Emergency Medical Retrieval Service (EMRS)

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Standard Operating Procedure
Public Distribution

Title Burns

Version 7

Related Documents British Burns Care Review

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Aims

· To ensure appropriate treatment and triage of major burns patients

Background

· The team is involved in the retrieval and pre-hospital care of patients with burns. Assessment and early management of actual and potential airway and respiratory compromise is essential, as is adequate fluid resuscitation.
· National Burns Care Review recommends that failure to admit complex burns cases into burns service site within 6 hours be “regarded as a critical incident and the reasons investigated”

Application

EMRS team members
SAS Paramedics
Burns Unit, GRI / ARI / St John’s, Livingston
Patients appropriate for retrieval team activation

- Adult burns cases where advanced medical intervention is appropriate to optimise safe transfer

Advice to GP prior to team arrival

- High volume irrigation of chemical burns, cold water immersion/irrigation of thermal/electrical burns + immediate dressings (Clingfilm)
- Oxygen, opioid analgesia, crystalloid fluids (normal saline/Hartmann’s by Parkland formula).
- Warming/hypothermia prevention

Medical management on scene

PRIMARY SURVEY

| A | Airway burns (perioral/nasal stigmata; altered voice; stridor) - early intubation |
| B | Smoke inhalation (circumstances; nasal/pharyngeal soot) |
|   | CO poisoning (oximetry unreliable). Commence oxygen. |
| C | Early shock is due to other injury! Escharotomy considered only after transfer |
| D | Other injuries; cardiac/neurological/diabetic/drug event? |
| E | Extent of burn, ocular burn? Core temperature? Avoid hypothermia |

- Have a low threshold for endotracheal intubation if air transfer is indicated.
- Use an Uncut ETT for intubation
SECONDARY SURVEY

Total Body Surface Area Assessment
Wallace Rule of nines to assess BSA.

Palm of patient’s hand approximates 1%

In acute situations lengthy depth assessment is inappropriate. A burn is a dynamic wound, and its depth will change depending on the effectiveness of resuscitation. Initial estimates need to be reviewed later.

**Depth of Burn**

*Superficial*  
erythema, rapid capillary refill

*Partial thickness*  
pain +/- blisters, some capillary refill present, sensate, hairs intact

*Full thickness*  
insensate, fixed staining / charring, leathery, hairs fall out

Most burns are a mixture of different depths. A burn is a dynamic wound, and its depth will change depending on the effectiveness of resuscitation. Initial estimates need to be reviewed later.

Age + % (partial / full thickness) burns approximates mortality
Fluids

Use Parkland formula with crystalloid only (Hartmann’s).

**Resuscitation volume = 4ml x % area burned x weight (kg)**

Half to be administered by 8 hours post burn, remaining half over subsequent 16 hours.

The formula should be seen as a guide only; the initial %BSA is likely to be inaccurate. Continue to use standard markers of volume status, in particular pulse pressure variation.

The end point to aim for is a urine output of 0.5-1.0 ml/kg/hour in adults.

Volume required likely to be higher if: Smoke inhalation injury, Pre-standing dehydration (e.g. alcohol toxicity Musculoskeletal / abdominal injury

**Analgesia**; titrated I.V. Morphine

**Urinary catheter** and record hourly urine output
Escharotomies

A circumferential deep dermal or full thickness burn is inelastic and on an extremity will not stretch. Tissue pressures rise after fluid resuscitation and can impair peripheral circulation. Initially, at risk limbs should be elevated and observed.

![Diagram of escharotomies for the chest](image)

Only the burnt tissue is divided, not any underlying fascia, differentiating this procedure from a fasciotomy. Where possible, depending on referring site, escharotomy should be done in a sterile environment with diathermy equipment, as the two major risks are bleeding and increased risk of invasive infection.

Wound dressing for transfer

- Cover all burned areas with cling film to prevent infection and allow for ease of assessment. Apply cling film to limbs longitudinally rather than circumferentially. Then wrap patient in sterile/clean sheets/covers to prevent heat loss. Use headwear if available.

- If transfer is delayed for any reason or journey will be longer than 6 hours, apply conservative dressings of paraffin impregnated gauze (e.g. Vaseline Petrolatum Gauze or Jelonet gauze), gamgee and bandages to manage fluid loss.

- **DO NOT APPLY SILVER SULFAZINE 1% CREAM (FLAMAZINE)** as it will mask the burn injury and make it difficult to assess.

Feeding:

- Consideration should be given to early feeding in the following circumstances:
  - ventilated patient
  - > 6 hr projected time between injury and arrival in ITU
  - Nasogastric tube sited and position confirmed by standard methods.
  - Feasible to maintain a degree of head up tilt

- Aim to give 100ml full fat milk delivered with a bladder tipped syringe prior to departure; repeated hourly if practical.
Triage

The British Burn Association has identified the following injuries as those requiring referral to a burns service:

- Total Body Surface Area (TBSA) greater than:
  - 10% if aged >16 years
  - 5% if aged <16, or full thickness in entirety

- Special Areas:
  - face, hands, feet, genitalia/perineum, flexure area
  - any circumferential partial / full thickness burn
  - inhalation injury / airway burn

- Special mechanisms:
  - Chemical if >5% TBSA
  - Hydrofluoric acid if >1% TBSA
  - High tension electrical (>1000volts)
  - High pressure steam / ionising radiation
  - Associated trauma (fracture, crush / head / penetrating injury), or medical co-morbidity liable to complicate management / recovery (cardiorespiratory / endocrine / neurological disease, pregnancy)
  - Suspected 'Non Accidental Injury' (children or elderly)
  - Burns at the extremes of age (<5 or >60 years of age)

Contacts:

1) Patients ≥ 13 years: Duty Burns Registrar via Glasgow Royal Infirmary or Aberdeen Royal Infirmary or St John’s Hospital, Livingston.

2) Patients aged <13 years: Duty general surgical registrar via Royal Hospital for Sick Children, Glasgow. Switchboard 0141-201-0000.

3) Glasgow Royal Infirmary Burns Unit: Tel: 0141 211 4324.

4) For Burns patients from the North please discuss with Aberdeen Burns Registrar prior to final triage. Tel 08454566000

Links

Care of Burns in Scotland Managed Clinical Network  www.cobis.scot.nhs.uk