Wound Management

ACI Statewide Burn Injury Service

Mechanisms
Burns can be caused from many different sources including:

- scald
- flame
- contact
- chemical
- electrical
- friction
- radiation
- reverse thermal (cold burns)
Scald

- Mainly superficial to partial
- Very young and elderly
- Tea/coffee, bath/shower
- Recently
  - 2min noodles
  - cup-a-soups
  - hot oil and
  - hair removal wax
Scald

Immersion Scald
- Wound red, moist
- >60 years
- No blanching present
- Dry, yellow eschar
- Note soles of feet

7 days later

Cup of Coffee

Bath
# Water temperatures

<table>
<thead>
<tr>
<th>Type of liquid</th>
<th>Temperature</th>
<th>Time for serious burn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling water from a kettle</td>
<td>100°C</td>
<td>under 1 second</td>
</tr>
<tr>
<td>Cup of hot tea/coffee</td>
<td>70-95°C</td>
<td>under 1 second</td>
</tr>
<tr>
<td>Hot water from a tap</td>
<td>65-75°C</td>
<td>under 1 second</td>
</tr>
<tr>
<td>Hot water from a kettle, 5-10 minutes after boiling</td>
<td>55°C</td>
<td>10 seconds</td>
</tr>
<tr>
<td>Hot water from a tap with a temperature regulator</td>
<td>50°C</td>
<td>3-5 minutes</td>
</tr>
</tbody>
</table>
Flame

Most flame burns mainly deep partial to full thickness

Generally teenage and young adult

Unburnt skin

Lighting candles - drunk

Photos courtesy of CRGH
• Commonly irons, oven doors and exhaust pipes
Chemical

- Types
  - Alkaline
  - Acid
  - Phosphorus

Caustic soda

Photos courtesy of RNSH
Chemical

Hydrofluoric Acid

Extravasation
Electrical

- Types –
  - Low voltage – Household 240 to 415 volts
  - High voltage – 1000 to 33000 volts
  - Lightning – extremely high voltage and amperage but extremely short duration

Photos courtesy of RNSH
Fork into powerpoint

Bit Christmas lights

Trod on fallen power lines (exit point)
Arcing Injury
Lichtenberg flowers/figures

- Caused by lightening

Negative Charge

Positive Charge
Friction

- Treadmills, gravel, MBA
- Varied depths, often deep dermal thickness

Dragged under car

Photo courtesy of RNSH
Radiation

- Sunburn, IPL, laser, radiotherapy
- Predominantly superficial

Photos courtesy of RNSH
Radiotherapy
IPL/Laser

IPL (Intense Pulse Light)

Laser
Reverse Thermal/Cold

- Severe **cold** burns similar to frostbite due to the rapid drop in temperature.
- Initial wound appears
  - Hyperaemic
  - Oedematous
  - without apparent tissue necrosis
Reverse Thermal/Cold

Remove person from danger - minimise duration of exposure
Remove clothing that has been exposed to the agent.

**PLEASE NOTE:** the usual recommendations for burns first aid (20 minutes of cool running water) is contraindicated in contact LPG gas cold burns

Rapid re-warming in a bath of water between 40 and 42°C for 15-30 minutes – aims to minimise tissue loss and reduce chemical irritation.
Active motion whilst rewarming is recommended
Avoid massaging affected area during rewarming
Pain Management
• Most difficult time for patient and staff to handle.

