

# Rehabilitation in Conflict

## BURNS



## What we will cover:

- Management in Humanitarian Settings
- Common Complications
- Adapted Clinical practice

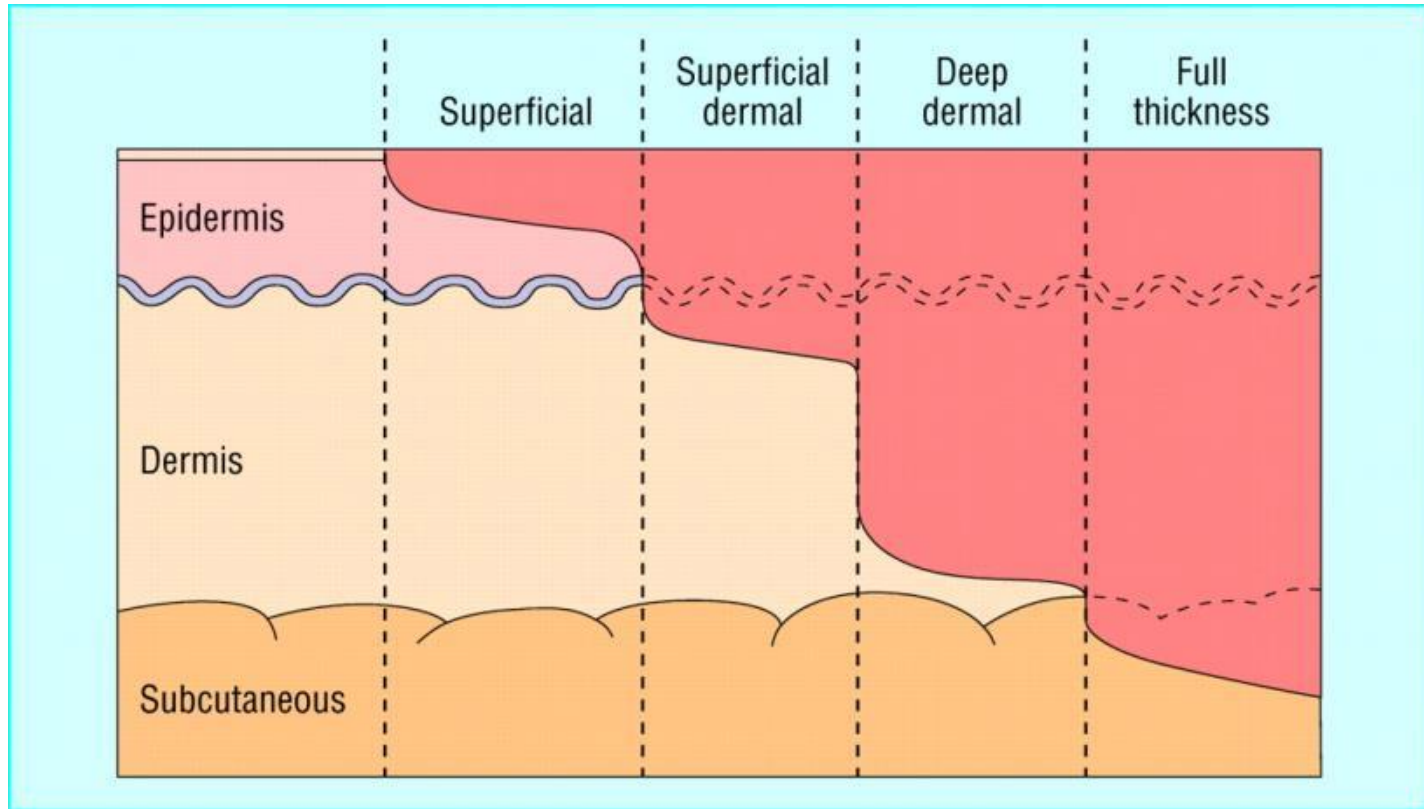
# Quick Overview

- Nearly 11 million people a year suffer burns severe enough to require medical attention
- Leading cause of disability and disfigurement
- Management in adults can take up to 2 years and even longer in children
- Rehabilitation is essential for good outcomes.
- Risks increase with disaster and displacement:
  - Electrical burns following earthquakes and cyclones
  - Fire as a disaster or caused by disaster
  - Chemical burns from industrial accidents or chemical weapons
  - Heat from blasts
  - Burn risk due to displacement – tents, adapted cooking practices etc.

