Burns in Children

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<td>BSUH Trauma Committee</td>
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<td>Date approved:</td>
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Paediatric Trauma Guidelines

Burns

See also:  LSEBN Paediatric referral guidelines (age < 17 years) / LSEBN Transfer Document

Background

BSUH is part of the London and South East Burn Network (LSEBN). Our current specialised burns service is at Queen Victoria Hospital, East Grinstead. Peanut ward can be contacted on 01342 414469 for advice and queries.

Children requiring intensive care or who cannot be admitted to QVH will need transfer to a tertiary facility. These include:

- Burns in children < 6 months of age
- Burns > 10% in children 6 months – 1 year of age
- Burns >15% in children 1 – 5 years of age
- Burns > 20% in children 5 – 16 years of age
- Burns + inhalation injury or need to ventilate
- Burn + major trauma
- Burn + requirement for inotropic support
- Burn + requirement for renal replacement
- Burn + base deficit > 6 and deteriorating
- Burn + O₂ requirement of > 50%

Contact will need to be made with:

1. Chelsea and Westminster Hospital, London 0203 3152500
2. St. Andrews Centre, Broomfield Hospital, Chelmsford 01245 516037

The National Burn Bed Bureau should be able to advise on bed availability. They can be contacted on 01384 215576.
Paediatric Trauma Guidelines

Management

On arrival to the ED, assess and deal with airway, breathing, circulation and disability as per APLS guidelines.

Airway (C-spine) and breathing
- protect C-spine if mechanism of injury suggests the possibility of cervical spine injury. Start with manual in-line stabilisation. If this is not possible, use head block and strapping. Get patient off spinal board ASAP. Nurse flat with spine in alignment. Log-roll to move patient.
- If spontaneously breathing administer high flow oxygen
- Intubate and ventilate if:
  - Severe respiratory distress or inadequate respiration
  - Evidence of smoke inhalation or airway burns
  - haemodynamic instability, depressed conscious state (GCS < 9) or agitation
- Measure oxygen saturations, respiratory rate, and blood gas

Circulation
- Assess and monitor heart rate, blood pressure and capillary return
- Insert large bore intravenous cannula (ideally x 2). If unable, gain I.O access.
- Take trauma panel bloods
- If circulation is inadequate give fluid bolus(es)
  - 10 ml/kg crystalloid in first instance then warmed blood in 10 ml/kg aliquots. Assess response after each aliquot
  - Activate the massive haemorrhage protocol if 40 ml/kg has not stabilised the child

Disability and environment
- Assess and monitor GCS, pupils and blood sugar
- Check core temperature
- Analgesia

Assessment of the burn should take place in the secondary survey after the airway, breathing and circulation have been assessed and stabilised.
Paediatric Trauma Guidelines

Clinical assessment and management of burns

1. Calculate percentage total body surface area burnt (see next page)
   Do not include areas of erythema.
   Blisters may need de-roofing to investigate skin below.
   Photograph burns using CED camera

2. Give resuscitation fluids and fast according to algorithm below
   All children with ≥ 10% TBSA burns will receive IV burns replacement fluids
   (“resuscitation fluid”) as per the Parkland Formula.

3. Place a urinary catheter in all children with burns ≥ 20% TBSA. Consider catheterising
   children with burns 10-19% TBSA and those with perineal burns.
   All children receiving IV fluids should have fluid balance documented.

4. Consider central venous access in unstable children.

5. Once burns are dressed, resuscitation fluids have started and all other injuries
   investigated and managed, arrange transfer to appropriate burns centre. If child is
   intubated and ventilated, they will need transfer through a retrieval service. Our current
   retrieval partner is South Thames Retrieval Service (STRS) 02071885000.
Paediatric Trauma Guidelines

Calculation of percentage body surface area burnt

<table>
<thead>
<tr>
<th>Area</th>
<th>0 years</th>
<th>1 year</th>
<th>5 years</th>
<th>10 years</th>
<th>15 years</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>9.5</td>
<td>8.5</td>
<td>6.5</td>
<td>5.5</td>
<td>4.5</td>
</tr>
<tr>
<td>B</td>
<td>2.75</td>
<td>3.25</td>
<td>4</td>
<td>4.5</td>
<td>4.5</td>
</tr>
<tr>
<td>C</td>
<td>2.5</td>
<td>2.5</td>
<td>2.75</td>
<td>3</td>
<td>3.25</td>
</tr>
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Initial fluid management in children with burns

**Age < 3 months**

- **< 10% burn**
  - Feed as normal
  - If NBM for another reason, give IV maintenance fluids

- **≥ 10% < 20% burn**
  - Feed as normal
  - IV burns replacement fluid
  - Only give IV maintenance fluids if NBM for another reason

- **≥ 20% burn**
  - Keep NBM
  - IV burns replacement fluid and IV maintenance fluids

**Age > 3 months**

- **< 10% burn**
  - Feed as normal
  - If NBM for another reason, give IV maintenance fluids

- **≥ 10% < 20% burn**
  - Feed as normal
  - IV burns replacement fluid
  - Do not give IV maintenance fluids

- **≥ 20% burn**
  - Keep NBM
  - IV burns replacement fluid only
  - Do not give IV maintenance fluids

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**Maintenance fluid** = 100 ml / kg for first 10 kg + 50 ml/kg for next 10 kg + 20 ml/kg for each additional kg – given over 24 hours.

Use 0.9% sodium chloride with 5% dextrose

**Burns replacement fluid according to Parkland Formula**

= 4 ml/kg per % burn over 24 hours from the time of injury

Give half in 1st 8 hours and half in next 16 hours.

Use Hartmann’s solution
Burns decision flow chart for children

- **Burns <1% and not complex**
  - Manage locally.
  - If concerned contact Queen Victoria Hospital, East Grinstead:
    - Peanut ward 01342 414469

- **Burns >1% or complex**
  - Discuss with Queen Victoria Hospital, East Grinstead:
    - Peanut ward 01342 414469

**Complex burns**
- **Site:** Face, hands, perineum, feet, circumferential
- **Depth:** Deep dermal and full thickness any site
- **Associated with:** smoke inhalation, electrical shock or trauma
- **Age:** <1 month
- **Toxic shock:** Delayed onset of high temp, rash, D&V, systemically unwell
- **Severe metabolic disturbance**
- **Child protection concerns**