



British Burn Association

Hydrogel Position Statement 2017

On behalf of the Pre-Hospital Special Interest Group

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First principles

- Burns 1st aid consists of water cooling of the wound, simple dressing and transport to appropriate burn services and should commence as early as possible after burn injury. ⁽¹⁾
- Pre-hospital Burns 1st aid is part of a continuum of care but can be administered by anyone in any setting and does not require professional training or education.
- Cuttle et al (2010) outlines reported benefits from burn 1st Aid confirming the utility, efficacy and necessity of this clinical practice within this continuum of burn care. Recent examination by Wood et al (2016) confirmed reported benefits in a large cohort study. ^(2,3)
- Recommended burn 1st Aid practices should reflect education and training approaches emphasizing evidenced based clinical care. ⁽⁴⁾

Cooling and Dressing

- Many benefits of (water) cooling of burn injury have been suggested historically and demonstrated clinically in multiple studies. Cost benefits to health systems have also been proposed. ⁽³⁾ New cooling mechanisms via gene expression and other physiological pathways in addition to direct reduction of thermal energy in the wound are theorized and may confer further benefits. ⁽⁵⁾
- Wound Covering is intended to protect the injured integument, prevent contamination, may reduce infection and contribute to reducing pain by eliminating contact of sensitized burn injuries with the open-air environment.

Alternative approaches - Hydrogel Burn Dressings

- Hydrogel burns dressings are hydro-gelatinous sheets consisting of a non-resorbable matrix of hydrophilic polymers containing >90% water in suspension and are widely used as an alternative to traditional burn 1st aid approaches, are promoted for use on all burns and have both cooling and dressing functions which may be employed in isolation (e.g. chemical burns dressing only after water irrigation). ^(6,7)
- Hydrogels reduce thermal energy in the burn wound via convective and evaporative mechanisms but function most effectively when exposed to an open-air environment. Efficiency may vary relative to wound heat, ambient environmental conditions, duration of use and other factors.
- Manufacturers promote hydrogel burn dressings to reduce pain, stop burn progression and prevent further injury. ⁽⁸⁾

Clinical evidence

- A large pool of low level evidence, principally animal and laboratory analysis and some human studies, shows cooling with water reduces destructive pathological changes in burn injury. Demonstrated benefits include: reducing burn wound temperature, easing pain, ameliorating burn progression, slowing and reduction of the inflammatory response, reducing oedema formation and limiting the necessity for surgical interventions whilst impacting healing, hospital stay, ICU admission, cosmetic and recovery outcomes. (9,10,11,12,13,14,,15,16,17,18,19, 20,21,22,23,24,3)
- Clinical evidence supporting the efficacy of hydrogels in the burn 1st aid role is weak and consists of hospital based studies with limited or no relevance to pre-hospital, one animal study and manufacturer commissioned studies subject to risk of bias. (25,26,27,28,29)
- There is no supporting evidence to establish the efficacy of hydrogel burn dressings when used outside manufacturer instructions, when one just function of the product is employed (e.g. just as a cooling agency), for fixed durations (e.g. just for 20mins) or as a delayed management (i.e. >1hr post injury).

Ongoing problems, knowledge gaps and clinical risks

General

- Burn 1st aid recommendations from major advisory bodies remain inconsistent across international, national and local jurisdictions. Furthermore, many EMS and other allied health care agencies and public 1st Aid organisations utilize local expert or consensus based decision making models often disregarding recommended approaches. This may include use of hydrogel based dressing products or other alternatives. (30, 31)
- Burn 1st aid practices of the lay public are notably inconsistent reflecting contradictory recommendations and teachings, invalid or non-clinically derived decisions. (32, 33)

Clinical

- The benefit of burn 1st aid management including the use of hydrogels in full thickness burn injury, complex multi-trauma scenarios with a burn injury component and in chemical and electrical burns has not been quantified in studies.
- Evidence to support the best 1st Aid approaches to management of chemical burn injury remain unclear.
- The effect of pre-hospital burn wound dressing on infection rates in burn injury has not been established. The evidence to recommend the “best” acute burn wound dressing for use in pre-hospital is lacking. (34)
- Cooling for prolonged periods, in any large TBSA burn, in the young or elderly patient, irrespective of the cooling medium, may induce hypothermia although evidence remains contradictory. (35,36,37)

Hydrogels

- Hydrogels may dry out with prolonged use, in hot conditions or where wound heat is significant. This may necessitate frequent undesirable dressing changes.
- Hydrogels may trap heat in the burn wound if covered in line with manufacturer instructions potentially worsening burn progression. (38)
- Hydrogels should not be applied to bitumen burns as the dressing may deconstruct and melt into the burn wound.

- Hydrogels may contribute to hypothermia risk if left uncovered and exposed to the ambient environment in line with designed mechanisms of action.
- Manufacturer recommended application of hydrogels (air exposure for best effect) may also limit or delay effective warming and covering of the patient thus also risking hypothermia.

Recommendations

1. Whilst the BBA recognises Hydrogel burn 1st Aid dressings have been adopted by some first responders, there is insufficient evidence at this time to recommend their use in burn 1st Aid practice.
2. Thermal burns should be cooled with clean cool *running* water for one (1) block of 20mins. This approach remains the best supported by evidence and expert consensus.
3. Where clean, cool, *running* water is not available, immersion in static water can be undertaken or cooling using clean wetted dressings or cloths. Frequent replacement of the water should occur.
4. Where no water for cooling is immediately available in any form, burns should be covered with Clingfilm and cooled at the first available opportunity up to 3 hours after the injury occurs. ⁽³⁹⁾
5. Thermal burns should be covered with Clingfilm in strips, never circumferentially or alternately using a clean, dry, lint free, preferably sterile, cloth or dressing. Hydrogel Burn 1st Aid dressings should not be used as a stand-alone dressing alternative.
6. There is no evidence to establish the efficacy of Hydrogel Burn 1st Aid dressings for the dressing of chemical burns. Hydrogels cannot be employed to “cool” chemical burns under any circumstances. Copious irrigation with clean water for at least 30mins and covering with a clean lint free dressing is currently recommended.
7. Excessive cooling with hydrogels and other cooling methods and environmental exposure can lead to the onset of hypothermia. Prevention of hypothermia using all available means remains of the highest priority. Continuous monitoring of patient temperature and the application of warming measures (preferably “active” warming strategies) should be undertaken at the earliest opportunity.

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