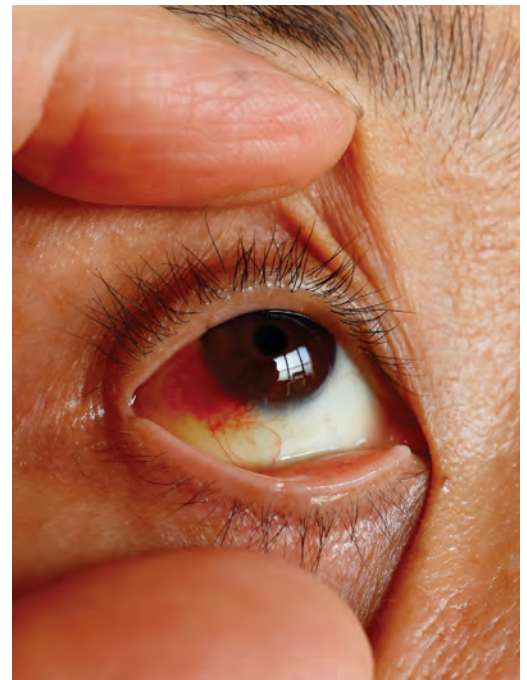


Ophthalmic trauma:

First-line management in primary care



**Christine Tan, Morgan Rayner,
Carl Eiselen, Elaine W Chong, Alp Atik**

Background

Eye trauma ranges from minor injuries to vision-threatening emergencies and contributes substantially to acute care resources in Australia. Although ocular trauma represents a small proportion of primary care consultations, its potential for permanent visual loss underscores the need for prompt recognition and management.

Objective

To provide general practitioners (GPs) with a practical, evidence-based guide for first-line assessment and management of common ophthalmic trauma, aligned with The Royal Australian College of General Practitioners (RACGP) competencies and focused on safe triage, early intervention and recognition of red flags.

Discussion

Key presentations include chemical injuries, corneal abrasions, foreign bodies and blunt trauma. Red flags requiring urgent referral include open globe injuries and orbital compartment syndrome. This article highlights essential assessment tips, irrigation techniques, fluorescein use, eyelid eversion and referral criteria.

EYE TRAUMA PRESENTATIONS encompass a broad spectrum of injuries, from minor abrasions to sight-threatening emergencies (Table 1). National data from the Australian Institute of Health and Welfare (AIHW) shows that 86,602 patients presented to Australian emergency departments with eye trauma over a 2-year period,¹ highlighting its substantial footprint in acute care. In the general practice setting, general practitioner (GP) trainee datasets indicate that ophthalmological presentations comprised 1.4–1.9% of all issues managed, though this included non-traumatic eye conditions as well.² Eye injuries accounted for approximately 0.2% of all GP visits according to broader AIHW surveillance.³

Objective

This article aims to serve as a practical guide for the first-line management of ophthalmic trauma within primary care settings. It is designed to complement the key ophthalmic competencies outlined in The Royal Australian College of General Practitioners (RACGP) Curriculum for Australian General Practice, with a specific focus on acute ophthalmic assessment and care that can be confidently delivered within general practice to save sight.

Trauma history and examination

Cardinal features on history and examination are helpful to quickly triage the severity of injuries and streamline definitive management. The mechanism of injury should be understood (blunt, penetrating, high velocity, projectile, chemical or thermal), the timing of injury and whether personal protective equipment (PPE) was worn. Associated neurological and/or systemic or life-threatening injuries must first be excluded. Symptoms and signs include reduced vision, redness, discharge, pain, photophobia, flashes, floaters and diplopia. Examination should document best corrected visual acuity in both eyes, intraocular pressure (if available, normal range 10–20 mmHg), pupil size, shape and reactivity, eye movements (pain, diplopia), and visual fields. External inspection should assess for lid lacerations, bleeding (including subconjunctival haemorrhage and hyphaema), corneal injury (using fluorescein staining if available) and features suggestive of penetrating eye injury (PEI; refer section on open globe injuries). A trauma referral checklist is provided (Figure 1).

