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# Clinical Guidance

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## Paediatric Critical Care: Early Management of Burns

### Summary

Explanation regarding management of a child with burns. This does not cover pre-hospital first aid and initial management of chemical burns.

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Related documents	<a href="#">Pain assessment and management</a>
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Relevant external law, regulation, standards	<a href="#">London South East Burn Network (LSEBN)</a> <a href="#">LSEBN identification of burn type</a> <a href="#">LSEBN management of severe burns</a>
<p>This clinical guideline has been produced by the South Thames Retrieval Service (STRS) at Evelina London for nurses, doctors and ambulance staff to refer to in the emergency care of critically ill children.</p> <p>This guideline represents the views of STRS and was produced after careful consideration of available evidence in conjunction with clinical expertise and experience. The guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient.</p>	

Change History		
Date	Change details, since approval	Approved by
03/2022	Sit upright if facial burn, 10mL/kg fluid bolus, blood products if trauma, exposure section expanded-first aid, hypothermia, intranasal diamorphine	ELCCG March 2022
05/2025	LSEBN links added (includes burn centres contact), previous contacts removed. Updated modified Parkland formula and fluid bolus amount for shock, removed cyanide poisoning treatment and suggestion for propranolol.	ELCGC May 2025

# Burns (early management)

- London and South-East Burns Network (LSEBN) guidelines: <https://www.lsebn.nhs.uk/downloads>
- All children with burns should have a multidisciplinary assessment—including plastic surgeons & anaesthetists

## If chemical burn ensure fully decontaminated

### Airway\*:

- C-spine protection if any possibility of spinal injury
- Maintain patent airway
- Keep all children with facial burns sitting upright
- Early intubation if anticipated airway problems (\*see right)
- Rapid Sequence Induction with rocuronium (NOT suxamethonium)
- CUFFED and UNCUT endotracheal tube (rides up with oedema)
- Consider suture or wire to teeth in major facial burns to secure

### Breathing:

- Ensure adequate oxygenation and ventilation, maintain sats >95%
- Respiratory failure can be due to chest trauma, inhalational injury or restrictive chest wall eschar formation

### Circulation:

- Early access - 2x large bore cannulae or intraosseous
- Blood Gas (lactate, O<sub>2</sub>Hb, COHb, MetHb), x-match, glucose, U&Es, CK; urine b-HCG if female adolescent
- Burns fluid resuscitation using **Modified Parkland Formula**
- **If shocked:** 10 + 10 mL/kg resuscitation (as indicated)
- Refractory hypotension, consider other causes e.g. trauma (may require additional resuscitation inc. blood products)
- Electrical burn: Baseline 12 lead ECG & monitor for arrhythmias
- Maintain urine output  $\geq 1$  mL/kg/h (early catheterisation)

### Modified Parkland Formula

- Applicable to burns > 10% TBSA
- Fluid requirement starts at time of burn
- Aim to replace fluid lost from burned surface in first 24 hours

**Percentage burn x weight (kg) x3 = fluid replacement in 24 hours**  
(half should be given in the first 8 hours)

### Neurological status:

- Assess and document GCS, pupil size & blood glucose
- Reduced GCS may be multifactorial: consider CT head

### Exposure / Environment:

Note time of incident, duration of contact, and, if electrical, voltage

- First Aid – ensure burn cooled for 20 minutes (effective up to 3 hours post-injury) with running water or serial wet cloths
- Remove any non-adherent clothing (leave adherent clothing in place)
- Risk of hypothermia: proactively maintain normothermia
  - (cool the burn, warm the child)
- Examine head to toe, front and back
- Check distal perfusion, pulses, temperature & colour: discuss need for escharotomy with specialist burns service.
- Use Lund & Browder chart to document percentage + depth of burn. Do not count erythema (estimate if no chart: Child's palm =1% BSA)
- Cover burn with non-adhesive towels or cling film (applied loosely), take photographs prior to applying dressing
- Leave blisters intact

### Burns referral criteria (LSEBN):

<https://www.mysurgerywebsite.co.uk/website/X13911/files/LSEBN%20Burns%20Referral%20Criteria.pdf>

### \* Anticipate airway problems:

- 1) **Airway burn &/ or Inhalation injury:** history of exposure, burns involving face or neck, singed nasal hair, carbonaceous debris in/ around mouth or nose & in sputum, stridor, wheeze, change in voice, respiratory distress
- 2) **Reduced or falling level of consciousness**
- 3) **Large burn  $\geq 25\%$**
- 4) **Electrical burns**

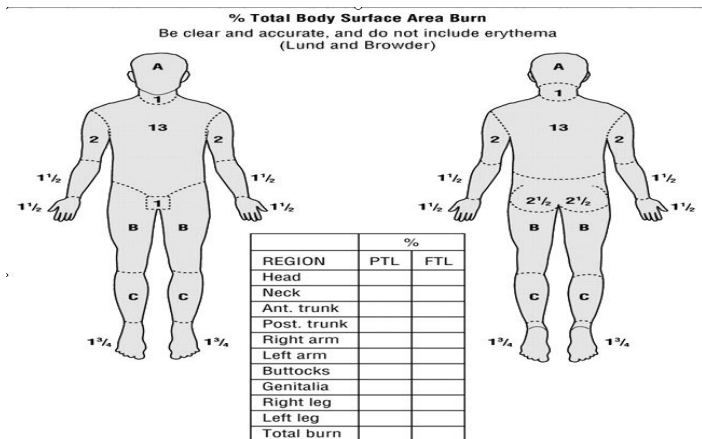
### Carbon Monoxide (CO) poisoning:

- Pulse oximetry unreliable (false high SpO<sub>2</sub> despite arterial hypoxia)
- Arterial blood gas (normal COHb levels 1-3%)
- Use 100% O<sub>2</sub> - CO clears in 3-5 hrs
- CO Hb level >20% may benefit from Hyperbaric Oxygen Therapy

### Cyanide poisoning: (aerosolisation of upholstery and fabrics)

- Features: metabolic acidosis (esp. if lactate >10mmol/L) despite 100% O<sub>2</sub> & adequate fluid resuscitation in first 2 hours of presentation; arteriovenous saturation difference <5%

**Discuss with specialist burns service & on-call consultant toxicologist**



AREA	Age 0	1	5	10	15	Adult
A = 1/2 OF HEAD	9 1/2	8 1/2	6 1/2	5 1/2	4 1/2	3 1/2
B = 1/2 OF ONE THIGH	2 1/2	3 1/4	4	4 1/2	4 1/2	4 1/2
C = 1/2 OF ONE LOWER LEG	2 1/2	2 1/2	2 1/4	3	3 1/4	3 1/2

[See LSEBN website for pictures of different types of burn](#)

For specialist advice, photos can be uploaded at [www.trips.nhs.uk](http://www.trips.nhs.uk)

### Analgesia:

- Assess and document pain score using age appropriate tool
- Intranasal diamorphine can be given (use local guideline)
- IV morphine infusion preferred to obtain baseline control of pain & boluses as required (see STRS app for infusion preparation).
- IV ketamine for procedures with anaesthetic support
- Regular paracetamol

### Other:

- 1) Consider Non-accidental Injury
- 2) No antibiotics/ steroids
- 3) Tetanus prophylaxis/ vaccination
- 4) Eye Care