



**ACI** NSW Agency  
for Clinical  
Innovation



# **ACI Statewide Burn Injury Service**

## **NSW Burn Transfer Guidelines**

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'Rule of nines' and 'Burn distribution' diagrams reproduced with permission from: Australian & New Zealand Burn Association, *Emergency Management of Severe Burns Course Manual* 17th Ed. 2013.

## Abbreviations

a/h	After hours	EUC	Electrolytes Urea Creatinine
ABG	Arterial Blood Gas	FBC	Full Blood Count
ACI	Agency for Clinical Innovation	FM	Fluid Maintenance
ACT	Australian Capital Territory	FR	Fluid Resuscitation
AMRS	Aeromedical and Medical Retrieval Service	HR	Heart Rate
ANZBA	Australian and New Zealand Burn Association	hr(s)	Hour(s)
ASNSW	Ambulance Service NSW	ICU	Intensive Care Unit
AVPU	Assessment tool for neurological status	IM	Intramuscular
b/h	Business hours	ISBI	International Society for Burn Injuries
BP	Blood Pressure	IV	Intravenous
BSL	Blood Sugar Level	IVC	Intravenous Catheter
C	Centigrade	kg	Kilograms
Cap	Capillary	LHD	Local Health District
CHW	the Children's Hospital at Westmead	Max	Maximum
CNC	Clinical Nurse Consultant	Mg	Milligrams
Coags	Coagulation test	mL	Millilitres
COHb	Carboxyhaemoglobin	Mm	Millimetres
CPR	Cardio Pulmonary Resuscitation	NETS	Newborn and paediatric Emergency Transport Service
CRGH	Concord Repatriation General Hospital	NSW	New South Wales
CVL	Central Venous Line	RNSH	Royal North Shore Hospital
DMSO	Dimethyl sulfoxide	RR	Respiratory Rate
DTP	Diphtheria Tetanus Pertussis	SBIS	Statewide Burn Injury Service
ECG	Electrocardiogram	TBSA	Total Body Surface Area
EMSB	Emergency Management of Severe Burns course	TIG	Tetanus Immunoglobulin
		V	Voltage

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# 1. Introduction

## 1.1 Purpose

The guidelines for transfer of burn patients in NSW were revised in 2013 to address changes to the management of burn patients. This most recent edition includes a number of areas which were identified as requiring inclusion or clarification. Burns can present at any point in the NSW health system and the ability to assess, manage and transfer these patients to tertiary services is central to good patient outcomes in appropriate timeframes.

### 1.1.1 Details

The Agency for Clinical Innovation (ACI) Statewide Burn Injury Service (SBIS) comprises three Burn Units located at Concord Repatriation General Hospital (CRGH), Royal North Shore Hospital (RNSH) and The Children's Hospital at Westmead (CHW).

This document is the third edition of the *NSW Statewide Burn Injury Service – Burn Transfer Guidelines*, first published in August 2004, and provides the necessary information for effective management and efficient transfer of patients with a burn injury in NSW to tertiary burn units.

The information given is based on the SBIS [Model of Care](#). The document reflects the standards identified by Australia and New Zealand Burn Association (ANZBA) and the International Society for Burn Injuries (ISBI) for the care and transfer of severe burn injuries.

## 2. Transfer criteria

The criteria for admission are consistent with those of the Australia and New Zealand Burn Association (ANZBA) and the International Society for Burn Injuries (ISBI). Burn mechanisms are varied and include: flame, scald, explosion, contact, chemical, electrical, friction, reverse thermal (cold) and radiation.

### 2.1 Medical retrieval

In determining the requirement for medical retrieval, these guidelines should be read in conjunction with Ambulance Service of NSW Protocol T1, *PD2010\_021 Critical Care Tertiary Referral Networks & Transfer of Care (Adults)*; and *PD2010\_030 Critical Care Tertiary Referral Networks*, in addition to the ensuing burn specific retrieval criteria:

The **medical retrieval** criteria are:

- any intubated patient
- inhalation injuries **with cutaneous burns**
- head and neck burns
- mid-dermal, deep dermal or full thickness burns >10% in children
- mid-dermal, deep dermal or full thickness burns >20% in adults
- burns with significant co-morbidities
- associated trauma
- significant pre-existing medical disorder
- circumferential burn to limbs or chest that compromises circulation or respiration
- electrical conduction injury with cutaneous burns
- chemical injury with cutaneous burns.

Retrieval services can be activated by contacting the following:

- Adults - Aeromedical & Medical Retrieval Service (AMRS) 1800 65 0004
- Children – Newborn & paediatric Emergency Transport Service (NETS) 1300 36 2500

Expert advice about the management of the burn injury, need for intubation and fluid resuscitation, can be obtained through these services using a multi-party conference call with relevant tertiary clinicians (including a burn surgeon and receiving intensivist).

The need for physician-assisted transfer is determined by the Retrieval Service (AMRS or NETS), in consultation with the receiving Burn Unit and ICU.

#### 2.1.1 Contact information

If immediate medical retrieval is considered necessary from the referring hospital, a single telephone call to AMRS or NETS is all that is necessary. The Retrieval Service will act as the agent for the referring hospital, facilitating clinical, transport and destination needs appropriate to the presenting clinical situation. All follow-up calls should be made via the Retrieval Service to ensure all participants (including retrieval staff) are included and there is efficient sharing of information.

**If the patient requires transfer, please complete and send a copy of the Burn Patient Emergency Assessment & Management Chart (Appendix 1) to the receiving Burn Unit.**



## 2.2 Referral

Some patients will require transfer to a specialised burns unit who do not meet the criteria for immediate medical retrieval. These patients should be referred to the on-call burns registrar at the appropriate hospital. Service contact numbers and geographical (Local Health District) divisions are provided in Appendix 2.

The **referral** criteria are:

- mid to deep dermal burns in adults >10% TBSA (total body surface area)
- full thickness burns in adults >5% TBSA
- mid-dermal, deep dermal or full thickness burns in children >5% TBSA
- burns to the face, hands, feet, genitalia, perineum and major joints
- chemical burns
- electrical burns including lightning injuries
- burns with concomitant trauma
- burns with associated inhalation injury
- circumferential burns of the limbs or chest
- burns in patients with pre-existing medical conditions that could adversely affect patient care and outcome
- suspected non-accidental injury including children, assault or self-inflicted
- pregnancy with cutaneous burns
- burns at the extremes of age – infants and frail elderly

Although not all patients in these categories will require transfer to a specialised burn unit, advice must be sought early in their management. If transfer is required from regional and remote facilities, Aeromedical & Medical Retrieval Service (AMRS) may be requested to effect transfer.