• Techniques used need to suit the situation, patient and staff.
• Optimal outcomes include
  • rapid onset of analgesia
  • little post procedure sedation
  • able to be administered on unit with patient and staff control
  • no need to fast/NBM
  • non-toxic for repeated use.
Pain Management

- Burn pain is complex
- Many phases of burn treatment, from the acute initial injury, through treatment, wound healing and onto rehabilitation.
- Three main categories
  - Background Pain
  - Breakthrough Pain
  - Procedural Pain
Background Pain

- Pain experienced, when at rest, in burned areas and treatment areas, e.g. donor site.
- Constant and dull in nature.
- Best treated with constant serum opioid levels, e.g.
  - acute phase, continuous narcotic infusion
  - slow released oral opioid as pain levels decrease.
Breakthrough Pain

- Rapid onset of pain and often short in duration.
- Occurs whilst attending to simple activities such as walking or changing position in bed.
- Relieved by quick release oral opioids and for patients with IV access, PCA or bolus doses.
Procedural Pain

- High levels of intense pain for duration of procedure, for example wound dressing changes and physiotherapy.
- Requires higher more potent doses of opioid administration.
Pharmacological
Pharmacological

- Opioids
- Analgesics
- Anxiolytics
Routes

- Intravenous
- Oral
- Intranasal
- Inhaled

http://indianexpress.com/article/india/india-news-india/do-you-take-one-of-these-300-banned-drugs/
Non-pharmacological
Adjuncts to analgesia

- Minimal wound exposure
- Avoidance of hypothermia
- Check position / splints / bandages
- Always investigate any pain that does not match the clinical picture
• Cool / irrigate the burn wound
• Cover the burn wound
• Elevate the burnt area
• Reassurance
Play Therapy

Music Therapy

http://stlrnc.org/ResidentLife/musictherapy.html

Itch
Analgesia: Itching

- Moisturising cream + + +
- Massage
- Antihistamines
- Gabapentin
- Ondansetron
- Oatmeal bath / shower products
Wound Management
Patient Assessment

Patient History
- Physical
  - Age
  - Co-morbidities
  - Nutrition
- Psychosocial
  - Support networks
- Mobility and independence

Injury History
- Date & time
- Source of Injury
- First aid
- Initial presentation
- Treatment
- Time to definitive care
Burn Wound Assessment

- Depth
  - Capillary refill
  - Appearance
  - Sensation
- Area (% TBSA)
- Anatomical location
  - Surrounding skin integrity
- Barriers to healing eg.
  - Necrotic tissue
  - Infection
Wound Cleansing Aims

- To remove necrotic burden such as:
  - exudate
  - old dressings/creams
  - loose dead skin
- To minimise pain & cellular damage
- To reassess the burn wound
• Wash in solution eg. Chlorhexidine Gluconate 5% diluted in water (1:2000), saline, etc
• Bowl, bath or shower
Hair

**Shaving:**
- Allows accurate assessment of % TBSA
- Avoids complications eg foliculitis
- Should extend 2-5cm around burnt area
Management on Transfer

- Analgesia
- Plastic wrap < 8hrs or
- Contact Burn Unit for dressing advice >8hrs
- Clean dry sheet
- Keep warm, prevent hypothermia
- Consult and Transfer to Burn Unit
- Documentation

Don’t delay transfer, doing complicated dressings
Blisters
Blisters

- Management of blisters guided by specialist clinician or institutional preference
- Treatment dependent on mechanism
Blister Management Options

Pros
- Natural skin barrier
- Limited trauma for patient.
- Reduced dressing time

Cons
- May cause pain and discomfort
- May limit function
- Cannot assess wound beneath
- Blister fluid may detrimental to healing
- Risk of spontaneous rupture

Pros
- May reduce pain and increase function
- Natural skin barrier remains

Cons
- Devitalised tissue may pose potential infection risk
- May be difficult to assess wound beneath
- May have a large amount of exudate continually released

Pros
- Decreases infection risk from breakdown of devitalised tissue
- Allows depth assessment
- May increase function
- Improved comfort once dressed

Cons
- Requires adequate analgesia and sedation
- Creates open wound - infection risk if not correctly managed

Slide prepared by Madeleine Jacques CHW
MINOR BURN BLISTER MANAGEMENT

Blisters are formed when there is separation of the epidermal and dermal layers, often with fluid present. The management of these blisters is generally guided by specialist clinician or institutional preference. The ACI Statewide Burn Injury Service recommended management for burn blisters is ‘de-roofing’ (removal of skin and fluid), after adequate analgesia.

