
EMERGENCY MEDICINE EDUCATION AND TRAINING

BURNS:

Assessment, management, and referral

Dr Mel Venn FACEM NWRH Jul 2021



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Increasing capacity to provide emergency medicine education and training for
emergency department teams.



Objectives

- Understand assessment of burns
- Initiate management
- Arrange follow-up/referral



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Overview

- Resources
- Epidemiology and Aetiology
- History taking
- Minor burn management – FAÇADE
- Burn wound assessment – size and depth
- Referral and advice
- Special burns – inhalational, chemical, electrical



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Burns Service Tasmania

<https://www.health.tas.gov.au/burns>

Tasmanian Government | Department of Health

1300 135 513

Department of Health > Service Information > Services Files > Royal Hobart Hospital > Treatments and Services > Burns Service Tasmania (Statewide)

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Royal Hobart Hospital

Burns Service Tasmania (Statewide)

The Tasmanian Burns Service is coordinated through the Tasmanian Burns Unit based at the Royal Hobart Hospital. The collaborative Tasmanian Burns Service includes:

- Emergency Services
- Rural and Regional Hospitals
- Launceston General Hospital Plastics Department
- General Practice
- Community Health
- Industry and community programs

The Tasmanian Burns Unit based at the Royal Hobart Hospital is the state wide provider for paediatric and adult patients that require specialised care by the burns multidisciplinary team.

Contact Us

Emergency / after hours:
For emergency medical treatment phone 000

Telephone:
03 6166 8308

Postal address:
GPO Box 1061
Hobart TAS 7001

Contact us online: [Contact us](#)

Information for patients

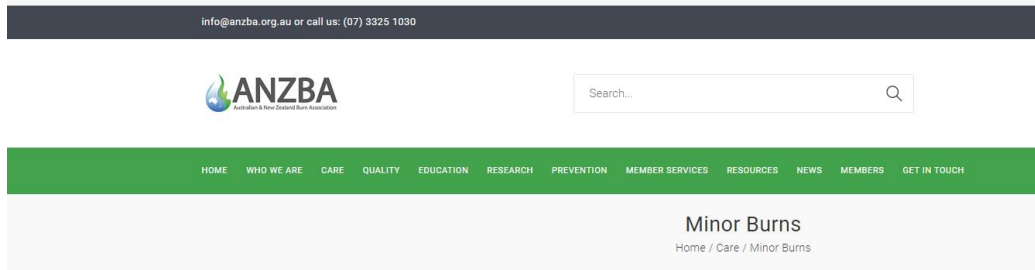
- [Handouts](#)
- [Prevention](#)
- [Resources](#)

For health professionals

- [Allied Health](#)
- [Downloadable Posters](#)
- [Education](#)
- [Journal and Database](#)
- [Minor Burns](#)

ANZBA.org.au

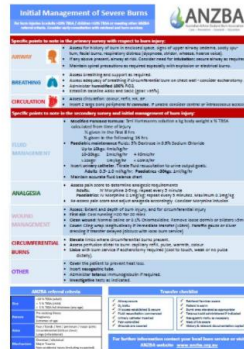
VicBurns.org.au



ANZBA Initial Management of Minor Burns poster can be found here:



Click the image to download the document



Click the image to download the document

Victorian Adult Burns Service AT THE ALFRED

HOME

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BURNS

Burns Management Guidelines

Each year, at least 5000 Victorians are treated for burn injuries in emergency departments and hospitals across the state(1). Approximately 400 people will be transferred to Victoria's two designated Burn Services, and only 8% of these injuries are considered severe, that is >20% Total Body Surface Area burns (2). Most burn injuries in Australia are minor and fortunately, severe burns are uncommon. It is unclear how many injuries are managed by General Practitioners, Primary Healthcare and Wound Care Services, or simply managed with dressing products purchased over the counter.

The aim of these guidelines is to provide a consistent standard of management for burn injuries managed outside of a Burn Service, particularly in the early stages after injury, to improve patient care and outcomes. The guidelines are based on scientific evidence where available and consensus expert opinion, and are a joint initiative between Victoria's two specialist Burns Services, the Victorian Adult Burn Service at The Alfred, and the Burn Unit at the Royal Children's Hospital.

These guidelines are dedicated to the memory of Professor John "Jock" Masterton (1928 - 2015). Jock established the Burn Unit at the Alfred in 1967, and was one of the visionary leaders who established the Australian & New Zealand Burn Association in 1976. The early 20th Century was an era of painful treatments, frequent infection and mortality, an era of limited understanding and a widespread perception of therapeutic nihilism, which due to his efforts and those of his peers, we no longer contend with in the 21st century. This website is dedicated to his legacy.

"Success is not final, failure is not fatal. It is the courage to continue that counts"

- Winston Churchill

We would like to advise visitors to this website that it contains content, in particular images and video, that may be distressing to some people.



