Guideline 9.1.3 – First Aid for Burns

Summary

To whom does this guideline apply?

This guideline applies to adults, children and infants.

Who is the audience for this guideline?

This guideline is for use by bystanders, first aiders and first aid training providers.

Summary of Recommendations

The Australian and New Zealand Committee on Resuscitation (ANZCOR) makes the following recommendations:

1. Remove the person from danger if safe to do so [Good Practice Statement].
2. ANZCOR recommends to commence cooling of burns with running water as soon as practicable [CoSTR 2015, strong recommendation, very low certainty of evidence].[1-4]
3. Duration of cooling should be at least 20 minutes [Good Practice Statement].[2,5]
4. Cooling should be commenced as soon as possible, but may help if started up to 3 hours after the burn [Good Practice Statement].[3,6]
5. For chemical burns, thoroughly irrigate with water then call Poisons hotline (Australia 13 11 26 and New Zealand 0800 764 766) and refer to safety data sheets [Good Practice Statement].[7]
6. Send for an ambulance for significant burns.

Abbreviations

Abbreviation	Meaning/Phrase
ANZCOR	Australian and New Zealand Committee on Resuscitation

ANZBA	Australian and New Zealand Burns Association
CoSTR	Consensus on Science with Treatment Recommendations
TBSA	Total Body Surface Area
SDS	Safety Data Sheet

1.0 | Introduction

A burn has been defined as an injury to the skin or other organic tissue primarily caused by heat or due to radiation, radioactivity, electricity, friction or chemicals.[8] A significant burn for the purpose of this document is one with any of the features described in the Appendix 1.[5]

2.0 | Initial Approach

- Ensure safety for rescuers, bystanders and the person.
- Send for an ambulance if significant burn or any doubt if this is a significant burn.
- Do not enter a burning or toxic atmosphere.
- Stop the burning process:
    - Stop, Drop, Cover and Roll
    - smother any flames with a blanket
    - douse with water if safe to do so.
- Move away from the burn source to a safe environment as soon as possible.
- Maintain an open airway and assess if the person is breathing normally. If not breathing normally, treat as described in ANZCOR Guideline 8.
- Check for other injuries if safe to do so.
- If safe, and if trained to do so, give oxygen to all people with smoke inhalation or facial injury, following The Use of Oxygen in Emergencies (Refer to ANZCOR Guideline 9.2.10).

The aims of first aid treatment of burns should be to stop the burning process, cool the burn and cover the burn. This will provide pain relief and minimise tissue loss.[2]

3.0 | Management of Heat/Thermal/Contact Burns

- These include flame, scald, blast (hot gas), inhalation injury and direct heat contact.
- ANZCOR recommends to cool burns as soon as practicable with cool running water [CoSTR

2015, strong recommendation/low quality evidence][1]. Cool for at least 20 minutes,[2,6] up to 3 hours after the burn, the sooner the better.[3] Use any clean cool liquid if water is not available. Use commercial cooling gels only after a minimum of 20 minutes of cool running water, or if no cool water is available. Cooling is effective up to 3 hours after injury.[3]
- If possible, remove all rings, watches, jewellery or other constricting items from the affected area without causing further tissue damage.
- Remove wet, non-adherent clothing as clothing soaked with hot liquids retains heat.
- Cover the burnt area with a loose non-stick dressing, preferably clean material e.g. plastic cling film. Place the cling film over the burn but do not wrap around a limb. Do not use cling film on the face.
- Cover unburnt areas and keep the person warm to reduce the risk of hypothermia particularly small children who may develop hypothermia quickly.
- Where feasible elevate burnt limbs to minimise swelling.

DO NOT peel off adherent clothing or burnt substances.

DO NOT use ice or ice water to cool the burn as further tissue damage may result.

DO NOT break blisters.

DO NOT apply lotions, ointments, creams or powders.

