St Helens and Knowsley Teaching Hospitals NHS
University Clinical Education Centre

NHS
Cheshire and Mersey
Critical Care Network

Cheshire & Mersey Critical Care Protocol for Burn Patients

1. Primary Survey

a. Airway Maintenance +- cervical spine protection

- **Intubate** if there is any doubt about airway (Note: Full thickness chest burns impede ventilation and respiratory effort and neck burns swell)
- Significant swelling will occur in major burns 6-12 hours later.
- Avoid suxamethonium 24 hours after burns. (Note: Be aware of concurrent rhabdomyolysis + K^+ in deep burns. Rocuronium is a suitable alternative)
- Use **uncut** tube, as facial swelling will cause accidental extubation.
- Note any vocal cord swelling and airway erythema.

b. Breathing and ventilation

- 100% O2 until CO levels are within normal range or resolution of a lactic acidosis (?Cyanide)

c. Circulation

- 2 wide bore peripheral lines or central line.
- must be well secured or stitched.

d. Disability

- Note GCS, pupils and limb movement before intubation.

e. Exposure

- remove any sources of heat, chemicals and burnt clothing (avoid water soaks if possible to prevent hypothermia)

2. Secondary Survey

- Treat any concurrent injuries found and note burnt area using Mersey Burn Unit Lund and Browder Burns chart. Appendix A. Ignore erythema. Superficial burns are red in colour, they blister and are painful. Full thickness burns are white, do not blister, have no capillary refill and have no sensation.
- Take blood for ABGs, Carboxyhaemoglobin, Group and Save, FBC, U&Es, LFTs, Clotting.

3. History

- AMPLE History (Allergies, Medication, Past medical history, Last meal, Event)
- Important aspects of History – documentation of mechanism of injury (fire burns, electrical burns, chemical burns, possibility of suicide and intoxication) time of injury, enclosed space, any other associated injuries, time of extrication.

4. Initiate Fluid Resuscitation for burns.

Modified Parklands Formula (For adult patients with more than 15% partial/full thickness burns)

% partial/full thickness burns X Weight (kg) X **1.5ml** = Total estimated fluid requirements for 24 hours from onset of burn. (The traditional Parkland's formula recommends 4ml/kg/%)

Give half of the volume in the first 8 hours as Hartmann's Solution, and second half over 16 hours.

- Insert Foley catheter in patients with burns >15 percent TBSA.
- Adequate urine output is 30 mL/hr to 100ml/hr
- See Appendix B for adjustments to fluid regimen based on urine output.

5. Pain Management and other medications

- Titrate doses of analgesia and sedation based on patient's hemodynamic stability and pain control. IV morphine is usually given for pain relief.
- A tetanus immunization should be given.
- Insert Nasogastric Tube for every intubated patient
- Consider DVT and GI prophylaxis if the patient will not be transported within 12 hours.

6. Escharotomies

- If transfer will be completed within 12 hours, escharotomies are rarely needed.
- Elevate burned extremities and assess distal pulses hourly. Assess for circumferential full thickness burns of extremities or trunk. Perform escharotomy as needed for decreased or absent pulses or respiratory compromise after discussion with burns/plastics SpR.

7. Wound Care

- Cover burns with cling film loosely to enable burns to be observed and to prevent hypothermia.
- Apply a thin layer of Flamazine cream and cover with gelonet to open burns if transport delayed by more than 12 hours
- If transfer to Burn Center is delayed beyond 24 hours, notify Whiston Burns Unit who will advice/ manage burns dressings.
- Keep patient warm, especially during transfer.

8. Special Considerations for Chemical Burns

- Remove ALL clothing. Be careful to protect yourself.
- Brush powered chemicals off wound: then flush burns for a minimum of 30 minutes with running water.
- Irrigate burned eyes with a gentle stream of saline. Follow with an ophthalmology review if transport is not imminent.

9. Special Considerations for Electrical Injuries

- Monitor distal pulses. Elevate burned extremities.
- Watch for cardiac arrhythmias and dark urine for myoglobinuria.

10. Airway Injuries

<u>Bronchoscopy</u>

All patients should be bronchoscoped within 24 hours of burns unless this is contra-indicated (e.g. high FiO2)

Bronchoscopic findings should be documented in notes. Findings may include:

- Carbonaceous particles and mucous plugs
- Mucosal oedema
- Mucosal contact bleeding
- Mucosal slough

0.9% Saline lavage is indicated if carbon or slough is observed during bronchoscopy. Do not use heparin or Sodium Bicarbonate.

11. Usual Criteria for referral to Whiston Hospital

- **See Appendix A**

Referral to Whiston Hospital Critical Care Unit will usually be required for,

- Partial or full thickness burns greater than 15%
- Inhalational Injury
- Electrical burns

Please discuss with Plastics SpR/SHO on call before referring to the ICU.

Contact Plastics SpR/SHO on Call 1st via Whiston Hospital Switchboard 0151-4261600 or Burn Nurse Specialist Bleep 1057 (Mon-Fri 8am till 4 pm)

Please contact the ICU SpR at 0151-4301581 for any critical care advice or directly to the ICU Consultant on call via Whiston Hospital Switchboard.

Please email: Dr Tushar Mahambrey if any further questions.
Tushar.Mahambrey@sthk.nhs.uk

Appendix A

St Helens and Knowsley Teaching Hospitals NHS
NHS Trust

Referral Criteria for Admission to the Mersey Regional Burn Unit.