## 2.3 Age-specific criteria

Children up to their 16<sup>th</sup> birthday should be referred to the Children's Hospital at Westmead. Anyone 16 years or older should be transferred to an adult burns unit.

## 2.4 Pregnancy

Women in their second or third trimester should be referred to RNSH where comprehensive obstetric services are available, should they be required. Referral of women in their first trimester should be decided on an individual basis, with consideration given to burn severity, predicted length of stay, etc.

## 2.5 Spinal injury

Adult patients with spinal cord injuries or suspected spinal cord injuries should be referred to RNSH where the acute specialist Spinal Unit is situated.

## 2.6 Multi-trauma

Adult patients with multiple-trauma and burn injuries should be transferred RNSH which is a NSW designated Major Trauma Service.

## 2.7 Interstate transfers

Health care facilities in areas close to the borders of Queensland, Victoria and South Australia may send patients to the closest Burn Unit which may be interstate. Appropriate communication and management must be instigated with the receiving hospital in these cases. If problems arise or assistance is required, the ACI Statewide Burn Injury Service should be called.

## 3. Assessing burn depth

Burn depth is dependent on the mechanism of injury and length of exposure to the heat source or agent.

### 3.1 Depth classifications

#### 3.1.1 Epidermal burn

- Skin intact, brisk capillary refill
- Erythema (not included in % TBSA assessment)
- Heal spontaneously within 3-7 days with moisturiser or protective dressing

#### 3.1.2 Superficial dermal burn

- Damage to upper layer of dermis
- Blisters present or denuded
- Pink, brisk capillary refill (under blister)
- Should heal within 7-10 days with minimal dressing requirements

#### 3.1.3 Mid dermal burn

- Heterogeneous, variable depths
- Dark pink, sluggish capillary refill
- Should heal within 14 days
- Deeper areas or over a joint may need surgical intervention and referral

#### 3.1.4 Deep dermal burn

- Burn extends into the deeper layers of the dermis but not through the entire dermis
- Blotchy red/whit, sluggish to absent capillary refill
- Generally need surgical intervention
- Refer to specialist unit

#### 3.1.5 Full thickness burn

- Entire destruction of dermis, sometimes underlying tissue involved
- White, waxy, brown, black. No capillary refill
- Surgical intervention and long-term scar management required
- Refer to specialist unit

See Appendix 4 for “Recognising Burn Depths chart”.

### 3.2 Wound appearance

Aside from the obvious epidermal or full thickness burn, initial determinations of burn depth can be somewhat difficult. The appearance of a burn wound can change over a period of time. Discernible differences in burn depth may not be apparent until 7-10 days after the burn injury. It is rare that a burn wound will be uniform in depth. Mixed or heterogeneous burn wounds are common.

## 4. Assessing body surface area burnt

### 4.1 Rule of nines

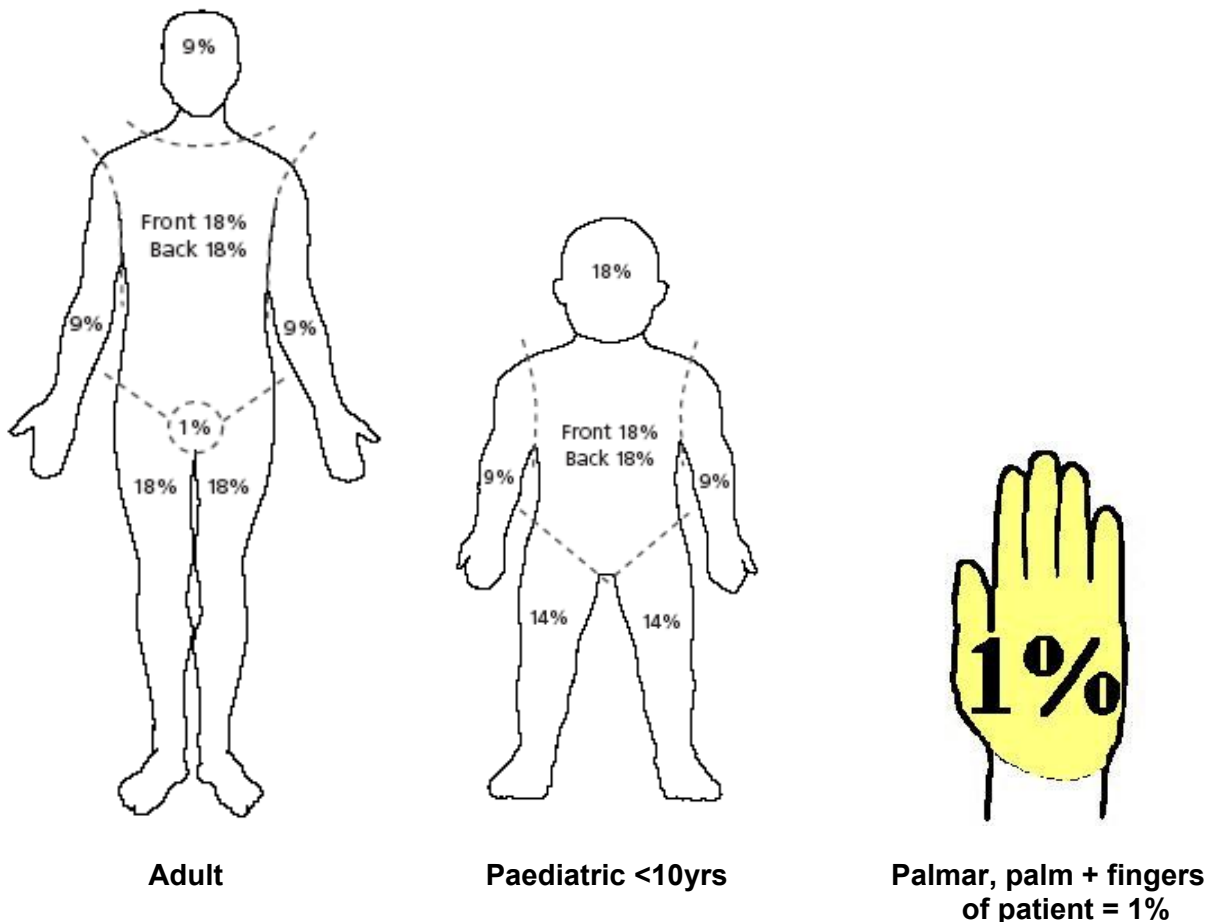
The “**Rule of Nines**” divides the body surface into areas of nine percent (%) or multiples of nine percent, with the exception that the perineum is estimated at one percent (%). This allows the extent of the burn to be estimated with reproducible accuracy.

