Emergency management of the patient with severe burns in the emergency unit

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Abstract
Burns are one of the common causes of injury with which patients present to emergency units. Much of the damage caused by burns can be prevented or reversed with appropriate emergency management in the emergency unit.

During the emergency phase, treatment should be directed towards three focus areas:
- Initial assessment and resuscitation (primary and secondary survey)
- Fluid resuscitation
- Wound care.

In Africa, generally, burn patients die of two causes:
- Early deaths, as a result of burn shock.
- Late deaths, as a result of sepsis and multiple organ failure.

Severe burns require intensive monitoring during the resuscitation and initial treatment phase.

When burn patients are managed with a systematic approach and care is provided by trained medical staff, the patient outcome improves and medical costs are reduced. Proper evaluation and management that start as early as possible post the burn event, greatly assist in minimising suffering and optimising the outcome for the patient.

Introduction
Burns have significant short- and long-term consequences for patients and their families, and are one of the most serious injuries to mankind. Although the outcome for burn patients has improved dramatically over the past years, burns still cause substantial morbidity and mortality.\(^1\)

Adequate and effective emergency management of the burn patient during the first few hours post burn can prevent the burn wound from becoming more deeply burnt, minimise possible bacterial infection, lessen pain, facilitate faster healing and rehabilitation and long-term functionality, as well as improve the cosmetic appearance of the area that was burnt.

Minor burns will heal most of the time without further treatment. Severe burns (major burns) can be defined as deep dermal to full-thickness burns that cover an area more than 5-8 cm, or are located on the hands, feet, face, groin, buttocks or a major joint.\(^2\)

The article will focus on educating the nurse in the effective emergency management of the burn patient, irrespective of the depth of the burn or percentage of total body surface area burnt, and can be used in the pre-hospital phase, primary healthcare area, e.g. clinic environment or emergency centre.

Nurses play a pivotal role in the overall management of the burn patient. They must be well versed in the different available protocols that can be used during the management of the burn patient. Management involves medical care and the psychological support of the patient and family. Optimal care of the burn patient requires a multi-disciplinary team approach. The burn nurse is at the core of this team. He or she is the coordinator of all patient care activities. During all the phases of management of the burn patient, the nursing assessment should focus on early detection or prevention of complications that are associated with minor to major burns. A list of the most important potential nursing diagnoses for burn patients in the resuscitative and acute phase are listed in Table I.\(^3\)
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Burn epidemiology and statistics

The American Burn Association reports that 500 000 patients per year seek medical treatment for burn injuries in the USA, and the mortality is 4 000 per year or 0.8% of those patients seeking medical treatment. The Fire Protection Association of southern Africa reported a total fire loss for 1999 in South Africa of R2 356 853 000. This figure equates to approximately R4 million per day.

Fire-related deaths account for 300 000 deaths globally per year. Most deaths are caused by scalds, and electrical and chemical burns. Ninety-five per cent of burns occur in low- and middle-income countries. Fire-related burn mortalities in low- to high-income WHO regions are listed in Table II.

Initial management of the patient who is severely burnt

The management of the burn wound should be initiated during the performance of the primary and secondary surveys. The burn wound should be cooled, while simultaneous evaluation and stabilisation of the patient are performed.

Table I: Nursing diagnoses of the burn patient

<table>
<thead>
<tr>
<th>Problem statement</th>
<th>Aetiology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ineffective airway clearance</td>
<td>Tracheal oedema due to inhalation injury</td>
</tr>
<tr>
<td>Impaired gas exchange</td>
<td>Interstitial pulmonary oedema</td>
</tr>
<tr>
<td>Fluid volume deficit</td>
<td>Fluid shifts, diuresis or evaporated water loss</td>
</tr>
<tr>
<td>Altered tissue perfusion</td>
<td>Impaired extremity vascular perfusion with circumscribed burns</td>
</tr>
</tbody>
</table>

Table II: Fire-related burn mortality rates (per 100 000 population) in World Health Organization regions, 2000

<table>
<thead>
<tr>
<th>Country</th>
<th>Low-and middle-income countries</th>
<th>High-income countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa</td>
<td>5.5</td>
<td>-</td>
</tr>
<tr>
<td>Eastern Mediterranean</td>
<td>4.8</td>
<td>1.5</td>
</tr>
<tr>
<td>Europe</td>
<td>4.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Western Pacific</td>
<td>2.0</td>
<td>1.5</td>
</tr>
<tr>
<td>Americas</td>
<td>1.17</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Figure 1 indicates the number and types of burns treated in 2008 by the Red Cross Children’s Hospitals in Cape Town.

