Faculty of Pre - Hospital Care
&
British Burn Association
Expert Consensus Meeting

Management of Burns in Pre - Hospital Trauma Care

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Abstract

Burns patients form a distinct and significant group of trauma patients cared for by first aiders, ambulance staff, nurses and doctors before reaching specialist care in hospital.

By optimising pre-hospital care significant differences can be made to the mortality and morbidity from burns injuries. This article updates key recommendations for the initial management of burn patients in the pre-hospital environment, based on the current available evidence and a consensus of burn care specialists from a range of disciplines.

Applicability of Recommendations in Pre-Hospital Trauma Care

Due to the varying levels of healthcare personnel delivering pre-hospital care services, this set of recommendations should not serve to contravene practitioners' qualifications or scope of practice.

A number of recommendations pertain to invasive or advanced procedures and may only be applicable to higher level practitioners. Yet, all practitioners should be aware of these recommendations and understand the implications for management, in particular when senior support is required or when care should be expedited.

Practitioners, irrespective of level, should endeavour to achieve best practice within their scope of practice and should be able to justify actions, if they should be contrary to the agreed recommendations.

Introduction

Each year, approximately 13'000 burns injuries require hospital attention across England & Wales. This has been gradually increasing year on year through the first decade of this century (1). The median burn size is between 1 – 2% total body surface area (TBSA). Overall, the all burns mortality rate is 1.5%, yet major burns (>20% TBSA) carry a significantly higher mortality rate (1).

50% of all burns occur in adult patients aged 16 – 64 years old. For adults, the mechanism of injury is predominantly from flame burns, and one third of adult burns are work related injuries. Children under four years old form 70% of all burn injured children, with >50% of paediatric burns as a result of scalds (2). 10% of burn injuries are to elderly patients, over 65 years old, however have a disproportionate mortality (~10% vs. 1%) and increased hospital length of stay (1).

Major burn injuries have an incidence rate of 4.7 per 100'000 population per year and form over 5% of all traumatic injuries across the UK (3). Approximately 1000 burns patients require fluid resuscitation each year, half of which are in children under 16 years old. 200 deaths occur each year as a result of burns injuries in the UK (1). Up to 5% of combat related injuries include burns (4), concomitant trauma injuries occur in 5-7% of burn injured patients (5) and 1% of major trauma patients in the UK will suffer burns injuries (6).

Burns disasters are extremely rare in the UK, with only 3 incidents involving more than 5 burns patients in the last 30 years (7). The 2017 Grenfell Tower fire however highlights the gravity of such disasters when they do occur. Promotion of individual and organisational strategies, such as; escape route planning, installation of fire alarm / sprinkler systems, behavioural changes, are to be encouraged (8) [III]. Fire services public education initiatives have been shown to reduce rates residential fires (9) [III].

The area of decreased tissue perfusion, or zone of stasis, within a burn injury is potentially salvageable with optimised, time critical care and early fluid resuscitation (10) [III]. Such care can also mitigate the effects of the corresponding systemic inflammatory response evoked by burns injuries, which has cardiovascular, respiratory, metabolic and immunological consequences.

Along with the influences of self-administered or lay person burn first aid, emergency response telephone guidance, fire service burn first aid (11,12), prehospital practitioners play a key role in improving clinical outcomes for burn injury patients.

This document contains a review of the available evidence and the consensus opinions of a multidisciplinary panel, including members of the Faculty of Pre-Hospital Care (FPHC) & British Burn Association (BBA), arising from a meeting held at Queen Elizabeth Hospital Birmingham on February 2nd 2016.

It serves to provide guidance regarding the pre-hospital management of burns injuries and to update the previous consensus for burns management from the FPHC (13), in association with the BBA.

Methods

A review through a structured literature search was undertaken and compiled using Pubmed, Ovid Embase and the Cochrane Library Database from January 1st 1991 to January 1st 2016. In addition, internet search engines, Google & Google Scholar, were used for supplementary material from academic journals, conference records, clinical practice guidance, burns advisory agencies, military documents, along with reference to international resuscitation guidelines. Search terms were applied with respect to the relevant topics and returned articles screened by title, as well as abstract where available, to be included in the review.