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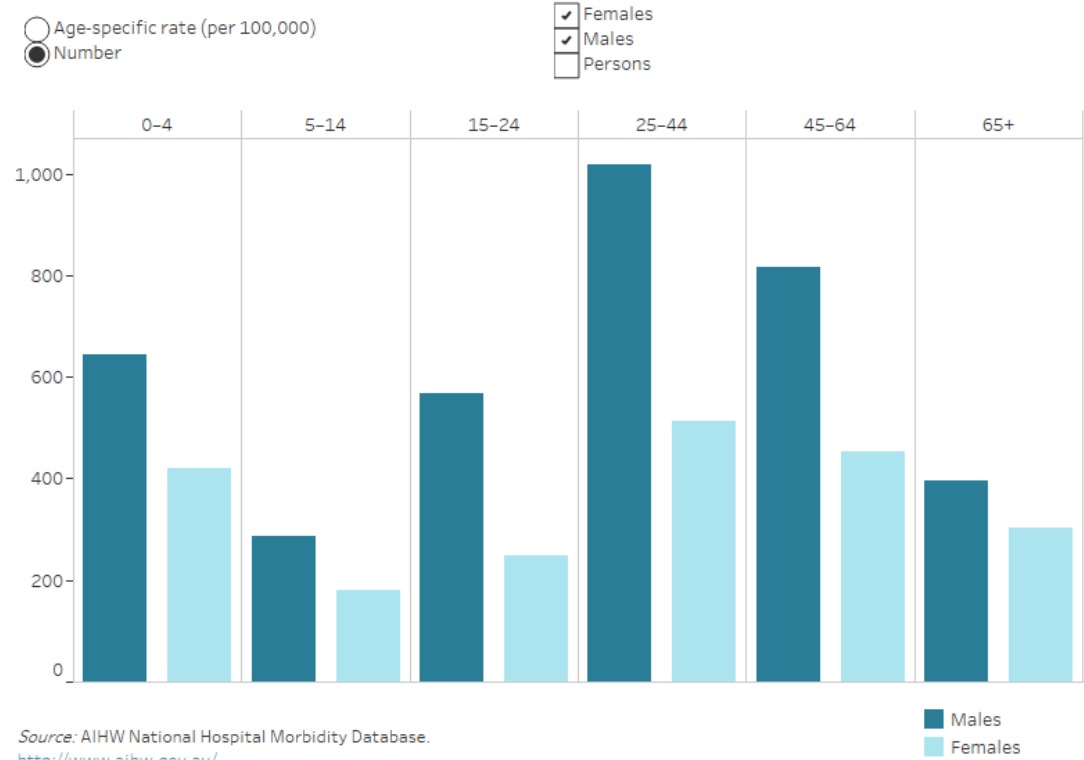
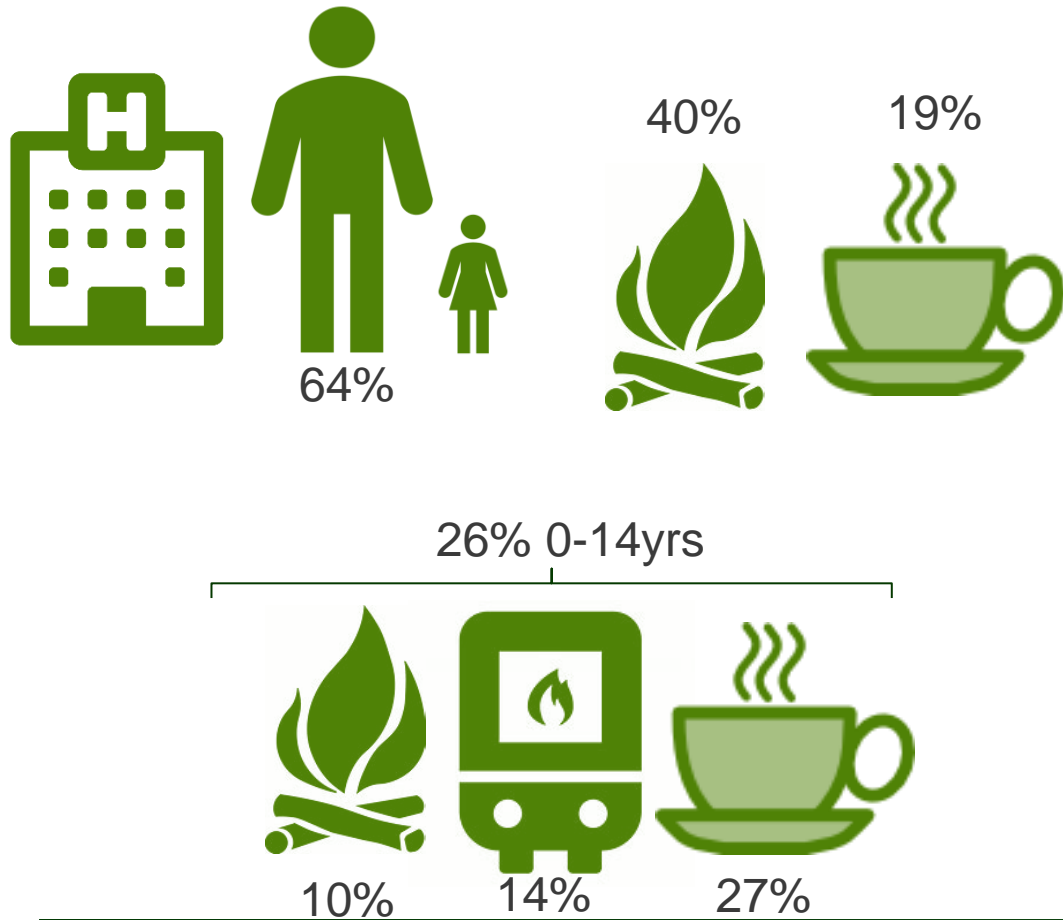
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TASMANIA

Epidemiology and Aetiology

5853 cases, 2.9% ICU, 98 deaths, 2017-18



AIHW Hospitalised Burn Injuries in Australia 2017-18



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History

- AMPLE – Allergies, Mechanism, PMHx, Last ate, Events prior
- Mechanism of injury
 - Date and time
 - Mechanism and length of contact time
 - Enclosed space?
 - Adequacy of first aid



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Minor burn management - FACADE

- First aid
- Analgesia
- Clean
- Assess
 - Size, depth, moisture
- Dress to maintain moist wound healing environment
- Elevate



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First Aid

► Stop the burning process

Chemical - Remove the burning agent and irrigate with water

Fire - Stop-drop-roll

Electrical - Turn off current

► Cool the burn

With running cold tap water for 20 mins (15°C)

Useful for up to 3 hours after injury

► Limit complications

Remove clothing not stuck to the burn site (cut around)

Remove all jewellery and watches

Cover the burn using a clean dressing/sheet or clingwrap

Prevent hypothermia

NEVER use ice or iced water



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Analgesia

- Opioids may be required
- Covering burn provides analgesia
- Nitrous oxide, intranasal fentanyl commonly used when cleaning, debriding and dressing burns
- Larger burns require general anaesthesia



