Guideline on Wound Management of Burn Injured Patients in the SWUK Burn Care ODN

South West UK Burn Care
Operational Delivery Network

This document provides a framework for wound management of burn-injured patients in the South West UK (SWUK) Burn Care Operational Delivery Network (ODN). It is appropriate for use by Primary Care, Emergency Departments, Minor Injury Units and Major Trauma Units and Centres.

First Aid

- STOP the burning process
- Cool the wound for at least 20 minutes under cold running tap water. Cooling is effective up to first three hours post injury. Ideal water temperature for cooling is 15 ^{o}C, range 8 ^{o}C to 25 ^{o}C
- If limited water supply, apply a cool water compress, change frequently over 20 minute period
- Irrigate chemical from skin/eyes immediately with warm running water for at least 15 minutes
- DO NOT use ice/iced water/ice packs
- Keep the remaining areas dry and warm to avoid hypothermia. If patient's body temperature falls below 35 ^{o}C stop cooling
- Remove all jewellery. If melted or firmly adherent to the wound this should be left undisturbed, but should not deter from cooling the burn wound[1]

SPECIALISED BURNS SERVICES

The Welsh Burns Centre & Paediatric Unit
Morriston Hospital, Swansea
Tel: 01792 703 802
Switch: 01792 702222
8:00-17:00: Burns Consultant of the day
17:00-08:00: Burns Consultant on call

SWUK Paediatric Burns Centre
Bristol Royal Hospital for Children
Tel: 0117 342 7901
Switch: 0117 923 0000
(Burns on-call) Bleep 6780

Bristol Burns Unit
Southmead Hospital
Tel: 0117 414 3100/3102
Switch: 0117 950 5050
(Burns on-call) Bleep 1311

Salisbury Burns Unit
Salisbury District Hospital
Tel: 01722 345 507
Switch: 01722 336262
(Burns on-call)

Plymouth Burns Facility
Derriford Hospital, Plymouth
Tel: 01752 792274
Switch: 01752 202082
(Burns on-call)

National Burns Bed Bureau
24 hr help line to find a burns bed nationally
Tel: 01384 679 036

Prepare the Wound

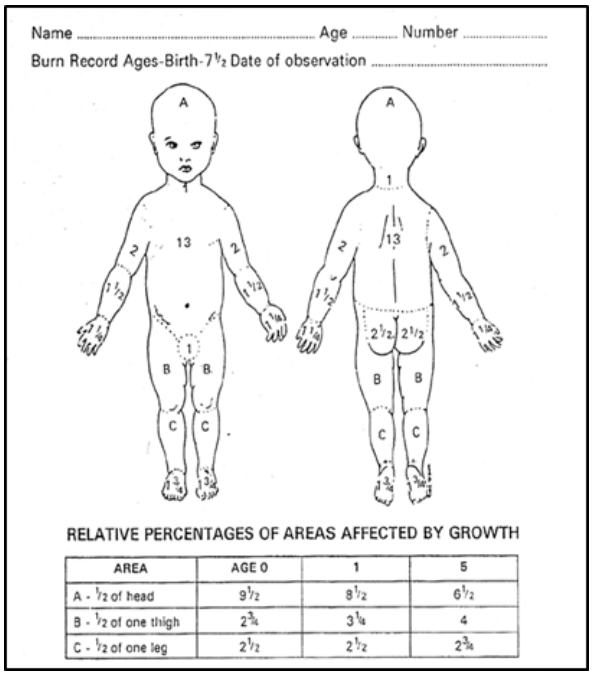
- Provide appropriate analgesia
- Check Tetanus immunisation status
- Remove any non-adherent clothing and jewelry
- Clean wound with tap water or Normal Saline
- Remove all loose and non-viable tissue and debris
- Burn blisters - deroof all large (> 6 mm) thin-walled blisters, thick-walled blisters on fingertips, palms and soles of feet in adults only. Contact paediatric burns service for advice on burn blister management in children. Small non-tense blisters could be left intact
- Debride all ruptured blisters and loose skin in adults.
- Routine antibiotic prophylaxis not required