**Children** have different body surface area proportions: Use the **Paediatric Rule of Nines** and **adjust for age** by taking 1% TBSA from the head and adding ½% TBSA to each leg for each year of life after 1 year until 10 years. (Adult proportions are reached at 10 years)

Additionally small burns may be estimated by using the area of the palmar surface (fingers and palm) of the **Patient’s** hand, which approximates to 1% body surface area.

When calculating the TBSA ignore simple erythema.

### Rule of Nines



Images reproduced with permission from: Australian & New Zealand Burn Association, *Emergency Management of Severe Burns Course Manual* 17<sup>th</sup> Ed. 2013.

## 5. Stabilisation prior to transfer

### 5.1 Primary survey

Immediately life threatening conditions are identified and emergency management begun. Do not get distracted by the obvious burn injury.

- A** Airway maintenance with cervical spine control
- B** Breathing and ventilation
- C** Circulation with haemorrhage control
- D** Disability - neurological status
- E** Exposure + environmental control
- F** Fluid resuscitation proportional to burn size

### 5.2 Cooling the burn wound

- The burn surface is cooled with cool running water. The ideal temperature is 15°C (range between 8°C and 25°C).
- Running water is applied for at least 20 minutes, within first 3 hours from the injury.
- Hypothermia must be prevented.
- Cool water can be used for its analgesic effect for up to three hours, but this should only occur on minor burn injuries less than 10% in adults and 5% in children where the likelihood of hypothermia is low.

***Ice or iced water should never be used to cool a burn injury.***

### 5.3 Preventing hypothermia

The burn injury will cause compromise to the body's thermo-regulatory system and the patient can lose body temperature very quickly. To prevent this, remove wet packs and soaks, clean off any residual cream or dressing product and cover the patient in a clean sheet or plastic cling wrap and warm blankets, space blankets or patient-warming blankets. Check the patient's temperature regularly.

### 5.4 Respiratory care

Give 100% oxygen (preferably humidified) to all patients except those with minor burns. 100% oxygen should be given to any patient retrieved from a fire or in a closed space even if cutaneous burns are not present.

<b>Criteria for intubation</b>
<p>1. Clinical evidence of possible airway compromise:</p> <ul style="list-style-type: none"><li>• head and neck burns/scalds with increased swelling</li><li>• stridor, hoarse voice, swollen lips</li><li>• carbonaceous material around or in the mouth, nose or sputum</li><li>• singed facial, head or nasal hairs</li><li>• intra-oral oedema and erythema</li></ul>
<p>2. Intubate early:</p> <ul style="list-style-type: none"><li>• if patient unconscious</li><li>• if there are head and neck burns with obvious swelling</li><li>• if the patient is to be transported and has potential airway compromise.</li><li>• if there are other clinical symptoms and signs and ABG results are indicative of respiratory dysfunction.</li></ul>

If there is any doubt regarding airway management prior to transport, please consult early with the appropriate retrieval service - AMRS (adults) or NETS (children). Retrieval service will set up a conference call with Intensive Care Unit at the designated Burn Unit for airway management advice.

## 5.5 Circulatory care

Two peripheral lines should be inserted; preferably through unburnt skin. Use 16 gauge cannula in adults and never smaller than 22 gauge cannula in children.

Fluid resuscitation guidelines shown in Section 6 should be followed. A silastic urinary catheter should be inserted when fluid resuscitation is commenced i.e. for adults with >20% burns and children with >10% burns. Adjust fluids to achieve recommended urine output.

For circumferential burn of the limbs use **ELEVATION** in the first instance. Seek advice from burns unit regarding the need for escharotomy.

## 5.6 Gastrointestinal care

All patients must remain nil by mouth until after consultation with the designated Burn Unit. However early feeding is important and this should be discussed early if transfer is delayed.

A nasogastric tube is required for

- all adult patients with >20% TBSA burns; paediatric patients with >10% TBSA burns
- all intubated patients
- patients with head and neck burns, after consulting with a Burn Surgeon

## 5.7 Pain management

Early pain management is important. Analgesia is always given intravenously. Morphine is the drug of choice in managing acute pain from burns.

**Adult requirements** administer a stat dose of IV morphine 2mg repeated if necessary every five minutes to a maximum of 0.2mg/Kg

**Paediatric requirements** administer a stat dose of IV morphine 0.1mg/Kg **repeated if necessary every 15 minutes to a maximum of 0.3mg/Kg.**

Assess pain score and adjust analgesia to patient requirements.

All medication administered prior to and during transfer must be appropriately documented. This should include dose, time of administration and authorization signature.

## 5.8 Wound management

**Once the patient is stable, cling film (e.g. Glad Wrap) is recommended for transfer within eight hours.** If the face is burnt, paraffin ointment should be applied.

If transfer is delayed beyond eight hours it is recommended to contact the Burn Unit for advice on wound management. Silver or paraffin gauze dressings are generally recommended.

**Never apply any primary dressing circumferentially as the area may swell and the dressing may cause constriction.**

If limbs are burnt, elevation can be used where possible to reduce swelling. Patients with head and neck burns should be nursed head-up to reduce oedema and swelling.

If escharotomy is required, it should only be undertaken after consultation with a burn surgeon. See escharotomy guide [Clinical Practice Guidelines: Escharotomy for Burn Patients](#).

Clinical photography can play a role in treating the patient. Clinical photographs sent from referring hospitals should be clearly identified with patient identification (e.g. Name and date of birth) and must be accompanied by documentation of consent. A consultative phone call in which relevant history can be provided must take place if sending photos to a Burn Unit.