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Cleaning/debridement

- Clean the area with cool clean water or saline
- Remove debris and contaminants
- Remove loose skin, derroof blisters








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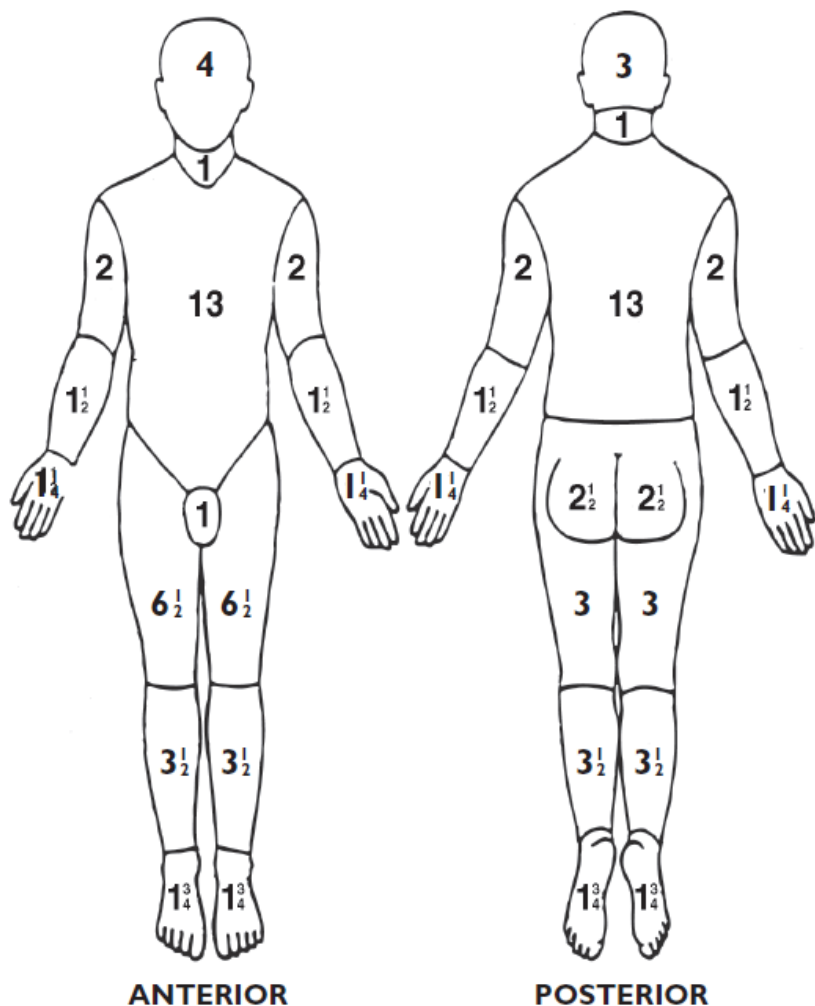
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Burn Depth and Minor Burn Dressings: THS Burns Service State-wide

First Aid	Preparation				Further Information
Cool running water for at least 20 minutes Remove affected clothing & jewellery Cooling continues to be beneficial for up to 3 hrs post burn injury Never use ice	Provide analgesia. Clean wound & remove all foreign matter, loose and non viable tissue/skin. De-roof all blisters if tense, over a joint, or if signs of infection are present. Remove all blistered skin 48-72 hrs post burn injury.				THS Burns Referral and Transfer Flow Chart THS Burns Wound Management Guideline (draft) Intranet: http://www.dhhs.tas.gov.au/intranet/stho/surgery/burns Internet: www.dhhs.tas.gov.au/burns
	Epidermal	Superficial Dermal	Mid Dermal	Deep Dermal	Full Thickness
Burns Referral & Transfer Flow Chart					
Assess Depth	Brisk capillary return Epidermis damaged but intact Red, no blisters Painful, dry Healing 3-7 days	Brisk capillary return Blistered, painful Red/pale pink Moist Healing < 14 days	Sluggish capillary return +/- Blisters Dark pink or mottled red Variable sensation Hair follicles intact Healing 10-21 days	Severely delayed or absent capillary return +/- Blistered skin & hair follicles Cherry red or white or mottled Sensation to deep pressure ↓ Moisture, healing > 21 days Require skin grafting	No capillary return No blisters, hair follicles or sensation, dry Leathery or brown or white or yellow or black Require skin grafting
Initial Dressing 0-48 hrs post burn injury	Moisturiser E.g. sorbolene cream 4 times/day	Absorbent dressing: •Foam •Alginate/gelling fibre •Silver Dressing if contaminated	Absorbent dressing: •Foam •Alginate/gelling fibre •Silver Dressing if contaminated	Topical antimicrobial E.g. Silver dressing: •Acticoat®- see application guide •Silver foam Refer: THS Burns Service	Topical antimicrobial E.g. Silver dressing: •Acticoat®- see application guide •Silver foam Refer: THS Burns Service
Dressing > 48 hrs post burn	Moisturiser E.g. sorbolene cream Reapply 4 times/day	•Foam •Hydrocolloid •Silver Dressing if contaminated Redress every 3-4 days	•Foam •Hydrocolloid •Silver Dressing if contaminated Redress every 3-4 days	Silver dressing: •Acticoat®- see application guide •Silver foam Redress every 3-4 days Refer :THS Burns Service	Silver dressing: •Acticoat®- see application guide •Silver foam Redress every 3-4 days Refer :THS Burns Service
Silver Dressings	Please consider a silver based dressing for the following: <ul style="list-style-type: none"> • Paed ≥ 5% TBSA and Adult ≥ 10% TBSA (Contact & Refer to RHH Burns/Plastics Team and utilise Transfer Dressings as per guidelines) • Flame and chemical burns • Deep dermal and full thickness burns • Immuno-suppressed patients (including diabetics and patients receiving high dose steroids) • Signs of infection &/or systemically unwell • Compromised First Aid (e.g. contaminated water, sea water etc) 				
Follow up	General Practitioner 24- 48 hrs post burn & initial review. Refer to RHH Burns Outpatient Clinic or LGH Plastics clinic as per the Burns Referral & Transfer Flow chart . All burns that take > 2 weeks to heal, deep dermal & full thickness burns or receive a skin graft, require scar management & referral to the Tasmanian Burns Service.				
Contact	State-wide and South: Tasmanian Burns Unit RHH Ph: 03 6166 8566 Available 24/7 for appointment booking and advice. Fax 6234 9636. Registrar 24/7 Ph: 6166 8308 North and North West: Plastics Clinic LGH Ph: 03 6777 6777. Plastics Registrar available 24/7				