In 2008, the National Injury Mortality Surveillance System of South Africa reported the following:

- **Non-transport injury deaths**: Burns (19%), followed by drowning (14.4%), were the leading causes of deaths due to unintentional injuries.
- Almost 40% of these deaths occurred in patients aged 15-44 years.
- There were two unintentional male deaths from injury for every female death.
- Burn injuries (1 451 deaths) are listed as number 10 on the Top 10 external deaths list, compared to sharp force injuries which are listed as number 1 (4 230 deaths).

The impact of fire-related mortalities in Africa, compared to other continents, can clearly be seen in Figure 1. The financial implications of the treatment and deaths of these patients need be recognised.

The leading cause of non-transport-related deaths was burns, as indicated in Figure 2.

Initial management of the patient who is severely burnt

The management of the burn wound should be initiated during the performance of the primary and secondary surveys. The burn wound should be cooled, while simultaneous evaluation and stabilisation of the patient are performed.

**Primary survey**

*Cool down the area that was burnt*

The area that was burnt should be cooled down with cold running water for a minimum period of 20 minutes. The recommended temperature should be 15°C. The cooling
down of the area that was burnt is of value for up to three hours after the burn has occurred.

**Airway and breathing with simultaneous cervical spine control**

All clothing, and especially jewellery, that covers the area that was burnt should be removed, while simultaneously ensuring the adequacy of the airway. The airway is an area of critical importance in the burn patient. Be aware of rapid airway compromise due to possible inhalation injuries. The patient should be intubated to support breathing before complications arise, even if there is just a suspicion of possible inhalation injury. The application of supplementary oxygen is critical to any burn patient, irrespective if inhalation injuries are suspected or not.

Cervical spine control should be carried out in all burn patients with associated trauma, while managing airway and breathing.

**Circulation**

Vascular access should be obtained, and preferably using two large-bore, high-flow intravenous lines. Any controllable bleeding should be stopped.

**Assessment**

Neurological assessment, placement of monitoring devices, and laboratory and radiological studies should follow.

**Secondary survey**

Burn patients should undergo a burns-specific secondary survey. During the head-to-toe examination, specific focus should be placed on the mechanism of injury, and a detailed history and assessment of the burn wound recorded. The head-to-toe assessment should only commence after life-threatening conditions have been excluded or treated.

**Determining the depth of the burn**

Burns are mainly classified as superficial or deep, depending on the depth of tissue damage. All burns can be a mixture of different depth areas (Table III).

**Determining the total body surface area burnt**

The rule of nines (Table IV) is used to estimate the total body surface area burnt. The body is divided into

<table>
<thead>
<tr>
<th>Determining burn depth</th>
<th>Colour</th>
<th>Blisters</th>
<th>Capillary refill</th>
<th>Sensation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Superficial burns</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Epidermal (includes only the dermis)</td>
<td>Red</td>
<td>No</td>
<td>Present</td>
<td>Present</td>
</tr>
<tr>
<td>Superficial dermal (the epidermis and the superficial part of the dermis)</td>
<td>Pale pink</td>
<td>Small</td>
<td>Present</td>
<td>Painful</td>
</tr>
<tr>
<td><strong>Deep burns</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deep dermal (destroy the dermal vascular plexus and the dermal nerve endings)</td>
<td>Blotchy red</td>
<td>+/-</td>
<td>Absent</td>
<td>Absent</td>
</tr>
<tr>
<td>Full-thickness burns (destroy the epidermis and the dermis)</td>
<td>White</td>
<td>No</td>
<td>Absent</td>
<td>Absent</td>
</tr>
</tbody>
</table>
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Morbidity and mortality increase as the surface area that was burnt increases in percentage of burns. It also rises with increasing age, as even small burns can be fatal to the elderly patient.5

**Fluid resuscitation**

Burn patients demonstrate a graded capillary leak, which increases with the size of the area that was burnt and following a delay in the initial resuscitation. A crystalloid solution, generally Ringer’s lactate, should be used for the first 24 hours. Children’s gluconeogenetic capacity is immature, resulting in the threat of hypoglycaemia. 5% dextrose solution should be added to the maintenance fluid for children.1

Two large-bore, peripheral intravenous lines should be inserted, preferably through tissue that was not burnt. The Parkland formula should be used to calculate the amount of resuscitation fluid that the patient should receive (Table VI).