### **5.8.1 Email addresses**

- CHW: [kidsburns@chw.edu.au](mailto:kidsburns@chw.edu.au)
- CRGH: [crghburns@email.cs.nsw.gov.au](mailto:crghburns@email.cs.nsw.gov.au)
- RNSH: [NSLHD-BurnsConsult@health.nsw.gov.au](mailto:NSLHD-BurnsConsult@health.nsw.gov.au)

## 6. Fluid resuscitation

Fluid resuscitation (FR) is necessary to maintain adequate circulating blood volume and renal function. Fluid resuscitation should be used for adults with burns >20% TBSA and children with >10% TBSA.

**The Modified Parkland Formula is used to calculate the fluid volumes needed for resuscitation and to generate the desired urine output.**

**Modified Parkland Formula**  
(Calculated from the time of injury)

**3-4mL Hartmann solution x Kg body weight x % TBSA**

**½ given in the first 8 hrs**

**½ given in the following 16 hrs**

Patients with delayed resuscitation, electrical conduction injury and inhalation injury have higher fluid requirements.

Desired urine output must be established and maintained for adults at; **0.5mL/Kg/hr** (range 0.5 to 1.0mL/Kg/hr) and for children <30Kg at **1mL/Kg/hr** (range 0.5 to 2 mL/Kg/hr).

A higher target urine output (2mL/Kg/hr) is indicated for patients with haemoglobinuria. Mannitol may be required to achieve this target.

The calculation of fluid resuscitation requirements is based on the time of the burn, not the time of presentation. The fluid resuscitation volume administered should address any deficit.

All care should be taken to avoid hyponatremia, especially in young children and the elderly.

Use 4mL in the formula for patients with delayed resuscitation, electrical conduction, inhalation injury and if patient has dehydration from other causes.

Early review of urine output and clinical status of patient is essential to evaluate the adequacy of the fluid resuscitation and make necessary adjustments to fluids replacement

### 6.1 Example 1 – adults

70Kg adult patient with 30% burns arriving immediately after the injury

**3 x 70 Kg x 30% = 6300**

Give ½ in the first 8 hours and ½ in the next 16 hours

1 <sup>st</sup> 8 hr period	3150 mL
2 <sup>nd</sup> 16 hr period	3150 mL
<hr/>	
<b>Total 24 hrs</b>	<b>6300 mL</b>



## 6.2 Paediatrics:

Due to children's limited physiological reserves and tendency to hypoglycaemia **fluid maintenance (FM)** should be added to the **fluid resuscitation (FR)** calculated with the Modified Parkland Formula.

Children weighing <30Kg should have maintenance fluid in addition to the calculated resuscitation fluid.

Maintenance fluid: 0.45% sodium chloride and 5% glucose.

Up to 10 Kg	100 mL/ Kg/day (max 1000 mL)		
10-20 Kg	100 mL/ Kg/day = 1000 mL	plus 50 mL/ Kg/day for each Kg over 10 Kg (max 500 mL)	
20-30 Kg	100 mL/ Kg/day = 1000 mL	plus 50 mL/ Kg/day for each Kg over 10 Kg = 500 mL	plus 20 mL/ Kg/day for each Kg over 20 Kg

### Paediatric Fluid Formula

FR + FM = total fluid requirements in first 24 hrs

**FR = 3-4 mL Hartmann solution x Kg body weight x % TBSA**

**plus**

**FM = Maintenance with 0.45% sodium chloride and 5% Glucose**

### 6.2.1 Example 2 – Children

A child weighing 25 Kg with a 20% burn will require the following:

Child fluid resuscitation (FR) = Modified Parkland Formula

3 mL x 25 Kg x 20% = 1500 mL in 24 hrs

**Give ½ in the first 8 hrs and ½ in the next 16 hrs**

1 <sup>st</sup> 8-hour period	750 mL
2 <sup>nd</sup> 16-hour period	750 mL
<hr/>	
Total FR 24hours	1500 mL/24 hrs

**plus**

child fluid maintenance (FM) 25 Kg child in 24 hours

1 <sup>st</sup> 10 Kg – 100 mL x 10 Kg	1000 mL
Next 10 Kg – 50 mL x 10 Kg	500 mL
Next 5 Kg – 20 mL x 5 Kg	100 mL
<hr/>	
Total FM 1600 mL/24 hrs	= 67 mL/hr

**Total fluid requirement = 3100 mL for 1<sup>st</sup> 24 hrs (i.e. 1500 mL (FR) + 1600 mL (FM))**

## 7. Special considerations

### 7.1 Electrical Burns (EMSB Manual 2013)<sup>1</sup>

#### 7.1.1 Overview of Electrical injuries

Electrical source	Likely injuries		
	Skin	Deep Tissue	Cardiac Arrhythmia
Low Voltage <1000V	Local entrance and exit wounds	No	Immediate cardiac arrest possible, otherwise nil
High Voltage >1000V	Flashover burn, full thickness entrance and exit wounds	Yes, especially muscle. Compartment syndrome, rhabdomyolysis	Transthoracic current may cause myocardial damage and delayed arrhythmias
Lightning	Superficial or dermal flashover burns. Exit burns on feet	Eardrum perforation and corneal damage	Respiratory/cardiac arrest – needs prolonged CPR

#### 7.1.2 Treatment

- Primary Survey - Treat cardiac and respiratory arrest
- Secondary Survey - Assess and manage associated trauma
- 24 hours of ECG monitoring may be required for high voltage injury, unconsciousness, or abnormal ECG on arrival
- Fluid requirements in electrical injuries are likely to be greater in volume than would be anticipated in a pure cutaneous burn. Concealed muscle damage in the limbs will be responsible for fluid loss which is not accounted for by the standard formula
- In those patients with deep tissue damage, haemochromogenuria is to be anticipated. A urinary catheter should be inserted both to detect the earliest sign of urine discolouration and to monitor urine output. If pigments appear in the urine, the infusion rate of fluids must be increased to maintain a urine output of 75-100mL/hr for adults, 2 mL/ Kg/hr for children.

### 7.2 Chemical Burns (EMSB Manual 2013)<sup>2</sup>

#### 7.2.1 In general

- Acids produce a coagulative necrosis
- Alkalis produce a liquefactive necrosis.
- All produce coagulation of protein by oxidising, corrosive or salt forming effects on protein.