Assess burn extent - Size



 Superficial Dermal
 Deep dermal/ Full thickness

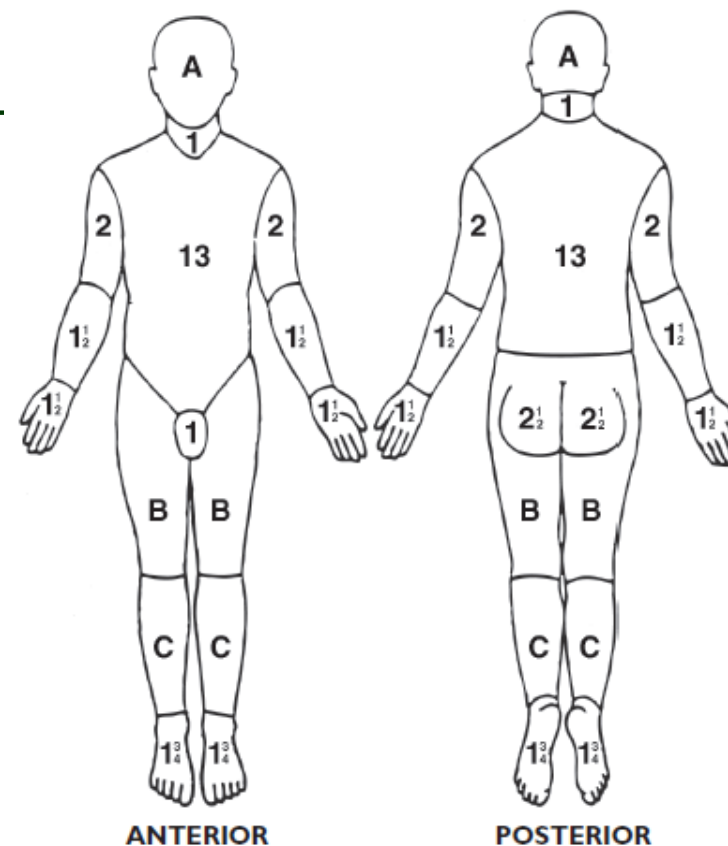
REGION	%
HEAD	
NECK	
ANT.TRUNK	
POST.TRUNK	
RIGHT ARM	
LEFT ARM	
BUTTOCKS	
GENITALIA	
RIGHT LEG	
LEFT LEG	
TOTAL BURN	

CHILDREN

Date: _____ Time: _____ hours

Ignore Simple Erythema

 Superficial Dermal
 Deep dermal/ Full thickness

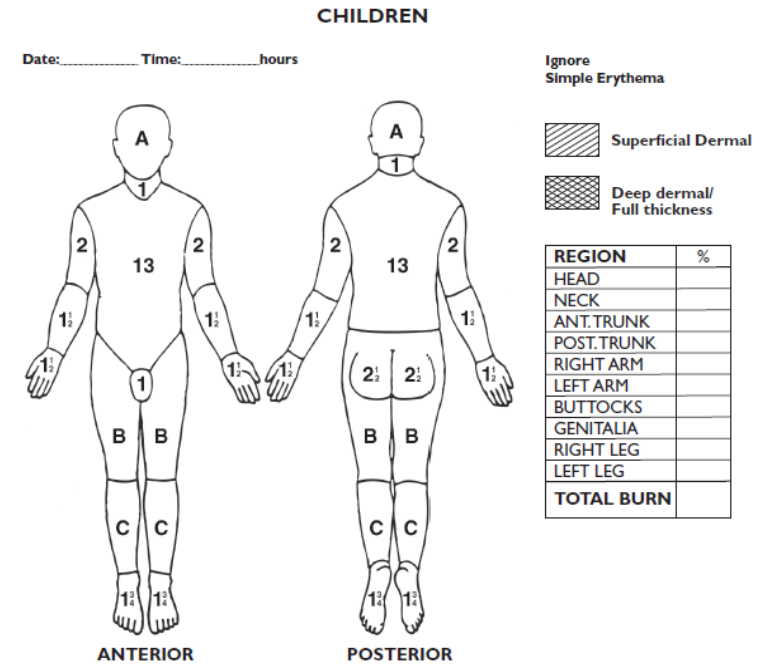


REGION	%
HEAD	
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ANT.TRUNK	
POST.TRUNK	
RIGHT ARM	
LEFT ARM	
BUTTOCKS	
GENITALIA	
RIGHT LEG	
LEFT LEG	
TOTAL BURN	

CHILDREN RELATIVE PERCENTAGE OF BODY SURFACE AREA AFFECTED BY GROWTH

AREA	AGE 0	1-4	5-9	10-15
A=1/2 of head	9 1/2	8 1/2	6 1/2	5 1/2
B=1/2 of one thigh	2 3/4	3 1/4	4	4 1/4
C=1/2 of lower leg	2 1/2	2 1/2	2 3/4	3

