Guideline: National Burn Service Initial Assessment

Purpose

- This document provides a guideline for the initial assessment and management of burn patients outside of a Regional Burn Unit
- This is not intended as a full therapeutic manual for burn treatment

Responsibility

- This guideline applies to teams of health professions caring for burn patients outside of a Regional Burn Unit.

Associated Documents

Other documents relevant to this guideline are listed below:

NZ Legislation	None
CMDHB Clinical Board Policies	None
NZ Standards	None
Organisational Procedures or Policies	Management of Paediatric Burns Procedure
Other related documents	Referral, Transfer and Discharge in the National Burn Centre Guideline Splinting Burns Procedure

Guideline

This guideline includes the following:

1.	Emergency Assessment and Management of Burn Injuries
2.	First Aid Management of Burn Injuries
3.	Referral guidelines
4.	Wound assessment
5.	Fluid Resuscitation
6.	Wound Management
7.	General Considerations
	Referral Pathway Poster
	Flow Chart – Wound Management v11

Important:	**Contact your Regional Burn Unit with any concerns or questions about any burn injuries or treatment.**

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1: Emergency Assessment and Management of Burn Injuries

Important: Attention to the burn wound must always be subsequent to the Primary Survey being performed, i.e. assessment of airway, breathing, circulation, neurological status etc (see Guideline on Emergency Management of Severe Burns).

Step	Action	
A	Airway	Airway: clear airway; maintain cervical spine protection; consider early intubation if airway compromised. ICU/anaesthetic review PRN.
B	Breathing	Breathing: apply supplemental oxygen – consider early mechanical ventilation
C	Circulation	Circulation: establish IV access – 2 wide bore short cannulae, preferably, but not necessarily, through unburnt tissue; IV fluid bolus; control any site of haemorrhage
D.	Disability	Assess cognitive function; GCS; PERLA; Glucose
E.	Environment	examine for other injuries, remove rings/clothing; keep warm
F.	Fluid	Fluid resuscitation as indicated proportional to burn size/severity (see below)

2: First Aid Management of Burn Wounds

Appropriate first aid treatment of burn wounds is important to:

- Prevent further tissue damage and progression of the burn wound.
- Minimise complications associated with swelling.
- Manage pain associated with the burn wound.
- Prevent hypothermia.

Step	Action
1.	Ensure Emergency Care room is heated and doors are kept closed
2.	Apply recognised first aid: 20 minutes cold running water (between 8-25 °C aiming for 15°C). Apply immediately or within the first 3 hours from the burn injury. Keep the patient warm to prevent hypothermia
3.	Avoid hypothermia: keep the patient's body as warm as possible. Check patient's temperature – if <36ºC apply external heating devices
4.	Remove clothing and jewellery
5.	**Cling Film:** the wound may be covered with Cling Film to minimise pain, prevent the wound from drying out and to allow assessment by multiple health professionals without disturbing the wound. **Note:** Cling Film is a temporary transport dressing only, applicable for the first eight hours only (from time of burn). More definitive dressings are covered in the Wound Management Pathway.
	To cover the wound with Cling Film: • Apply the Cling Film to the burn wound, ensuring the inside surface of the Cling Film is against the wound. • Do not wrap Cling Film tightly around limbs as this may restrict swelling. Instead lay it loosely lengthwise along the limbs. • Sterile guards may be used over the Cling Film for comfort and security.
6.	**Management of Swelling:** • Elevate all burned limbs on pillows as soon as possible. • If the face, head or neck is burned, elevate the head of the bed. • Circumferential burns to limbs require hourly monitoring of the colour, warmth and capillary refill of the extremities. • Deep circumferential burns may require early escharotomy. If any signs of circulatory compromise, or difficulty breathing in the case of extensive torso burns, escharotomy must be considered – see Escharotomy Guidelines.
7.	**Give adequate analgesia:** e.g. iv morphine
8.	**Give tetanus toxoid / tetanus immunoglobulin as indicated**

3: Referral Guidelines

The following injuries must always be referred to /discussed with a Regional Burn Unit.

1. Burn > 10% TBSA in an adult. Burn >5% TBSA in a child
2. Full thickness burn >5% TBSA in either adult or child
3. Burns of special areas: face, hands, feet, perineum
4. Electrical Burn
5. Chemical Burn
6. Burn associated with an inhalation injury
7. Circumferential burns of limbs/ chest
8. Burn at the extremes of age (e.g. <2yrs or > 70yrs)
9. Associated trauma
10. Non-accidental injury
11. Burn injury in patients with pre-existing medical disorders that could complicate management, prolong recovery or increase mortality
12. **Any burn which has failed to heal with conservative management after 2 weeks**

Important: Referrals to the National Burn Centre must always be made through the local Regional Burn Unit.