Half (50%) of the calculated resuscitation fluid has to be administered in the first eight hours. The remainder must be given over the next 16 hours. It is important to note that fluid resuscitation should be calculated from the time of injury, and not from the time that the patient arrived at the emergency unit.9

Maintenance fluid should be calculated to be administered over a 24-hour period. Blood should be administered if haemorrhage occurs from other injuries.

Monitoring urine output is the most reliable method of monitoring fluid resuscitation, namely 0.5 ml/kg/hour (an average of 30-50 ml/hour) for an adult, and 1 ml/kg/hour for a child (< 30 kg).9

**Electrical burns**9

Electrical burns are divided into three main groups.

**Low-voltage burns**

Low-voltage burns result from any electrical supply below 1 000 volts of alternating current. This includes standard single-phase household electrical supplies. The common car battery can cause significant burns when a short circuit is generated by items such as metallic watch straps and wedding rings.

Local wounds and cardiac arrest, but no deep tissue damage, may be caused. The alternating household current can cause muscle spasm and tetany, and prevent the victim from releasing the electrical source.

**High-voltage burns**

High-voltage burns result from any electrical supply that is

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**Table IV:** Rule of nines percentages per body part for adults and children7

<table>
<thead>
<tr>
<th>Body area</th>
<th>Adult</th>
<th>Child</th>
</tr>
</thead>
<tbody>
<tr>
<td>Head</td>
<td>9%</td>
<td>18%</td>
</tr>
<tr>
<td>Chest and abdomen</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>Back</td>
<td>18%</td>
<td>18%</td>
</tr>
<tr>
<td>Right arm (circumferential)</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Left arm (circumferential)</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Perineum</td>
<td>1%</td>
<td>-</td>
</tr>
<tr>
<td>Right leg (circumferential)</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>Left leg (circumferential)</td>
<td>18%</td>
<td>14%</td>
</tr>
</tbody>
</table>

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**Table V:** Changes in the rules of nine for children after 12 months of age8

<table>
<thead>
<tr>
<th>Age</th>
<th>Percentage of head</th>
<th>Percentage of each leg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–12 months</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>1-2 years</td>
<td>17%</td>
<td>14.5%</td>
</tr>
<tr>
<td>2-3 years</td>
<td>16%</td>
<td>15%</td>
</tr>
</tbody>
</table>

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**Table VI:** Fluid calculation9

<table>
<thead>
<tr>
<th>Resuscitation fluid calculations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>3-4ml Ringer’s lactate/modified Ringer’s solution/kg body weight/% that is burnt</td>
</tr>
<tr>
<td>Children</td>
<td>3.5ml Ringer’s lactate/modified Ringer’s solution/kg body weight/% that is burnt plus maintenance fluid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Maintenance fluid calculations</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>5% glucose in half normal saline 100 ml/kg up to 10 kg, plus 50 ml/kg from 10-20 kg, plus 20ml/kg for each kg over 20 kg</td>
</tr>
</tbody>
</table>

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anatomical regions that represent 9% or multiples of 9% of the total body surface. The outstretched palm and fingers (of the patient) that approximate to 1% of the body surface area can be used for small burnt areas.

The rule of nine might not be as accurate in children due to their different body surface area proportions, compared to those of an adult. Children have proportionately smaller hips and legs and larger shoulders and heads. For this reason, the paediatric rules of nines should be used.7

For every year of a child’s life beyond one year old, the head decreases in relative size by approximately 1% and each leg gains 0.5% in comparison with the total body surface area. A practical example of this is provided in Table V.

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above 1 000 volts. They are most commonly encountered in high-tension transmission cables, and power stations and substations. The current criminal practice of copper theft is resulting in a high number of patients being treated for high-voltage burns in South African emergency departments.

High voltage can cause two types of injuries, flash burns and current transmission burns.

A flash burn refers to a cutaneous burn without deep tissue damage that results from a high-tension discharge or “flashover”, in which the current does not pass through the victim. The arc can ignite clothing and cause deep thermal burns.