#### 7.2.2 First aid

- Any dry powders should be brushed away
- Copious constant running water >1hour
- Bitumen and alkali burns require irrigation with water for an even longer period than other chemical burns.
- Chemical injuries to the eye also require copious irrigation and referral

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<sup>1</sup> Emergency Management of Severe Burns (EMSB) Course Manual 17<sup>th</sup> Ed. 2013. Australian & New Zealand Burn Association (ANZBA). Electrical Burns chapter pp70-78

<sup>2</sup> Emergency Management of Severe Burns (EMSB) Course Manual 17<sup>th</sup> Ed. 2013. Australian & New Zealand Burn Association (ANZBA). Chemical Burns chapter pp79-84

### 7.2.3 Hydrofluoric Acid

- Used in glass etching, metal cleaning, electronics manufacturing
- After penetrating tissue, hydrofluoric acid dissociates into hydrogen and fluoride ions (which bind with calcium ions) causing hypocalcaemia

### 7.2.4 Treatment

- Prompt water irrigation
- Trim fingernails
- Topical calcium gluconate burn gel (10% with Dimethyl sulfoxide [DMSO])
- Local injection with 10% calcium gluconate (multiple injections 0.1 - 0.2 mL through 30G needle into burn wound). Number and frequency of injections monitored by pain response.
- Intra-arterial infusion of calcium gluconate
- Intravenous ischaemic retrograde infusion (Biers block) of calcium gluconate.

## 7.3 Eye burns

- Physical signs include blepharospasm, tearing, conjunctivitis and uncontrolled forceful rubbing of the eye
- Treat with copious irrigation of water.
- Topical antibiotics prevent secondary infection
- **All chemical eye burns require urgent consultation with an ophthalmologist.**

## 7.4 Tetanus prophylaxis

Tetanus status must be assessed for every person. Check the table (the *Australian Immunisation Handbook* 9<sup>th</sup> Edition) below for follow-up.

History of tetanus vaccination	Time since last dose	DTPa, DTPa-combinations, dT,dTpa, as appropriate	Tetanus immunoglobulin* (TIG)
≥3 doses	<5 years	NO	NO
≥3 doses	5-10 years	NO	NO
≥3 doses	>10 years	YES	NO
<3 doses or uncertain+		YES	YES

\*The recommended dose for TIG is 250IU, given by IM injection using a 21 gauge needle, as soon as practicable after the injury. If more than 24 hours has elapsed, 500IU should be given.

+Individuals who have no documented history of a primary vaccination course (3 doses) with a tetanus toxoid-containing vaccine should receive all missing doses.

## 8. Transfer

Transfer should occur within four hours if possible.

If an Intensive Care bed is required, the AMRS will organise transfer for adults and NETS will organise for children.

### 8.1 Documentation

The Burn Patient Emergency Assessment & Management Chart (Appendix 1) should be completed for all patients being transferred and be faxed to the Retrieval Service (AMRS or NETS) or receiving burn unit at the time of initial call and then a copy given to the Team for transport; along with any signed consents, history and relevant information.

A photocopy of the fluid balance chart, amount of analgesics given and any signed consents obtained, should be sent with the patient or, in retrieval cases, faxed or given to the AMRS or NETS as appropriate.

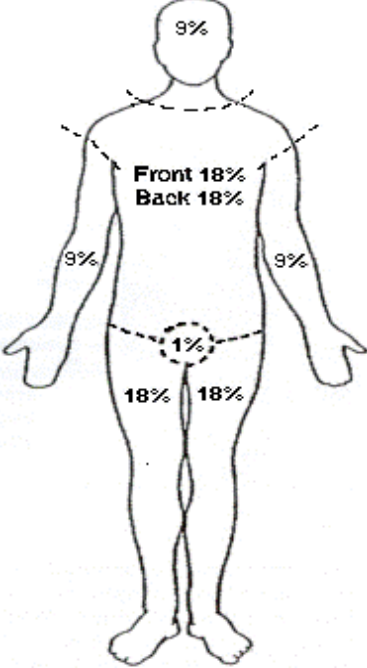
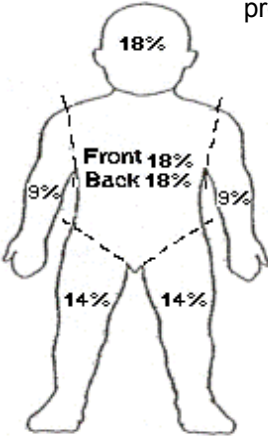

A phone call should accompany any faxed document to ensure they are received by the appropriate person.

## 9. Treatment of minor burns and those not meeting transfer criteria

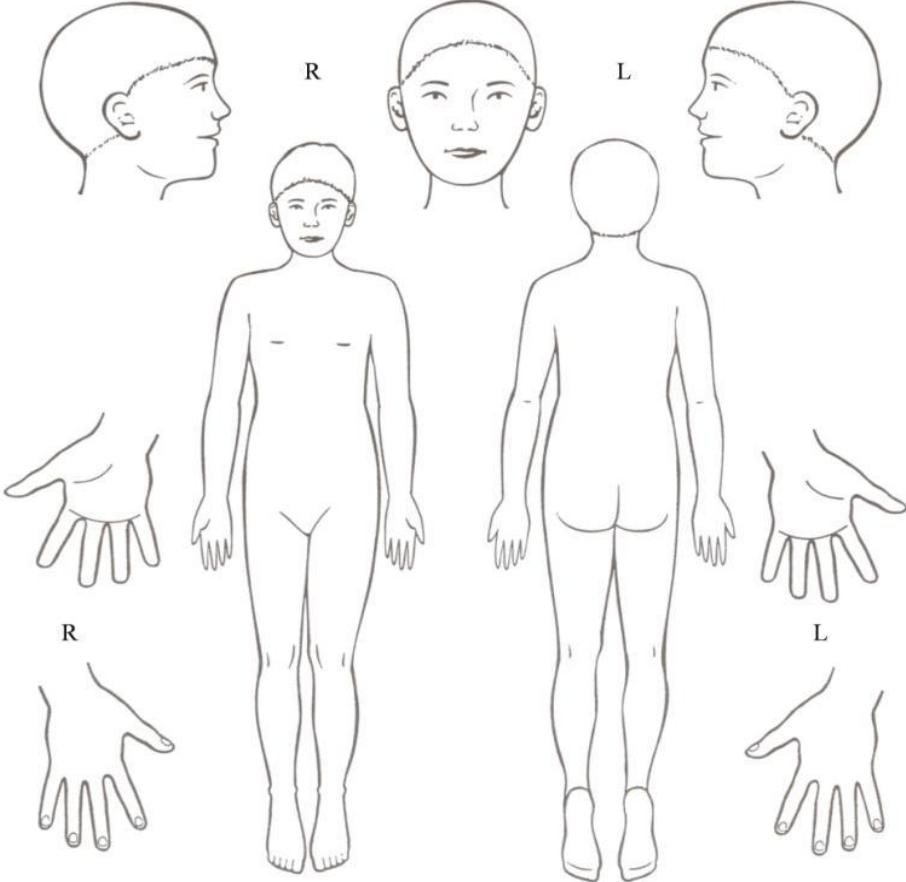
- Many patients not meeting the burn referral criteria can be managed at their primary referring site. The ACI Statewide Burn Injury Service is able to provide support and assistance to primary health sites to liaise in ongoing burn management.
- Services exist within the ACI Statewide Burn Injury Service for burn advice 24hrs a day. The contact details are provided in Appendix 2.
- Each tertiary referral site has an ambulatory care service for wound management and minor burn review. These services can be contacted during business hours. Contact details are provided in Appendix 2.
- For minor burn management advice please refer to the [Minor Burn Management document](#).