Download referral form (www.nationalburnservice.co.nz) & fax to the appropriate Regional Burn Unit

- Auckland Regional Burn Unit (Co-located with National Burn Centre), Middlemore Hospital
  Ph: 09 270 0000 (ask for on call Plastic Surgery Registrar)
  Fax: 09 276 0114

- Waikato Regional Burn Unit , Waikato Hospital
  Ph: 07 839 8899 (ask for on call Plastic Surgery Registrar)
  Fax: 07 8398725

- Wellington Regional Burn Unit, Hutt Hospital
  Ph: 04 570 9999 (ask for on call Plastic Surgery Registrar)
  Fax: 04 570 9239 (Plastic and Burn Ward)

- Canterbury Regional Burn Unit, Christchurch Hospital
  Ph: 03 364 0640 (ask for on call Plastic Surgery Registrar)
  Fax: 03 364 0456 (Dept. Plastic Surgery)

Admission into any hospital is typically based around one of the following:

1. the need for wound care which cannot be delivered as an outpatient *(e.g. frequent or complex dressing issues)*
2. analgesic requirements too great to be managed as an outpatient *(e.g. ongoing narcotic analgesia requirement or failure to manage dressing-change pain)*
3. functional, social and/or psychosocial indicators requiring rehabilitation or specialist services *(e.g. physiotherapy, occupational therapy)*
4. concerns over progression of the burn injury and or its sequelae *(e.g. oedema compromising circulation or airway)*

4: Wound Assessment

1. History
2. Burn Depth
3. Body Surface Area Estimation
4. Non-accidental injury

1.	**History/ Documentation**
	• Cause of burn injury: • Flame, electricity, chemical • Time of injury • First Aid measures • Other trauma • Past medical history • Medications / allergies / vaccination history • Initial management • Communication / advice from NBC/ RBUs
2.	**Burn Depth ANZBA Classification**
i.	Epidermal • Dry, no blisters • Very superficial • Heals spontaneously in 7-10 days
ii.	Superficial dermal • Fine blisters, blanches with pressure • Painful • Heals within 2 weeks
iii.	Mid dermal • Dark pink, large blisters, sluggish refill • Less painful • Heals 14-21 days
iv.	Deep dermal • Blotchy red/ white, no blisters • No sensation • Heals very slowly – usually needs grafting
v.	Full thickness • White, waxy, charred • Insensate • Grafting needed if >1cm^2
3.	**Estimation: Total body surface area burnt**
i. ii.	Rule of nines: • Head 9%, Anterior chest 9%, Abdomen 9% • Upper/ mid/ low back 18% • Each lower limb 18%, Each upper limb 9% • Perineum 1% ***Note:*** *The rule of nine's is different in children*
iii.	Area of ***patient's*** palm with fingers extended :1%

Important: Non-accidental injuries should be considered for all at risk populations, both paediatric and geriatric.

4.	**Non Accidental injury** (NAI) Indicators of potential NAI or scalds include:
1.	Delay in seeking help
2.	Historical accounts differ over time
3.	History inconsistent with wound appearance or development of child
4.	Past history of NAI
5.	Inappropriate behaviour by patient/ caregivers
6.	Scalds with defined immersion lines: glove and stocking pattern
7.	Symmetrical pattern
	Note : *All non-accidental injuries should be referred to the Regional Burn Unit* The investigation of non-accidental injury should not be performed by the patient's primary surgical / nursing team but by a dedicated team skilled in child protection

5: Fluid Resuscitation

Intravenous resuscitation required for:

- **all adult burn patients with > 15% TBSA injury**
- **all paediatric patients with > 10% TBSA injury**

Important: Any patient with a burn size requiring fluid resuscitation must be discussed with your Regional Burn Unit and have hourly urine outputs measured.

1.	Resuscitation: **Modified Parkland formula** **3-4mls Crystalloid / %TBSA burned/ kg body weight** Appropriate crystalloid fluids include: Lactated Ringers, Hartmans, Plasmalyte *Avoid Normal Saline as large volumes will result in a hyperchloraemic metabolic acidosis*
2.	½ calculated volume in first 8 hrs; ½ calculated volume in next 16hrs – from time of burn injury
3.	Monitor urine output and aim for an output of: - 0.5ml/kg/hr adults; 1ml/kg/hr children. Urinary catheter should be placed if IV resuscitation required ***Note** : the presence of haemochromagens in the urine (dark discolouration) indicates the presence of muscle and blood breakdown products and requires increasing goal urine output to 1-2ml/kg/hr.*
4.	Monitor bloods: at least once during each resuscitation period FBC, Haematocrit; U&E; CoHb
5.	For children < 30kg maintenance fluid containing glucose should be administered in addition to resuscitation fluid
6.	Colloid 0.3-0.5%/kg/TBSA can be considered: after the first 18-24hrs , for very large burns, inhalation injury, large paediatric burns

6: Wound Management

Definitive management of burn wounds should be performed in facility where final treatment will take place.

