Multidisciplinary Burn Care & Rehabilitation
Rehabilitation: A Team Effort

- Physical Abilities
- Functional Activities
- Psychosocial Issues
- Nutritional Needs
- Communication and Swallowing Problems
Physical and Functional
Which Burns Scar?

- Epidermal/Superficial dermal: Heal in < 14 days
- No scarring: Sun care and moisturise
Which Burns Scar?

- Mid dermal depth
- Healed 14-21 days = may scar/pigmentation changes
- > 21 days will scar in children and a flag for adults
Which Burns Scar?

- Full thickness
- usually grafted
- will scar
Scar Prediction: Who is at Higher Risk?

- **Age:** ↓ age = ↑ in scar activity

- **Skin type:** ↑ skin pigment = ↑ in scar activity (e.g. Mediterranean, Asian)

- **Genetic predisposition**

- **Length of time to heal:** the longer to heal the more active the scarring process
How do scars develop?

- Initially healed burn is **pink flat soft**
- healed burn goes into state of “over drive”
- period of increased vascularity
- new tissue develops in a distorted knotty fashion e.g. fibrocytes and collagen
A Hypertrophic Scar Is:

- Red or purple
- Raised above level of surrounding skin
- Hard (firm to touch) and dry
- Has strong contractile forces
Red, Raised and Hard
Poor outcomes
Hypertrophic Scars

• Can impact on self image and appearance

• Restrict range of movement

• Limit functional independence

• Affect psychological health
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## Treatment Principles

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Compression

- Reduces vascularity - limits deposition of scar tissue
- Controls oedema
- Used continuously
  - garments
  - bandages
  - tubular stretchy bandage
Compression
Compression Garments
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Softening

Contact media  e.g. silicone gel sheeting or hydrocolloid dressing

Hydrocolloid sheeting
Silicone gel sheeting
Softening

Massage
• Break collagen bundles
• Massage with moisturiser
• Firm pressure
• Patient/carer participation
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Moisturising

- Deep burns can lose sebaceous and sweat glands
- Moisture replaced with water based moisturiser
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Stretching

- Position of comfort is position of contracture

- Need to counter the contractile forces of active scar tissue
Stretching

- Positioning
- Splints
- Exercises
Body Positioning
Stretching - Positioning
Splinting

• Immobilise (post grafting)
• Stretch
• Position
• Oedema management
• Prevent deformity
• Correct deformity (serial, dynamic)
Stretching with Splints
Stretching – Passive Exercise

• Stretching during dressing changes

• Continue daily stretching months after burn has healed
Stretching – Active Exercise
Course of Treatment

- Continues until optimal functional ROM achieved
- Scar management continues until pale soft flat
- Continues with reconstructive surgery
- Children reviewed until fully grown

BURNED SKIN AND ACTIVE SCARS CONTRACT OVER HOURS RATHER THAN OVER DAYS OR WEEKS
Mature scars:

- Pale, Soft, Flat
Good Result: Mature Scars

• Full Range of Movement
Immature scar under good control
Instead of
Problem Areas

- Flexor surfaces of all joints
- Hands (many moving parts)
- Axillas
- Mouths/faces
- Necks
- Feet/toes
- Elbows and knees
Hands

• Most common body part to be burned

• Small area big impact – highly functional

• Can be isolated burn or part of a larger burn

• Most moving parts in smallest area
Hand Burns
Position of comfort/deformity
Without therapy
Correct hand positioning

• For dorsal or circumferential burns
Combination of Exercises and Splinting

Children:

• Splinting more intensive.

• Exercises only for the hours that the splint can be left off and range maintained.

• Joint stiffness not as much of a concern
Adults:

• Splint overnight (functional position)
• Exercise++ by day
• Functional activity encouraged
Desired Outcome
Return to Usual Activities and Roles

• Common **functional issues** include:
  • Self-care
  • Home duties
  • Community access
  • Return to work/school
  • Sexual needs
  • Leisure activities
Early Intervention – Activities of Daily Living
Early Intervention – Mobility
Maximum Function
Complications

Common problems:
- Deconditioning
- Loss of hand function
- Loss of AROM
- Altered sensation
- Hypersensitivity to sun
- Folliculitis

Severe burn injuries can result in:
- Impaired thermoregulation
- Loss of digits/limbs
- Heterotrophic ossification
- Intensive care neuropathy
- Decreased function
- Chronic skin breakdown
Psychosocial
The impact of a severe burn can affect the patient and family’s ability to reintegrate back into their pre burn life
Adjustment to a severe burn injury can be a challenging and demanding journey for **patients, families and staff**. The impact can be enormous.

