NEW ZEALAND ASSOCIATION OF GENERAL SURGEONS

Promoting Surgical Excellence

NZAGS Trainee Day
Taranaki Base Hospital
New Plymouth, NZ

Emergency Management of Burns

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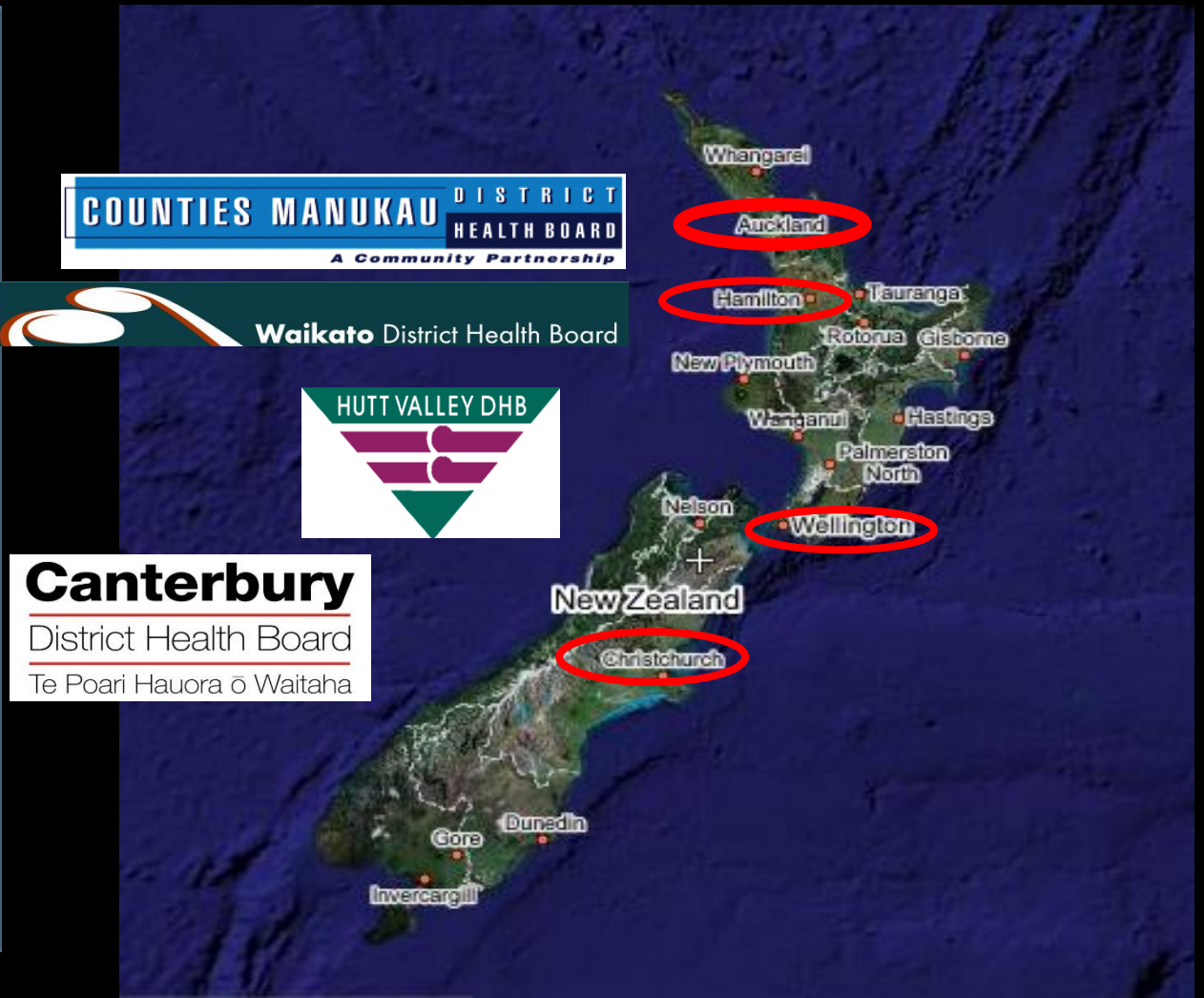
THE UNIVERSITY OF AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

COUNTIES MANUKAU HEALTH

Disclosures

- The author has no relevant financial relationships to disclose as it pertains to the content of this presentation
- The author has no relevant financial relationships with the manufacture(s) of any commercial product(s) and/or provider(s) of commercial services discussed in this activity

National Burn Service - Regional Burn Units



Who, Where & How

- Very young (& very old)
  - ~50-60% are scalds, predominately in the kitchen or bathroom
  - ALWAYS beware non-accidental injury
- Adults
  - ~50% from explosions & flame
  - ~33% from scalds
  - ~50% are at home, ~15-20% at work

Burn Injury

- Function of…
  - contact time
  - temperature
  - external protection (ie clothing)
  - area of contact (thickness of skin)
  - age of patient (very young & old with thin skin)
  - *mechanism of burn*
    - thermal, chemical, electrical

