

British Burn Association

First Aid Clinical Practice Guidelines

Compiled by: Kristina Stiles and Nicholas Goodwin, April 2018
On behalf of the Pre-Hospital Special Interest Group

www.britishburnassociation.org

The prompt and effective application of burns first aid has been shown to positively impact on the burn outcome, preventing further tissue damage and reducing subsequent morbidity.^{1,2} However, there is widespread variation in the first aid advice currently available for management of burns and scalds.^{3,4,5,6} The following recommendations are based on evidence from a systematic literature review and form a minimum standard of care for first aid management of burns and scalds that is practical and effective to perform in any setting or environment.

Thermal burns

STOP the burning process

- Remove person/s from the source of the burn, once safe to do so⁷
- Extinguish burning clothing using water or the 'Stop, Drop and Roll' method⁸
 - **STOP** where you are
 - **DROP** to the ground and cover your eyes and mouth with your hands
 - **ROLL** over and back and forth until the flames are out
- Isolate electrical power sources, if safe to do so before attempting rescue
- Avoid chemical cross-contamination

REMOVE clothing and jewellery

- Remove any burned/contaminated/damp/constricting clothing, if able to do so⁹
- Remove any nappies, jewellery and contact lenses near burned area, if able to do so
- Leave any molten/adherent clothing.

COOL the burn

If water is available

- Do not delay cooling.
- Cool the burn **immediately** with cool running tap water for 20 minutes and within 3 hours of injury^{10,11,12}
- Aim to complete 20 minutes of cooling. Further cooling attempts may induce hypothermia, especially in children and the elderly, or where large burns are present.¹³

If water supply is limited

- Apply a cool water compress using any clean wetted lint free cloth
- Change compress frequently over 20-minute period
- If no water is immediately available in any form, burns should be covered with cling film and cooled at the first available opportunity within 3 hours of injury.^{7,11,14}
- Hydrogels are marketed but evidence as to their efficacy is limited³¹

Do not

- Use ice or iced water to cool burns^{16,17}

WARM the patient

- "Cool the burn but warm the patient".⁷
- Keep patient warm to prevent hypothermia (children and elderly are most susceptible)¹⁵
- Cover non-burned areas during cooling and continue to warm throughout care interventions

COVER the burn

- Cover the cooled burn with loose longitudinal strips of cling film or any clean lint free cloth or non-adherent dressing¹⁸
- Do not wrap cling film circumferentially around limbs or other burned areas
- Do not apply cling film to facial burns
- Cover irrigated and fully decontaminated chemical injuries with a wet compress

British Burn Association

First Aid Clinical Practice Guidelines

Chemical burns

Immediacy of decontamination and dilution through irrigation of chemical injury is paramount as the duration of the chemical's contact with the skin is a major determinant of burn severity^{19,20}

Remove chemical agent

- Wear appropriate personal protective equipment to minimize the risk of cross-contamination
- Brush off dry powders, remove fragments of solid chemical substances and discard contaminated clothing prior to wet decontamination¹⁹

Irrigate

- Do not delay **immediate** irrigation for detailed assessment of patient or acquiring a particular irrigation fluid, regardless of delay in presentation.
- Commence urgent irrigation of skin/eyes with a sterile isotonic solution (e.g. Hartmann's or Normal Saline), an amphoteric solution, or room-temperature running water for at least 20 minutes. ^{19,21,22,23,24}
- Continue irrigation until the patient experiences a decrease in pain or burning in the wound or until the patient has been assessed by a burn specialist.²⁵
- Do not irrigate dry lime, phenols, muriatic acid, concentrated sulphuric acid and elemental metals with water.¹⁹
- Do not attempt to neutralize the chemical due to the potential exothermic reaction, which could contribute to further tissue destruction.²⁵

Treat

- Access National Poisons Information Service/TOXBASE for agent-specific decontamination and treatment information
- Administer antidote treatment for specific agents if appropriate¹⁹
- Manage any systemic toxicity or expected side-effects of a chemical agent¹⁹