Search terms (MeSH) included; Burns, Pre-Hospital Emergency Care, First Aid, Thermal Injury, Airway Management, Inhalation Burn, Resuscitation, Chemical Burns, Eye Burns, Hypothermia, Pediatrics/Paediatrics, Elderly, Trauma. Search terms were adapted for use within each database, all searches were limited to English language articles.

This review was presented at a consensus meeting, held at Queen Elizabeth Hospital Birmingham on February 1st 2016. The meeting was attended by invited members of the FPHC and BBA, along with a multidisciplinary audience. The presentations of the available literature, together with panel discussions, were used to review and develop the clinical guidance.

Hierarchy of evidence is applied to the level of recommendations and the underlying literature justifying each statement (14). The level of evidence is detailed within the main body of the text in order to illustrate the relative merit underpinning the recommendation and define the grade of recommendation made by the consensus panel.

Level of evidence	Type of evidence
Ia	Evidence from systematic reviews or meta-analysis of randomised controlled trials
Ib	Evidence from at least one randomised controlled trial
IIa	Evidence from at least one controlled study without randomisation
IIb	Evidence from at least one other type of quasiexperimental study
III	Evidence from non-experimental descriptive studies such as comparative studies, correlation studies and case-control studies
IV	Evidence from expert committee reports or opinions and/or clinical experience of respected authorities

Table 1. Levels of Evidence (14).

Grade of recommendation	Type of evidence
A	Based on hierarchy I evidence
B	Based on hierarchy II evidence or extrapolated from hierarchy I evidence
C	Based on hierarchy III evidence or extrapolated from hierarchy I or II evidence
D	Directly based on hierarchy IV evidence or extrapolated from hierarchy I, II or III evidence

Table 2. Grade of Evidence (14).

Recommendations

Prior to clinical management guidance, it is imperative to stress the importance of not overlooking critical aspects of pre-hospital care including; scene safety, extinguishing flames and avoiding cross-contamination of chemicals/corrosive substances/causative agents (15) [IV].

Airway Management

Airway burns or inhalational injury must be excluded in the primary assessment of any burns patient. Airway burns can be defined into two anatomical categories; supraglottic and infraglottic.

The majority of airway burns will be supraglottic, limited to the naso/oro-pharynx and larynx, due to the highly effective capability for heat exchange by the upper airways. Heat damage of the supraglottic airway may be severe enough to produce upper airway obstruction. Clinically significant airway obstruction may be delayed in onset until fluid resuscitation is well underway.

Infraglottic airway burns should be considered in specific circumstances including; steam inhalation or aspiration of scalding liquid, blast injury, flammable gases under pressure, or aerosolisation of chemicals (16) [IV]. Features of infraglottic airway burns may include; impaired ciliary activity, erythema, hypersecretion, oedema, mucosal ulceration, and bronchial spasm (16) [IV].

A large-bore, uncut endotracheal tube (ETT) should be utilised, especially if inhalation injury is suspected. The larger ETT facilitates subsequent bronchoscopy or pulmonary toilet in-hospital, and decreases the risk of later airway occlusion, due to blood clot or mucus cast. The ETT should be left uncut to reduce the risk of tube submersion if facial swelling occurs.

Securing the ET tube can be difficult as adhesive dressings frequently fail on burnt skin. Cotton ties can be used, however care is required to regularly reassess the tension, as facial swelling can lead to the ties cutting into the skin and causing constriction. Commercial devices for holding ETT may be effective in such circumstances.

No contraindication exists to the use of airway adjuncts for establishing or maintaining a patient's airway following a burns injury. However, it must be recognised that impending airway compromise as a direct result of airway burns will only be adequately treated through the placement of an ETT. Early decision making is important as increasing oedema can raise the difficulty of intubation if delayed.