NB If your facility does not have capacity or resources (access to adequate analgesia and dressings) to follow this guideline, incise and drain the blister and contact the appropriate Burn Unit.

De-roofing is done to:
- remove non-viable tissue
- prevent uncontrolled rupture of blister
- avoid risk of blister infection
- relieve pain from tense blisters
- reduce restriction of movement of joints
- assess the burn wound bed

Prior to de-roofing
- Assess blister size. Burn blisters ≤5mm can be left intact.
- If patient is being transferred to a burn unit contact the receiving unit before de-roofing.
- Obtain consent from the patient or family.
- Administer appropriate analgesia and allow time to take effect prior to procedure.
- Take digital image before and after de-roofing procedure if possible.

Procedure for de-roofing blisters >5mm
- de-roof blister either with moist gauze or forceps and scissors
- dress wound appropriately with a moist, non or low-adherent dressing
- refer patient to local emergency department or burn service if your facility does not have the capacity or resources to de-roof blisters.

Important clinical considerations
- There is risk of infection or desiccation if removing blister skin when adequate facilities or resources are not available (i.e. in remote area).
- Consider leaving blister intact until patient transferred to appropriate facility.
- Skin on the palm of the hand and the sole of the foot is thicker. Consider leaving blisters intact in these areas if appropriate.
- Consider leaving small, non-tense blisters intact when there is a risk of poor patient compliance with the procedure and on-going care i.e. patients with dementia, learning difficulties, etc.

Contacts
Royal North Shore Hospital - NURSBNBurnConsult@health.nsw.gov.au
Burn Unit: (02) 9963 2711
Ambulatory Care: (02) 9963 2710
Concord Repatriation Hospital - burnconsult@health.nsw.gov.au
Burn Unit: (02) 9757 7776
Ambulatory Care: (02) 9757 7775
The Children’s Hospital at Westmead - major burns@health.nsw.gov.au
Burn Unit: (02) 9845 1114
Ambulatory Care: (02) 9845 1953
ACI Statewide Burn Injury Service resources
Blister consensus – key points

Prior to de-roofing:

- Assess blister size. Burn blisters ≤5mm can be left intact.
- **If patient is being transferred to a burn unit contact the receiving unit before de-roofing.**
- Obtain consent from the patient or family.
- Administer appropriate analgesia and allow time to take effect prior to procedure.
- Take digital image before and after de-roofing procedure if possible.
Debridement of blisters
Dressing Products
Which dressing?

- Moisturiser eg Sorbolene, DermaVeen
Which dressing?

- Silicone
- Film
- Silver
- Impregnated Gauze
- Hydrocolloid
Silicone

Photo courtesy of CRGH
Which dressing?

- Hydrocolloid
- Film
- Silicone
- Silver
- Impregnated Gauze
Hydrocolloid
Which dressing?

- Silver
- Impregnated Gauze
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Which dressing?

- Impregnated Gauze
- Silver
- Silicone
- Hydrocolloid
Impregnated Gauze
Which dressing?

- Silver
- Impregnated Gauze
- Hydrocolloid
- Apply Flamazine impregnated cloth to wound and apply bandage
Fixation
Adhesive woven tape
Tubular bandage
Cotton Glove
Specialised Fixation
Dressing Complications
Maceration
‘Pus’ look
Bleeding
Swelling - constriction
Email addresses

- For Digital Photo Review (need consent + History)
- Clinician to clinician only

- CHW
  kidsburns@chw.edu.au
- RNSH
  NSLHD-burnsconsult@health.nsw.gov.au
- CRGH
  Slhd-concordburnsunit@health.nsw.gov.au
Available on website:

- Burn Education Day lectures
- Specific dressing selection and application refer to Clinical Practice Guidelines: Burn Wound Management
- Functional and physiological management refer to Physio/ Occupational Therapy Practice Guidelines
- Burn Transfer and Model of Care Guidelines
ACI Statewide Burn Injury Service