Common ophthalmic traumas

Chemical injuries

Chemical injuries can range from simple irritation to vision threatening. It is important to consider the mechanism of injury and whether there are other injuries.

Table 1. Common ophthalmic traumas, GP management and red flags for ophthalmological review

Condition	GP management	Red flags
Chemical injury (eg caustic soda)	• Immediate irrigation – do not delay • Check pH of both eyes, instill topical anaesthetic (eg tetracaine), irrigate copiously with 0.9% sodium chloride or BSS • Evert lids to flush and sweep fornices for particulate matter • Recheck pH of both eyes, 5 minutes after irrigation complete • Continue irrigation until pH normalises between 7.0 and 7.4 • Prescribe topical chloramphenicol QID for 1 week and regular lubrication, arrange follow up/referral depending on severity	• Alkaline substances are typically more damaging than acidic agents due to deeper penetrance of ocular tissues • Corneal haze or opacity indicate significant corneal injury • Beware the white eye; limbal ischaemia carries poor prognosis; loss of limbal stem cells impairs the cornea's ability to heal and regenerate • Check for associated injuries such as inhalation, facial burns • Paediatric cases should be referred early for ophthalmological assessment
Corneal abrasion	• Instill topical anaesthetic (eg tetracaine) • Evert the eyelid +/- sweep with a moist cotton bud to ensure no retained foreign body • Instill fluorescein dye to identify abrasions • Prescribe chloramphenicol QID for 1 week and regular lubrication • Review with optometrist or GP in 1 week to ensure healing and symptom resolution	• Any suspicion of penetrating globe injury • Contact lens wear because of increased risk of microbial keratitis • Cold sore history or dendritic lesion raising suspicion for herpetic eye disease • Reduced VA/large or central abrasion • Signs of infection such as white infiltrate, persistent pain or a non-healing epithelial defect
Corneal foreign body	• Instill topical anaesthetic (eg tetracaine) • Evert the eyelid +/- sweep with moist cotton bud • Instill fluorescein dye to identify abrasions • Remove foreign body with a moistened cotton tip or sterile needle under slit lamp magnification and good lighting • Re-stain with fluorescein dye to identify any new defects and ensure Seidel negative (no leak) • Initiate topical chloramphenicol QID for 1 week and arrange follow-up in 24–48 hours • Refer for removal of residual rust rings, retained foreign bodies, or if complete removal is not possible	• Any suspicion of penetrating eye injury • The foreign body is deeply embedded or centrally located overlying the visual axis • There is significant corneal damage or visual impairment • You are unable to remove the foreign body completely • Symptoms and signs of infection (eg white infiltrate, persistent pain, a non-healing epithelial defect)
Blunt trauma	• Careful history is essential to identify red flags such as flashes and floaters that might signal retinal injury or intraocular bleeding • Check VA, IOP if available, EOM, pupil size and reactivity (traumatic mydriasis) and examine for hyphaema, fluorescein staining to check for corneal abrasions or Seidel-positive leak suggestive of globe rupture/open globe injury	• Flashes, floaters +/- curtain in vision might indicate retinal injury or detachment • Abnormal pupil shape/reactivity or the presence of a hyphaema • Features concerning for orbital compartment syndrome; tight orbit, inability to open the eye, severe pain, diplopia, EOM restriction • Features concerning for orbital fracture including focal tenderness, infraorbital numbness, extraocular muscle entrapment, pain or diplopia
Open globe injuries	• Stop further examination/pressure • Do not remove protruding/retained foreign bodies • Rigid eye shield, nil by mouth, anti-emetics, analgesia, tetanus booster and urgent ophthalmology referral	• Irregular/peaked pupil, uveal/vitreous prolapse, Seidel positive 'waterfall' sign on fluorescein exam suggestive of open globe injury
Lid lacerations	• Exclude other associated intraocular injuries with slit lamp exam including fluorescein staining, and assess for other concurrent systemic injuries • Take clinical photographs with patient consent and discuss with relevant ophthalmological or surgical teams • Prescribe topical chloramphenicol ointment QID to reduce the risk of secondary infection +/- tetanus if indicated	• Lid margin involvement • Medial canthus/canalicular injury • Levator injury/ptosis • Bite wounds • Paediatric or suspected non-accidental injury/domestic violence

BSS, balanced salt solution; EOM, extraocular movements; GP, general practitioner; IOP, intraocular pressure; QID, four times a day; VA, visual acuity.