3yr old girl, scald



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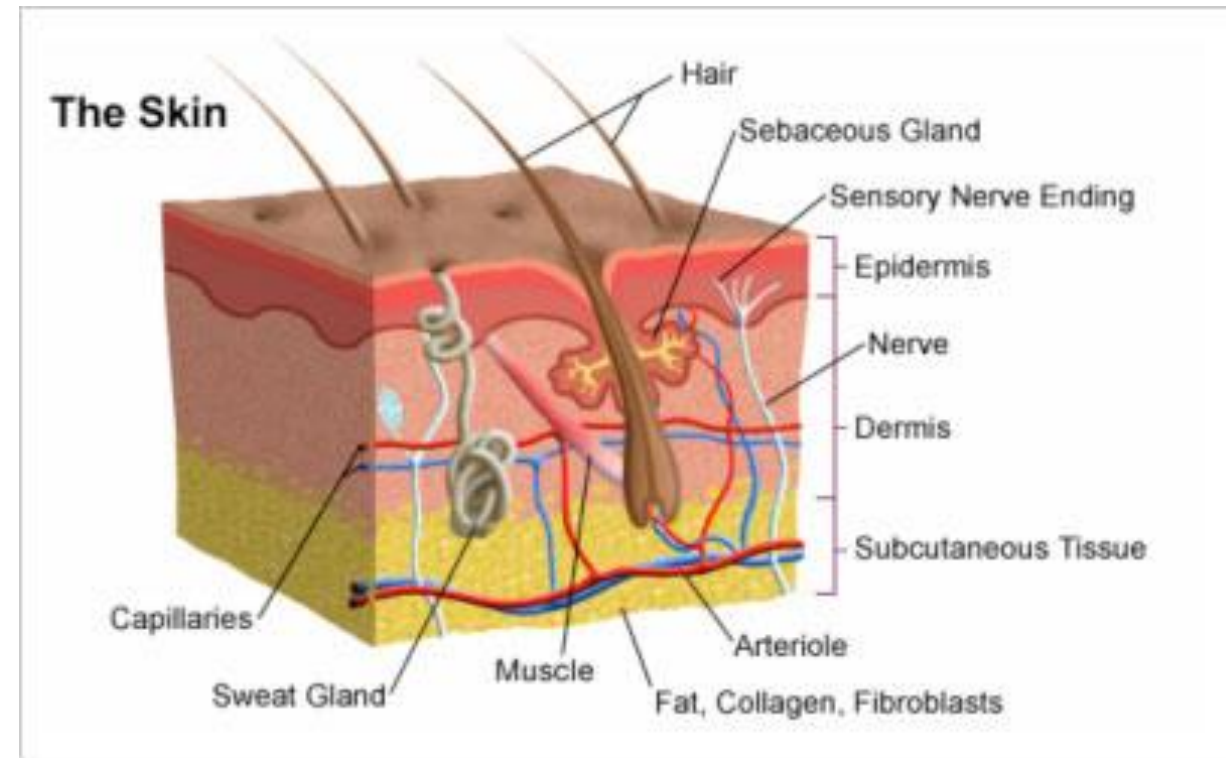
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Assess burn extent - depth

- Epidermal
 - Superficial dermal partial thickness
 - Mid dermal partial thickness
 - Deep dermal partial thickness
 - Full thickness
-
- Most burns are MIXED depth
 - Most accurate assessment day 3-5



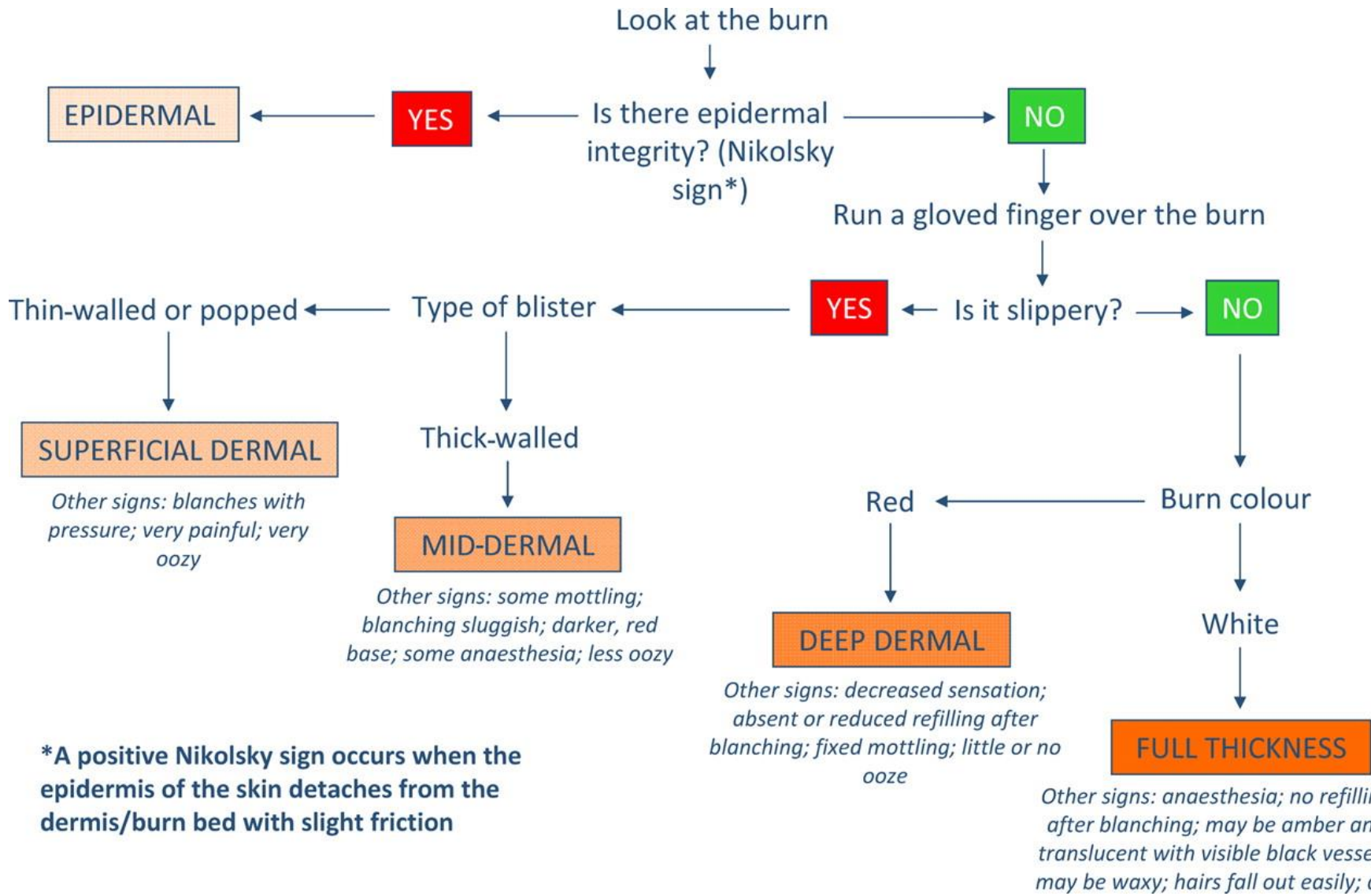
<https://www.vicburns.org.au/burn-assessment-overview/burn-depth/>



