Burns - Full guideline

Initial management- KIDS Transport Team Guidelines

Refer EARLY to KIDS NTS for advice - 0300 200 1100

Initial management:
The immediate management of burns patient should follow the (ABCDEF ") approach

Airway

Protect C-spine until clinically cleared as stable
Administer 100% O_2 to all patients initially. Aim for saturations of >95%. Obtain formal co-oximetry as soon as possible to exclude CO poisoning (normal carboxyhaemoglobin level 0-5%). If level raised, continue 100% O_2 until level <10%

Intubation is recommended for:

- **Airway burns**: suggested if burned in enclosed space, stridor, burns to face, singed nasal hairs, soot in sputum, change in voice, brassy cough
- **Inhalational injury**: suggested if burned in an enclosed space, dyspnoea, hypoxaemia (SpO_2 <94% in room air), increased CO level
- **A large burn area**: for which high levels of analgesia will be required
- **Reduced conscious level**: GCS<8 or fluctuating level of consciousness

When intubation is recommended **don't delay** intubation waiting for KIDS team to arrive
With the help of senior anaesthetist **site a cuffed tube is avaliable**
DO NOT cut the ET tube as facial swelling may increase over 12-72 hours.
ARDS and ventilation difficulties are common and can be better managed with a cuffed ETT.
If the face is burned the tube may be fixed with cotton tape tied over the ears.

Breathing

Pulmonary Injury:
The pulmonary complications of burns and inhalation:

1. Airway obstruction and pulmonary oedema (0-24 hours)
2. Acute lung injury (ALI)/Acute respiratory distress syndrome (ARDS) (24–72 hours)
3. Pneumonia and pulmonary emboli (days to weeks)

Management:
Aggressive suctioning for airway secretion clearance
Use bronchodilators for bronchospasm (nebulised and/or intravenous)
Consider flexible bronchoscopy to assess the extent of airway involvement

- Impaired chest wall compliance and secondarily impaired ventilation can be caused by a full thickness burn of the anterior and lateral chest wall. This restriction may require urgent relief by escharotomy to enable adequate ventilation.

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Ventilation strategies:

The use of lung protective strategies should be applied to children with acute lung injury/ARDS.
Commonly applied respiratory support strategies include:

- Low tidal volume/high positive end-expiratory pressure (PEEP)
- High frequency oscillatory ventilation (HFOV)
- Inhaled Nitric Oxide for refractory hypoxaemia.

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Circulation

Assess circulation (heart rate, respiratory rate, blood pressure, capillary refill time, peripheral temperature, peripheral pulses, urine output)
If there is circulatory involvement:

- All patients requiring fluid resuscitation should have two large-bore intravenous (or IO) cannulas ,through the burn if necessary, and an indwelling urinary catheter attached to an hourly urine collection bag.
- Treat shock with fluid boluses. If this does not improve parameters repeat primary survey looking for causes of shock.
- Take blood for FBC, U&E, ABG, G&S, CK, Clotting screen and BHCG.

Circumferential limbs burn.
Absence of peripheral pulses requires immediate contact with local burns service as an escharotomy may be required.

Disability

Assess pain scores and administer iv opiate analgesia as required
Assess GCS, pupils' reactivity. Intubation is indicated if GCS less than 8

Exposure

- Remove loose clothing's and jewellery, leave any adherent clothing
- Clean with normal saline
- Assess Total Burn Surface Area (TBSA) %. Use Lund and Browder chart below to document findings. Ignore simple erythema don't include it in TBSA %
- Cover the burn wounds in loose cling film prior to transfer

Fluid Management

Treat shock with fluid boluses. After initial fluid resuscitation, replacement fluid should be calculated **from the time of burn:**

%TBSA burn x body wt in Kg x 0.25ml/hr

Hartman's in the first 8 hours (**from time of injury** not when seen)

After 8hrs: 4.5% Human Albumin Solution at 0.1ml/kg/%TBSA/hr

These are in addition to the child maintenance fluids calculated the normal way and using dextrose 5% with normal saline

