Burn Wound Management
Mechanisms

ACI Statewide Burn Injury Service
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

Cup of Coffee

Bath

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

7 days later
## 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

Photos courtesy of CRGH

Lighting candles - drunk
Contact

- Commonly irons, oven doors and exhaust pipes
Contact

Oven door  Coiled Hotplate  Heater
Chemical

- Types
  - Alkaline
  - Acid
  - Phosphorus

Caustic soda

Photos courtesy of RNSH
Chemical

Hydrofluoric Acid

Extravasation
Electrical

- Types –
  - 1. Low voltage – Household 240 to 415 volts
  - 2. High voltage – 1000 to 33000 volts
  - 3. Lightening – 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 lightning

Negative Charge

Positive Charge
Friction

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

Dragged under car

Photo courtesy of RNSH
Radiation

- Sunburn, IPL, laser, radiotherapy
- Predominantly superficial
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
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 be detrimental to healing
- Risk of spontaneous rupture

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

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

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

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

Slide prepared by Madeleine Jacques CHW
Blister consensus
Blister consensus – key points

Rationale:

- ‘De-roofing’ (removal of skin and fluid) burn blisters
- Allows assessment of burn wound bed
- Removes non-viable tissue
- Prevents uncontrolled rupture of blister
- Avoids risk of blister infection
- Relieves pain in tense blisters
- Reduces restriction of movement of joints
Blister consensus – key points

Recommendation:

- Appropriate analgesia must be administered prior to procedure
- Burn blisters ≤5mm can be left intact
- Burn blisters >5mm should be
  - ‘de-roofed’
  - dressed appropriately with a non or low-adherent dressing
- referred to local ED/ burns service if your facility does not have the resources to ‘de-roof’ blisters
- Contact the SBIS to identify training /education needs
Blister Debridement example
Consideration should be given to:

- Small, non-tense blisters
- Infection may occur (i.e. in remote area)
- Palmar surface of the hand and the plantar aspect of the foot
- Patient compliance with the procedure and on-going care i.e. patients with dementia, learning difficulties, and toddlers
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
Washing

- Wash in solution eg. Chlorhexidine Gluconate 5% diluted in water (1:2000), or saline
- 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 Burns Unit
- Documentation

Don’t delay transfer, doing complicated dressings
Dressing Products
Which dressing?

- Moisturiser eg Sorbolene, DermaVeen
Which dressing?

- Silicone
- Film
- Silver
- Vaseline Gauze
- Hydrocolloid
Silicone

- Hydrophilic polyurethane foam with soft silicone layer
- Flexible
- Conformable
- Absorbent
- Non-stick
- Remains in situ 7 days
- Used on superficial to mid-dermal burns
Which dressing?

- Hydrocolloid
- Film
- Silicone
- Silver
- Vaseline Gauze
Hydrocolloid

- Hydrocolloid containing carboxymethylcellulose
- Provides moist wound environment
- Absorbs exudate
- Used on superficial to mid-dermal burns
- Allow 2cm margin around wound.
- Can remain intact 2-5 days if no signs infection.
Hydrocolloid
Which dressing?

- Silver
- Vaseline Gauze
- Hydrocolloid
Which dressing?

- Silver
- Vaseline
- Gauze
- Hydrocolloid
Silver

- Antimicrobial soft silicone foam dressing, containing silver.
- Absorbs exudate and provides a moist environment for wound healing.
- Mepilex Ag+ conforms to the body and can be cut to fit any shape.
- Apply with over lap of 2 cm to edges of wound and seal as with normal dressings.
Which dressing?

- Silver
- Vaseline
- Gauze
- Hydrocolloid
Silver

- Nanocrystalline silver impregnated antimicrobial barrier dressings.
- Releases silver directly to wound bed.
- Reduces risk of colonisation and acts as a barrier to bacteria whilst maintaining moist wound environment.
- Dressing is kept moist to encourage release of silver crystals into wound bed.
- Used in initial stages of burn wound.
- Left intact 3 days (Acticoat) or 7 days (Acticoat7).
Silver
Silver
Which dressing?

- Vaseline
- Gauze
- Silver
- Silicone
- Hydrocolloid
Vaseline Gauze

- Tullegras containing soft paraffin and chlorhexidine 0.5%
- Provides bacterial coverage as non-stick antiseptic gauze
- May be left intact 1-7 days (depending on situation).
- Used on burns after initial assessment, after skin grafting, and for home dressings
- Available in different sized sheets, or rolls
Vaseline Gauze
Which dressing?

- Silver
- Vaseline
- Gauze
- Hydrocolloid
Silver

- Contains silver sulphadiazine 1% and Chlorhexidine gluconate 0.2%.
- Aids in reducing infection
- Must be changed 24hrs after each application to reduce excess silver absorption.
- Available in 50g tubes or 500g pots.
Silver

- Apply Silvazine impregnated Daylee to wound and apply bandage
Fixation
Adhesive woven tape
Bandage
Tubular bandage
Cotton Glove
Specialised Fixation

- Image of a pair of black spats with a label reading "Ladies spats".
- Image of a child's head wrapped in yellow bandages.

Additional note: Specialised Fixation is crucial in managing injuries, especially in children.
Dressing Complications

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Maceration
‘Pus’ look
Skin Staining
Bleeding
Bleeding
Slippage
Slippage
Slippage
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
  - CRGH.BurnsUnit@sswahs.nsw.gov.au
Further Information

- Available on website:
  - Burn Education Day lectures - * new *
  - 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
Pain Management

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Pain Management

- Most difficult time for patient and staff to handle.

- Techniques used need to suit the situation, patient and staff.
Pain Management

- 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 or
- slow released oral opioid as pain levels decrease.
Pain Management

- **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.
Pain Management

- **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.
Pain measurement tools

What does your hospital use?

http://ergonomics.about.com/od/ergonomicbasics/ss/painscale_2.htm

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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/
Adjuncts to analgesia

- Minimal wound exposure
- Avoidance of hypothermia
- Check position / splints / bandages
- Always investigate any pain that does not match the clinical picture

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Analgesia

- Cool / irrigate the burn wound
- Cover the burn wound
- Elevate the burnt area
- Reassurance
Massage
Play Therapy


© EMSB
Music Therapy


http://stinrc.org/ResidentLife/musictherapy.html
Adult analgesia: Itching

- Moisturising cream +++
- Massage
- Antihistamines (Loratadine / Phenergan)
- Oatmeal bath / shower products
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