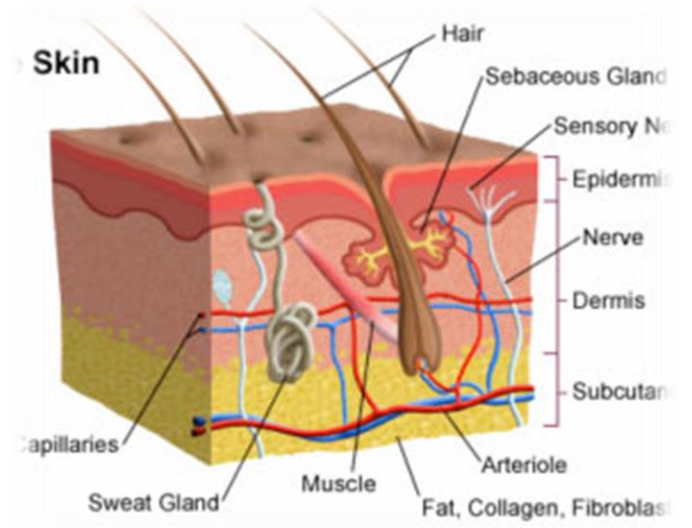
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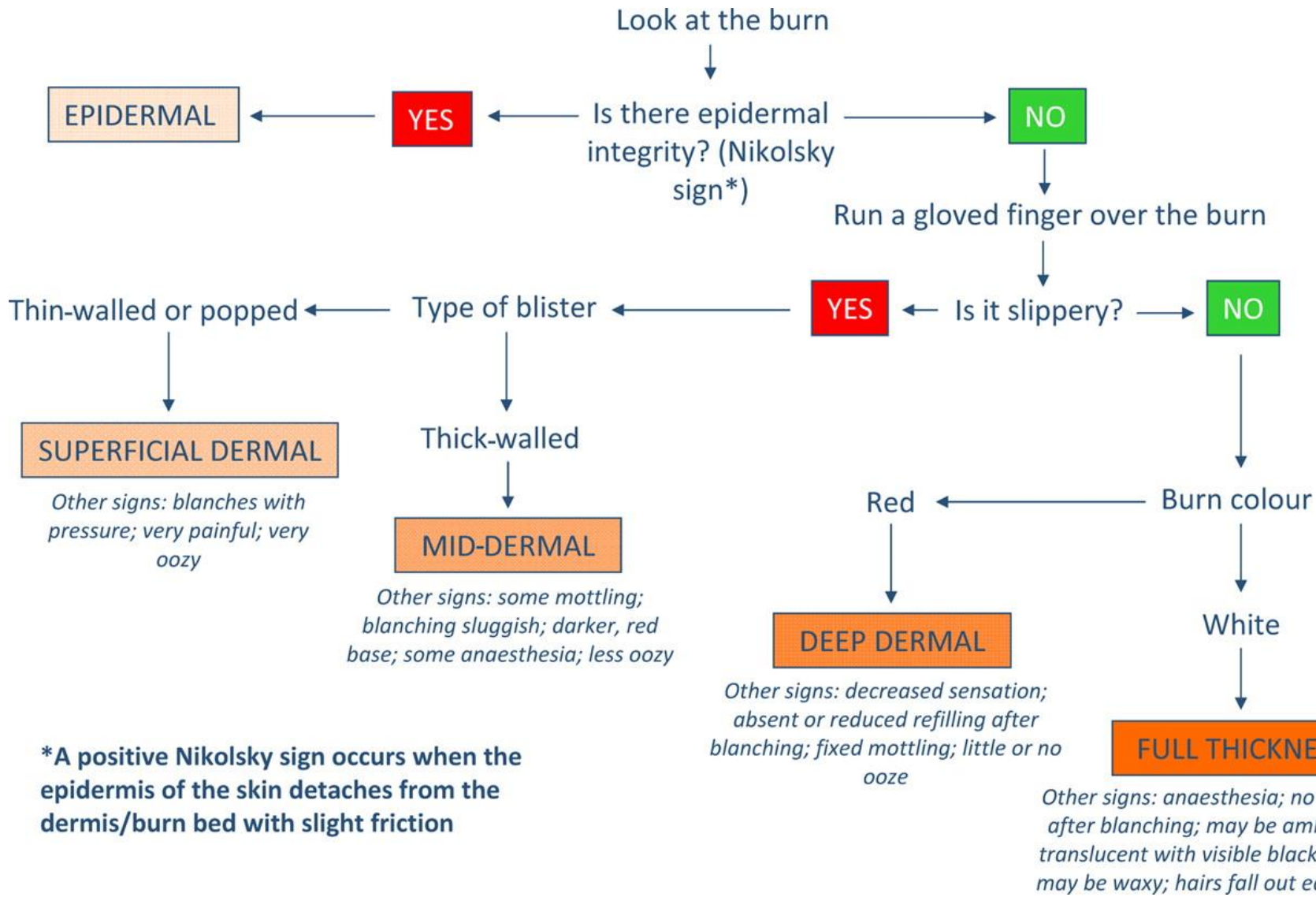
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*A positive Nikolsky sign occurs when the epidermis of the skin detaches from the dermis/burn bed with slight friction