# Appendix 1: Burn Patient Emergency Assessment & Management Chart

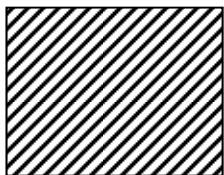
To be used for patients requiring transfer to a burn unit	<b>Place patient label here or:</b> MRN: _____ Name: _____ D.O.B: _____ Sex: _____ AMO: _____ Ward: _____
<b>Presentation Date:</b> _____ <b>Time:</b> _____ <b>Trauma Call:</b> <input type="checkbox"/> YES <input type="checkbox"/> NO <b>Burn Date:</b> _____ <b>Burn Time:</b> _____ <b>Triage Category:</b> _____ <b>Weight ( Kg):</b> _____ <b>Doctor:</b> _____ <b>Burn Mechanism:</b> _____ _____ _____	
<b>First Aid given:</b> <input type="checkbox"/> NO <input type="checkbox"/> YES <b>Specify</b> _____	
<b>Airway</b>  Intubation required _____ Y / N size of tube _____  <b>Cervical Spine</b>  <input type="checkbox"/> Normal <input type="checkbox"/> At Risk <input type="checkbox"/> Immobilised	<b>Breathing – O2</b>  RR _____ Air Entry _____ O2 saturation _____ Burn circumferential around chest / neck? <input type="checkbox"/> Yes <input type="checkbox"/> No
<b>Circulation – 2 x IV lines</b>  HR _____ BP _____/_____ Circumferential burns? Yes/No specify _____ Size and location cannulas _____ Cap refill centrally <input type="checkbox"/> 1-2 seconds <input type="checkbox"/> > 2 seconds <input type="checkbox"/> Absent Cap refill peripherally <input type="checkbox"/> 1-2 seconds <input type="checkbox"/> > 2 seconds <input type="checkbox"/> Absent	
<b>Disability</b> Level of consciousness (AVPU): _____ <b>AVPU = A – Alert, V - Response to Vocal stimuli, P - Responds to Painful stimuli, U – Unresponsive</b> Pupils: (L) _____ mm (R) _____ mm	<b>Environment</b> Patient Temp. _____°C @ _____ (time/date) Temp route _____ Remove clothing and jewellery <b>Keep unburnt areas warm</b> Warm IV fluids <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> N/A Warm blankets <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> N/A
<b>Assess % Total Body Surface Area (TBSA) burnt using Rule of Nines (see page 2)</b>  TBSA body chart completed? <input type="checkbox"/> No <input type="checkbox"/> Yes By whom? _____	
<b>Fluid Resuscitation</b> (see page 3 for specific fluid calculations) <input type="checkbox"/> Not required Large bore IVCs (2 for >20%, 1 for >10%) or CVL inserted? <input type="checkbox"/> Yes <input type="checkbox"/> No Bloods taken: <input type="checkbox"/> FBC <input type="checkbox"/> EUC <input type="checkbox"/> BSL <input type="checkbox"/> Coags <input type="checkbox"/> COHb <input type="checkbox"/> Drug screen IDC Inserted? (if > 10% TBSA or perineum) <input type="checkbox"/> Yes <input type="checkbox"/> No Nasogastric tube inserted? (if > 15% TBSA) <input type="checkbox"/> Yes <input type="checkbox"/> No	
<b>Co-existing injuries?</b> <input type="checkbox"/> Yes <input type="checkbox"/> Possible (e.g. blast / electrical injury) <input type="checkbox"/> No Specify _____	
<b>Pain Management Morphine</b> (alt if allergic) Adults Stat IV 2mg, repeat every 5mins as required <b>Max. 0.2mg/ Kg</b> Children Stat IV 0.1mg/ Kg, repeat every 15mins as required <b>Max. 0.3mg/ Kg</b> Minor burn Oral analgesia (e.g. paracetamol +/- codeine / oxycodone, etc.) may be adequate	<b>Immunisation</b> Immunisations up to date? <input type="checkbox"/> No <input type="checkbox"/> Yes Specify _____ Tetanus status: <input type="checkbox"/> Primary course given <input type="checkbox"/> Last dose of booster _____ <input type="checkbox"/> Give Immunoglobulin if < 3 doses <input type="checkbox"/> Give booster if last booster > 5yrs ago

Rule of Nines	Palmar
Adult	Palm + fingers = 1%
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p><b>Paediatric</b></p> <p>For every year of life after 12 months take 1% from the head and add ½% to each leg, until the age of 10 years when adult proportions</p>  </div> <div style="text-align: center;"> <p>(Patient's hand)</p>  </div> </div>	