Assess Depth and Size of Burn

Burn Area Assessment

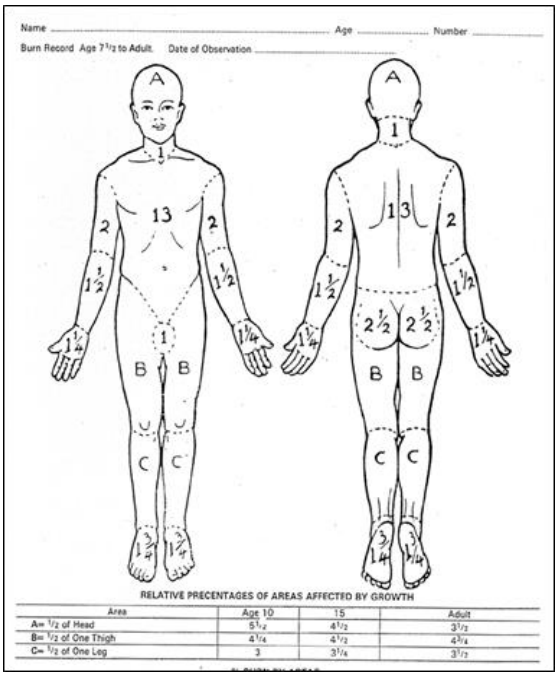
Lund & Bowder charts provide the most accurate means of burn area assessment in children and adults [Figs. 1 & 2]. All areas of blistering are included, while areas of erythaema without blistering are excluded.

Fig. 1 Paediatric Lund & Bowder Chart



AREA	AGE 0	1	5
A - ½ of head	9½	8½	6½
B - ½ of one thigh	2¾	3¼	4
C - ½ of one leg	2½	2½	2¾

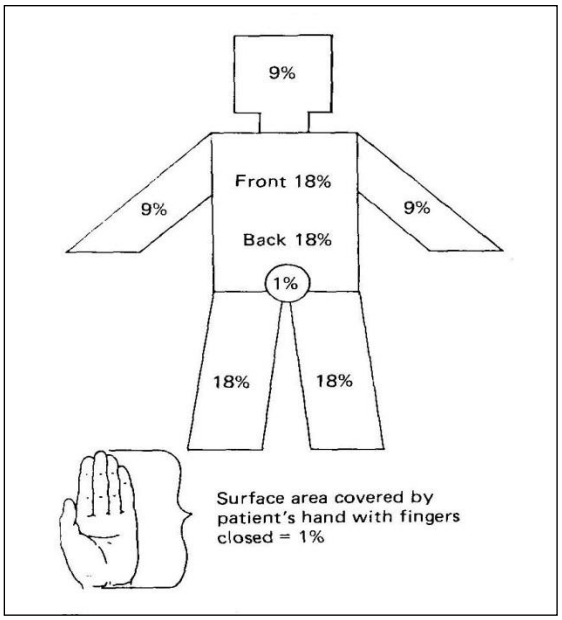
Fig. 2 Adult Lund & Bowder Chart



Area	Age 10	15	Adult
A= ½ of Head	5½	4½	3½
B= ½ of One Thigh	4¼	4½	4¾
C= ½ of One Leg	3	3¼	3½

When these are not available, the 'Rule of Nines' may provide a pragmatic alternative [Fig. 3]. This should NOT be used when assessing burns in children.