# Types of burns

- Flame – open fires, most common in adults
- Scald – hot liquids, common in children
- Electrical (3-4%) - loose wiring, flooding
- Chemical (3%)

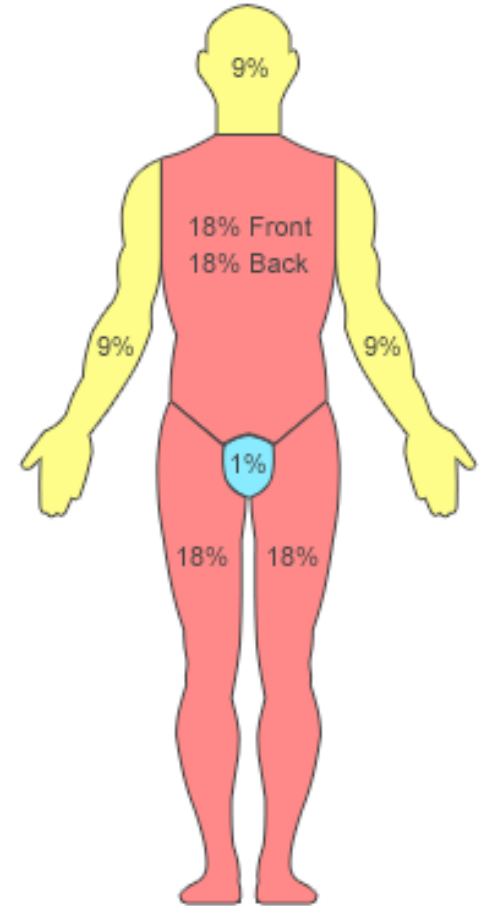
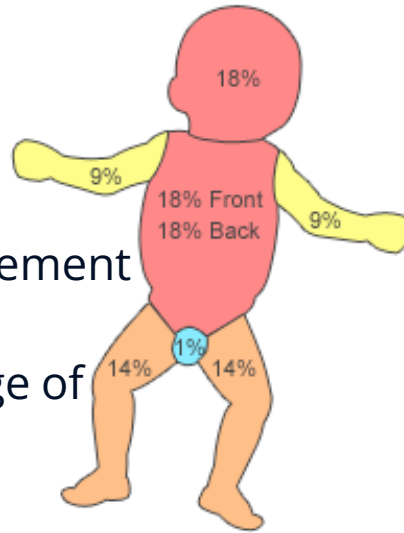
# Burn classification: dependent on depth



Depth of burn	Tissues destroyed	Appearance of burns	Sensitivity to pain	Healing time and prognosis
Superficial	Outer layer of epidermis	Erythema No blister Slight oedema Blanches with pressure	Intense pain	3 – 10 days no scarring
Partial thickness superficial	All of epidermis, upper layers of dermis. Some hair follicles and glands intact	Red Blisters Moist Oedema Blanching	Painful and hyper-sensitive	7 – 20 days can scar and pigment change
Partial thickness Deep	Epidermal and severe dermal damage Most nerve endings, hair follicles and sweat glands destroyed	Variable in colour White with red Wet or waxy dry No blisters No blanching Eschar forms	Generally insensitive to pain due to destroyed nerve endings	21 – 35 days Severe scarring Risk of contractures May need grafting
Full thickness	All skin layers down to fat or bone	White Charred Dry Inelastic	No pain	Very severe scarring Risk of contracture No skin regeneration Will need grafting Prolonged hospitalisation

# How big?

- Knowing the extent helps with management
- Total body surface area is a percentage of the body
- The larger the burn the harder it is to manage and the higher the risk of complications requiring medical and surgical intervention
- If over 20% of body then systemic affect, can be fatal due to loss of circulating blood and shock due to loss. Sepsis and multi organ failure are a risk



# Can you identify the burn?

















# First Aid

Immediate (Tell me)





- **Airway** obstruction, facial burn, inhalation injury?
- **Breathing** distress, rate, deformity, chest wall burn
- **Circulation** HR, BP, shock, fluid loss, circumferential burns
- **Disability** consciousness
- **Exposure examine** removing clothing with fragile skin, extent of burns / injury
- **Fluids** – input/output

# Acute Medical Management in the facility

- Assessment – TBSA, location, depth
- Beware inhalation injury
- Beware restricted circulation or ventilation – circumferential burns
- Beware Hypovolaemic shock

## Management:

- Cool burn with clean running water if < 3 hours
- Pain management
- Decision based on TBSA > 20% oral rehydration (IV if indicated). > 40% IV fluids.
- Scrub and clean – re-estimate TBSA and re-triage
- Excision and grafting if indicated
- Dressing – no evidence for specific types at present.