Systemic Effects of a Major Burn

- Depends upon… TBSA
  Patient's age
  & Patient's reserves

- <20% → usually no major effects

- Larger burns result in:
  - Hypovolaemia from fluid shifts
  - Immunosuppression
  - Gastric stasis

ATLS / EMST / EMSB Basics

- Primary Survey
  - A = airway with C-spine control
  - B = breathing & ventilation
    - always supply supplemental O_2
    - carbon monoxide poisoning may give cherry-pink colour despite patient being ‘hypoxic’
    - half-life of CO in room air is 4–5 hours, down to 45 minutes with O_2
    - evaluate possibility of INHALATIONAL INJURY
  - C = circulation with haemorrhage control
    - burns do not cause hypotension
    - occult injuries will be responsible for hypotension

INHALATIONAL INJURY

- Doubles the mortality rate
- Important determinant of survival from burn

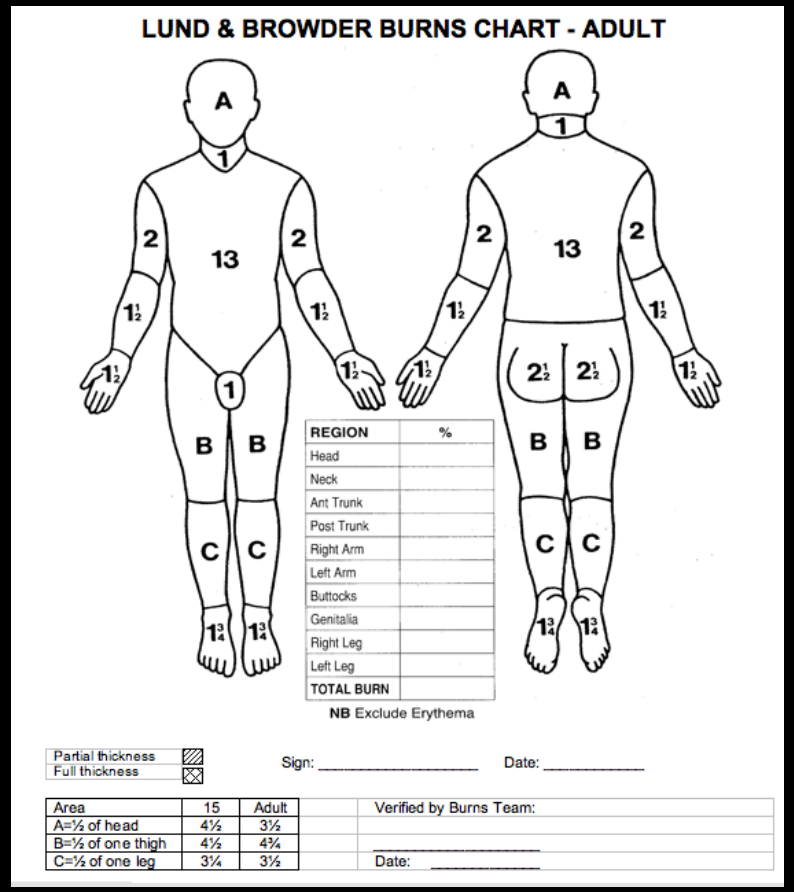
- Suspect if *history* of…
  - trapped in confined space with fire

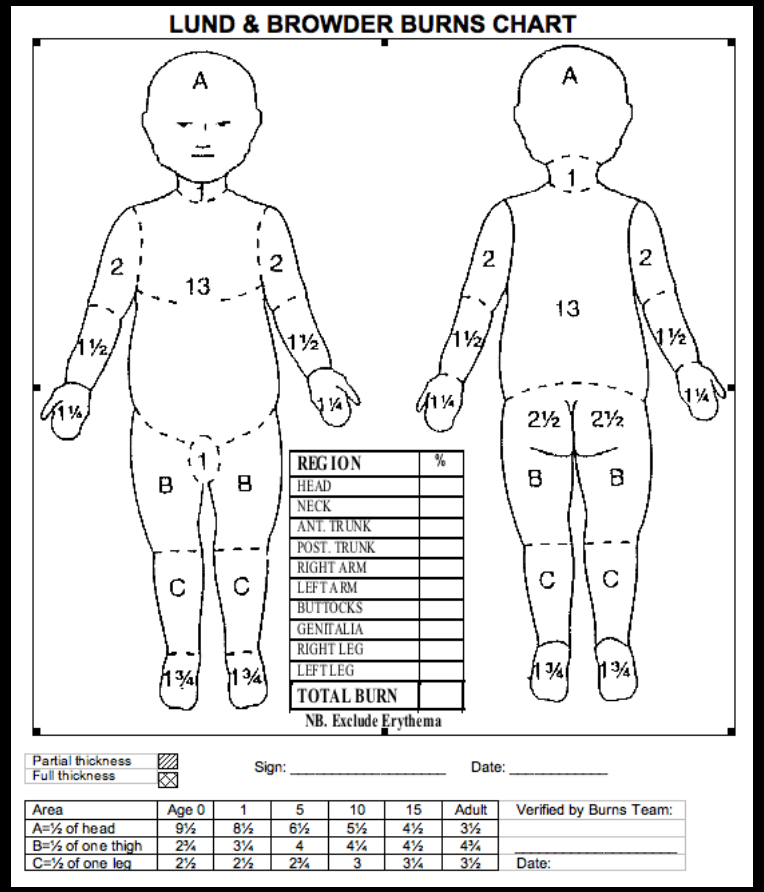
- Suspect if *find*…
  - burns or singing to mouth, nose, pharynx
  - carbonaceous sputum
  - stridor, change in voice