Fig. 3 The Rule of Nines



Burn Depth Assessment

Burn depth assessment can be difficult. The depth and appearance of a burn wound may change with time. Initial assessment should attempt to differentiate superficial and deep burns.[2,3]

Superficial	Blistered. Painful. Soft. Pink with blanching on pressure
Deep	Pale, charred, red or black appearance Firm 'leathery' texture. No blanching on pressure

Circumferential full-thickness burns

Circumferential full-thickness burns of the limbs or torso may have constrictive effects on distal limb perfusion or on chest expansion as the underlying tissues swell. Decompression (i.e. surgical escharotomy) may be required to prevent this.

The need for surgery prior to transfer to a specialised burns service is dealt with in the SWUK Burn Care ODN document ***'Standards for the Need for Surgery prior to the transfer of Burns Patients within the in the South West UK Burn Care Operational Delivery Network'***[4].

Dressings and Follow-up

Superficial Burn/Erythema	
Initial Primary Dressing	• Moisturise with non- perfumed soothing gels/creams to non-broken skin
Initial Secondary Dressing	• Apply a light dressing if required for patient comfort
Follow-up	• Provide analgesia • If blistering develops advise patient to return for review • If healed, discharge

Partial thickness burn	
Initial Primary Dressing	• Cover with non-adherent, atraumatic dressing such as Silicone contact layers or Foams
Initial Secondary Dressing	• Manage excess exudate in the first 72 hours with absorbent dressing such as Gauze or Foam • Secure with non-constrictive adhesive tape dressing • Use a Crepe or Tubular bandage
Advice	• Mobility exercises • Elevation of affected area at rest
Follow-up	• Provide analgesia • Review wound in 24-48 hours, then according to dressing type used, at least every 3-5 days until healed

Deep Dermal and Full Thickness Burns

All deep dermal and full thickness burns should be discussed with local Burn Service

Other types of burn injury and their management

Chemical Burns

- Remove contaminated clothing and dry chemical residue
- Copious irrigation is required with tepid running water or saline as appropriate
- Continued prolonged irrigation is required for all chemical burns for one hour or more until the patient's chemical burning sensation has ceased/neutralised even if pH test trip is normal (neutral = 7) or until transfer to Specialised Burns Service if appropriate.
- Bitumen and alkali burns require irrigation with water for an even longer period than other burns
- Hydrofluoric acid burns required neutralisation with calcium gluconate.
- Chemical eye injuries require copious water irrigation. Diphoterine is very helpful. Refer to ophthalmologist.
- For further advice on chemicals, contact the National Poisons Information Service (https://www.toxbase.org/) or call 0344 892 0111

Electrical Burns

- Relevant history may include loss of consciousness or cardiac symptoms such as chest pain or palpitations
- A twelve-lead ECG should be undertaken
- Cardiac monitoring is required within the first 24 hours period for significant injuries
- All significant electrical injuries should be admitted to a Specialised Burns Service for definitive treatment.
- Discuss any episode further with the on-call burns team at your local burn service

Facial Burns

- Cleanse aseptically with saline and apply soft Paraffin to raw areas. Please note soft paraffin ointment is an inflammable product; ensure the patient is aware of this. Soft Paraffin should never be applied in the presence of inflammable gases such as home oxygen that may be used for chronic chest conditions.
- Apply soft Paraffin to lips, clean eyes with saline, refer to ophthalmologist if required
- Ensure patient is aware of the flammability of soft Paraffin.
- If patient uses home oxygen, consider use of water based gel
- Apply eye drops or ointment as appropriate (eg Chloramphenicol Ointment)
- Exclude eye injury using Fluorescein
- Consider airway assessment and monitor for airway swelling

- Undertake anaesthetic review if any concerns
- Discuss with on-call burns team at your local burn service
- A non-perfumed moisturiser cream/emollient, such as E45 or Nivea, can be applied twice daily once the facial burn has healed. (NB: not for use when home oxygen is required)

Blisters (Burns only)

- Small blisters of 1 cm or less may be left intact
- Large blisters and blisters over joints will need to be de-roofed and dead skin trimmed away.
- Re-dress with non-adhesive dressings such as a silicone based primary dressing. Consider Hydrocolloid dressings to small areas only but do not wrap around fingers but place in longitudinal strips

Does the patient need to be transferred to a Specialised Burns Service?