## Early Rehab:

- **Oedema control**
- **Splint and elevate hand and arm burns**
- **Maintain patient in anti-deformity position**



# Beware Inhalation Injury

- Direct thermal injury to the upper airways / lower airway
- Smoke inhalation – systemic intoxication (cyanide, carbon monoxide) – chemical injury
- Inhalation injury worsens mortality by 40%
- Pneumonia can increase mortality by 70%

## Early Medical Management:

- Sit patient up if no suspicion of other trauma injuries
- Avoid excess fluid;
- Consider early intubation and ventilation.

# Respiratory considerations

- Pulmonary oedema
- Sloughing of respiratory epithelium
- Loss of cilia
- Increase hyperactivity of airway
- Ulceration
- Loss of surfactant
- Increase mucous production
- Atelectasis
- Bacteria colonisation
- Pneumonia – 1 week post injury

# Surgical Interventions

Basic:

- Escharotomy
- Debridement

Higher level care:

- Split skin graft
- Flaps

# Escharotomy



This cut releases the pressure and allows improved circulation (if a limb) and improved ventilation (if around the chest wall).

# The next procedures are not just burns...

Debridement's, grafts and to a lesser extent flaps are amongst the most common procedures in major trauma emergencies



# Debridement Surgery

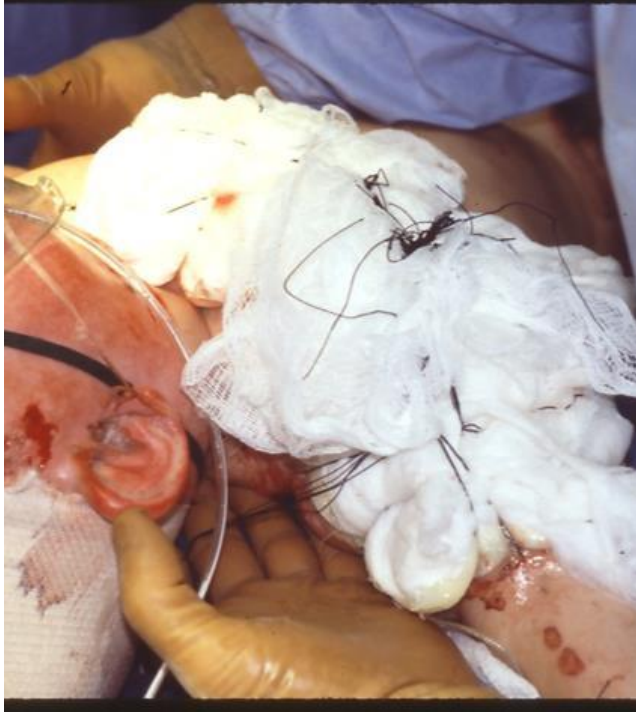
- Removal of dead tissue
- Improves survival
- Decreases length of stay
- Reduces costs
- Reduces hypertrophic scarring
- Limits duration of pain that patients must endure



# split skin graft surgery



# Securing SSG's





# SSG considerations

- Post-operatively, a SSG should be immobilized especially if the SSG crosses the joint or is near a joint.
- **There should be no movement of the grafted area for 4-5 days (shear is particularly dangerous for a graft). This is standard but should be discussed with surgeon.**
- Elastic bandages are applied to the lower limbs for support prior to mobilisation. In low resource settings it is generally advised to mobilise at day 5 **but discuss with your surgeon.**
- Change of dressing is normally at 5 days post-op. It is always useful to be present at the first change of dressing so you assess the state of the SSG and plan your treatment in discussion with the surgeon.

# Flaps

- For avascular structures
- A flap is a unit of tissue that is transferred from one site (donor) to another (recipient site) while maintaining its own blood supply
- Classified based on
  - Location (local, regional, distal)
  - Tissue – whether skin, muscle, bone,
  - Type of blood supply.

