- » Remove any foreign body if visible on sclera or conjunctivae with moist cotton bud.
- » Stain with fluorescein to reveal corneal foreign body if it is not obvious.
- » Consider X-ray of orbit to exclude intra-ocular metallic foreign body.

Amended to:

GENERAL MEASURES

- » If the foreign body is not embedded, irrigate eye with sterile water or sodium chloride 0.9%.
- » Remove any foreign body if visible on sclera or conjunctivae with moist cotton bud.
- » Stain with fluorescein to reveal corneal foreign body if it is not obvious.
- » Consider X-ray of orbit (with frontal and lateral views) to exclude intra-ocular metallic foreign body if the mechanism is projectile in nature.

[1] NEMLC Report AH Chp 19 Eye_2017-19 Review Cycle.

Medicine treatment – chloramphenicol: *Added*

External comment received to include chloramphenicol 1% ophthalmic ointment for 6 hourly application as prophylaxis following foreign body related eye injuries. This addition was supported by the Committee and informed by expert opinion. The treatment duration of 5 days was informed by guidance in the technical product information[2]. Amendments to the STG are as tabulated below:

AMENDED FROM:

MEDICINE TREATMENT

Local anaesthetic if needed:

Tetracaine1% eye drops, instil 1 drop in the affected eye(s), before removal of the foreign body.
Apply an eye shield until the anaesthetic effect wears off.
Never give anaesthetic drops to the patient to take home

AMENDED TO:

MEDICINE TREATMENT

Local anaesthetic if needed:

- Tetracaine 1% eye drops, instil 1 drop in the affected eye(s), before removal of the foreign body.
  - Apply an eye shield until the anaesthetic effect wears off.
  - Never give anaesthetic drops to the patient to take home.

Prophylactic antibiotics:

- Chloramphenicol 1%, ophthalmic ointment, applied 6 hourly for 5 days.

Medicine treatment – oxybuprocaine 0.4%: *Retained*

Medicine treatment – tetracaine 1%: *Added to TI database*

The Committee support the addition of tetracaine 1% to the PHC therapeutic interchange (TI) database in alignment with the AH TI database[3] and Section 18.3.1 above.

18.3.3 EYE INJURY, BLUNT OR PENETRATING

Medicine treatment – paracetamol: *Guidance amended*

Dosing guidance on the administration of paracetamol in adults has been updated in alignment with the PHC and AH Pain chapters and Section 18.1.4 above.

REQUEST FOR NEW STGs

External comments have been received motivating for the development of new STGs for both the PHC and AH Eye chapters. The Eye chapters have been identified for priority review in the next review cycle. The following will be considered for prioritization in the PHC Eye chapter:

» Vernal Keratoconjunctivitis (VKC)

[2] Product Information. Chloramphenicol 1% eye ointment. Martindale Pharmaceuticals Ltd. Last revised 29/03/2022 Chloramphenicol 1.0% w/w Antibiotic Eye Ointment - Summary of Product Characteristics (SmPC) - (emc) (medicines.org.uk).

[3] NEMLC Report AH Chp 19 Eye_2017-19 Review Cycle.