Trauma referral checklist

- ☒ Patient details
- ☒ Past ocular history (glasses or contact lens wear; surgeries, lasers, injections; previous eye trauma)
- ☒ Family history (glaucoma, retinal detachment)
- ☒ Past medical history
- ☒ Medications
- ☒ Allergies
- ☒ Social history (driving, occupation)

Trauma specifics:

- ☒ Mechanism of injury (blunt, sharp, high velocity, chemical, thermal)
- ☒ Date and time of injury
- ☒ Symptoms and signs
- ☒ Immediate management
- ☒ Contact details and logistics (patient and referrer)

Figure 1. Trauma referral checklist.

Burns to the face or body, inhalation injuries and paediatric cases should be urgently discussed with an ophthalmologist or hospital that can manage the associated injuries. Delayed presentations should be referred to ophthalmology directly, as the injury is likely to be more severe. The key steps in managing chemical injury are irrigation and rechecking pH (physiological range between 7.0 and 7.4) 5 minutes post-irrigation. Begin by checking pH of both eyes using universal indicator paper applied to the conjunctival fornices. Gently pull down the lower lid and check in the space between the lid and the globe.⁴ Be aware that alkali chemicals are more damaging than acidic chemicals due to deeper penetrance of ocular tissues.^{5,6} Instill topical anaesthetic drops (eg oxybuprocaine or tetracaine) and commence irrigation with normal saline or

a balanced salt solution. This can be done manually by flushing with saline tubes or bags, or via an intravenous (IV) giving set on full flow. If only tap water is available, the patient should irrigate continuously under a sink in the direction from the nose bridge to ear, so as not to allow the caustic substance to affect the other eye. The patient should look up, down, left and right throughout. The lid must be everted to flush and remove any particulate matter. Repeat topical anaesthesia as required.

Wait 5 minutes after ceasing irrigation and recheck pH. Always check pH of both eyes. Continue irrigation until pH normalises between 7.0 and 7.4. There is no limit to the volume of fluid required to normalise pH.⁷ If persistently abnormal, consider retained particulate matter. After pH has normalised, assess ocular

surface damage with instillation of fluorescein and document epithelial defects, absence of conjunctival or limbal blood vessels, eyelid involvement and visual acuity. The Roper-Hall classification is useful to grade corneal damage and degree of limbal ischaemia which correlates with severity and prognosis (Table 1).⁸⁻¹⁰

Red flags in ocular chemical injuries:

- High initial pH (alkali) burns: deeper penetrance of ocular tissues; requires prolonged irrigation
- Limbal ischaemia (vascular blanching): indicates severity; limbal stem cell loss carries poorer prognosis
- Delayed presentation: injury is likely to be more severe.

Post-irrigation management:

- Chloramphenicol ointment four times a day (QID) for 1 week
- Intensive lubrication
- Review every 1-2 days to ensure closure of epithelial defects and visual recovery
- Refer for review and/or obtain phone advice from local ophthalmology services.

Corneal abrasion

The cornea is densely innervated, and even minor abrasions can be intensely painful. Pain can often be out of proportion to the extent of the abrasion. Fluorescein staining confirms the diagnosis by revealing epithelial defects under cobalt blue light. Always evert the lid to exclude retained foreign bodies. Treatment includes topical chloramphenicol QID for 1 week and simple oral analgesia.

Topical anaesthetic drops are for examination only and are not prescribed because of their inhibitory effect on epithelial healing and potential for corneal melt with prolonged or excessive use.¹¹ Patients should be reassured that corneal abrasions typically heal within 24-48 hours. Until healing takes place, symptoms include pain, photophobia, epiphora, difficulty opening the eye and transient reduced vision. These are all expected to return to baseline in mild injuries once healing is complete. Patients should be followed up at the 1-week mark by a GP or optometrist. Injuries with suspicious mechanism for penetrating injury, or in contact lens wearers, require early ophthalmologist assessment.