# Local Flaps



# Surgical Complications

- Infection
- Dehiscence
- Vascular insufficiency  
(mechanical tension, kinking, compression)
- Haematoma/seroma
- Failure / necrosis
- Systemic issues e.g. low BP

Monitor:

- Temp
- Turgor
- Blanch / Capillary refill
- Tissue colour

# Common Complications of Burn Injuries

(Tell me)

# Wound Management

- Is it healthy?
- Washing / cleaning
- Dressing changing frequency
- Patients environment: humanitarian context
- Wounds often highly contaminated
- Delayed closure
- Life threatening to minor wounds/lacerations
- Chronic and infected wounds



# Infection

# Warning signs of sepsis

- Feeling unwell
- Shivering / shaking
- Lethargic
- Spreading redness
- Temp
- Increase RR
- Increase PR
- Increased pain
- Dressings soiled / smell
- Loss of appetite





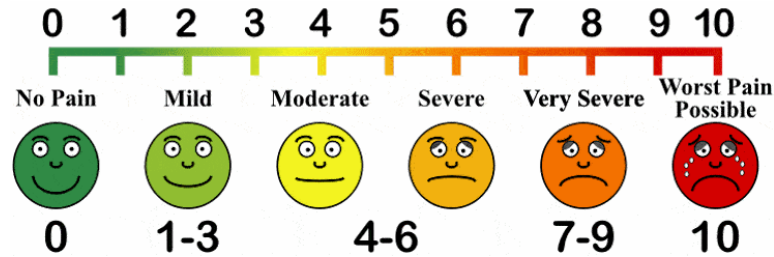
# Oedema

- Oedema – Normal response to injury
- Develops over 4-5 days peaks at 3
- Can compromise wound healing



# Pain

- Identify the underlying cause
- Pain causes:
  - Burn site
  - Oedema
  - Itching
  - Movement
  - Dressing changes
- Not just physical
- fear, worry, discomfort, distress, anger, guilt, depression
- How are you going to assess pain?
  - And on movement?



# Delayed healing

- Inadequate Nutrition
- Weight loss
- Protein (muscle) breakdown
- Poor wound healing
- Immune suppression
- ↑ Risk of infection

# Nutrition

- All burns will cause an increased metabolic rate (of 2-3 times the normal rate), which increases with the size of the burn
- Skin loss and muscle breakdown also leads to deficiencies in vitamins and minerals. Children are growing and therefore require relatively more nutrition
- Poor nutrition will significantly delay wound healing: An adult with 40% TBSA will lose 30% of his body weight in less than 21 days and will possibly die without nutritional support.
- If the patient has lost more than 10% from their pre-morbid weight then she/he is likely to develop complications

# Scarring

- The longer the burn takes to heal and the deeper it is the worse the scarring
- Wounds heal from the dermis. If this has been burnt away then normal skin cells can't regenerate, scar tissue forms in its place
- Can get migration from surrounding epithelial cells
- Wounds >3 weeks will likely scar
- wounds that take longer will develop hypertrophic scarring. Develops in 1-3 months after injury
- Scars will take 2 years to reach maturation

# Scar Characteristics

- **Colour:** vascularity and pigmentation
- **Sensory:** pain, pruritus and other
- **Function:** contraction, stiffness, thickness, adhesions
- **Form:** volume, thickness

Hypertrophic: imbalance of collagen at wound site, develop 1-3 months post injury

Keloid: dense fibrous tissue spreads outside original injury after healing



# Contractures

- **Contracture** impairment caused by replacement of skin with scar tissue of insufficient flexibility
- Rehab is trying to prevent this
- Contractures cause loss of ROM
- Secondary contracture of neighboring joints / structures
- Disability, reduced function



# Psychological Impact

- Flash backs
- Emotional trauma
- Loss of sleep
- Low mood
- Change in behavior
- Self esteem
- Body image
- Fear
- Role in family and society

# Rehabilitation

- Dressings
- Positioning
- Mobilization - active and passive movements to joints
- Stretching
- Splints
- Massage
- Strengthening / Functional activities

# Dressings Application/Changes



Why?

- Need to see wounds
- Too tight
- Too restrictive
- Strike through

Consider rehab during dressing changes in collaboration with team

# Pain Management

- Team approach
- medications available?
- Use the skills you have – communication, explain what you are going to do
- **Reassurance and encouragement**
- Distraction
- Reduce anxiety
- Use pain scales
- Build trust