Electrical burns

- Prioritise and manage life threatening conditions as per standard ATLS protocol²⁵
- Cool the injury site(s) immediately with cool running tap water for 20 minutes within 3 hours of injury (after the electrical source has been controlled)²⁵
- If there is no history of unconsciousness, cardiac arrest, or abnormal rate or rhythm (normal ECG), prolonged monitoring is not required.^{25,26}

Tar and Bitumen Burns

- Cool the molten agent and the injury site(s) with cool running tap water for 20 minutes within 3 hours of injury or until it is completely cooled²⁵
- Once cooled, use solvents containing liquid paraffin or any oily substance to emulsify the tar. Tar removal is not an emergency and may be delayed until arrival at the burn service.

Cold burns (frostbite)

- Prioritise and manage life threatening conditions, such as hypothermia or severe trauma over the presence of regional cold injury.^{25,27}
- In the pre-hospital care of cold injury, begin local rewarming only if refreezing will not occur in transit. Avoid refreezing if field thawing occurs.²⁸
- Rewarm rapidly and continually in circulating water at 37°C to 39°C with a mild antibacterial agent (povidone-iodine or chlorhexidine) for at least 30 minutes within 12 hours of injury.^{27,28,29,30}
- Rewarming is complete when all injured tissues have regained sensation, feel soft and pliable to the touch, with a red-purple appearance.^{25,27}
- Do not use dry heat as it may compound the injury.²⁵
- To avoid further tissue damage, do not apply pressure, massage or rub the affected area²⁵
- Elevate the injured area to reduce any developing swelling.²⁵