Table 2. Roper-Hall classification system for chemical eye injuries^{8,9,10}

Grade	Corneal involvement	Limbal involvement	Prognosis
I	Corneal epithelial defect, no corneal haze	None	Good
II	Corneal epithelial defect with corneal haze, iris details still visible	<1/3	Good
III	Total epithelial loss, corneal haze, iris details obscured	1/3 to 1/2	Guarded
IV	Opaque cornea, iris and pupil obscured	>1/2	Poor

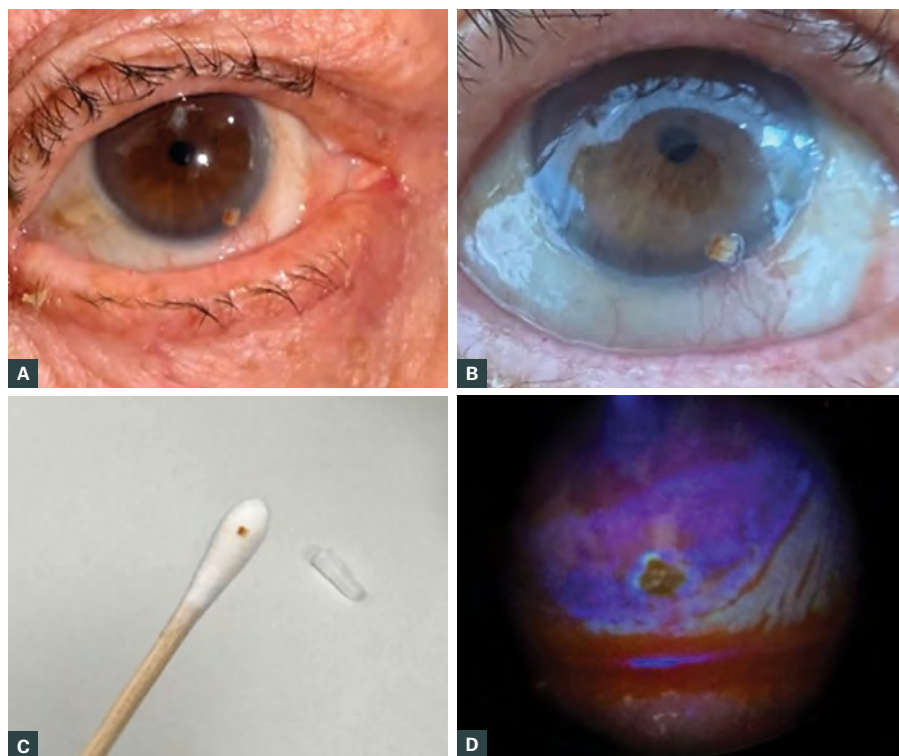


Figure 2. (A) Right eye showing a small retained corneal foreign body at the 5–6 o'clock region with associated peri-limbal injection. (B) Same eye from (A), photograph taken with higher magnification anterior segment photography. (C) After instillation of oxybuprocaine eye drops, the retained foreign body was completely removed at the slit lamp with a gentle swipe using an oxybuprocaine/saline soaked cotton tip. (D) Re-staining with fluorescein showing a $<1 \times 1$ mm residual epithelial defect, Seidel negative.

Corneal foreign body

Corneal foreign bodies are common and often manageable in general practice (Figure 2). Instill topical anaesthetic drops, examine with fluorescein under cobalt blue light and always evert the lid to exclude subtarsal material. Linear pattern corneal abrasions can signal the presence of subtarsal foreign bodies. Superficial foreign bodies might be gently removed with a moistened cotton tip or sterile needle under slit lamp magnification and good lighting. Saline flush can aid in removing debris. Always re-stain to check for an epithelial defect post-removal and ensure Seidel negative with no leakage of intraocular fluid (a positive Seidel sign is a red flag; this is a 'waterfall' or diluted streak of fluid seen with fluorescein under cobalt blue light, signaling full thickness defect; refer section on open globe injuries). Initiate topical

chloramphenicol QID for 1 week and arrange follow-up in 24–48 hours. A rust ring might be left with metallic foreign bodies and might require later removal with referral to ophthalmological services.