Clinical features for prophylactic intubation, which have been shown to correlate with the need for intubation include full thickness facial burns, stridor, respiratory distress, swelling on laryngoscopy, smoke inhalation, and singed nasal hairs (16) [IV].

Within the Rapid Sequence Intubation (RSI) checklist, practitioners should be prepared to perform a surgical airway if intubation should fail. Landmarks should be identified and equipment prepared before beginning the RSI. A direct transverse incision through skin and cricothyroid membrane may fail in the obese patient or if the anatomy is difficult to palpate, due to tissue oedema or overlying burnt skin.

A longitudinal skin incision to expose the anatomy followed by a transverse incision into the cricothyroid membrane is recommended in this situation (17) [IV].

Breathing

Respiratory system support, in accordance with current British Thoracic Society "Guidelines for emergency oxygen use in adult patients" advocate the use of oxygen for all patients with major trauma, including burn injury.

Treatment should be initiated through the use of a non-rebreathing reservoir mask at 10 – 15 l/min and aim for oxygen saturations within the range of 94–98% (18) [IV]. Further to routine breathing assessment, asphyxiant inhalation should be considered, especially if patients have been trapped in an enclosed smoke-filled environment.

In addition to pulse oximetry, pre-hospital practitioners should evaluate a range of signs and symptoms to exclude asphyxiant inhalation. These include; lethargy, irritability, severe temporal headache, generalized muscle weakness or CNS depression.

Cyanosis may frequently be absent following carbon monoxide (CO) or cyanide (CN) poisoning and a high index of suspicion should be maintained in order to avoid overlooking such diagnoses. Cherry red discoloration following asphyxiant inhalation is rare (19) [III].

Standard pulse oximeters cannot differentiate between carboxyhemoglobin (COHb) and oxyhemoglobin (O2Hb) until COHB levels reach >40%, due to similar absorbances (extinction coefficients). This results in pulse oximeters measuring COHb similarly to O2Hb, therefore failing to demonstrate reduced pulse oximetry. Carbon monoxide poisoning may be present even with normal pulse oximetry levels (20) [III]. If available, carbon monoxide meters may aid diagnosis: a level >30% indicates severe poisoning.

Initial management remains high flow oxygen (21) [IV]. The administration of 100% normobaric oxygen until COHb is normal (<3%) and the patient's presenting symptoms of CO poisoning have resolved (22) [IV]. The half-life of carboxyhaemoglobin is 320 minutes breathing air. This can be reduced to 80 minutes breathing 100% oxygen (23) [IV].

Altered mental status and central nervous system (CNS) depression may be due to smoke / asphyxiant inhalation. Correlation between high blood carbon monoxide (CO) and cyanide (CN) levels with cardiac arrest and burns injuries / smoke inhalation has been shown (24) [III], thus conscious level monitoring should be undertaken as routine in all burns patients.

Hydroxycobalamin treatment has been associated with improved survival in the management of acute cyanide poisoning caused by smoke inhalation and an acceptable risk versus benefit profile rendering it suitable for prehospital use (25) [III].
Administration of high flow oxygen and cyanide poisoning antidotes (Hydroxycobalamin 5mg I.V.) is recommended in burn patients with suspected smoke inhalation displaying alterations in mental status and / or cardiovascular instability. (26,27) [IV].

Occult trauma, self-inflicted poisoning or medical comorbidities, should also be considered for causes of depressed conscious level. Self-infliction (or suicidal intention) accounts for approximately 1.5 – 6 % of all burns injuries (28,29) [III] and a focused history should be obtained from the patient whenever possible.

Circulation

Difficulty in placing IV access is frequently encountered following large burns. If two attempts fail, the use of intraosseous circulatory access should be considered.

The use of intraosseous (IO) circulatory access does allow for sufficient fluid volumes to be administered for burns injury resuscitation (30) [IIb]. Infusion rates, without pressure bag application, range between 5-10ml/min dependent upon anatomical site and underlying hypovolaemia status (30) [IIb]. Therefore, dual IO access may be required for administration of higher fluid volumes.