Current transmission results in cutaneous and deep-tissue damage. Swelling within the limbs, as a result of the deep muscle damage, may produce a situation that is similar to “crush syndrome” in which fasciotomy may be required.

**Lightning burns**

Lightning burns result from an extremely high-voltage, high-amperage, DC electrical discharge of ultra-short duration.

South Africa has one of the highest lightning ground strikes densities in the world. The South African Weather Service has reported the following figures (Figure 3).

A direct strike causes a discharge to be transmitted directly through the victim’s body and causes high mortality. When lightning strikes an object of high resistance, such as a tree, the current is deflected through the victim on its way to the ground as a side flash or a splash. The current flows over the surface of the victim, causing superficial or partial-thickness burns. Lightning can be responsible for unusual skin damage with an arborescent or splashed-on appearance known as Lichtenberg flowers.

The initial rescue of the victim of an electrical accident may place the rescuer at risk. The rescuer needs to ensure that all power sources close to the victim are switched off. Once clear of the power source, the primary survey should begin, as with the management of any other burns.

**Additional management of injuries caused by electrical burns**

The fluid resuscitation requirement for electrical burns is likely to be greater in volume than that needed to treat a cutaneous burn. Concealed muscle damage in the limbs will be responsible for fluid loss which is not accounted for by the standard formula. Haemochromogenuria, the abnormal presence of haemoglobin pigment from erythrocytes or muscle in the urine, must be anticipated. A urinary catheter should be inserted to detect the earliest sign of urine discoloration and to monitor urine output. If urine discoloration appears, the infusion rate should be increased to maintain a urine output of 75-100 ml/hour.

A 12-lead electrocardiogram should be obtained for all patients who are admitted with an electrical burn. Patients should be monitored for a minimum of 24 hours post the electrical burn for the development of any cardiac rhythm abnormalities. Preferably, the patient should be admitted to an intensive care or high-care unit for close monitoring.

Hourly assessments for peripheral circulation should be made. Attention should be paid to developments pertaining to pain, changes in skin colour, oedema, capillary refill, peripheral pulses and skin sensations.

**Chemical burns**

Many products that are used in industry, agriculture and military science, as well as at home, are capable of producing chemical burns. Any exposed part of the body that comes into contact with noxious materials can suffer from a chemical burn, but mostly the hands and upper limbs are affected.

Table VII provides an explanation of the classification of chemicals, and a brief discussion of the required specific treatment.

The principal difference between thermal and chemical burns is the length of time during which tissue destruction continues since the chemical agent causes progressive...
damage until it is inactivated by a neutralising agent or by dilution with water.

Healthcare workers must be aware of the importance of protecting themselves from the contaminant by wearing personal protective equipment. Constant water flow is the most important treatment for most chemical burns. It should be started within 10 minutes of contact for the best effect.

**Burn wound management**

Tissue that was burnt involves direct coagulation and microvascular reactions in the surrounding dermis that may result in extension of the injury. Large burn injuries result in a systemic response that is caused by a loss of the skin barrier, the release of vasoactive mediators from the wound and subsequent infection.7

**Initial nursing management**

The burns should be drenched thoroughly with running water to prevent further damage. All burnt clothing should be removed.

If the area that was burnt is limited, immerse the site in water for at least 20 minutes to reduce pain, oedema and tissue damage.

If the area that was burnt is large, apply a clean dressing after it has been cooled down with water to prevent systemic heat loss and hypothermia, especially in children and the elderly.11

<table>
<thead>
<tr>
<th>Type</th>
<th>Examples</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkalis</td>
<td>Sodium, potassium, ammonium, lithium and calcium hydroxide (washing powders, drain cleaners and paint removers)</td>
<td>Most common around the house. Long-term damage to tissue as they penetrate deeper. Irrigate for longer than acid (a minimum of one hour with running water).</td>
</tr>
<tr>
<td>Acids</td>
<td></td>
<td>Very painful, and varies from erythema to black eschar.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Irrigate with copious amounts of running water for a minimum of 15 minutes.</td>
</tr>
<tr>
<td>Hydrofluoric acid</td>
<td></td>
<td>Topical calcium gluconate gel.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local injection with 10% calcium gluconate (0.1–0.2 ml through 30-G needle into the burn wound).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Intra-arterial infusion of calcium gluconate.</td>
</tr>
<tr>
<td>Petrol (gasoline)</td>
<td></td>
<td>Two types: Burns due to ignition have higher fluid requirements, and the burns tend to be larger. Burns due to immersion in, or extensive skin contact with, gasoline. Wash with running water for a minimum of 15 minutes.</td>
</tr>
<tr>
<td>Tar</td>
<td>Contains complex chemicals including phenols and hydrocarbons, thus some toxicity.</td>
<td>Cooling. Remove with toluene.</td>
</tr>
</tbody>
</table>

The risk of hypothermia should be prevented by warming the environment, keeping the wounds covered, and warming the patient with sterile sheets, while administering warm fluids.