Important: Burn wounds are initially sterile and routine use of systemic antibiotics is not advised.

1.	Take wound swab prior to cleaning and applying dressing
2.	Debride all loose skin, clean wounds with aqueous chlorhexidine
3.	Blisters i. leave small blisters intact; ii. debride blisters over joints or if restricting movement iii. snip large, tense blisters
4.	If patient due for transfer and will reach the local Regional Burn Unit within 8 hours, cling film is an acceptable dressing
5.	If patient due for transfer within 24 hours dress wounds with simple dressing: non-adherent layer and secondary pad
6.	If transfer is to be delayed more than 24 hours commence dress with silver dressing such as Acticoat (or Silver cream dressing) ***after*** consultation with the Regional Burn Unit
7.	Daily review of wound/ dressing initially appropriate
8.	For mixed depth burns consider use of Silver dressing such as Acticoat or equivalent.
9.	Acticoat needs to be changed every 3 (7) days. Moisten with water ***not*** saline (as this will inactivate the silver).
10.	Eyes • Irrigate gently with saline • Flourescein to identify corneal injury • Copious irrigation for chemical injury • Antibiotic ointment • *All ocular injuries should have an ophthalmological review*

Important: Toxic Shock Syndrome can develop rapidly even in very small paediatric burns. Maintain a high level of suspicion. If in doubt remove all dressings and commence appropriate treatment early!

7: General Considerations

- Burn patient are best managed by a multi-disciplinary team
- Early involvement of all team members improves patient outcomes

1.	Analgesia: Opiates: IV (not IM) morphine Paracetamol Entonox: for procedural pain; consider inhaled Penthrax Supervised sedation/ Ketamine
2.	Consider either splintage or active mobilisation all joints / hands / ankles
3.	Any concern regarding airway injury must have ICU / Anaesthetic review
4.	> 65years: consider Geriatric/ Rehab review
5.	Paediatric review as needed
6.	Psychological/ Psychiatric review as necessary. Burn patients have higher rates of premorbid psychiatric conditions than the normal population
7.	Early nutritional review / Vitamin supplementation
8.	Ophthalmology review for all ocular injuries
9.	Nasogastric tube – for medication/ nutrition / gastric decompression

References

Nil

Definitions

Terms and abbreviations used in this document are described below:

Term/Abbreviation	Description
ICU	Intensive Care Unit
U&E	Urea & Electrolytes
TBSA	Total Burn Surface Area
IV	Intravascular
IM	Intramuscular
FBC	Full blood count
CoHb	Carboxyhaemoglobin
NAI	Non accidental injury
NBC	National Burns Centre
RBC	Regional Burns Centre

Referral Pathway Poster

New Zealand National Burn Service

Referral Pathway to Regional Burn Units

Referral procedure to a Regional Burn Unit / Plastic Surgery Unit:

1. **Referral form to be completed (http://www.nationalburnservice.co.nz/pdf/referralform.pdf)**
2. **Contact the Plastic Surgical Registrar for your Regional Burn Unit (RBU) / Plastic Surgery Unit**

Auckland Region:
Counties Manukau District Health Board

Phone: 021 784 057 or 09 276 0000 locator 938017 (on-call plastic surgery registrar)
Fax: 09 276 0114

Waikato Region:
Waikato District Health Board

Phone: 07 839 8899 (ask for plastic surgery registrar on-call) Fax: 07 839 8725

Wellington Region:
Hutt Valley District Health Board

Phone: 04 570 9999 (ask for plastic surgery registrar on-call) Fax: 04 570 9239

Christchurch Region:
Canterbury District Health Board

Phone: 03 364 0640 (ask for plastic surgery registrar on-call) Fax: 03 364 0456

National Burn Centre (NBC) transfers:
The decision to transfer a patient to the National Burn Centre (Middlemore Hospital) is made following the referral procedure.