Temperature Management

Hypothermia in burn patients has been shown to be an independently associated with mortality (31) [III], thus measures should be instigated to actively warm patients to avoid hypothermia (32) [IIb].

Patients will be required to be fully exposed to make an accurate assessment of burn severity, however to reduce heat loss, this should be for the minimal amount of time necessary, exposing only the area being examined and body temperature assessed regularly.
Body temperature in children should be vigilantly monitored, especially if burn cooling is being performed, as the risk for hypothermia is increased by children's greater surface area to body mass ratios. This is equally applicable to elder burn patients who, due to medical co-morbidity and diminishing physiological reserves, may have poor thermoregulation and are likely to succumb to hypothermia more rapidly.

Burn Severity

The use of the Lund & Browder chart has been shown to be the most reliable method for accurately determining burn TBSA severity (33) [IV]. Electronic versions have also been demonstrated to be as effective and more efficient methods for calculating burn TBSA (34) [II]. The posterior surfaces of a supine patient must be examined fully to provide an accurate assessment, and only burns of partial or full thickness should be included (exclusion of areas with superficial burn characteristics: erythema, dry surface, no blistering, skin intact, skin blanching with brisk capillary refill).

Due to the differential anatomical surface area for children, an appropriately scaled paediatric burns chart should be used for determining burns size estimation.

Estimation need only to inform a simplified delineation between those burn TBSA <20%, 20-50% & >50% for guidance of pre-hospital care strategies, particularly as burn area may evolve with time and standard of care. Further management can be determined based upon whether the burn is minor (<20%) or major (>20%), with regard to the necessity of fluid resuscitation and the triage to a burns facility or centre.

Burn Cooling

Cool running water has been demonstrated to the most effective method of burn cooling and has beneficial effects on burn healing outcome (35) [III]. The optimal duration of burn cooling is 20 minutes (36,37) [III/IIb]. Durations of cool water application shorter than 20 minutes have a limited effect on improved burn healing outcomes (36) [III]. Cool water temperatures should be less than 20ºC, with optimal healing benefit achieved with water approximately 12ºC (38) [Ib]. Ice water (<8ºC) should be avoided, due to increased tissue necrosis (37) [Ib].

Water should preferably be drinkable to reduce risk of wound infection, non-pottable water should be avoided for burn cooling.

For effective cooling to be performed, fluid volumes ranging between 20 – 120 litres of water may be required and at rates of application of at least, 1 – 1.5 L per minute to the burn area(s) (37,39) [IIb].

Whilst burn cooling is effective up to three hours after injury (40) [III], it should be applied as rapidly as possible, ideally within 10 minutes (41) [III]. Cooling should only be delayed or omitted in circumstances of immediate life threat or severe trauma complications.

All jewellery and clothing covering the burnt areas should be removed. If any material is adherent to the skin it should be left in situ, however cooling should continue undeterred (42) [IV].

Burn cooling appears not to directly contribute to patient hypothermia (43,44) [III]. However, burn cooling treatment should be attentively monitored during the pre-hospital phase of care and measures instigated to actively warm patients to avoid hypothermia as outlined above (32) [IIb].

Chemical Burns

Amphoteric solutions have demonstrated benefits for the treatment of chemical burn injuries. Both within experimental / laboratory studies, as well as in certain clinical studies, the use of amphoteric solutions has shown reduction in tissue damage, faster pH resolution and improved analgesia, with no adverse effects (45,46) [Ia/IV].

However, the reporting and methodology of these studies is poor, or shows a high risk of bias (45) [Ia]. In a single unaffiliated clinical series, the in hospital use of amphoteric solutions did not show significant difference in the time to healing, the length of hospital stay, or need for surgery (47) [III].

For chemical burns, amphoteric solutions are likely to be safe and as/more effective than alternative irrigation solutions, therefore the use of an amphoteric solution is recommended (45,46) [Ia/IV]. For ocular chemical burn injuries, specific amphoteric eye wash should be used (48) [Ia].