British Burn Association

First Aid Clinical Practice Guidelines

References

www.britishburnassociation.org

- ¹ Wood FM, Phillips M, Jovic T, Cassidy JT, Cameron P, Edgar DW, et al. Water First Aid Is Beneficial In Humans Post-Burn: Evidence from a Bi-National Cohort Study. *PLoS ONE* 2016; 11(1): e0147259.
- ² Cuttle L, Pearn J, McMillan JR, Kimble RM. A review of first aid treatments for burn injuries. *Burns* 2009; 35: 768–775.
- ³ Skinner A, Peat, B. Burns treatment for children and adults: a study of initial burns first aid and hospital care. *The New Zealand Medical Journal* 2002; 115:1-9.
- ⁴ Varley A. Investigation to review is the current information provided to the general public regarding first aid treatment for burns and scalds in children is evidence-based. Presented at the 2013 British Burn Association Annual Conference, Liverpool, May 2013.
- ⁵ Wallace HJ, et al. Determinants of burn first aid knowledge: Cross-sectional study. *Burns* 2013; 02:007-015.
- ⁶ Walker A, Baumber R, Robson B. Pre-hospital management of burns by the UK fire service. *Emerg Med J* 2005; 22:205–208.
- ⁷ Allison K, Porter, K. Consensus on the prehospital approach to burns patient management. *Emerg Med J* 2004; 21: 112-114.
- ⁸ National Fire Protection Association. Learn Not to Burn® - Level1. 2014. [Online] Available: <http://sparkyschoolhouse.org/app/uploads/2015/06/Level1.pdf> [Accessed 4 April 2018].
- ⁹ Lau EYK, Tam YYW, Chiu TW. Importance of clothing removal in scalds. *Hong Kong Med J* 2016; 22:152–7.
- ¹⁰ Bartlett N, Yuan J, Holland AJ, Harvey JG, Martin HC, La Hei ER. et al. Optimal duration of cooling for an acute scald contact burn injury in a porcine model. *J Burn Care Res*, 2008; 29:828-34.
- ¹¹ Cuttle L, Kempf M, Liu P-Y, Kravchuk O, Kimble RM. The optimal duration and delay of first aid treatments for deep partial thickness burn injuries. *Burns* 2010; 36:673-679.
- ¹² Nguyen NL, Gun RT, Sparno AL, Ryan P. The importance of immediate cooling — a case series of childhood burns in Vietnam. *Burns* 2002; 28:173–176.
- ¹³ Hostler DL et al. Admission temperature and survival in patients admitted to burn centers. *Burn Care Res* 2013 Sep-Oct; 34(5):498-506.
- ¹⁴ Bartlett N, Yuan J, Holland AJ, Harvey JG, Martin HC, La Hei ER. et al. Optimal duration of cooling for an acute scald contact burn injury in a porcine model. *J Burn Care Res* 2008; 29:828-34.
- ¹⁵ Durrant CAT, Simpson AR, Williams G. Thermal injury – the first 24 hours. *Curr Anaesth Crit Care* 2008, 19: 256–63.
- ¹⁶ Cuttle L, Kimble R. First aid treatment of burn injuries. *Wound Pract Res* 2010 18(1): 6–13.
- ¹⁷ Tobalem M, Harder Y, Tschanz E et al. First-aid with warm water delays burn progression and increases skin survival. *JPRAS* 2013 66:260–6.
- ¹⁸ Goutos I, Tyler M. Early management of paediatric burn injuries. *Paediatrics and Child Health* 2013; 23(9):391–6.
- ¹⁹ Palao R, Monge I, Ruiz M, Barret JP. Chemical burns: Pathophysiology and treatment. *Burns* 2010 36:295-304.
- ²⁰ Chau JP, Lee DT, Lo SH. A systematic review of methods of eye irrigation for adults and children with ocular chemical burns. *Worldviews Evid Based Nurs* 2012 Aug; 9(3):129-38.
- ²¹ Wang X, Han C. Re-emphasizing the role of copious water irrigation in the first aid treatment of chemical burns. *Burns* 2014 Jun; 40(4):779-80.
- ²² Hardwicke J, Bechar J, Bella H, Moiemmen N. Cutaneous chemical burns in children – A comparative study. *Burns* 2013 Dec; 39(8):1626-30.
- ²³ Lewis CJ, Al-Mousawi A, Jha A, Allison KP. Is it time for a change in the approach to chemical burns? The role of Diphoterine® in the management of cutaneous and ocular chemical injuries. *Journal of Plastic, Reconstructive & Aesthetic Surgery* 2017 May; 70(5):563-567.
- ²⁴ Zack-Williams SD, Ahmad Z, Moiemmen NS. The clinical efficacy of Diphoterine® in the management of cutaneous chemical burns: a 2-year evaluation study. *Ann Burns Fire Disasters* 2015 Mar 31; 28(1):9-12.
- ²⁵ American Burn Association. Advanced Burn Life Support (ABLS) Course Handbook. American Burn Association 2011. ABA, Chicago.
- ²⁶ Searle J, Slagman A, Maaß W, Möckel M. Cardiac monitoring in patients with electrical injuries. *Deutsches Ärzteblatt International* 2013; 110(50): 847–53.
- ²⁷ Hallam MJ, Cubison T, Dheansa B, Imray C. Managing frostbite. *BMJ* 27 November 2010; 341:1151-1156.
- ²⁸ McIntosh SE, Hamonko M, Freer L, Grissom CK, Auerbach PS, Rodway GW, Cochran A, Giesbrecht G, McDevitt M, Imray CH, Johnson E, Dow J, Hackett PH. Wilderness Medical Society Practice Guidelines for the Prevention and Treatment of Frostbite. *Wilderness & Environmental Medicine* 2011; 22:156–166.
- ²⁹ Nygaard RM, Lacey AM, Lemere A, Dole M, Gayken JR, Lambert Wagner AL, Fey RM. Time Matters in Severe Frostbite: Assessment of Limb/Digit Salvage on the Individual Patient Level. *J Burn Care Res* 2017; 38:53–59.
- ³⁰ Kiss TL. Critical care for frostbite. *Crit Care Nurs Clin North Am* 2012; 24(4):581-91.
- ³¹ Goodwin N.S, Spinks A, Wasiaik J. The efficacy of hydrogel dressings as a first aid measure for burn wound management in the pre-hospital setting: a systematic review of the literature. *Int. Wound J* 2016 Aug; 13(4):519-25.