**BURN DISTRIBUTION** (shade affected areas on diagram below)



**Shade affected area**

**Total % TBSA**

= \_\_\_\_\_

**NB** Faint erythema not included in % TBSA

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<b>RESUSCITATION FLUIDS</b> (if > 10% TBSA for children, >15% for adults)	
Weight _____ Kg	
<b>Modified Parkland Formula = 3-4 mLs x weight ( Kg) x % TBSA burn</b> to be given as <b>Hartmann's</b> solution in 24 hrs following the injury (see Transfer Guidelines) 3-4 mLs x _____ Kg x _____ % TBSA = total fluids for 1st 24 hrs <b>* NB This is a guide only - Titrate fluids to urine output*</b>	
<b>Total resuscitation fluids in 24 hrs</b>	_____ mLs <b>Start time</b> _____ <b>Finish time</b> _____
50% Replacement in 1 <sup>st</sup> 8 hrs following injury	_____ mLs
Total Fluid given prior to admission	_____ mLs
Subtract Fluid already given = fluid to be given to complete 1 <sup>st</sup> 8hrs	_____ mLs
<b>Hourly rate for replacement</b> (within 1 <sup>st</sup> 8 hrs)	_____ mLs/hr <b>Start time</b> _____ <b>Finish time</b> _____
Remaining 50% of Replacement in next 16 hrs	_____ mLs
<b>Hourly rate for replacement</b> (in subsequent 16 hrs)	_____ mLs/hr <b>Start time</b> _____ <b>Finish time</b> _____
Maintenance fluids (for children < 30 Kg only)	_____ mLs/hr
<b>MAINTENANCE FLUIDS</b> (Not applicable for adults)	
Children < 30 Kg require maintenance fluids (0.45% sodium chloride and 5% Glucose) in addition to resuscitation fluids	
Up to 10 Kg	100 mL/ Kg/day
10-20 Kg	1000 mLs <b>plus</b> 50 mL/ Kg/day (for each Kg >10 Kg and <20 Kg)
20-30 Kg	1500 mLs <b>plus</b> 20 mL/ Kg/day (for each Kg > 20 Kg)
<b>URINE OUTPUT</b>	
<ul style="list-style-type: none"> <li>• Children 1 mL/ Kg/hr (range 0.5 – 2 mL/ Kg/hr)</li> <li>• Adults 0.5 – 1 mL/ Kg/hr</li> <li>• 2 mL/ Kg/hr required for pigmented urine such as myoglobinuria / haemoglobinuria</li> </ul>	
<b>REFERRAL CRITERIA</b>	
Refer to Transfer Guidelines ("Referral" meaning <i>contact</i> with not necessarily <i>transfer</i> to Burn Unit)	
<ul style="list-style-type: none"> <li>• Mid-dermal, deep dermal or full thickness burns in children &gt;5% TBSA, in adults &gt;10% TBSA.</li> <li>• Any priority areas are involved, i.e. face/neck, hands, feet, perineum, genitalia and major joints.</li> <li>• Caused by chemical or electricity, including lightning.</li> <li>• Any circumferential burn.</li> <li>• Burns with concomitant trauma or pre-existing medical condition.</li> <li>• Burns with associated inhalation injury.</li> <li>• Suspected non-accidental injury.</li> <li>• Pregnancy with cutaneous burns</li> </ul>	
<b>DRESSING</b>	
For transfer to specialist unit within 8 hrs apply cling film to burnt areas (Vaseline gauze/white paraffin for face). <b>Do not wrap circumferentially.</b> For delayed transfer > 8 hrs apply antimicrobial dressing such as Vaseline gauze or silver dressing, after discussion with burn unit	
For burns not requiring transfer to specialist unit	
<ul style="list-style-type: none"> <li>• Give pre-med analgesia 30mins prior to procedure (e.g. paracetamol +/- codeine / oxycodone, etc.)</li> <li>• Clean wound with chlorhexidine 0.1%, saline or clean water</li> <li>• Apply appropriate dressing such as silver dressing or Vaseline gauze (see Minor Burn Management)</li> <li>• make follow-up appointment and advise on care and analgesia for home usage and pre-dressing</li> </ul>	



<b>HISTORY OF INJURY</b>		
When did it happen? Time:		Date:
How did it happen?		
Who saw it?		
Who else was there?		
What was done?		
Was the burn cooled? <input type="checkbox"/> No <input type="checkbox"/> Yes If YES when, with what and for how long?		
<b>MEDICAL HISTORY</b>		
Past Medical History		
Co-morbidities?		
Allergies? <input type="checkbox"/> No <input type="checkbox"/> Yes If YES specify?		
Medications? <input type="checkbox"/> No <input type="checkbox"/> Yes If YES specify?		
Last oral intake?		
Social History		
<b>SOCIAL ISSUES</b>		
Any features of concern? E.g. non-accidental injury/self-harm/abuse? <input type="checkbox"/> No <input type="checkbox"/> Yes If YES specify?		
Child Protection Service notified? <input type="checkbox"/> No <input type="checkbox"/> Yes Reference Number _____ Action taken _____		
<b>Signature:</b>		
<b>Print name:</b>		
<b>CONTACT NUMBERS</b>		
<b>Retrieval</b> (refer to Transfer Guidelines for Retrieval Criteria)	<b>Transfer and consultations</b> (Burns Registrar via Hospital Switch)	<b>Minor Burn Management</b> Burn Ambulatory Clinics
AMRS (adult retrieval) 1800 650 004 NETS (paediatric retrieval) 1300 362 500	RNSH 02 9926 7111 (adult) CRGH 02 9767 5000 (adult) CHW 02 9845 0000 (paediatric)	RNSH 02 9463 2108 CRGH 02 9767 7775 CHW 02 9845 1850
<b>NB Digital pictures can be emailed to Burn Units only after consent and contact have been made</b> <b>RNSH - <a href="mailto:NSLHD-BurnsConsult@health.nsw.gov.au">NSLHD-BurnsConsult@health.nsw.gov.au</a></b> <b>CRGH - <a href="mailto:crghburns@email.cs.nsw.gov.au">crghburns@email.cs.nsw.gov.au</a></b> <b>CHW - <a href="mailto:kidsburns@chw.edu.au">kidsburns@chw.edu.au</a></b>		

## Appendix 2: Contact details for the ACI Statewide Burn Injury Service

### Retrieval Contacts

#### Adults (16 years +)

AMRS - Aeromedical and Medical Retrieval Service  
1800 650 004

#### Children (< 16 years)

NETS - Newborn & paediatric Emergency Transport Service  
1300 36 2500  
[help@nets.org.au](mailto:help@nets.org.au)

### ACI Statewide Burn Injury Service campuses

Although the Local Health Districts have, for adult burns, a designated first point of contact (see below), the burn unit that accepts the transfer will depend on bed availability.

**NB** Patients in areas close to the borders of Queensland, Victoria and South Australia may send patients to the closest Burn Unit which may be interstate. Appropriate communication and management must be instigated with the receiving hospital in these cases.