Immediate irrigation is imperative and should ideally be applied in less than 10 minutes from the time of injury, regardless of irrigation solution used, as this has been shown to lead to a five-fold decrease in full thickness severity and halves hospital length of stay (41) [III].

In the absence of amphoteric solutions, irrigation with should be performed with Hartmann's or Normal Saline solutions. If neither would be available, irrigation with tap or bottled water (45) [Ia].

Treatment of chemical burns should be undertaken whenever encountered, regardless of delay to presentation as the burning process may continue for many hours following contact. The duration of irrigation should be continued for as long as practically safe and possible.

Burn Dressings

Burn wounds should be dressed with loosely applied polyvinyl chloride dressings (cling film), in order to aid with wound hygiene (49) [IV]. Cling film should be laid over the wound and not applied in a completely circumferential manner, to avoid a constrictive effect. If cling film is not available, wounds may be dressed with clean damp cloth or non-adherent dressings (50,42) [Ia/IV].

The use of hydrogel dressings is not recommended. Evidence demonstrating the efficacy of hydrogels for burn cooling when compared to water is limited (50,51) [Ia]. Cooling temperatures to aid healing are not sufficiently achieved (52) [IIb] and such dressings need to remain uncovered to allow air movement for cooling (53) [III].

Fluid Resuscitation

For patients with burn injuries covering greater than 20% of the adult total body surface area, fluid resuscitation should be initiated in the pre-hospital setting (54) [III]. Delayed fluid resuscitation has physiological detrimental consequences when compared with early regimes (55) [III]. Under-resuscitation may lead to decreased tissue perfusion, acute renal failure, and death. However, administration of excessive fluid volumes can lead to worsening oedema formation, elevated compartment pressures, Acute Respiratory Distress Syndrome (ARDS), and multiple organ dysfunction (56,57,58) [II/III]. Over-resuscitation however can also have detrimental effects on mortality and morbidity, fluid creep (59) [IV], airway oedema (60) [IV] and abdominal compartment syndrome (61) [III].

Many fluid resuscitation regimes have been described, based upon accurate TBSA, weight and age. Ideally, fluid administration should be guided by monitoring for adequate rates of urine output (Adults: 0.3 – 1ml/kg/hr; Children: 1 – 1.5ml/kg/hr), but this is not feasible within most pre-hospital care settings. Frequently there is overestimation of burn TBSA, yet an under-resuscitation of burns patients (62) [III].

The use of a threshold method for fluid administration rates is recommended for pre-hospital settings, which requires an estimation of TBSA, age & weight only (see Figure 1) (63) [II]. Accurate documentation of fluid volumes administered should be handed over to the hospital team caring for the patient, in order to optimise ongoing resuscitation.

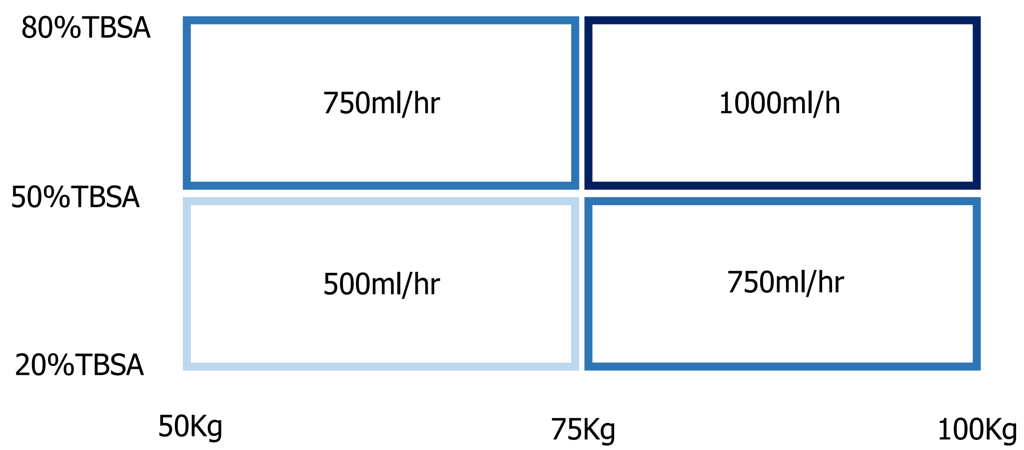

Figure 1. Adult Burns Fluid Grid (63).