# Oedema Management

## Acute

- Oedema develops over 4-5 days
- Elevate
- Mobilise – active

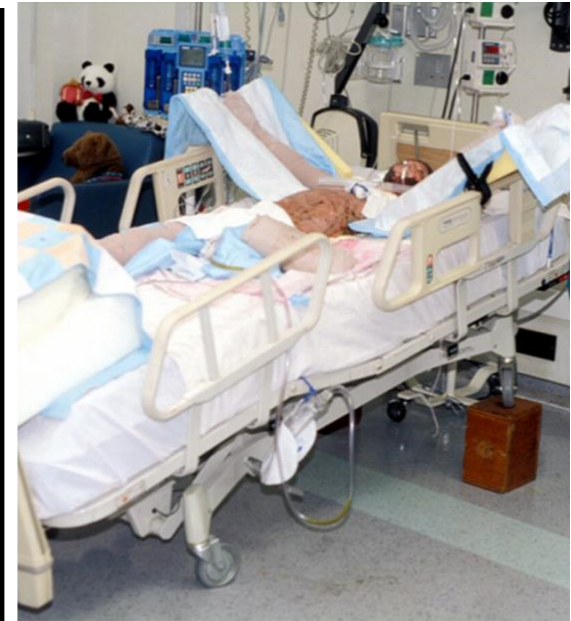
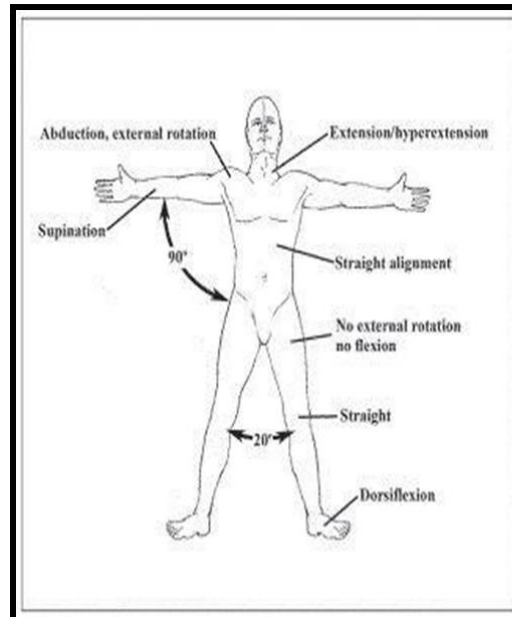
## Sub Acute

- Elevate
- Mobilise – active and passive to soft tissue
- Compress (can be 23 hours a day, with monitoring)
- Splint



# Positioning

- Helps improve ROM, Pain, Oedema
- Where is the burn and what are you trying to achieve?
- Reduce swelling
- Prevent contracture
- Function



# Stretching

- For contracture prevention, range of movement
- Low load and long in duration
- Sustain for approximately 20 mins
- Overstretch can cause tissue breakdown
- But if you don't they will loose range
- When stretching scar it will blanch - Important to go to this point

# Splinting

- For contracture prevention, pain relief, maintain function
- Protect structures
- Protection or correction of deformity
- Immobilise skin grafts
- Varying times 2 hours on / off or throughout the night and encouraging movement in the day





# Mobilisation

- CVS fitness helps with healing, for range of movement, psychological benefit
- Burn patients should be out of bed unless they are unstable
- Walking, running, playing games, exercise programmes
- *Contraindications* – exposed tendon, grafts immediately after surgery, excessive pain (manage pain first)

# Exercise

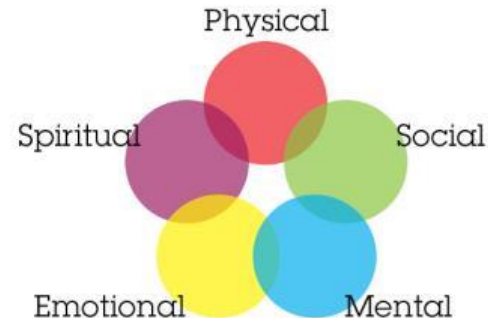
- Passive
- Active
- Active Assisted
- Functional
- Strengthening
- Balance retraining
- Endurance
- Restrictions?

# Moisturise and Massage

- Helps with pain, itching, scar formation
- **Massage** helps with pain, itching, hypersensitivity, improve movement, release adherent tissue.
- Use with positioning
- Appropriate levels of pressure, considering sensitivity, amount of friction / lubrication and healing stage
- Techniques: right angles to scar, circular, rolling
- Not too much friction as epidermis is fragile

# Psychological Impact

- Team approach
- Listen
- Understand
- Reassure how normal their response is
- Connect those who have been through it (peer support)
- Build trust through your rehab
- Educate and motivate
- Don't give up
- Involve relatives



# Expectation / Reintegration

- Think about the whole person
- Think ahead
- Manage fear – think of your approach
- Education and motivation – empower and incorporate family members
- Manage expectations
- Burn patients – support network/peer groups

**Thank you!**  
**Any questions?**



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