



Burn Care Basics

Risk factors

Risk factors which increase the likelihood of a person suffering a burn include:⁴

- Young children: these injuries are often caused by spilling scalding drinks or from touching oven hobs or irons.
- Elderly people
- Occupation with increased exposure to fire
- Underlying medical conditions: epilepsy, peripheral neuropathy, cerebral palsy, or cognitive disabilities
- Smoking

Assessing burn severity

During the 'exposure' section of the ABCDE assessment, the severity of the burns should be assessed.

This involves estimating the percentage of the total body surface area injured (%TBSA) and the depths of each of the burns.

Remember to expose in sections to keep the patient as warm as possible.

Assessing %TBSA

Accurate estimation of the percentage of the body burnt is important to allow appropriate fluid resuscitation. The morbidity and mortality of the injury are also closely related to the surface area injured.

‘Palmar surface’ method

The ‘Palmar surface’ method is useful to estimate the size of smaller burns or to estimate the size of unburnt surface area in patients with very large burn injuries.

The surface area of the patient’s entire hand equates to approximately 0.8% of the patient’s total body surface area and can be used to estimate burn coverage.

The important thing to remember is that you need to use the patient’s hand size to estimate the percentage coverage and not your hand.

Lund and Browder chart

The Lund and Browder chart is the most accurate method as it considers different body shapes when calculating the surface area affected. This means that it is also suitable for use in paediatric patients.

The paediatric chart considers how growth affects the relative percentages of the body’s surface area. This produces a chart where different areas of the body have different percentages of total body surface area depending on the patient’s age.

Assessing depth

After administering adequate fluid resuscitation (the depth of the burn does not guide the initial resuscitation volume), the depth of the burns should be assessed to guide further treatment.

The British Burn Association has produced a new classification system:

Superficial: (1st degree)

- Only epidermis damaged
- Appearance: Dry & erythematous
- Blanches: Yes
- Bleeding on pinprick and CRT: Brisk bleeding and capillary refill
- Painful
- Prognosis: Heals in 5-10 days without scarring

Superficial Partial (2nd degree)

- Epidermis & upper dermis damaged
- Appearance: Wet, blistered & erythematous
- Blanches: Yes
- Brisk bleeding and capillary refill
- Painful
- Heals in <3 weeks without scarring

Deep Partial (2nd degree)

- Epidermis, upper & lower dermis damaged
- Dry, yellow, or white
- No blanches
- Delayed bleeding, sluggish or absent capillary refill
- Decreased sensation
- Heals in 3-8 weeks with scarring if >3 weeks to heal

Full Thickness (3rd degree)

- All skin layers to subcutaneous tissues damaged
- Dry, leathery or waxy white
- No blanches
- No bleeding, absent capillary refill
- No sensation
- Heals in >8 weeks with scarring

Wound management

Initial wound management includes:

- -I'd Remove loose clothing and jewellery apart from anything that is adhered to the wound.-
- -I'd Cool the wounds with cool tap water for 20 minutes if the wound occurred 3 hours ago or less. Do not use ice packs or other extremely cold products.-
- -I would clean the wound with saline.-
- -I'd Cover the wound with clingfilm loosely.-

Fluid resuscitation

In the first 8 to 12 hours after a burn, fluid rapidly shifts from the intravascular to interstitial fluid compartments, meaning that hypovolaemia can quickly occur if fluid resuscitation is inadequate. Hypovolaemia may cause reduced organ perfusion and tissue ischaemia.

Correct any clinical hypovolaemic shock using the Parkland formula.

Parkland formula in adults

$2-4\text{ml} \times \text{Body Weight (kg)} \times \text{Total Body Surface Area Affected (TBSA) (\%)}$

= Initial crystalloid fluid requirement for the first 24 hours

Only include partial (2nd degree) and full thickness (3rd degree) burns in the TBSA calculation.

Fluid deficits should be corrected with Hartmann's solution (crystalloid fluids):

Give the first 50% of the total calculated volume over the first 8 hours since the time of the burn (not the time of hospital arrival or assessment).

Give the remaining 50% of the volume over the following 16 hours.

Titrate fluid requirements by closely monitoring and maintaining urine output above > 0.5ml/kg/hour in adults and around 1ml/kg/hr in children to ensure adequate end-organ perfusion.

Analgesia

Adequate pain relief should be given early as burn injuries can be extremely painful.

This should take the form of cooling methods like running the wound under cold water and covering it with clingfilm, alongside pharmacological analgesia such as paracetamol, NSAIDs, opioids, and/or ketamine as required.

Referring to specialist burn services

The British Burn Association states that a patient should be referred to specialist burns services when any of the following circumstances are present:

- All burns $\geq 2\%$ TBSA in children or $\geq 3\%$ TBSA in adults
- All deep partial or full-thickness burns
- All circumferential burns
- Any chemical, electrical or friction burns or cold injuries
- Any burn not healed in two weeks
- Any burn with suspicion of non-accidental injury
- Burns over the perineum, face, hands, feet, genitals, or major joints
- Pregnant patients or those with severe comorbidities

Reconstruction

Superficial and superficial partial-thickness burns usually heal naturally within three weeks.

However, deep partial and full-thickness burns often require early excision of the necrotic tissue followed by a skin graft to aid healing and prevent hypertrophic scar tissue from forming.

Wound debridement

Excision of necrotic tissue can be completed by the following methods:

Tangential excision: layers of necrotic tissue are progressively removed until the tissue becomes porcelain white, has many small bleeding points and is firm to the touch.

Fascial excision: in full-thickness burns, all the skin and subcutaneous tissue are removed to the level of the fascia.

Amputation: this may be used in unsalvageable limbs, very deep burns, or electrocutions.

How to dress a burn

Wound dressing:

- using topical medication or a wound membrane, should provide 4 benefits, including:
 - (1) prevention of wound desiccation,
 - (2) control of pain,
 - (3) reduction of wound colonisation and infection, and
 - (4) prevention of added trauma to the wound.
- Most topical dressings for outpatient use have a viscous carrier that prevents wound desiccation and a broader antibacterial spectrum that reduces wound colonisation.
- The addition of a gauze wrap minimises soiling of both clothing and unburned skin and protects the wound from the external environment. A large number of excellent agents are available.
- Superficial facial burns are commonly treated with a clear, viscous antibacterial ointment.
- Antibiotics may be needed to treat infection of the wound.
- A referral to the plastic surgeons may be required too.

Credits to Nurse Veronica