Fluid resuscitation is indicated for children with greater than 20% TBSA burns. This is recommended to align with the adult guidance to minimise uncertainty and optimise fluid resuscitation. Fluid resuscitation remains weight based. In the absence of accurate body weight then estimation, by age, may be calculated. This should begin promptly, be accurately recorded and monitored in its titration. Fluid resuscitation for paediatric patients should optimally be highest sodium content fluid (0.9% Saline) if available.

Ideally, fluid resuscitation should be performed with warmed intravenous fluid and thus should be administered by the use of pre-hospital in-line fluid warmer devices.

Oral fluid administration is a potential route for rehydration, but should be reserved for awake patients with only moderate burns (64) [IV].

Burn Analgesia

Adequate pain treatment during all phases of burn treatment is mandatory (65) [IV]. Pain severity is slightly diminished with full thickness burns; however, most patients still experience significant pain. The presence of pain should not be used to exclude full thickness burns (66) [IV].

Covering the burn with a dressing will provide an analgesic effect. Choice of analgesic should be titrated according to the patients pain score.

There is no evidence to support the use of any particular opiate medication for burns and efficacy has been equally demonstrated for morphine and fentanyl against methoxyflurane (67) [III].

Appropriate management of pain in the child with a burn injury is important in maximizing their outcome. Pre-hospital analgesia administration for paediatric patients is below expected (68) [III] and inability to assess pain is the commonest reason for withholding opiate analgesia (69) [III]. Paediatric pain management should therefore be administered at the earliest opportunity.

Non-Steroidal Anti Inflammatory Drugs (NSAIDs) are not recommended for use in burns patients requiring fluid resuscitation, due to the effects on inflammatory response mediation, acute kidney injury and wound healing (70) [III].

Burn Safeguarding

Non-accidental injury (NAI) should be considered in all cases of burns injuries and vital information can be gathered by pre-hospital practitioners. This is especially the case when dealing with paediatric burns, where between 10-20% of burns injuries are seen to be of an NAI cause (71,72) [III/Ia] and this is likely to be an underestimate given difficulties in accurately detecting such cases. All details relating to the environment and circumstances resulting in the injury should be relayed to the hospital paediatric teams to facilitate a thorough investigation.

Highlighting the risk of non-accidental burns injuries in elderly or vulnerable adult patients, as well as in paediatric burns, should also be considered as part of the role of the pre-hospital practitioner.

Escharotomy

Chest escharotomy decompresses the restriction on chest wall expansion and also assists in decompressing intra-abdominal hypertension, retention of carbon dioxide, and central venous and inferior vena caval pressures while significantly increasing serum oxygen concentration and systolic blood pressure (73) [III].

The requirement for chest escharotomy in the pre-hospital setting is rare. While there are no high level studies of patient outcomes after emergent chest escharotomy, it is presumed that the physiologic changes from this procedure are potentially lifesaving in this patient group who already have a very high mortality (74) [III].

Indications for performing pre-hospital chest escharotomy (including the neck, as required) should be only in cases of circumferential or near circumferential eschar and impending or established respiratory compromise, due to thoraco-abdominal burns.

Escharotomy should be performed following mid-axial lines through burnt skin only.
Escharotomy may cause significant external haemorrhage, wounds should therefore have direct pressure applied for haemostasis and necessary volume resuscitation with blood products.

Pre-hospital limb escharotomy is not recommended in standard pre-hospital practice, given the short transfer times to hospital, especially as performing such procedures carry a significant risk of complications. It may be considered in prolonged field care scenarios, beyond the scope of this document.