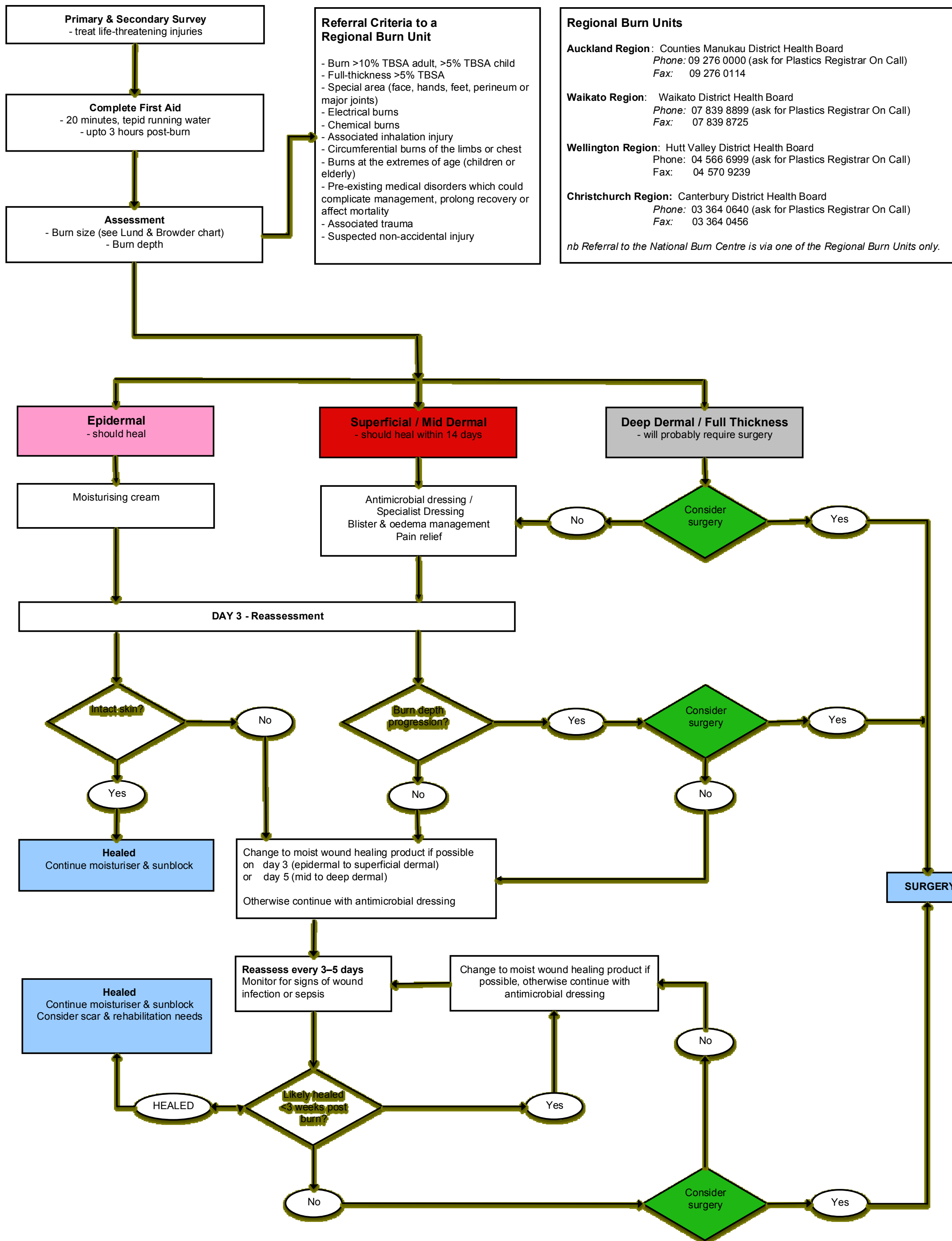
Referral criteria for Regional Burn Unit:

- Burns greater than 10% total body surface area (TBSA) or 5% in a child.
- Burns of special areas, eg. the face, hands, feet, genitalia, perineum and major joints.
- Full thickness burns greater than 5% TBSA.
- Electrical burns (including lightning injury).
- Chemical burns.
- Burn injury with inhalation injury.
- Circumferential burns of the limbs or chest.
- Burns at the extremes of age, ie. young children and the elderly.
- Burn injury in patients with pre-existing medical disorders that could complicate management, prolong recovery, or affect mortality.
- Any patient with burns and concomitant trauma (e.g. fractures) in which the burn injury poses the greater immediate risk of morbidity or mortality.

Middlemore Hospital
Waikato Hospital
Hutt Hospital
Christchurch Hospital

www.nationalburnservice.co.nz

Flow Chart – Wound Management v12



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