Administer tetanus toxoid to all burn patients.

After cooling with water, burns should be covered with an applicable dressing, kitchen cling wrapping, or other recommended dressing, as prescribed by the protocol of the burns unit.

Limbs should not be constricted, or circulation compromised with dressings that are too tight. Dressings should be checked regularly to exclude compression.9

Blisters are protective. Only puncture or aspirate large blisters (>2% BSA), and those that obstruct bandaging and occur over flexures that inhibit movement.9

**Escharotomy**

Rigid eschar may interfere with body functions. Escharotomy may be required as soon as possible when the chest area is extensively burnt (rigidity of the chest wall decreases, which may lead to reduced ventilation), and when limbs are burnt circumferentially. This is because the increase in pressure, due to the accumulation of oedema under the rigid skin that was burnt, might interfere with the circulation and lead to tissue death in the distal part of the affected extremity.7

The guideline principle is to assist the healthcare worker to ensure that the patient can be transferred in an optimal condition to a higher level of care. The burn should be
frequently reassessed to obtain a more accurate diagnosis of the extent and depth of the burn, should transfer be delayed. It is essential to consult with the receiving burn unit regarding its protocol on burn wound care, to ensure that the correct required wound care is started as soon as possible to facilitate optimum wound healing and rehabilitation.

Psychosocial support of the burn patient

Burn patients experience traumatic injuries to the body which present extraordinary challenges to psychosocial resilience. Ideally, psychiatrists, psychologists or trauma counsellors should be involved in the treatment of the patient with burns. Early debriefing should take place as soon as possible, and should continue throughout the rehabilitation phase.

Burn patients originate from diverse cultures, and healthcare providers must be sensitive to cultural issues that may affect patients and families in the recovery process. Coping with a multitude of unfamiliar experiences results in extraordinary stress that can inhibit a patient’s or family’s ability to participate in the recovery process. Cultural traditions should, as far as possible, be incorporated into the treatment plans to enhance recovery.

Psychosocial support must be based on the assumption of life beyond the hospital, but death can occur. It should include plans that assist the patient to live until the cessation

**Table VIII: Difficulties in managing burns**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Examples</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flame burns</td>
<td>Synthetics in clothes can retain heat.</td>
<td>Eliminate any ongoing burning by removing the clothes as soon as possible, and flushing with cold water.</td>
</tr>
<tr>
<td>Chemical burns</td>
<td>Chemicals continue to burn if in contact with the skin.</td>
<td>Remove chemically contaminated clothing, and wash chemicals from the skin with continuous flushing, using large volumes of running water, for an extensive period of time.</td>
</tr>
</tbody>
</table>

**Airway and pulmonary difficulties**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Examples</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbon-monoxide poisoning</td>
<td>Carbon monoxide binds to the haemoglobin molecules. This displaces oxygen and results in decreased oxygen delivery to the tissues.</td>
<td>Immediate use of high-flow 100% oxygen to remove the carbon monoxide from the haemoglobin, and replace it with oxygen.</td>
</tr>
<tr>
<td>Upper airway injury with potential obstruction</td>
<td>Oral burns can cause rapid swelling of the tongue and mucosa. This impedes the airway patency. Supraglottic oedema can lead to obstruction. Larynx and infraglottal oedema can lead to obstruction.</td>
<td>100% oxygen. Airway support and early intubation. Prepare for possible emergency surgical airway.</td>
</tr>
<tr>
<td>Lower airway injury with impaired gas exchange</td>
<td>Lung damage due to smoke inhalation. Onset of the symptoms is often delayed. Chest wall burns and impaired ventilation. A full-thickness burn of the anterior and lateral chest wall can lead to severe restriction of chest wall motion, especially as oedema develops beneath the eschar.</td>
<td>100% oxygen. Airway support and early intubation. Early transfer to a burn centre. An escharotomy might be required for chest-wall burns.</td>
</tr>
</tbody>
</table>