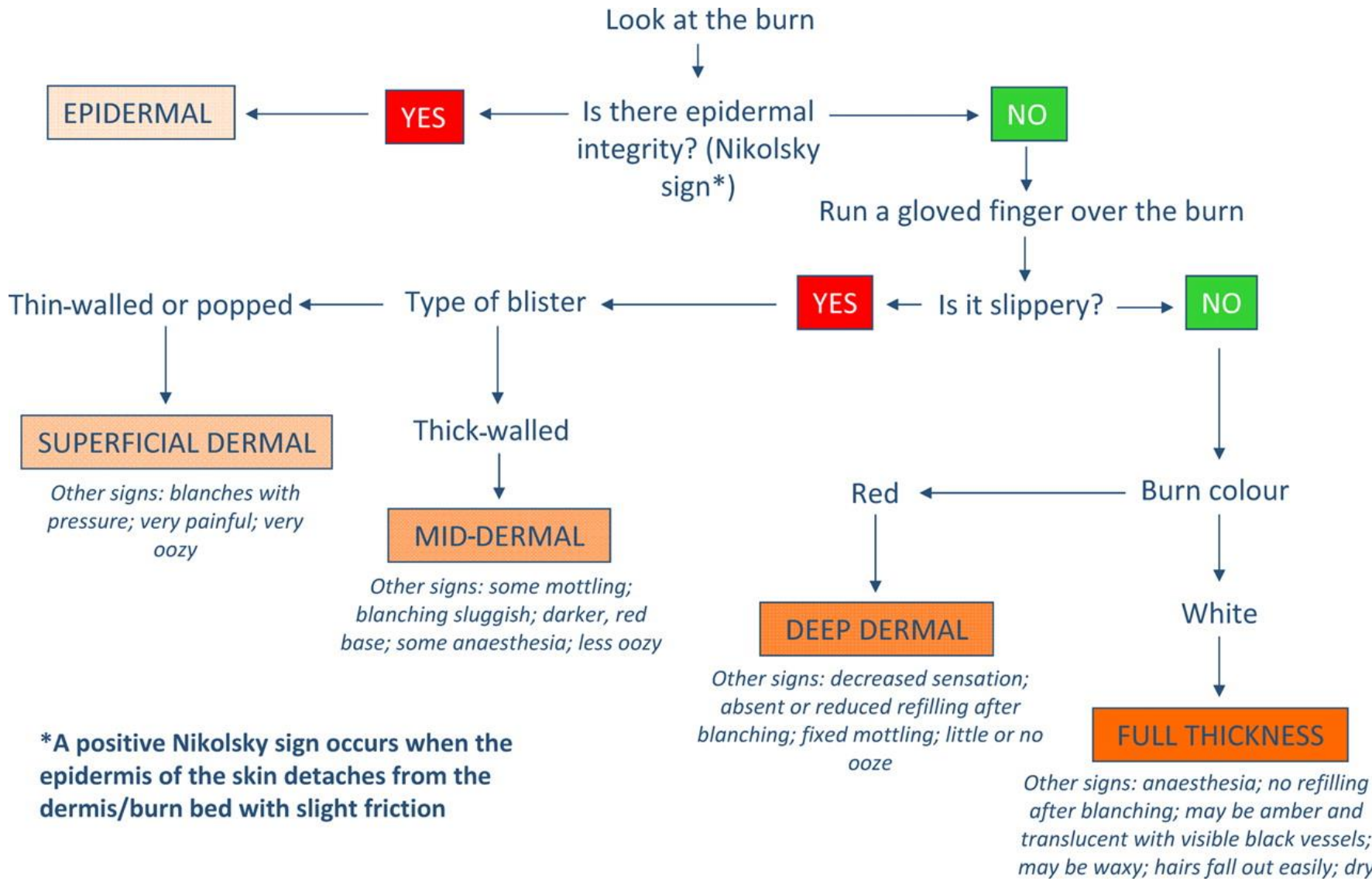
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***A positive Nikolsky sign occurs when the epidermis of the skin detaches from the dermis/burn bed with slight friction**



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Dressings

Transfer dressing = cling wrap or clean cloth

Consider silver:

- Contaminated
- Signs of infection
- Immunocompromised patient
- Children

	Epidermal	Superficial Dermal	Mid Dermal
Burns Referral & Transfer Flow Chart			
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Referral and Advice

- Local ED MOIC
- Plastics Registrar RHH or LGH
- Tas Burns Unit RHH

THS Burns Referral and Transfer Flow Chart

Referring Doctor:

- Primary survey
- Secondary survey
- First Aid
- Transfer Dressings

Urgent Transfer (to RHH or interstate)

is indicated for:

- Burns >10% TBSA Adults or >5% TBSA in Children
- Orofacial burns at risk of a compromised airway
- Intubated patients with a cutaneous burn
- Burns with associated inhalation injury or major trauma
- High voltage electrical injury
- Deep dermal/Full thickness Circumferential chest, abdominal or limb burns
- Chemical burns
 - >10% TBSA adults
 - all children
 - any systemic effects

Referral to RHH directly (all areas) for:

- Burns to special areas that require specialist expertise ie extensive deep burns to face and hands
- Significant comorbidities
- Extremes of age (Elderly, pregnancy, Children <2 years)
- Suspected non accidental injury

Contact: Ph. 6166 8308 (switch)
RHH on call Burns/Plastics Consultant

If transfer is decided upon:

Patient to make own way if able, or
Ph: AT (1800 008 008) if an ambulance is required.