3.1 | Inhalation Burn

Always assume inhalation injury if there are burns to the face, nasal hairs, eyebrows or eyelashes, or if there is evidence of carbon (sooty) deposits in the nose or mouth. Coughing of black particles in sputum can indicate a risk of inhalation burn. An inhalation burn should be suspected when an individual is trapped in an enclosed space for some time with hot or toxic gas, steam or fumes produced by a fire, chemicals etc. An inhalation injury may result from irritant gases, even if not hot. These agents produce a chemical burn and an inflammatory response. Hoarse voice and/or breathing difficulties may indicate damage to the airway.

Do not assume the person burnt is stable following an inhalation injury simply because the person is breathing, talking and able to get up. Some gases produce delayed lung damage (inflammation) which may develop up to 24 hours later.

- Remove to fresh air if safe to do so.
- Maintain an open airway and assess if the person is breathing normally (Refer to ANZCOR Guideline 4).
- Give oxygen if available and trained to do so, following The Use of Oxygen in Emergencies (Refer to ANZCOR Guideline 9.2.10).
- Send for an ambulance.

3.2 | Electrical Burns

Electrical burns, including lighting strike, are often associated with other injuries such as involvement of the heart, sometimes with cardiac arrest, respiratory system[9] and loss of consciousness.

The priorities in the management of the electric shock are to:

- Isolate/turn off the power supply without touching the person, if safe to do so.
- In case of high-voltage electrocution, such as that caused by fallen power lines, immediately notify emergency services. Everything will conduct electricity if the voltage is high enough, so keep at least 10m from the person or wires. Authorities differ on the safe distance, but 10m is the maximum recommended.[10-12] Do not attempt to remove wires or other materials with any object, including wooden ones which still conduct high voltages, until the power has been turned off by authorised personnel.[13]
- Commence cardiopulmonary resuscitation if required following the Basic Life Support Flow Chart (Refer to ANZCOR Guideline 8).
- Cool burns if safe to do so, with cool running water for at least 20 minutes.[2,5]
- Send for an ambulance.
- Give oxygen if available and trained to do so, following The Use of Oxygen in Emergencies (Refer to ANZCOR Guideline 9.2.10).

3.3 | Radiation Burns

Radiation burns may be caused by solar sunburn, electric arc welder, lasers, industrial microwave equipment and nuclear radiation.

- Treat radiation burns as for heat/thermal burns but be aware that there may be few external signs.

3.4 | Chemical Burns

Government regulations on hazardous substances and Work, Health and Safety require the manufacturer or importer of a hazardous chemical to prepare a safety data sheet (SDS) for the chemical.[14,15] A supplier must provide a SDS to a workplace at the time of first supply or upon request. These SDSs provide first aid information specific to each chemical and include information relevant to eye contact, skin contact, inhalation and ingestion. Information can also be sought from the Poisons Information Centre on 131 126 in Australia and 0800 764 766 in New Zealand.

The aim of first aid for chemical burns is not to cool the burn but to dilute the chemical.

- Avoid contact with any chemical or contaminated material, using appropriate personal protection equipment.
- Remove the person to a safe area if safe to do so.
- Remove the chemical and any contaminated clothing and jewellery as soon as practical.
- Brush powdered chemicals from the skin.
- Without spreading the chemical to unaffected areas, IMMEDIATELY flush the area directly with running water for at least 20 min, up to one hour, until the stinging stops [Good Practice Statement].[7]
- ANZCOR suggest that if chemical enters the eye, open and flush the affected eye(s) thoroughly with water [CoSTR 2015, weak recommendation/very low quality evidence][1] for as long as tolerated and refer the person for urgent medical attention. If only one eye is affected then flush with the head positioned so as the affected eye is down to avoid spread of the chemical to the unaffected eye. Flushing of the eye is more important than immediate transfer for medical care.
- If available, in hard copy or on the internet, refer to Safety Data Sheets (SDS) for specific treatment.
- Call the Poisons Information Centre[5, 6] for further advice.
- Refer to instructions on the container for further specific treatment.
- Send for an ambulance.