- **All burn injuries with a TBSA of 15% or greater.**
- **Burns of any kind associated with a confirmed or suspected inhalation injury. Following clearance of an intensive care bed at Whiston.**
- **Circumferential burns of any limb.**
- **Elderly burn patients.**
- **Any burn associated with trauma. Patient must be stable.**
- **Burn injuries in patients with a pre-existing medical disorder which could complicate management, prolong recovery or affect mortality.**
- **All electrical injuries.**
- **Burns of the feet, all major joints, genitalia and perineum.**

If an intubated patient is too unstable for transfer please contact The Burn Nurse Specialist to arrange an outreach assessment on 0151 426 1600 bleep 1057 (Mon to Fri 8am till 4pm)

Contact the SHO on call for Burns & Plastics via the main switchboard Whiston Hospital.
0151 426 1600.
ENSURE THE FOLLOWING INFORMATION IS DISCUSSED WITH THE SHO FOR BURNS & PLASTICS.

- Name
- DOB
- Address
- Date, time and mechanism of injury
- Past medical conditions, recent surgical procedures
- Medications and allergies
- An estimation of TBSA (total burn surface area) using a Lund and Browder chart– page 2)
- The location and determination of depth of burn, e.g. superficial, deep dermal, full thickness
- if an inhalation injury is suspected. An anaesthetic opinion **MUST** be sought before arranging a transfer to the Burn Unit.

This information can be faxed to
0151 430 1508.
If faxing please contact the burn unit to confirm you are sending a fax on
0151 430 1540
PLEASE NOTE DO NOT USE THIS NUMBER TO DIRECTLY REFER PATIENTS TO THE BURN UNIT.

Referral Criteria for Assessment in the Burn assessment Unit (BAU)

- **All minor burn injuries with a TBSA of 10% or less.**
- **All minor burn injuries where surgery may be required.**
- **Facial burn injuries over 24 hours old with documented evidence that the airway is not at risk.**
- **All chemical burn injuires.**
- **All burns to hands where functional impairment may be evident.**
- **clinically infected burn wounds where intravenous antibiotics are required.**

Referral Can be made at any time by contacting the SHO on call for Burns and Plastics via the hospital main switchboard Whiston on
0151 426 1600

or

The Burn Nurse Specialist

0151 426 1600 bleep 1057
(Mon—Fri 8am till 4pm)

The patient will be asked to attend accident and emergency department at Whiston Hospital in order to be registered. They will then be rapidly assessed in the BAU.

The following information is required.

- Name, DOB, Address
- Date, time and mechanism of injury
- Past medical conditions, recent surgical procedures
- Medications and allergies
- An estimation of TBSA (total burn surface area) using a Lund and Browder chart– page 2)
- The location and determination of depth of burn, e.g. superficial, deep dermal, full thickness

Please apply an non adherent dressing, do not apply any topical ointments or creams

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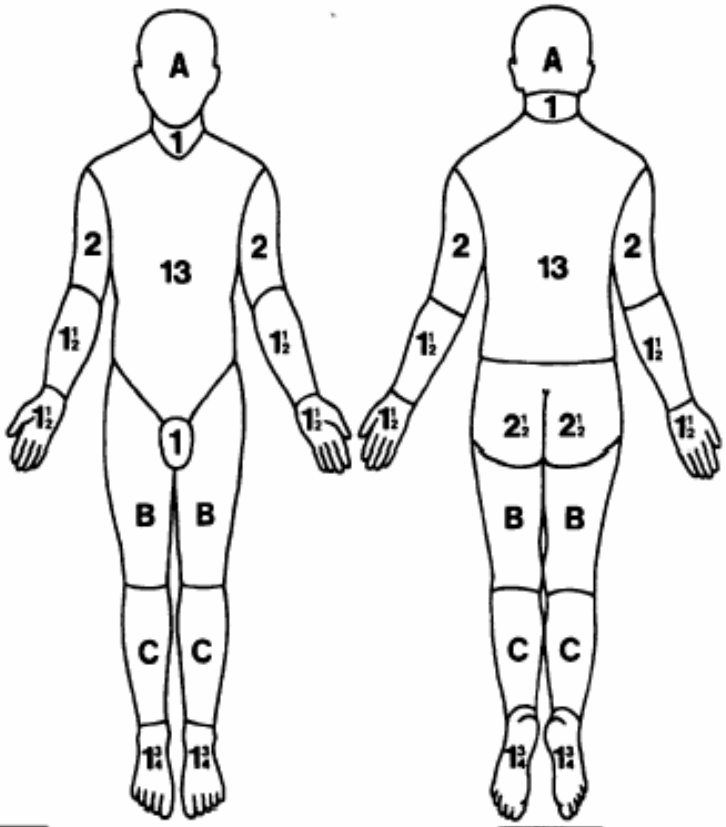
MERSEY BURN UNIT
LUND & BROWDER BURN ESTIMATION CHART

Name……Hosp ID……..Dept/Ward……..

Date…… Signature ……...……

IGNORE SIMPLE ERYTHEMA

RELATIVE PERCENTAGES AFFECTED BY GROWTH



Area	% TBSA PTB	% TBSA FTB
Head		
Neck		
Anterior chest		
Posterior chest		
Right arm		
Left arm		
Buttocks		
Genitalia		
Right leg		
Left leg		
Right foot		
Left foot		
Total % TBSA		

Partial Thickness Burn **PTB**

Full Thickness Burn **FTB**

Area	Age 10	Age 15	ADULT
A= ½ of head	5½	4½	3½
B= ½ of one thigh	4½	4½	3¼
C= ½ of one leg	3	3¼	3½