Burn Wound Assessment

Size of Burn (TBSA)

- Lund & Browder Chart





Burn Depth Assessment

- Easy to assess extremes
  - superficial burns will heal
  - full-thickness burns won’t

- Partial thickness burns
  - sometimes only time will tell
  - basic principal of modern burn care:

  GRAFT IF WON’T HEAL IN 14-21 DAYS

Fluids Resuscitation

- Parkland Formula for calculation of fluid replacement required for burns patient

TOTAL BODY SURFACE AREA BURNT x 3 ml x WEIGHT OF PATIENT IN KG

Give 1st half of calculated fluid over 8 hours from time of burn

Give remainder over the next 16 hours

Preparation for Transfer to RBU

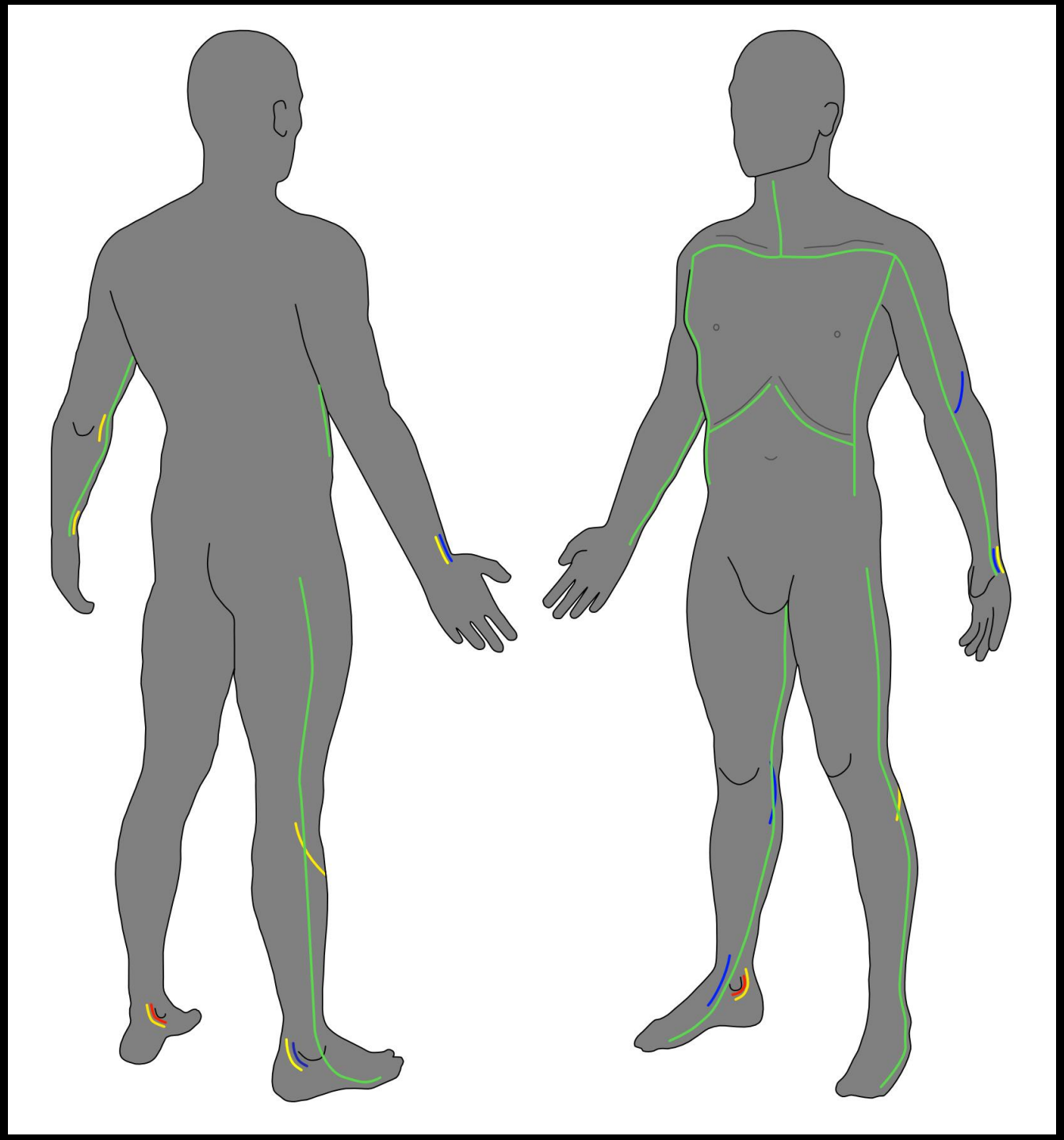
- Respiratory System
  - 100% humidifed O_2
  - consider intubation if long transfer & concerns about inhalational injury
- Circulatory System
  - iv lines, fluid resus
  - watch peripheral circulation
    - May need escharotomies if circumferential limb or torso burns (especially if full thickness)

Escharotomies - To Do or Not To Do?