Red flags in corneal abrasion and/or corneal foreign body management

Ophthalmology referral is required if:

- There is suspicion of penetrating eye injury (eg sharp, high velocity injury or peaked pupil)
- The foreign body is deeply embedded or centrally located overlying the visual axis
- There is significant corneal damage or visual impairment
- You are unable to remove the foreign body completely
- There are symptoms and signs of infection (eg worsening pain, worsening vision,

photophobia, red eye, infiltrate/white opacity)

- There is prior ocular history including surgeries, injections and/or contact lens wear.

How to evert eyelids

To evert the upper lid, ask the patient to look down. With your non-dominant hand, gently grasp the upper eyelashes and pull the lid slightly away from the globe. Using a cotton bud in your dominant hand, press down above the tarsal plate and fold the lid upwards over the bud. Carefully inspect the palpebral conjunctiva and fornix for injuries and retained foreign bodies. Lower lid eversion is achieved by gently pulling the lid downwards.

Less common ophthalmic traumas

Blunt trauma

Blunt ocular trauma is often in relation to sporting injuries, particularly contact and ball sports (eg football, basketball, cricket, badminton and squash). In a study by Ashraf et al, it showed that of 1700 sports-related presentations, 54% were attributed to ball sports, with the top three sports overall being soccer, Australian rules football and basketball.¹² Common complications of blunt trauma include traumatic hyphaema and retinal dialysis.^{13,14} Traumatic hyphaema results from bleeding into the anterior chamber and carries risks of secondary glaucoma and corneal blood staining if accompanied by prolonged raised intraocular pressure (IOP). Retinal dialysis is a peripheral retinal tear, an important cause of retinal detachment in younger patients. Hyphaemas, changes to visual acuity, loss of red reflex or high velocity injuries should be referred to ophthalmology.

Open globe injuries

Open globe injuries or PEI are full-thickness breaches of the eye wall and constitute an ophthalmic emergency (Figure 3). Suspect in any penetrating or high velocity trauma, particularly with markedly reduced vision (eg hand movements or light perception only), peaked pupil, or visible prolapse of vitreous or uveal tissue. Tape a clear shield over the eye, give analgesia, antiemetics to prevent vomiting, and ensure nil by mouth. Administer tetanus booster if indicated. Refer urgently to ophthalmology.