**Restoring and maintaining haemodynamic stability**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Examples</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypovolaemia</td>
<td>Loss of plasma volume is rapid after a burn, and can be easily underestimated.</td>
<td>Look for other traumatic injuries (fractures and blunt trauma). Estimate the percentage of body surface area burnt, and use the fluid calculation formula to estimate fluid requirements. Remember to add more fluid or blood for other traumatic injuries.</td>
</tr>
<tr>
<td>Impaired distal perfusion from burn tissue compression</td>
<td>As oedema develops under the burnt tissue, tissue pressure increases. This is of concern in extremities with a circumferential burn. Initially, the increasing pressure impedes venous return, which markedly accentuates further oedema production, raising pressure to a level that then impedes arterial blood flow.</td>
<td>Remove constricting objects, such as jewellery. Immediate elevation of burnt extremities. Monitor using pulse palpation and/or Doppler. Perform an escharotomy if perfusion is impaired.</td>
</tr>
</tbody>
</table>
of life. The patient’s family must be helped to prepare for bereavement, and once death has occurred. Keeping the family informed about changes in the patient’s condition and actively encouraging its members to continue their relationship with the dying patient can help the patient and the family through this very difficult event.

Pain management

The skin is our interface with the outside world. Because the skin contains abundant nerve endings, any serious burn will result in severe and possibly prolonged pain.

The first step in pain control is to cool down the area that was burnt. Pain control also includes use of intravenous opioids (morphine). Frequent small titrated dosages of opioids are recommended for continuous pain management.

Pain therapy must be tailored to avoid cardiac and respiratory problems in adults and children. A second area of concern is hypotension due to vasodilatation. Pain management of children with burns presents a special case. Children should not be denied analgesics. Opioids are a good choice, but it is important to remember that the analgesic half-life is shorter in children who are severely burnt.

Nonpharmacological pain management interventions are those that prevent or avoid unnecessary elements of care that might cause pain. For example, soaking dressings adequately can ease pain during their removal. Remaining calm while providing care, and equipping the patient with some control during painful procedures, can facilitate comfort when giving therapy and wound care.

Difficulties in managing burns

Due to the nature of burns, there might be high-alert areas that can cause severe difficulties in the management of the burn patient. Table VIII provides an overview of difficulties that nurses can expect to encounter.

Criteria for referral to a burns centre

The South African Burn Society has published the following criteria that can be used as a guideline for the safe and timely referral and transfer of a burn patient to a burns centre:

Paediatric burns should be transferred:

- In patients less than one year of age.
- In patients from 1-2 years of age, with burns > 5% of the total body surface area.
- In patients older than 2 years of age, with partial-thickness burns that are > 10% of the total body surface area.
- Where child abuse is suspected.

Burn patients should be transferred:

- In any age group, with full-thickness burns of any size.
- Who have burns in sensitive areas, such as the face, hands, feet, genitalia, perineum or major joints.
- Who have electrical or lightning burns.
- Who have chemical burns.
- Who have inhalation injuries due to fire or scald burns.
- Who have circumferential burns to the limbs or chest.
- Who have pre-existing medical disorders that could complicate management.
- Who have burns and concomitant trauma.
- When treatment requirements exceed the capabilities of the referring centre.
- Who have septic burn wounds.

Conclusion

Although international burn statistics reflect a decline in burn incidents, burn patients will continue to present to emergency units. Emergency management of burn patients, from the time of the burn and for the first 24 hours, remains critical to the initial survival, recovery and rehabilitation of burn patients.

The accurate calculation of the total body surface area burnt and the correct fluid resuscitation volumes is essential in the initial management of patients as part of the primary survey to address life-threatening concerns.

Each well-managed patient is a life saved, and a survivor who can continue to be a breadwinner, or a mother who will be able to continue to care for her family.

Acknowledgements

The Emergency Management of the Severe Burn course of the Australian and New Zealand Burn Association has been adapted for the South African environment, and provides critical knowledge on the initial management of burn patients. The support of the following organisations in presenting the course must be applauded: the South African Burn Society, Emergency Medicine Society of South Africa and the Phoenix Burns Project.

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