

Flash Burns

SESLHDPR/499

Aim:

- Early identification and treatment of flash burns from ultraviolet radiation sources (e.g. welding torch, direct sunlight, sunlamp), escalation of care for patients at risk.
- Early initiation of treatment / clinical care and symptom management within benchmark time.

Assessment Criteria: On assessment the patient should have one or more of the following signs / symptoms:

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|--|--|--|
| <input type="checkbox"/> History of recent welding or being in vicinity of someone using a welder in last 12 – 24 hours without protective eyewear | <input type="checkbox"/> Photophobia (can be severe) | <input type="checkbox"/> Excessive tearing |
| <input type="checkbox"/> Exposure to snow without protective eyewear //UV light or water glare in past 24 hours | <input type="checkbox"/> Red eyes | <input type="checkbox"/> Blurry vision |

Escalation Criteria: Immediate sight -threatening presentations that require escalation and referral to a Senior Medical Officer (SMO):

- | | | |
|---|---|--|
| <input type="checkbox"/> Potential penetrating eye injury | <input type="checkbox"/> Loss of vision | <input type="checkbox"/> Pain / erythaemia over sphenoid-temporal region |
| <input type="checkbox"/> Severe corneal damage | <input type="checkbox"/> Visible foreign body on the cornea | <input type="checkbox"/> Severe pain |

Primary Survey:

- | | |
|--|---|
| • Airway: patency | • Breathing: respiratory rate, accessory muscle use, air entry, SpO ₂ . |
| • Circulation: perfusion, BP, heart rate, temperature | • Disability: GCS, pupils, limb strength |

Notify CNUM and SMO if any of the following red flags is identified from Primary Survey and Between the Flags criteria ¹

- | | | |
|---|---|--|
| <input type="checkbox"/> Airway – at risk | <input type="checkbox"/> Breathing – respiratory distress | <input type="checkbox"/> Circulation – shock / altered perfusion |
| • <i>Partial / full obstruction</i> | • <i>RR < 5 or >30 /min</i> | • <i>HR < 40bpm or > 140bpm</i> |
| | • <i>SpO₂ < 90%</i> | • <i>BP < 90mmHg or > 200 mmHg</i> |
| <input type="checkbox"/> Disability – decreased LOC | <input type="checkbox"/> Exposure | • <i>Postural drop > 20mmHg</i> |
| • <i>GCS ≤ 14 or a fall in GCS by 2 points</i> | • <i>Temperature <35.5°C or >38.5°C</i> | • <i>Capillary return > 2 sec</i> |
| | • <i>BGL < 3mmol/L or > 20mmol/L</i> | |
| | • <i>Ketone</i> | |

History:

- Presenting complaint
- **Allergies**
- **Medications:** anticoagulant therapy, anti-hypertensives, diabetic medications, analgesics, inhalers, chemotherapy, non-prescription medications, any recent change to medications
- **P**ast medical past surgical history relevant
- **L**ast exposure to ultraviolet radiation source of flash burn
- **E**vents and environment leading to presentation
- **Pain Assessment / Score:** **PQRST** (Palliating/ provoking factors, Quality, Region/radiation, Severity, Time onset)
- **Associated signs / symptoms:** excessive tearing, blurred vision, sensation of foreign body in the eye, bloodshot eye(s)
- **History:** Eye surgery, vision quality including vision correction required (e.g. glasses, contact lenses)

Systems Assessment:

Focused ophthalmic assessment:

- *Inspection:* Inspect skin around eye, eyelids, conjunctiva, pupil light response and clarity of cornea. Examination by slit lamp/magnifier with fluorescein drops is necessary to determine damage to cornea.^{2,3}
- Complete visual acuity testing and record result.

Notify CNUM and SMO if any of the following red flags is identified from History or Systems Assessment.

- | | | |
|---|--|--|
| <input type="checkbox"/> Haziness of cornea | <input type="checkbox"/> Loss of vision | <input type="checkbox"/> Injury with loss of visual acuity |
| <input type="checkbox"/> Severe pain | <input type="checkbox"/> Mechanism / injury meeting trauma call criteria* | |

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Investigations / Diagnostics:

Ophthalmology Exam: <ul style="list-style-type: none"> Examination by slit lamp/magnifier with fluorescein drops is necessary to determine damage to cornea. 	Laboratory / Radiology: <ul style="list-style-type: none"> Not clinically indicated
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Nursing Interventions / Management Plan:

Bedside^{4,5}: <ul style="list-style-type: none"> Instill topical Tetracaine (Amethocaine) 0.5% drops to eyes as per District Standing Order – this will alleviate pain so patient is able to co-operate with examination of eyes. Visual acuity after instillation of topical anaesthetic Oral analgesia as appropriate. Reassure patient and family of the nature of corneal burn, provide update. Do Not continue to use Amethocaine eye drops as it will delay healing process.
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Resuscitation / Stabilisation:^{4,5} <ul style="list-style-type: none"> Oxygen therapy & cardiac monitor [as indicated] IV Cannulation (consider large bore i.e. 16-18gauge) IV Fluids: Sodium Chloride 0.9% 1 litre stat (<i>discuss with SMO</i>) 	Symptomatic Treatment:^{4,5} <ul style="list-style-type: none"> Analgesia: as per district standing order Topical Eye Drops: Tetracaine (Amethocaine) as per district standing order
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Supportive Treatment:

- Reassure patient that it will be painful for a short time until the corneal surface regenerates usually within 24 hours.
- Rest and adequate analgesia is the best treatment.
- Usually reviewed after 24-48 hours to see that healing has taken place.

Practice Tips / Hints:

- Local anaesthetic drops should be used initially. Should not be given to patient to take home as it can delay the healing process.
- Education on wearing protective eye wear in the future when work in any environment where ultraviolet radiation exposure (e.g. welding) is a part of a job.
- Further detailed Ophthalmology resources are available from the ACI [ophthalmology resources](#)

Further Reading/References:

- SESLHD Deteriorating Patients-Clinical Emergency Response System for management of adult and maternity inpatients. SESLHD/283. 2019 <https://www.seslhd.health.Deteriorating Patient-Clinical Emergency Response System for Management of Adult and Maternity inpatients>
- Pane, A. and P. Simcock (2005). *Practical ophthalmology: a survival guide for doctors and optometrists*. London, Churchill Livingstone.
- NSW Health Eye Emergency Manual Second Edition 2019 – Found online ACI (cited 2021) [Eye Emergency Manual | Agency for Clinical Innovation](#)
- SESLHD Framework for Emergency Nurse Protocols and Standing Order.2018. <https://www.seslhd.health.nsw.gov.au/sites/default/files/documents/SESLHDPR369.pdf>
- SESLHD Standing Order Emergency Department Tetracaine (Amethocaine) Hydrochloride June 2020 <http://seslhd/2020/SESLHDEDSTOTetracaineAmethocaine>

Acknowledgements: SESLHD Adult Emergency Nurse Protocols were developed & adapted with permission from:

- Murphy, M (2007) Emergency Department Toolkits. Westmead Hospital, SWAHS
- Hodge, A (2011) Emergency Department, Clinical Pathways. SSEH SESLHD.

Revision & Approval History

Date	Revision No.	Author and Approval
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