- To release rigid and inelastic burnt skin (eschar) to allow:
  - Circulation (in a limb)
  - Breathing (when chest involved)
- Usually in FT Circumferential burns

- Should not be performed before discussion with your RBU

- An operative procedure – to be performed urgently (but not immediately) in theatre

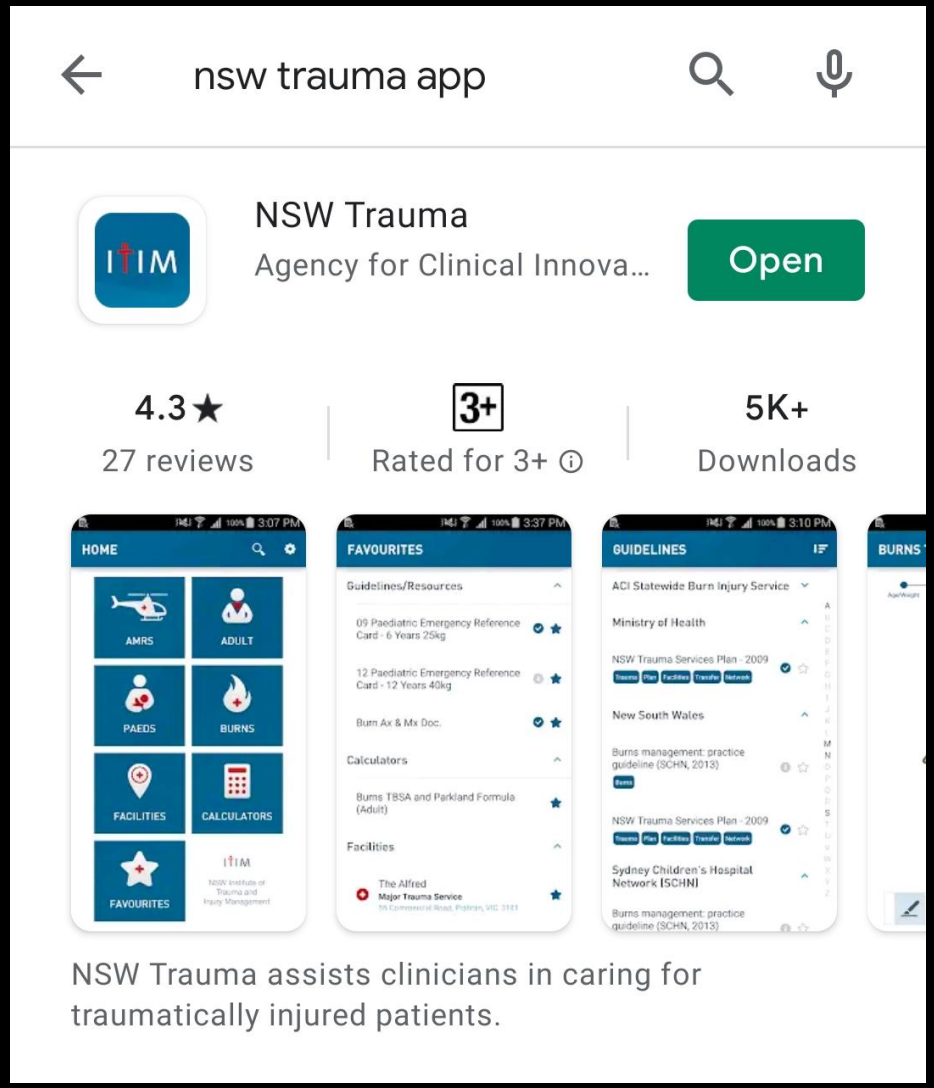


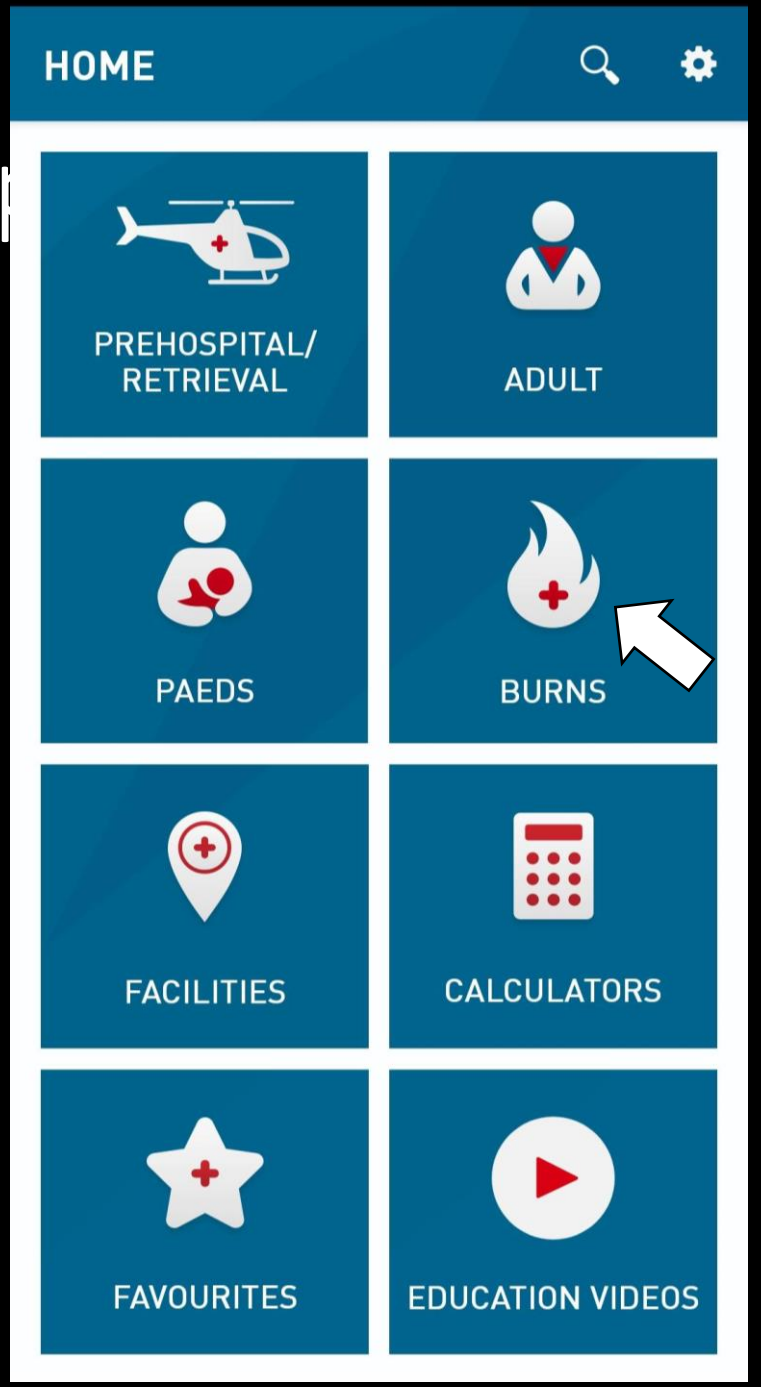
Preparation for Transfer

- Burn wound
  - keep covered *without* tight circumferential dressings
  - dry & warm dressing
  - Often use Gladwrap or similar if no better dressings available

- Pain relief

Recommend NST Trauma Ap





BURNS

- Algorithms
- Calculators
- Checklist
- Contact Details
- Facilities
- Guidelines
- New Zealand specific content
- Resources
- South Australian Paediatric Burn Service Guidelines

NEW ZEALAND SPECIFIC CON...