DO NOT attempt to neutralise either acid or alkali burns with another chemical, because this will increase heat generation which may cause more damage. Instead, flush with water as described above.

DO NOT apply cling wrap or hydrogel dressings to chemical burns.

Acknowledgements

[Australian and New Zealand Burns Association (ANZBA)]

Prof Fiona Wood, Australian Honour, Member of the Order of Australia (AM)

Appendix 1 “Significant burn”

A significant burn for the purpose of this document is:[5]

- A burn greater than 10% of total body surface area (TBSA) which in an adult is approximately the size of the arm or half the leg
- burns of special areas—face, hands, feet, genitalia, perineum, and major joints
- full-thickness burns greater than 5% of TBSA
- electrical burns

- chemical burns
- burns with an associated inhalation injury
- circumferential burns of the limbs or chest
- burns in the very young or very old
- burns in people with pre-existing medical disorders that could complicate management, prolong recovery, or increase mortality
- burns with associated trauma.

All infants and children with burns should be medically assessed.

Further Reading

ANZCOR Guideline 2 Managing an Emergency

ANZCOR Guideline 8 Cardiopulmonary Resuscitation

ANZCOR Guideline 9.2.3 Shock

ANZCOR Guideline 9.3.3 Hypothermia and Cold Injury First Aid management

ANZCOR Guideline 9.5.1 First Aid management of Poisoning

ANZCOR Guideline 9.2.10 The Use of Oxygen in Emergencies

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Cheng, MD; Sung Phil Chung, MD, PhD; Julie Considine, RN, PhD; Daniela T. Costa-Nobre, MD, MHS; Keith Couper, RN, PhD; Katie N. Dainty, MSc, PhD; Peter G. Davis, MD; Maria Fernanda de Almeida, MD, PhD; Allan R. de Caen, MD; Edison F. de Paiva, MD, PhD; Charles D. Deakin, MA, MD;, Therese Djärv M, PhD; Matthew J. Douma, PhD(c), RN; Ian R. Drennan, ACP, PhD; Jonathan P. Duff, MD;, Kathryn J. Eastwood P, BParamedicStud, BNurs; Walid El-Naggar, MD; Jonathan L. Epstein, MEMS, NRP; Raffo Escalante, MD; Jorge G. Fabres, MD, MSPH; Joe Fawke, MBChB; Judith C. Finn, PhD, RN; Elizabeth E. Foglia, MD, MA, MSCE; Fredrik Folke, MD, PhD; Karoline Freeman, PhD; Elaine Gilfoyle, MD, MMEd; Craig A. Goolsby, MD, MEd*; Amy Grove, PhD, CPsychol;, Ruth Guinsburg M, PhD; Tetsuo Hatanaka, MD, PhD; Mary Fran Hazinski, RN, MSN; George S. Heriot, PhD;, Karen G. Hirsch MMJH, MD, MPH; Shigeharu Hosono, MD, PhD; Ming-Ju Hsieh, MD, MSc, PhD;, Kevin K.C. Hung M, MPH; Cindy H. Hsu, MD, PhD; Takanari Ikeyama, MD; Tetsuya Isayama, MD, MSc, PhD;, Vishal S. Kapadia M, MSCS; Mandira Daripa Kawakami, MD, PhD; Han-Suk Kim, MD, PhD; David A. Kloeck, MBBCh, FCPaed, Crit Care (SA); Peter J. Kudenchuk, MD; Anthony T. Lagina, MD; Kasper G. Lauridsen, MD; Eric J. Lavonas, MD, MS;, Andrew S. Lockey M, PhD; Carolina Malta Hansen, MD, PhD; David Markenson, MD, MBA; Tasuku Matsuyama, MD, PhD; Christopher J.D. McKinlay, PhD, MBChB; Amin Mehrabian, PharmD; Raina M. Merchant, MD, MSHP; Daniel Meyran, MD; Peter T. Morley, MBBS; Laurie J. Morrison, MD, MSc; Kevin J. Nation, NZRN; Michael Nemeth, AEMCA(f), MA;, Robert W. Neumar M, PhD; Tonia Nicholson, MBBS, BscPsych; Susan Niermeyer, MD, MPH; Nikolaos Nikolaou, MD; Chika Nishiyama, RN, DrPH; Brian J. O'Neil, MD; Aaron M. Orkin, MD, MSc, MPH, PhD(c); Osokogu Osemeke, MD, PhD; Michael J. Parr, MB, BS; Catherine Patocka, MDCM, MHPE; Jeffrey L. Pellegrino, PhD, MPH; Gavin D. Perkins, MB, ChB, MMEd, MD; Jeffrey M. Perlman, MBChB; Yacov Rabi, MD; Joshua C. Reynolds, MD, MS; Giuseppe Ristagno, MD, PhD;, Charles C. Roehr M, PhD; Tetsuya Sakamoto, MD, PhD; Claudio Sandroni, MD; Taylor Sawyer, DO, MEd;, Georg M. Schmölzer M, PhD; Sebastian Schnaubelt, MD; Federico Semeraro, MD; Markus B. Skrifvars, MD, PhD; Christopher M. Smith, MD, MSc; Michael A. Smyth, BSc(hons), MSc, PhD; Roger F. Soll, MD; Takahiro Sugiura, MD, PhD; Sian Taylor-Phillips, PhD; Daniele Trevisanuto, MD; Christian Vaillancourt, MD, MSc; Tzong-Luen Wang, MD, PhD, JM;, Gary M. Weiner MMW, MD, BSc; Jane Wigginton, MD, MSCS; Jonathan P. Wyllie, MBChB;, Joyce Yeung P, RN; Jerry P. Nolan, MBChB; Katherine M. Berg, MD. 2021 International Consensus on Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science With Treatment Recommendations Summary From the Basic Life Support; Advanced Life Support; Neonatal Life Support; Education, Implementation, and Teams; First Aid Task Forces; and the COVID-19 Working Group. *Circulation*. 2022;145:e645–e721. doi: 10.1161/CIR.0000000000001017