- Specialised Burns Services in the South West of England and South/Mid Wales are designated as Facilities (minor burns), Units (moderate burns) and Centres (major burns). Each service can treat patients up to their maximum referral threshold.

Telephone support and advice on burn wound care management is available at all times.

For urgent referrals and advice contact numbers for each Specialised Burn Services are available on the first page of these guidelines.

- The suggested minimum threshold for referral to a Specialised Burn Care Service[5] can be summarised as:

	ADULTS (≥ 16 yrs)	CHILDREN (> 16 yrs)
Size	• All burns ≥ 3% Total Body Surface Area (TBSA) • Any burn injury >25% TBSA + inhalation injury or >40% TBSA without inhalation injury must be referred and transferred to the SWUK ODN Adult Burn Centre in Swansea following discussion with the on-call burns consultant	• All burns ≥ 2% Total Body Surface Area (TBSA)* • Any burn injury >30% TBSA or ≥ 15% and under 1 yr or ≥ 20% and full thickness must be referred and transferred to the SWUK ODN Paediatric Burn Centre in Bristol following discussion with the on-call burns consultant

Depth	• All full thickness /deep dermal burns	• All full thickness/deep dermal burns
Site	• All burns to hands, feet, face, neck, perineum or genitalia	• All burns to hands, feet, face, neck, perineum or genitalia
Mechanism	• Any chemical or electrical burn • Any cold injury • Any burn where there is suspicion of non-accidental injury or neglect	• Any chemical or electrical burn • Any cold injury • Any burn where there is suspicion of non-accidental injury or neglect
Co-morbidities	• Any burn with a concomitant medical illness which may influence healing (eg diabetes, paraplegia) • Any burn with concomitant trauma (eg inhalation) • Any burn with concomitant psychiatric illness	• Any burn with a concomitant medical illness which may influence healing (eg diabetes, paraplegia) • Any burn with concomitant trauma (eg inhalation) • Any burn with concomitant psychiatric illness
Time	• Any burn not healed within two weeks	• Any burn not healed within two weeks
Other factors	• Any unwell/febrile patient with a burn • If burn wound changes appearance / signs of infection or there are concerns regarding healing • Any other burn that the referring department is not happy about or confident to manage.	• All those predicted to require assisted ventilation, specifically for their burn injury for more than 24 hrs • Any child who is physiologically unstable as a result of burn injury • All children requiring respiratory support • Suspected signs of toxic shock syndrome/sepsis/ infected wounds
• If the above criteria/threshold is not met, then continue with local care and dressings as per these guidelines. If unsure, call specialised burns service for advice.		

Advice on Transferring a Patient

- Cover burn injury with loose strips of cling film and do not apply any creams or ointments if transferring patient within six hours of presentation
- Remove any non-adherent clothing and jewelry
- Ensure any burn injured limbs are elevated
- If chemical burn, please transfer patient with chemical agent if available or provide details of the chemical agent
- If transfer to a Specialised Burns Unit is to be significantly delayed, then the burn wound should be washed with Chlorhexidine solution 0.1% or normal saline then more formal dressings should be applied. This should only be after liaison with the

receiving burn service. If applicable, then simple application of non-adherent film, tulle/jelonet/gauze dressings to the burn wounds and wrap secondary dressings of gauze and crepes bandages loosely too allow for potential excess swelling.
- Keep patient warm (blanket, bair hugger, space blanket)
- For more serious burns, refer to advice on transfer of critically ill adults and children[6,7]

References

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5. The National Burn Care Referral Guidance. The National Network for Burn Care (NNBC). February 2012 https://www.britishburnassociation.org/wp-content/uploads/2018/02/National-Burn-Care-Referral-Guidance-2012.pdf
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