



Consensus on the pre-hospital approach to burns patient management

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Summary Burns patients form a large group of trauma patients cared for by first aiders, ambulance staff, nurses and doctors before reaching specialist care in hospital. Guidance for these important carers is often poor or confused and this engenders anxiety and detracts from optimal patient care. This paper outlines nine key steps in the initial management of burn patients in the pre-hospital environment based on current available evidence and a consensus of specialists from all disciplines caring for burns patients. The basis of care should be that simple things should always be performed well.

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Introduction

In the United Kingdom (UK), burns patients account for approximately 175,000 emergency department attendances and 15,000 hospital admissions each year (National Burn Care Review, 2000). Consequently the first aid and pre-hospital care for this large group of patients is of great importance and yet in the authors' experience, simple things are often not done very well.

In 1998 a national survey revealed 58% of UK ambulance services had no specific treatment policy for burns patients (Allison, 2002). Pre-hospital

carers often feel out of their depth in caring for burns patients, particularly children and there is a lack of teaching and simple, evidence-based guidelines.

The Faculty of Pre-hospital Care set out to improve the information available concerning immediate care of the burns patient in simple, unambiguous guidelines, so that any carer (including first-aider, ambulance personnel, nurse or doctor) could administer safe, appropriate care. The process to achieve consensus over these guidelines has taken time and the advice and ratification by all groups that look after burns patients from the point of their injury through to definitive care has been painstakingly followed (Tables 1 and 2).

It is hoped that the guidelines, although basic, can form the basis for current pre-hospital care and

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Table 1 Process of consensus guidelines.

| | |
|---|-------------------------|
| Ambulance service and plastic and burns surgeons questionnaire survey | 1998 |
| Presentation of data at Trauma UK meeting | June 1999 |
| Presentation of Data at British Burns Association (BBA) meeting | April 2000 |
| Letter in BBA newsletter inviting suggestions and help | September 2000 |
| Publication: "The UK pre-hospital management of burn patients: current practice and the need for a standard approach" | Burns 2002; 28:135–142. |
| Consensus meeting held in Birmingham | February 2001 |
| Consensus information presented at BBA meetings | April 2001, 2002 |
| Consensus guidelines included in Joint Royal Colleges and Ambulance Liaison Committee (JRCALC) | March 2002 |

Table 2 Individuals and organisations present at the consensus meeting in February 2001.

| |
|---|
| Ambulance services (West Midlands, Warwickshire, County Air Ambulance) |
| Ambulance service association |
| Medical directors of three ambulance services |
| British Association of Immediate Care Schemes (BASICS) and BASICS education |
| Faculty of pre-hospital care, Royal College of Surgeons of Edinburgh |
| British Burns Association |
| Local burns surgeons |
| Burns nurses |
| Military medical staff |
| DERA |
| Voluntary aid societies |
| Fire services |
| Clinical biochemist |
| British Association of Accident and Emergency Medicine (BAEM) |
| Accident and emergency specialty consultants |
| General practitioners |

Table 3 Consensus guidelines.

| |
|--------------------------------|
| 1. SAFE Approach |
| 2. Stop the burning process |
| 3. Cooling |
| 4. Covering/dressing |
| 5. Assessment of AcBC |
| 6. Assessment of burn severity |
| 7. Cannulation (and fluids) |
| 8. Analgesia |
| 9. Transport |

that they may be updated as new evidence or arrangements for burns patients are made within the UK (Table 3).

SAFE approach

For all pre-hospital emergencies, this acronym can be used to remind the carer as to the first priorities in patient care.

- Shout or call for help.
- Assess the scene for dangers to rescuer or patient.

- Free from danger.
- Evaluate the casualty (Greaves and Porter, 1999; National Association of Emergency Medical Technicians, 1994; Basic Life Support, 1997; IHCD, 1994; IHCD, 1991).

Stop the burning process

The burning process should be stopped/extinguished and the patient should be removed from the burning source. All burnt clothing should be removed (unless it is stuck to the patient) and any jewellery, which may become constrictive. All items of clothing should be brought in a plastic bag to the hospital for examination. Patients with chemical burns may need a longer period of irrigation under tap water and specific information about the chemical concerned should be obtained.