NBC Burn Referral Form
burns · referral · form · New · Zealand

NBC Burn Transfer Form
burn · transfer · form · New · Zealand

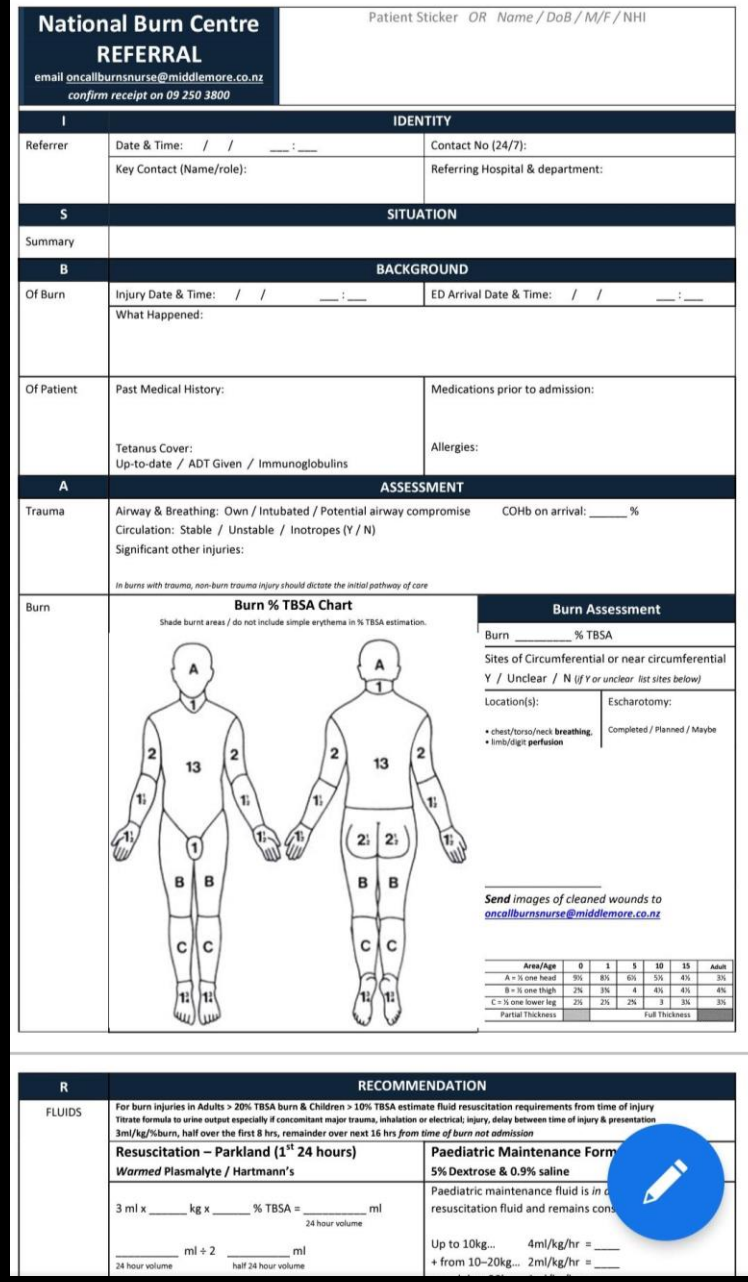
NZ Burn Service Website

NZ Escharotomy Guideline
burn · escharotomy · New · Zealand

NZ Initial Ax & Mx Guideline
burn · assessment · management · New · Zealand

NZ Referral Pathway
burn · injury · New · Zealand · referral · pathway

NZ Referral Poster
burns · New · Zealand · referral · poster



National Burn Centre REFERRAL
email oncallburnsnurse@middlemore.co.nz
confirm receipt on 09 250 3800

Patient Sticker *OR Name / DoB / M/F / NHI*

I	**IDENTITY**	
Referrer	Date & Time: / / :	Contact No (24/7):
	Key Contact (Name/role):	Referring Hospital & department:
S	**SITUATION**	
Summary		
B	**BACKGROUND**	
Of Burn	Injury Date & Time: / / :	ED Arrival Date & Time: / / :
	What Happened:	
Of Patient	Past Medical History: Tetanus Cover: Up-to-date / ADT Given / Immunoglobulins	Medications prior to admission: Allergies:
A	**ASSESSMENT**	
Trauma	Airway & Breathing: Own / Intubated / Potential airway compromise Circulation: Stable / Unstable / Inotropes (Y / N) Significant other injuries: *In burns with trauma, non-burn trauma injury should dictate the initial pathway of care*	COHb on arrival: _____ %
Burn	**Burn % TBSA Chart** Shade burnt areas / do not include simple erythema in % TBSA estimation.	**Burn Assessment** Burn _____ % TBSA Sites of Circumferential or near circumferential Y / Unclear / N *(if Y or unclear list sites below)* Location(s): • chest/torso/neck **breathing**. • limb/digit **perfusion** Escharotomy: Completed / Planned / Maybe ***Send** images of cleaned wounds to* *oncallburnsnurse@middlemore.co.nz*

Area/Age	0	1	5	10	15	Adult
A = ½ one head	9½	8½	6½	5½	4½	3½
B = ½ one thigh	2¾	3¼	4	4¼	4½	4¾
C = ½ one lower leg	2½	2½	2¾	3	3¼	3½
Partial Thickness			Full Thickness			

R	**RECOMMENDATION**	
FLUIDS	For burn injuries in Adults > 20% TBSA burn & Children > 10% TBSA estimate fluid resuscitation requirements from time of injury Titrate formula to urine output especially if concomitant major trauma, inhalation or electrical; injury, delay between time of injury & presentation 3ml/kg/%burn, half over the first 8 hrs, remainder over next 16 hrs *from time of burn not admission*	
	Resuscitation – Parkland (1st 24 hours) ***Warmed*** **Plasmalyte / Hartmann's**	**Paediatric Maintenance Form** **5% Dextrose & 0.9% saline**
	3 ml x _____ kg x _____ % TBSA = _____ ml 24 hour volume	Paediatric maintenance fluid is *in addition to* resuscitation fluid and remains constant
	_____ ml ÷ 2 _____ ml 24 hour volume half 24 hour volume	Up to 10kg... 4ml/kg/hr = ____ + from 10–20kg... 2ml/kg/hr = ____