Recommendations - Summary

Recommendation	Grade
Large bore endotracheal tube intubation is recommended for definitive airway management in burns patients with airway compromise.	D
Prophylactic intubation is recommended when suspicion of impending airway compromise is accompanied by full thickness facial burns, stridor, respiratory distress, swelling on laryngoscopy, smoke inhalation or singed nasal hairs.	D
A longitudinal skin incision is recommended for surgical airway placement in burns patients.	D
High flow oxygen should be initiated through the use of a non-rebreathing reservoir mask at 10 – 15 l/min and aim for oxygen saturations within the range of 94–98%.	D
Intraosseous circulatory access is recommended for burns patients fluid resuscitation and drug administration, when intravenous access fails.	D
Administration of high flow oxygen and cyanide poisoning antidotes (Hydroxycobalamin 5mg IV) is recommended in burn patients with suspected smoke inhalation displaying alterations in mental status and / or cardiovascular instability.	D
A strong recommendation is given to avoid hypothermia through active warming measures and body temperature monitoring should be conducted throughout the prehospital phase of burn care.	C
The use of the Lund & Browder chart (or electronic equivalent) is recommended as the optimal method for accurate burns severity estimation.	D
A recommendation is given to estimate burns severity between the following categories; <20%, 20-50% & >50% TBSA.	D
The use of cool running water for a period of 20 minutes is strongly recommended for burns first aid and should be conducted at the earliest opportunity, up to three hours from injury.	B
Ice water cooling is not recommended for burn cooling.	B
A recommendation is given to treat chemical burns as soon as possible and at any opportunity, regardless of delay in presentation.	D
Amphoteric solutions are recommended for first line use in chemical burn first aid, if immediately available.	D
A recommendation for fluid irrigation treatment of chemical burns to be performed for as long as practically safe and possible.	D
The use of polyvinyl chloride (cling film) dressing is the recommended method of burns wound care.	D
Initiation of fluid resuscitation is recommended for adult & paediatric burns >20% TBSA, guided ideally by the threshold method for determining fluid requirements.	D
Adequate administration of analgesia, as per local guidance, is strongly recommended for burn patients.	D
Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) are not recommended for burns analgesia.	C
A recommendation for all burn injuries to be considered as a result of Non-Accidental Injury (NAI) until proven otherwise.	D
Chest escharotomy is only recommended for circumferential or near circumferential eschar with impending or established respiratory compromise, due to thoraco-abdominal burns.	C

Table 3. Summary of Recommendations

Limitations

This guideline is based on the available evidence concerning pre-hospital burns care. Literature is limited, with very few high level articles available, and requiring extrapolation or inference of conclusions/outcomes.

Further Research

Although many areas of pre-hospital trauma care necessitate higher levels of evidence through research to categorically determine best practice, areas for further research highlighted within this document include;

- the role of hydrogel dressings in pre-hospital care, with particular attention to situations where burn cooling through the use of cool water is not possible.
- validation of the burns grid threshold method for pre-hospital fluid resuscitation in civilian populations for adults and the development of a paediatric threshold method,
- cost benefit analysis of amphoteric solutions for the pre-hospital treatment of chemical burns in UK practice setting.
- methods for increasing parental awareness for the management of burns and scalds in children (75) [III].

Summary

Burns patients form a significant group of trauma patients cared for by first aiders, ambulance staff, nurses and doctors before reaching specialist care in hospital. By optimising pre-hospital care significant differences can be made upon the mortality and morbidity from burns injuries. This article updates the key recommendation in the initial management of burn patients in the pre-hospital environment based on the current available evidence and a consensus of specialists from a range of disciplines caring for burns patients.

Acknowledgments

The authors would like to give thanks to all those who have been involved with the development of these guidelines.

Special thanks are given to the following groups;

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Competing Interests

None of the principal authors has any competing interests to declare.

Funding

The consensus meeting was funded by the Clinical Standards Committee, Faculty of Pre-Hospital Care.

Provenance & Peer Review

Commissioned; Internally Peer Reviewed

Word Count

4335 words

Citation

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