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About this Guideline

Search date/s	2020

Question/PICO:	**1 Population:** Adults and children in first aid settings with a thermal burn. *Intervention:* Active cooling using water as an immediate first aid intervention for 20 minutes or more duration. **Comparators:** Active cooling using water as an immediate first aid intervention for any other duration. **Outcomes:** Primary outcomes: Size (critical) – defined as percentage of total body surface area (TBSA) at any reported time point (continuous). Depth (critical) – as reported in articles by authors in three or four categories and analyzed from the negative dichotomous outcome of full thickness depth (including deep dermal partial thickness). Secondary outcomes: Pain (important) - defined as any measurement of pain or administration of pain medications (continuous and/or categorized outcome). Adverse outcomes (important) – defined as any reported adverse outcome and *a priori* identified hypothermia (dichotomous outcome; yes/no). Wound healing (important) – defined as time to re-epithelization in days (continuous outcome). Complications within 24 hours (important) - defined as organ dysfunction, ICU-care, infections (within seven days), bleeding, rhabdomyolysis as well as surgical procedures such as fasciotomy and escharotomy.
Method:	1. ILCOR CoSTR 2021[13] 2. Rapid review of burns guidelines [2] 3. Evidence Update Feb 23
Primary reviewers:	Finlay Macneil, Natalie Hood
Other consultation:	Prof Fiona Wood AM
Worksheet	• Worksheet to Support Guideline 9.1.3 – First Aid for Burns – March 2023 (183 KB)
Approved:	March 2023
Guideline superseded:	ANZCOR Guideline 9.1.3 Burns January 2016

Referencing this guideline

When citing the ANZCOR Guidelines we recommend:

ANZCOR, 2026, Guideline 9.1.3 – First Aid for Burns, accessed 29 September 2026,

https://www.anzcor.org/home/first-aid/guideline-9-1-3-first-aid-for-burns