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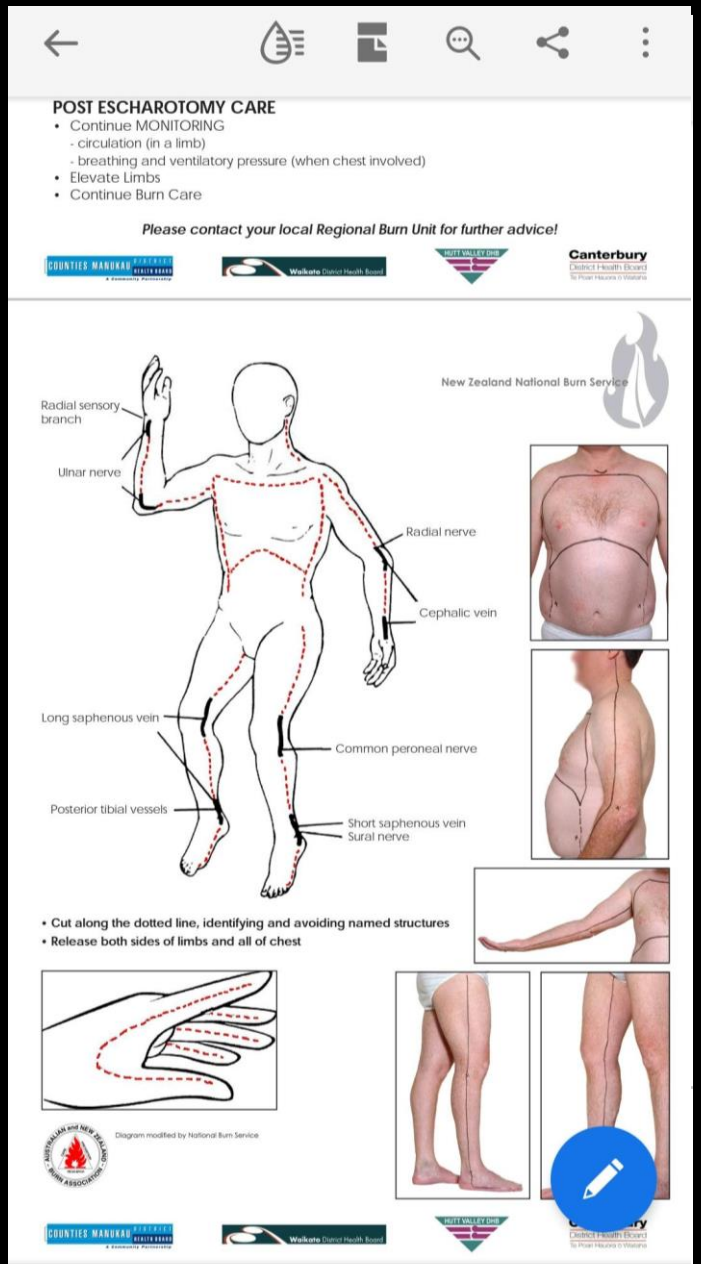