Cool the burn wound

There is often confusion over this process and how long it should last for. It is suggested that the ambulance service despatch system will advise the

'999' caller to cool the burn area for up to 10 min. Cool running tap water is sufficient and ice cold water should not be used. If this has been done, pre-hospital carers should cool for another 10 min during package and transfer. If the burn area is small (<5%) then a cold wet towel can be placed on the burn area, on top of the Clingfilm™ dressing (see next section), but before wrapping up the whole patient to maintain body warmth beneath the blankets. Delays in transporting the burn patient should be minimised, as should the risk of inducing hypothermia, particularly in children. A helpful reminder is to: "Cool the burn wound but warm the patient" (Allison, 2002; Nguyen et al., 2002a,b; Jandera et al., 2000; Sawada et al., 1997; Lawrence, 1996; Hodson, 1992; Latarjet, 1990; Lawrence, 1987; Clayton and Solem, 1995; Demling et al., 1979; Kravitz, 1974; Kravitz, 1970; Australian and New Zealand Burn Association, 1996; First Aid Manual, 1997; Judkins, 1999; Burns, 1997; Raine et al., 1981; Jelenko et al., 1974; Jelenko et al., 1973; Jelenko et al., 1971; King and Price, 1963; Ofeigsson, 1965; Cooke et al., 1999; Childs, 1994).

Dressings

Dressings are important to help the patient's pain control and to keep the burnt area clean. The burnt area should be covered with a cellophane type wrap Clingfilm™, remembering the possible constricting effect of wrapping; smaller pieces are perhaps better than circumferential sheet. The patient should be wrapped up in blankets or a duvet.

In chemical burns after irrigation/cooling, Clingfilm™ theoretically may worsen the burn effect, so the affected area should be irrigated thoroughly until pain or burning has decreased and only wet dressings should be used. Care should be taken with the management of powder injuries, which may be worsened with water. If available, data regarding the likely chemical should be taken with the patient to hospital (Allison, 2002; O'Rourke et al., 1999; Kinsella and Booth, 1991; Vartak et al., 1991; Queen et al., 1987; Coats et al., 2002; Treharne and Kay, 2001; Cole et al., 1991).

Assessment and management of immediately or imminently life threatening problems: airway with cervical spine stabilisation, breathing, circulation (AcBC)

It should be remembered that the patient may have other injuries co-existent with their burn injury.

These should be suspected, diagnosed and treated as with any other pre-hospital emergency. The patient should have high flow oxygen delivered via a non-rebreath mask (15 litres/min). If a patient has an isolated burn injury which is small, and when no inhalation injury is suspected, the oxygen may not be necessary (Australian and New Zealand Burn Association, 1996; American College of Surgeons, 1997; Hodgetts et al., 1995).

Assessment of burn severity

In order to estimate the size of the patient's burned area, use the Wallace rule of nines or the "half burnt/half not" approach (Serial halves: >1/2, <1/2, 1/4–1/2, <1/4). This latter technique although new, is effective in burn size estimation in pre-hospital care. Other important features of the burn injury to define are:

- Time of burn injury.
- Mechanism of injury (flame {clothes or patient caught fire}, flash burn, scald, electrical, chemical).
- Burn within confined space = possible respiratory inhalation injury.
- In children and elderly, always be mindful of potential nonaccidental injury.

It is of paramount importance that the pre-hospital carer keeps good records (Ashworth et al., 2001; McGugan et al., 2000; Collis et al., 1999; Hammond and Ward, 1987).

Cannulation and intravenous fluids

The emphasis for patient cannulation should be for the administration of titrated opiate/opioid analgesia. It is important that cannulation procedures do not unnecessarily extend the on scene time; this should be limited to two attempts only.

Fluid replacement with 0.9% normal saline or Hartmann's solution *can* be commenced if the patient is cannulated, but *must be* started for burns >1/4 TBSA and/or if time to hospital is more than 1 h from time of injury. A guide to fluid volumes is:

- 1000 ml for adult, 500 ml for child 10–15 years, 250 ml 5–10 years, no fluids for under 5's.
- Fluid therapy should ideally be warmed (Henry and Scalea, 1999; Myers, 1997; Warden, 1992; Dalton, 1995).

Analgesia

As previously indicated, analgesia is best accomplished by cooling and covering the burned area.

Intravenous opiate/opioid can be titrated to make the adult patient more comfortable and should be accompanied by an anti-emetic. In children intranasal diamorphine is an option that may be considered. Entonox should only be used when these options are unavailable as it may be difficult to administer, has varying efficacy and decreases the oxygen delivery (Allison, 2002; Hodson, 1992; Coats et al., 2002; Kendall et al., 2001; Chambers and Guly, 1994; Phillips, 1980; Wilson et al., 1997).

Transport

All treatment should be carried out with the aim of *reducing* on-scene times and delivering the patient to the appropriate treatment centre. This should be the nearest appropriate accident and emergency (A&E) department, unless local protocols allow direct transfer to a burns facility.

Communication with A&E should give the standard information (age, gender, incident, ABC problems, relevant treatment, ETA) (National Burn Care Review, 2000; Cummings and O'Keefe, 2000; Baack et al., 1991; Novak and Tury, 1991; Palmer and Sutherland, 1987; Marichy et al., 2002; Nakae and Wada, 2002; Slater et al., 2002; De Wing et al., 2000).

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