Referral and discussion is indicated for:

- Burns to special areas (face, hands, feet, perineum, genitalia, major joints) not previously discussed above
- Low voltage electrical burns
- Superficial circumferential burns to limb or chest
- Comorbidities which may complicate management
- Chemical Burns ≤ 10% in adults
- Full Thickness burns

Contact Ambulance Tasmania (AT) Critical Care

Transfer Line: **1300 558 329** for a conference call:

- AT Medical Retrieval Consultant
- RHH Burns/Plastics Consultant
- +/- RHH Intensive Care Consultant (Adult or Paediatric) if required.

Interstate Transfer (Alfred or RCH) will be considered in conjunction with the Victorian Burns Service for burn injuries:

- > 50% TBSA in Adults
 - > 40% TBSA in Children
 - > 20% TBSA in Children with associated trauma or inhalation injury
 - RHH Burns Unit unable to receive further patients
- Draft THS Protocol: Patient Transfer*
Draft THS Protocol: Management of end of life & withdrawal of life prolonging treatment in major burns major burns

Tasmanian Burns Service Contacts

RHH Burns Unit Ward 5A (24 hr advice) - Ph. 6166 8308
RHH Burns/Plastics Registrar (24 hr advice) - Ph. 6166 8308
RHH Burns CNC: (M,T,T,F) - Ph. 0428 370 714
Email: rhhburnscnc@ths.tas.gov.au
RHH Burns Outpatient Unit (M, T, T, F) - Ph. 6166 0098
LGH Plastics Registrar (24 hr advice) - Ph. 6777 6777
LGH Plastics Outpatient Unit - Ph. 6777 6777

Forms (THS staff use only) / Resources

- [Burns Transfer Chart](#)
- [Lund & Browder Chart](#)



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- Comorbidities which may complicate management
- Chemical Burns \leq 10% in adults
- Full Thickness burns

Contact:

Southern Area: RHH on call Burns/Plastics Registrar

Ph. 6166 8308 (switch)

North/Northwest Area: LGH on call Plastics Registrar

Ph. 6777 6777 (switch)



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Special burns – chemical

Mechanism:

- The type of agent involved and how much
- Strength and concentration of the agent
- Site of contact and whether swallowed or inhaled
- Manner and duration of contact
- Mechanism of action of the chemical

Management:

- decontamination (likely water irrigation)
- ? buffer or neutralising agent



*Full thickness burn caused by cement.
© Copyright 2019 vicburns.org.au*

Acid

- very painful
- irrigate with water, treat as for thermal burn

Alkali

- liquefy tissue and penetrate deeply
- Irrigate with water >1hr, surgical mgmt for deeper burns

Cement

- Wet cement caustic, pH up to 12.9
- Pain and burning delayed hours
- Prolonged irrigation, surgical mgmt for deeper burns

Bitumen

- Transported at up to 190°C, used at 150°C; burns due to heat, not chemical toxicity
- Cool bitumen with copious water
- Remove with vegetable or paraffin oil, can add 1/3 kerosene

Petrol (hydrocarbons, alkanes, cycloalkanes)

- Hydrocarbon causes endothelial cell damage
- Dissolves lipid compounds, causing increased membrane permeability and fluid loss
- Ignition burns → large burns, high fluid requirements, long hospital stays
- Immersion/contact burns → partial thickness injury, inhalational lung damage, systemic toxicity

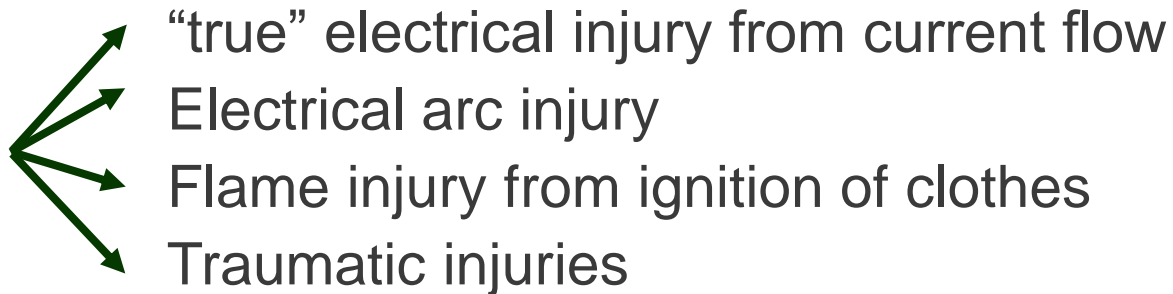
Hydrofluoric acid

- Inorganic acid of F⁻, very corrosive
- 2% TBSA can be fatal
- H⁺ ions cause acid injury
- F⁻ ions penetrate damaged skin and bind Ca²⁺ ions
- Soft tissue necrosis, severe hypocalcaemia
- Arrhythmias from hypoCa and hypoMg
- Irrigate +++ with water
- Inactivate with calcium gluconate (topical, local, IA, IV retrograde infusion (Bier's))

Special burns – electrical

Mechanism:

- Low voltage domestic (240V single phase AC) or industrial (413V 3-phase AC) → localised tissue destruction
- High voltage powerlines → deep, extensive tissue damage
- Lightning → variable pattern



*Full thickness exit wound to armpit post high voltage electrical burn injury
© Copyright 2019 vicburns.oig.au*

Inhalational injury

Suspicious features:

- Fire/smoke in enclosed setting
- Hoarseness, change in voice, harsh cough, stridor
- Burns to face, head, neck swelling, inflamed oropharynx
- Singed facial hair, soot in saliva/sputum/nose



Fibreoptic bronchoscopy can confirm inhalation injury
© Copyright 2019 vicburns.org.au

Above larynx - burn from inhalation of hot gases → oedema obstructs airway

Below larynx - volatile products of combustion CO, CO₂, HCN, HCl, HBr, S/P/N oxides →
→ combine with lung water to make acid/alkali → lung injury

Systemic intoxication – CO, HCN, HF, phosgene, ammonia



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Approach to burns: Any questions?



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2yr old child

Walked on hot bitumen



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25yr old woman

Scald from boiling whey



Image: litfl.com



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Summary



- History and assessment of extent
- Initiation of treatment
- Referral and follow-up



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