#### Royal North Shore Hospital

Local Health Districts: *Northern Sydney, Central Coast, Hunter New England, Northern NSW and Mid North Coast.*

##### Burn Unit

Ph: 02 9463 2111  
Fax: 02 9463 2006

##### Burns Registrar /Consultant on-call

Ph: 02 9926 7111 then page Burns Registrar

##### Intensive Care Unit

Ph: 02 9463 2600

##### Ambulatory Care

Ph: 029463 2108 (b/h),  
Ph; 02 9463 2111 (a/h)

##### Burns/Plastics CNC

Ph: 02 9926 7111 then page Burns/Plastics CNC  
Office: 02 9463 2102

Digital photos can be sent to [NSLHD-BurnsConsult@health.nsw.gov.au](mailto:NSLHD-BurnsConsult@health.nsw.gov.au) only after consent and contact have been made.

**Concord Repatriation General Hospital**

Local Health Districts: *Illawarra Shoalhaven, Nepean Blue Mountains, South Eastern Sydney, South Western Sydney, Sydney, Western Sydney, Far West, Murrumbidgee, Southern NSW, Western NSW and ACT.*

## Burns Unit

Ph: 02 9767 7776

Fax: 02 9767 5835

## Burns Registrar/Consultant on-call

Ph: 02 9767 5000 then page

## Intensive Care Unit

Ph: 02 9767 6404

## Ambulatory Care

Ph: 02 9767 7775 (b/h)

Ph: 02 9767 7776 (a/h)

## Burns CNC

Ph: 02 9767 5000 then page 60271

Office: 02 9767 7798

Digital photos can be sent to [crqhburns@email.cs.nsw.gov.au](mailto:crqhburns@email.cs.nsw.gov.au) only after consent and contact have been made.

**The Children's Hospital at Westmead**

*Will take referrals for all children to the age of 16 years in NSW and the ACT.*

## Burn Unit

Ph: 02 9845 1114

Fax: 02 9845 0546

## Burns Registrar on-call

Ph: 02 9845 000 then page Surgical or Plastics Registrar on call for Burns

## Intensive Care Unit

Ph: 02 9845 1171

## Ambulatory Care

Ph: 02 9845 1850 (b/h), 9845 1114 (a/h)

## Burns Nurse Practitioner

Ph: 02 9845 0000 then page 7038

Office: 02 9845 1850

Digital photos can be sent to [kidsburns@chw.edu.au](mailto:kidsburns@chw.edu.au) only after consent and contact have been made.

**ACI Statewide Burn Service Directorate**

Can be contacted for any information regarding burns, issues with burn transfers and admissions, Clinical Practice Guideline information and advice and direction on who to contact for clinical issues within the service.

ACI Statewide Burn Injury Service Network Manager

Ph: 02 9463 2105 (b/h)

Fax: 02 9463 2006

Mob: 0421 029 430

Webpage: [www.aci.health.nsw.gov.au/networks/burn-injury](http://www.aci.health.nsw.gov.au/networks/burn-injury)

## Appendix 3: Burn Transfer Flow chart

### Medical Retrieval

- intubated patient
- inhalation injuries
- head and neck burns
- >10% in children
- >20% in adults
- burns with significant co-morbidities
- associated trauma
- significant pre-existing medical disorder
- circumferential burn to limbs or chest that compromises circulation or respiration
- electrical conduction injury
- significant chemical e.g. hydrofluoric acid

#### Contact

AMRS adults      NETS children  
1800 65 0004      1300 36 2500

Set up conference call with receiving Burn Unit and ICU (if required), facilitates communication with primary referral site

CHW ICU              9845 1171  
CRGH ICU            9767 6404  
RNSH ICU            9463 2600

AMRS/NETS will coordinate transfer between primary hospital and the receiving hospital

### Referral

- >5% children, >10% adults
- burns to the hands, feet, genitalia, perineum, and major joints
- chemical burns
- electrical burns including lightning injuries
- burns in patients with pre-existing medical conditions
- suspected non-accidental injury including children, assault or self-inflicted
- pregnancy with cutaneous burns (RNSH 2<sup>nd</sup> & 3<sup>rd</sup> trimester)
- extremes of ages

#### CHW:

Surgical Registrar on-call notified Tel. 9845 0000 then page Surgical Registrar on call for burns

#### CRGH:

Burns Registrar on-call notified Tel 9767 5000 then page Burns Registrar

#### RNSH:

Burns Registrar on-call notified Tel 9926 7111 then page Burns Registrar

The on call registrar will offer advice and arrange a bed in liaison with Bed Management and the Burns Unit. They are responsible for receiving the patient. The referrer will make the ambulance booking.

### Minor Burns

Minor burns are treated in consultation with the referring doctor as an outpatient; either locally (at original place of care) or on referral to an ambulatory care burns clinic for assessment

#### Contact Burn Ambulatory Care

CHW: 9845 1850 (b/h)  
9845 1114 (a/h)  
[kidsburns@chw.edu.au](mailto:kidsburns@chw.edu.au)

CRGH: 9767 7775 (b/h)  
9767 7776 (a/h)  
[crghburns@email.cs.nsw.gov.au](mailto:crghburns@email.cs.nsw.gov.au)

RNSH: 9463 2108 (b/h)  
9463 2111 (a/h)  
[burnsconsult@health.nsw.gov.au](mailto:burnsconsult@health.nsw.gov.au)

Referred to Service

Not referred to Service

## Appendix 4: Recognising Burn Depths chart

### Epidermal Burn (Erythema)



- Skin intact, red, brisk capillary refill
- Faint erythema not included in % TBSA
- Heal spontaneously within 3-7 days with moisturiser or protective dressing

### Superficial Dermal Burn



- Blisters present or denuded
- Pink, brisk capillary refill
- Should heal within 7-10 days with minimal dressing requirements

### Mid Dermal Burn



- Heterogeneous, variable depths
- Dark pink, sluggish capillary refill
- Should heal within 14 days
- Deeper areas may need surgical intervention

### Deep Dermal Burn



- Heterogeneous, variable depths
- Blotchy red/white
- Sluggish to absent capillary refill
- Surgical intervention
- Refer to specialist unit

### Full Thickness Burn



- Outer skin, and some underlying tissue dead
- White, brown, red, black
- No capillary refill
- Surgical intervention and long-term scar management required
- Refer to specialist unit



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