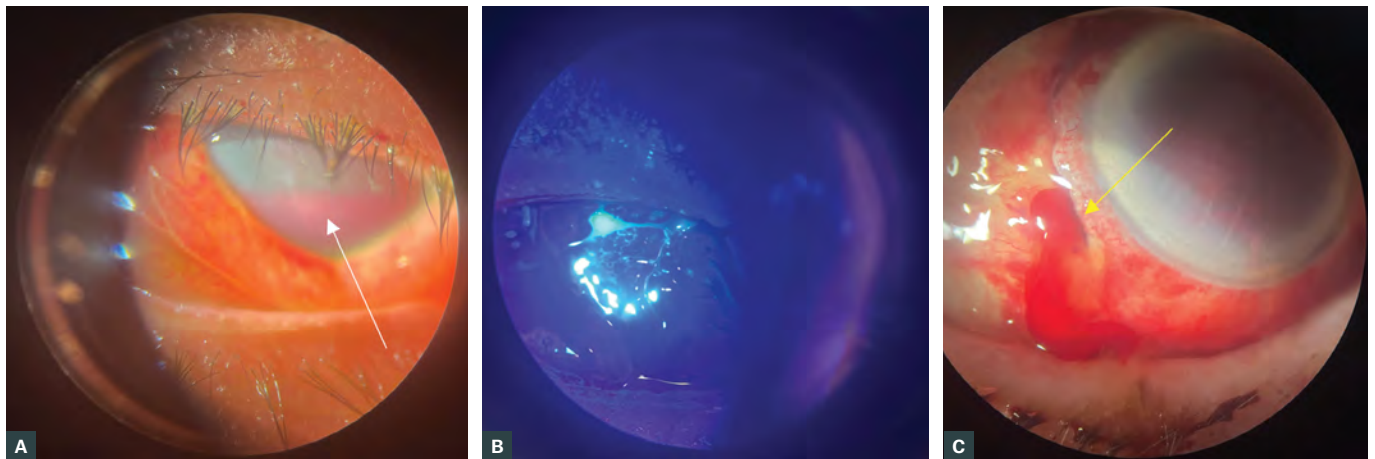


Figure 3. (A) Right eye photograph taken with a smartphone camera through a slit lamp eyepiece; open globe injury sustained after impact from a metal rake, primary wound at the lateral globe. A dense macrohyphaema (white arrow) is visible as well as corneal oedema. (B) Same eye from (A), fluorescein dye under cobalt blue light demonstrating a Seidel positive sign – appearing as a ‘waterfall’ of fluid signalling leakage of ocular fluids and open globe injury. (C) Left eye photograph of a different patient taken with a smartphone camera through a slit lamp eyepiece; globe rupture sustained from a mechanical fall with head strike, nasal rupture with extrusion of blood and uveal tissue (yellow arrow). Significant corneal oedema, Descemet’s folds and total hyphaema are also seen.

Emergency recognition of orbital compartment syndrome

Orbital compartment syndrome is caused by acutely raised intraorbital pressure and is a time critical diagnosis. Key signs include tight eyelids, raised IOP (often 40+ mmHg), eye muscle movement restriction, presence of relative afferent pupillary defect (RAPD; meaning on swinging light test abnormal pupil dilates when light is shone onto it) and proptosis. Refer urgently to

emergency department or to a center capable of performing a lateral canthotomy and cantholysis.

Lid lacerations

Lid lacerations involving the lid margin require referral and oculoplastics subspecialty input because of the risk of functional impairment (Figure 4). Remain vigilant for concurrent eye trauma, such as ensuring there is no associated corneal abrasion or PEI.

Paediatric eye trauma

Paediatric eye trauma should be discussed early and referred because of the vulnerability of younger eyes and risk of amblyopia. This poses consequences for learning and development when vision is affected at an early age. Statewide paediatric services and guidelines should be consulted and paediatric ophthalmology input obtained where possible. Where broader child safety or wellbeing concerns arise, escalate promptly and involve multidisciplinary care including social and legal services, especially in suspected non-accidental injury.

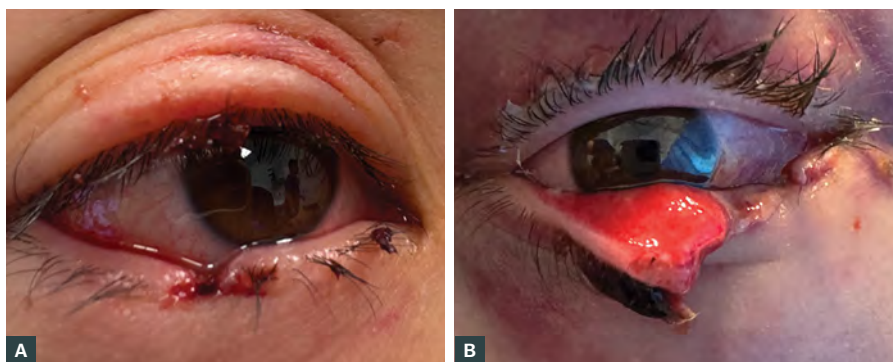


Figure 4. (A) Right lower lid full thickness laceration with wedge-shaped defect and loss of lashes. (B) Different patient, left lower lid full thickness laceration and de-gloving type injury with palpebral conjunctiva on show. Both cases (A) and (B) have intact medial canthus; the medial canthus is crucial as lacerations here carry risk of damaging canaliculi and injury to lacrimal apparatus.