- Aim urine output > 1 ml/kg/hour
- Titrate fluids up or down according to frequent clinical assessment and urine output (UO) .
- If inadequate UO, check catheter, double infusion rate, reassess at 1 hour, if still low consider re-evaluating size and severity of burn and need for increased volume of fluid.
- Catheterise all burns >10% or if cardiovascular instability. Aim for urine output of > 1 ml/kg/hr (2-4ml/kg/hr in rhabdomyolysis, especially with burns secondary to electrocution)

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Birmingham Children's Hospital (BCH) Burns Centre operates as a burn facility, unit and centre for the West Midlands, and it is the Centre for the East Midlands. It is also part of the Midlands Burn Care Network (MBCN) and therefore receives referrals from all parts of the country depending on bed availability

Burn Services in the Midlands (Description of Capability)

Hospital	Level of service	Description of patients treated and cared for in service
University Hospitals Birmingham NHS Foundation Trust	Burns Centre	Adults with minor, moderate, severe and complex severe burns
Birmingham Children's Hospital NHS Foundation Trust	Burns Centre	Children with minor, moderate, severe and complex severe burns
Nottingham University Hospitals NHS Trust	Burns Unit	City Hospital campus: Adults with minor, moderate and severe burns Queens Medical Centra: Children with minor and moderate burns
University Hospitals of Leicester NHS Trust	Burns Facility	Adults and Children with minor burns

Please contact Children's Burns Service on phone numbers listed

Children's Burns Services	Site	Level	Contact
Birmingham Children's Hospital NHS Foundation Trust	Birmingham Childrens Hospital	Centre	0121 333 8964/ 8965
Nottingham University Hospitals NHS Trust	Queens Medical Centre	Unit	0115 924 9924 ext 70362 or 62388
University Hospitals of Leicester NHS Trust	Leicester Royal Infirmary	Facility	07956 266 983/ 07539 867 191 (clinic hours) Out of hours SPR on call for Burns

Reasons for paediatric admission to burns centre (Burns ICU) include:

- Intensive care of children with larger burns (cardiovascular, respiratory, and nutritional support, fluid management, temperature and pain control, alternate-day dressing changes under sedation / GA)
- Post-operative care after major wound debridement and skin-graft surgery
- Wound sepsis, including TSS (Toxic Shock Syndrome)
- Intubated facial burns
- Medical skin loss – for example, TENS (Toxic Epidermal Necrolysis), SJS (Stephen Johnsons Syndrome), SSSS (Staphylococcal Scalded Skin Syndrome)

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Threshold to refer to Burns Centre

Criteria		Paediatrics Burn Centre Threshold
Total body surface area (TBSA)	Refer	• ≥30% • ≥15% if under 1 yr old
	Discuss	• ≥20% • ≥10% if less than 1 yr old
Depth	Refer	≥20% TBSA if full thickness
Age	Discuss	Any burn injury in a neonate
Physiological instability	Refer	• All requiring inotropic support. • All requiring renal support. • All requiring respiratory support for more than 24 hours. • Oxygen requirement >FiO2 50% • Base deficit >6 and deteriorating. • Burn + major trauma

For referrals and discussions please call KIDS CONFERENCE LINE 0300 200 1100

Consider asking the parents to send photos to bch-tr.burns@nhs.net. Parents need to include the following sentence in their email “I give consent for these photographs to be stored on my child’s personal record”