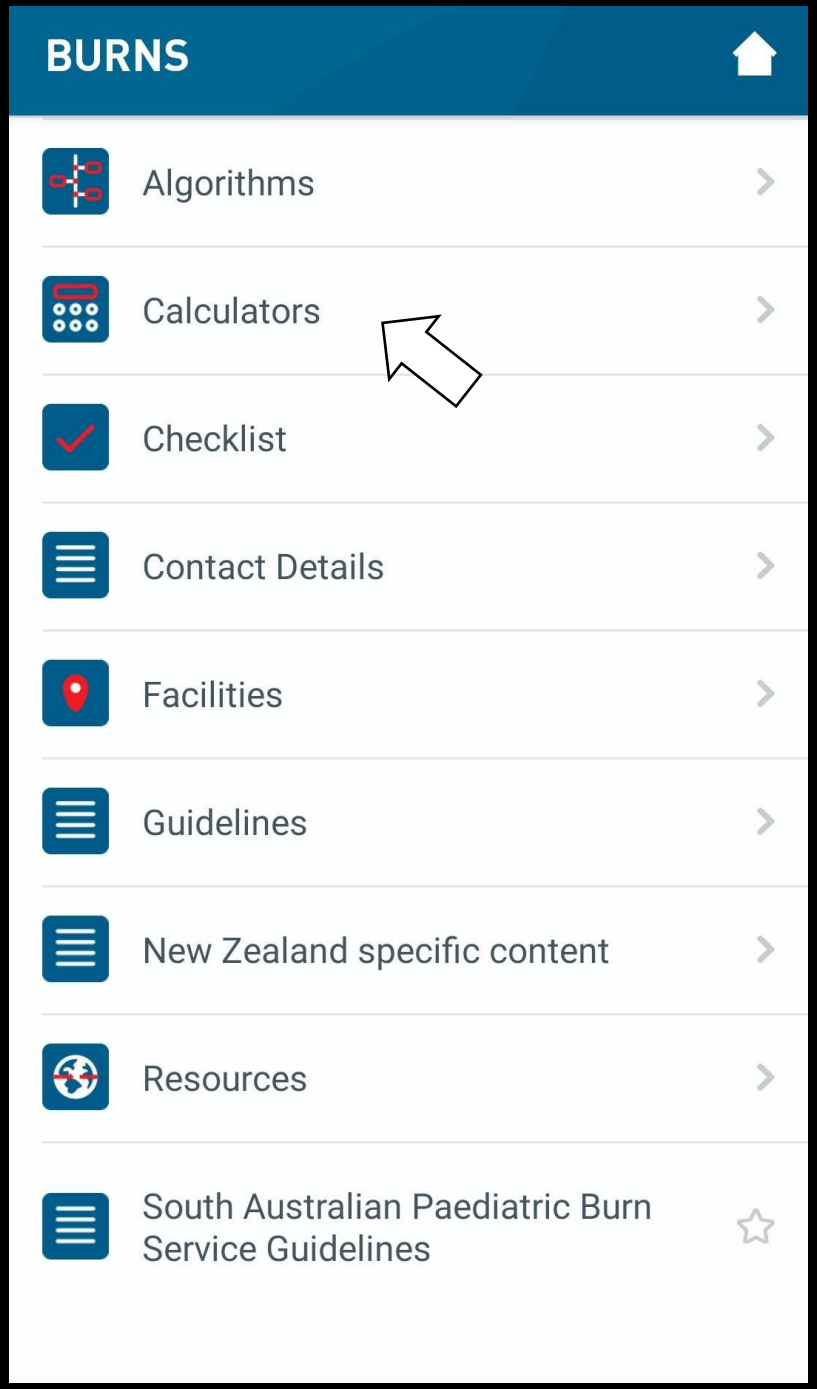
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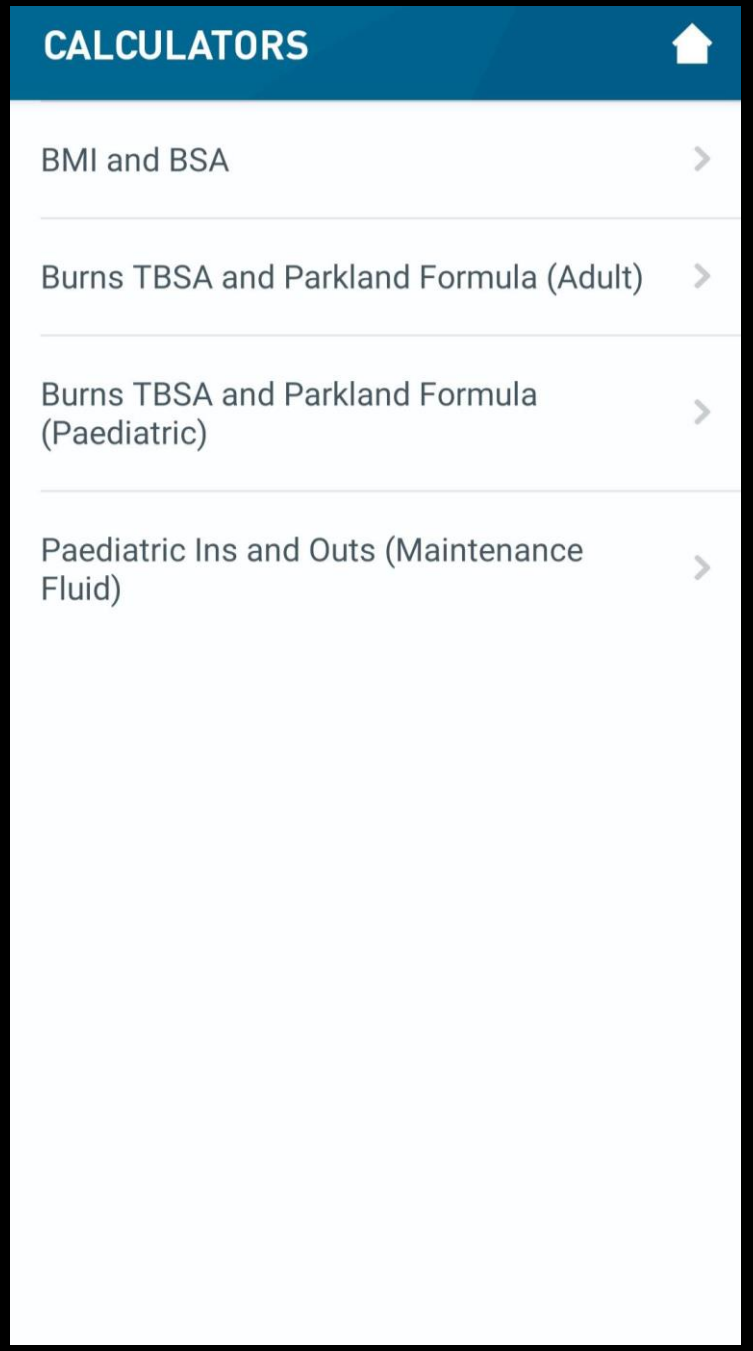
CALCULATORS
BMI and BSA
Burns TBSA and Parkland Formula (Adult)
Burns TBSA and Parkland Formula (Paediatric)
Paediatric Ins and Outs (Maintenance Fluid)

Summary

Call the NBS for advice anytime!!!

- Stop the burn, cool for 20 minutes
- EMST ABCD
- Beware inhalational injury
- Escharotomies are indicated to maintain or restore perfusion
  - On discussion with RBU
- Fluid as per Parklands formula