Conclusion

Ophthalmic trauma presents a diverse array of challenges in primary care. While many injuries are manageable in the general practice setting, others require prompt recognition, initiation of time critical intervention and referral to tertiary services. By staying informed about common ocular injuries and utilising available resources (Box 1), GPs can deliver sight-saving care and significantly improve patient outcomes.

Box 1. Eye trauma resources for general practitioners

- **Eye emergency manual:** An illustrated guide,¹⁵ https://aci.health.nsw.gov.au/_data/assets/pdf_file/0013/155011/ACI-Eye-Emergency-Manual.pdf
- **Eye emergency app:** For medical, nursing and allied health staff in emergency departments, critical care and general practice,¹⁶ <https://aci.health.nsw.gov.au/networks/ophthalmology/eye-emergency-app>
- **Emergency department clinical practice guidelines:** The Royal Victorian Eye and Ear Hospital,¹⁷ <https://eyeandear.org.au/health-professionals/clinical-practice-guidelines>
- **Paediatric eye trauma:** Acute eye injury – Clinical practice guideline,¹⁸ www.rch.org.au/clinicalguide/guideline_index/Acute_eye_injury
- **Life in the fast lane:** Lateral canthotomy – instructional guide,^{19,20} <https://litfl.com/procedure-lateral-canthotomy>

Key points

- Exclude neurological injuries in head trauma first, if there is suspected eye injury.
- Always look at the ‘uninjured’ eye.
- Not all globe ruptures or PEIs are associated with low IOP.
- Always evert the eyelids with corneal foreign bodies.
- Leave roughly 5 minutes before checking the pH after eye irrigation for chemical injuries (otherwise you are checking the pH of the irrigating fluid).

for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

Correspondence to:
christine-tan@outlook.com

References

References are available online only.

Authors

Christine Tan BBiomed, MD, GradDipOphthSc, Ophthalmology Registrar, Department of Ophthalmology, The Royal Melbourne Hospital, Melbourne, Vic

Morgan Rayner MD, FRACGP, Lecturer, Department of General Practice, Melbourne Medical School, Faculty of Medicine, Dentistry and Health Sciences, The University of Melbourne, Melbourne, Vic

Carl Eiselen BSc, MD, GDipSurgAnat, Clinical Research Fellow, Nuffield Department of Clinical Neurosciences, University of Oxford, Oxford, UK; Honorary Clinical Research Fellow, Oxford Eye Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, UK

Elaine W Chong MBBS, MEpi, PhD, FRANZCO, FAMS, Head of Ophthalmology, Department of Ophthalmology, The Royal Melbourne Hospital, Melbourne, Vic; Senior Research Fellow, Centre for Eye Research Australia, Melbourne, Vic; Deputy Head of the Corneal Unit and Consultant Ophthalmologist in Medical Retina, Department of Ophthalmology, The Royal Victorian Eye and Ear Hospital, Melbourne, Vic

Alp Atik BMed (Dist), BMedSci (Hons), MPH MMed (OphthSci), FRANZCO, Head of the Glaucoma Unit, Department of Ophthalmology, The Royal Victorian Eye and Ear Hospital, Melbourne, Vic; Consultant Ophthalmologist, Department of Ophthalmology, The Royal Melbourne Hospital, Melbourne, Vic

Competing interests: None.

Funding: None.

Provenance and peer review: Commissioned, externally peer reviewed.