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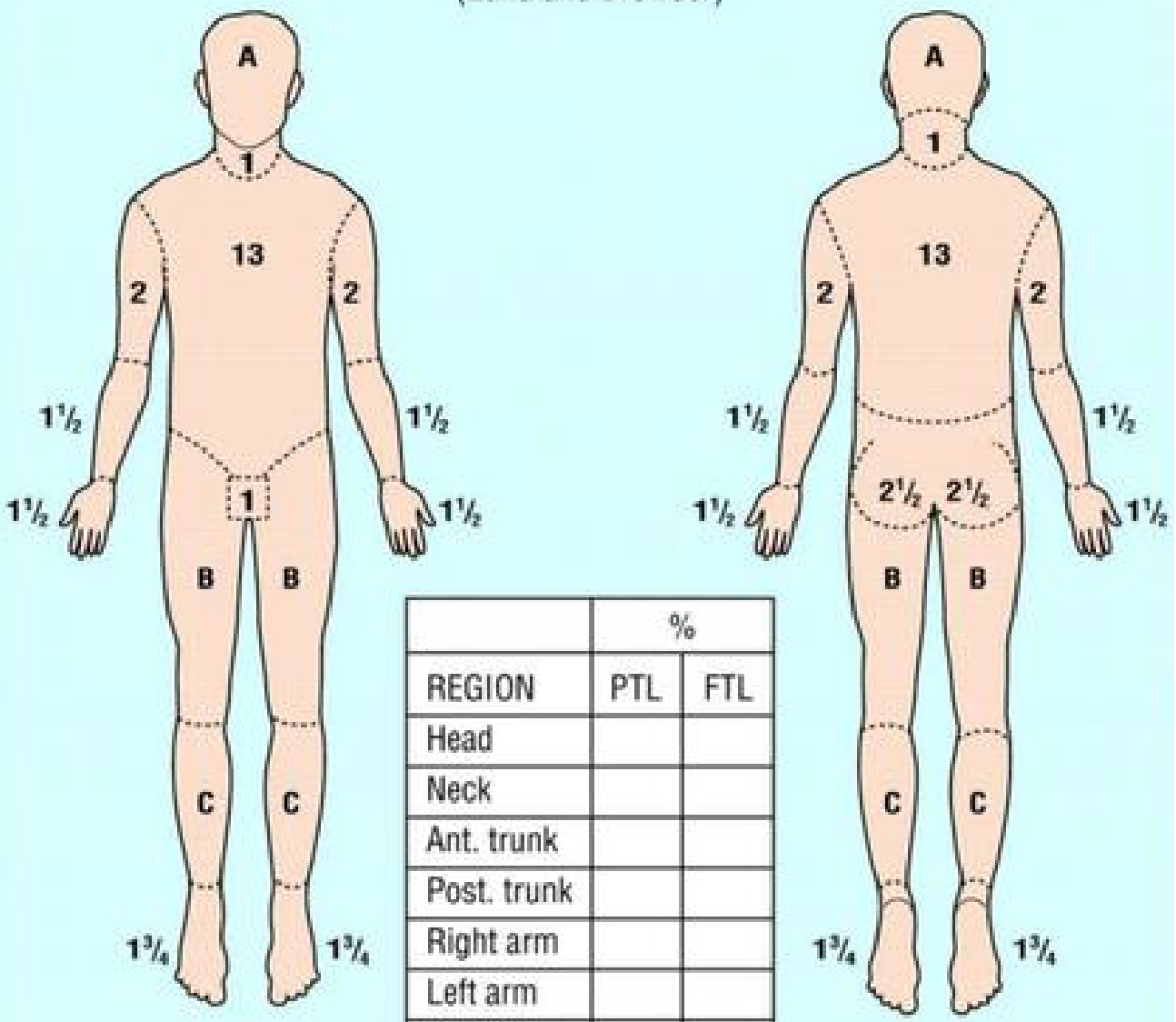
% Total Body Surface Area Burn

Be clear and accurate, and do not include erythema
(Lund and Browder)



	%	
REGION	PTL	FTL
Head		
Neck		
Ant. trunk		
Post. trunk		
Right arm		
Left arm		
Buttocks		
Genitalia		
Right leg		
Left leg		
Total burn		

AREA	Age 0	1	5	10	15	Adult
A = ½ OF HEAD	9½	8½	6½	5½	4½	3½
B = ½ OF ONE THIGH	2¾	3¼	4	4½	4½	4¾
C = ½ OF ONE LOWER LEG	2½	2½	2¾	3	3¼	3½