As well as recovering physically, patients must work towards a psychosocial recovery by confronting a complex range of emotional responses to their injury.
Biopsychosocial Understanding

**BIO**
- Wound closure
- Scar management
- Pain
- Itch
- Mobility
- Range
- Muscle/body mass
- Infection control
- Comorbidities

**PSYCH**
- Trauma responses
- Mood
- Pain
- Itch
- Sleep
- Coping
- Behaviour
- Body image
- MH vulnerability

**SOCIAL**
- Supports
- Connections
- Background
- Resources
- Housing
- Education
- Health Literacy
- Integration
- Other stressors
Psycho-Social Challenges

Acute:
Surviving the initial injury
Recovering from trauma
Repairing self as well as the body

Rehabilitation:
A new life, body & sometimes new self
Adjusting and new coping
Changed body image
Reintegration and impact on relationships
Psycho-Social Recovery

Physical Recovery

Psychosocial Recovery

NSW Government

Agency for Clinical Innovation
Risk factors resulting in loss of independence after burn injury:

- Elderly
- Pre-existing mental health problems
- Other co-morbidities e.g. DM, IHD, DD, D&A

Protective factors resulting in better outcomes:

- Social and family support,
- Coping,
- Post traumatic growth and resilience,
- Meaning making,
- Community belonging
Psycho-Social Considerations

- May need supported care to return home / work / school
- May need increased care or services
- May need longer term therapeutic interventions to facilitate reintegration into life after burn
Psycho-Social Adjustment

• Changed body image
• Developmental issues
• Relationship issues
• Reintegration
Psycho-Social Adjustment

- Psychological trauma associated with the burn and acute treatment e.g. post traumatic stress disorder (PTSD)

- Compliance with physical treatment requirements
Nutrition
A major burn leads to a hypermetabolic state

- Lasts 6 - 12 months following wound healing
- Major burn up to double normal requirements
- Use muscle mass NOT fat stores for energy

Figure 15-1 Percent resting metabolic rate. (From Kinney JM et al.: Nutrition and metabolism in patient care, Philadelphia, 1988, WB Saunders.)
Nutrition

- Burns >10% TBSA & smaller burns to face, hands, or inhalation injury:
  - High energy, high protein diet
  - Oral nutrition supplements

- Consider *enteral* feeds
  - Adults >20% TBSA
  - Children >15% TBSA
Inadequate nutrition can lead to:
- Muscle wasting
- Delayed wound healing
- Immune compromise
- Increased LOS

Requirements reduce over time
- Aim to avoid inappropriate weight gain in recovery
A large burn injury results in an increased metabolic rate which is part of the stress response to burns.

Adequate nutrition is essential to optimise wound healing.

Nutrition support should be individualised, monitored and adjusted, as needed, during recovery from a burns injury.
Communication & Swallowing
Dysphagia = disorder of swallowing
(affects oral, pharyngeal and/or oesophageal phase swallowing)

Dysphonia = disorder of voice
(may affect person’s ability to communicate effectively)

Other communication impairments:
- loss of voice due to intubation / tracheostomy
- loss of facial expression due to scar tissue and contractures (affects emotive language)
- psychological stress may affect voice, fluency or language development
Incidence of dysphagia:
- post thermal burn injury in adults = 11.18% (Rumbach et al 2011)
- post burn injury age >75 years = 46.97% (Clayton et al 2018)
- post inhalation burn injury = 89.47% (Clayton et al 2019)

Incidence of dysphonia:
- post thermal burn injury in adults = UNKNOWN
- post inhalation burn injury = 100% in acute period (Clayton et al 2019), 47.37% at 6 months post injury (Clayton et al 2019)
Dysphagia & Dysphonia

Causes:
Often multifactorial with sensory and motor components:
- Direct impact of burn of oropharyngeal and laryngeal tissue
- Acute de-conditioning and muscle atrophy from critical care

Identified & validated risk factors for dysphagia & dysphonia:
- Head & neck burn injury
- Inhalation injury
- Intubation & mechanical ventilation
- Tracheostomy
- >18% TBSA burn
- Concomitant neurological injury
- Advanced age (>75 years)
- Significant comorbidities
Dysphagia & Dysphonia

TREATMENT

Dysphagia:
- Use of clinical and instrumental assessment
- Use of compensatory and therapeutic strategies
- Focus on pharyngeal strengthening

Dysphonia:
- Flexible endoscopy early to assess and guide management
- Prophylactic treatment to prevent laryngeal contractures and maladaptive voicing behaviours

PROGNOSIS FOR RECOVERY
- Dysphagia: very good, literature reports up to 90% fully recover
- Dysphonia: long term disorders are not uncommon
Please Keep Communication Open

Contact the Burn Unit

- The Children’s Hospital at Westmead
  9845 1114
- Concord Repatriation General Hospital
  9767 7776
- Royal North Shore Hospital
  9463 2112
- ACI Statewide Burn Injury Service
  9463 2105
ACI Statewide Burn Injury Service