AI declaration: The authors confirm that there was no use of artificial intelligence (AI)-assisted technology

correspondence ajgp@racgp.org.au

References

1. Tovell A, McKenna K; Australian Institute of Health and Welfare (AIHW). Eye injuries in Australia, 2010–11 to 2014–15. AIHW, 2018. Injury research and statistics series no. 194. Cat. no. INJCAT 114.
2. Morgan S, Tapley A, Henderson KM, et al. Australian general practice trainees' exposure to ophthalmic problems and implications for training: A cross-sectional analysis. *J Prim Health Care* 2016;8(4):295–302. doi: 10.1071/HC16024.
3. Australian Institute of Health and Welfare (AIHW). Eye-related injuries in Australia. AIHW, 2009. Cat. no. INJCAT 123.
4. Kwok L, Burbidge A. Chemical eye injury in remote and urgent care clinic settings. *Aust J Gen Pract* 2024;53(12 Suppl):S45–48. doi: 10.31128/AJGP-10-23-6998.
5. Soleimani M, Naderan M. Management strategies of ocular chemical burns: Current perspectives. *Clin Ophthalmol* 2020;14:2687–99. doi: 10.2147/OPHT.S235873.
6. Bizrah M, Yusuf A, Ahmad S. An update on chemical eye burns. *Eye (Lond)* 2019;33(9):1362–77. doi: 10.1038/s41433-019-0456-5.
7. The Royal Victorian Eye and Ear Hospital. Emergency department clinical practice guideline: Chemical injuries of the eye. The Royal Victorian Eye and Ear Hospital, 2022. Available at <https://eyeandear.org.au/health-professionals/clinical-practice-guidelines> [Accessed 20 July 2025].
8. Eslani M, Baradaran-Rafii A, Movahedan A, Djalilian AR. The ocular surface chemical burns. *J Ophthalmol* 2014;2014:196827. doi: 10.1155/2014/196827.
9. Ballen PH. Treatment of chemical burns of the eye. *Eye Ear Nose Throat Mon* 1964;43:57–61.
10. Roper-Hall MJ. Thermal and chemical burns. *Trans Ophthalmol Soc U K* 1965;85:631–53.
11. Miller DD, Wagner IV, Ten Hulzen RD, et al. Delayed corneal healing after the use of topical ophthalmic anesthetics. *Cureus* 2024;16(9):e70455. doi: 10.7759/cureus.70455.
12. Ashraf G, Arslan J, Crock C, Chakrabarti R. Sports-related ocular injuries at a tertiary eye hospital in Australia: A 5-year retrospective descriptive study. *Emerg Med Australas* 2022;34(5):794–800. doi: 10.1111/1742-6723.13982.
13. The Royal Victorian Eye and Ear Hospital. Emergency department clinical practice guideline: Hyphaema. The Royal Victorian Eye and Ear Hospital, 2022. Available at <https://eyeandear.org.au/health-professionals/clinical-practice-guidelines> [Accessed 20 July 2025].
14. Rohowetz LJ, Jabbehdari S, Smiddy WE, et al; Retinal Dialysis Study Group. Retinal detachment associated with retinal dialysis: Clinical features and outcomes of surgery in a 10-year study. *Ophthalmol Retina* 2023;7(10):857–61. doi: 10.1016/j.oret.2023.06.013.
15. NSW Agency for Clinical Innovation (ACI). Eye emergency manual, 3rd edn. ACI, 2023.
16. NSW Agency for Clinical Innovation (ACI). Eye emergency app [mobile application]. ACI, 2023.
17. The Royal Victorian Eye and Ear Hospital. Emergency department clinical practice guideline: Acute management of penetrating eye injury and ruptured globe. The Royal Victorian Eye and Ear Hospital, 2024. Available at <https://eyeandear.org.au/health-professionals/clinical-practice-guidelines> [Accessed 20 July 2025].
18. The Royal Children's Hospital Melbourne. Clinical Practice Guideline: Acute eye injury. The Royal Children's Hospital, 2022. Available at www.rch.org.au/clinicalguide/guideline_index/Acute_eye_injury [Accessed 20 July 2025].
19. Ostrowski K, Miers J. Procedure: Lateral canthotomy. *Life in the Fast Lane* (blog), 2025. Available at <https://litfl.com/procedure-lateral-canthotomy> [Accessed 20 July 2025].
20. Peisah RI, Ostrowski K. Emergency management of orbital compartment syndrome: Lateral canthotomy and cantholysis case series. *Australas Emerg Care* 2025;28(1):67–71. doi: 10.1016/j.auec.2024.09.004.