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Nursing management of minor burn injuries



This article discusses burns, with particular emphasis on minor burn injuries, and the role nurses can play in managing such injuries.

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AIMS AND INTENDED LEARNING OUTCOMES

The aim of this article is to provide nurses with appropriate knowledge and information to manage a patient with a minor burn injury. After reading this article you should be able to:

- Define which burns are categorised as minor
- Discuss the general care and treatment required for minor burns
- Understand the wound care of a minor burn and the rationale for dressing selection
- Give appropriate after care advice to minor burn sufferers
- Advise patients on how to reduce further burn-related accidents.

INTRODUCTION

Each year, burn or scald injuries account for many patients who seek medical or hospital treatment and advice. An annual number could be over 100,000 – although exact statistics are not known (Lawrence 1996).

Although not life-threatening, nor necessitating major interventions, patients with minor burns require and deserve expert nursing care.

Knowledge of the burn and its effect on the patient is needed to make appropriate decisions on the management of the patient. Prior to classifying a patient's injury as to whether it is a minor burn or not, the nurse must undertake a systematic assessment of the patient. This will enable the nurse to plan, implement and deliver the most appropriate, safe and effective care to the patient.

HOLISTIC PATIENT ASSESSMENT

The initial assessment of any burn-injured individual is always based on the 'ABC' of trauma management. If there are any difficulties with the airway, breathing or circulation, the patient needs immediate medical assessment and treatment. Once assured that the patient has no life threatening problems and that vital signs are stable, a more thorough assessment of the patient and his or her presenting burn injury can be undertaken.

In the assessment you should try to establish the cause of the burn and whether there were any

relevant contributing factors. For example, was the burn a result of a seizure, fainting or hyperglycaemic episode, or following drug or alcohol intoxication.

Some individuals are more prone or predisposed to burn injuries or have an increased vulnerability to accidents (Kolman 1983, MacArthur and Moore 1975).

NOW DO TIME OUT 1

What people do you think are more predisposed to burn injuries, and why?

There are often social factors which need to be taken into account when assessing patients with burns, especially if the burn was due to a fire at the patient's home, leaving it destroyed, or uninhabitable, whereby outpatient management would be unsuitable. Similarly, patients who are seen to have mental health problems may require interventions that lead to hospitalisation.

When assessing children or elderly people you should also consider the possibility of abuse or neglect. A description of the injury that appears incompatible with the age or ability of the individual needs, or any delay in seeking medical attention, may need careful consideration. You should follow local procedures and policies to contact appropriate personnel.

BURN ASSESSMENT

The ability to make an accurate assessment of the burn wound is an important nursing skill and is part of the total assessment of the patient, therefore should not be viewed in isolation. The cause, type, extent, depth, location of the burn, and the patient's general condition and past medical history, will determine the severity of the injury and affect the patient's treatment.

Causes and types of burn Burns occur from a variety of causes – as a result of an accident, as a consequence of abuse, from self-harm or from an assault. Types of burns can vary from scalds due to contact with hot liquids or flames, to exposure to

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Table 1. Types of burns

TYPE	HAZARDS
Wet heat	Hot water, beverages
Dry heat	Fires, matches, bonfires
Chemicals	Some cleaning agents
Electrical	Overhead/underground power cables
Radiation	Sunlight, sunbeds
Inhalation	Smoke, toxic fumes

chemical or electrical substances (Table 1).

Extent of burn The extent of the burn injury is determined by the total body surface area (TBSA) affected, and is calculated and documented on specific charts. For patients over the age of 16 years the 'Rule of Nines' (Wallace 1951) indicates the percentage of TBSA accounted for by various parts of the body. Nine per cent for the head and each arm, 18 per cent each for lower limbs and front and back of the trunk, and 1 per cent for the perineal region (Fig. 1).

In children, whose proportions are different to adults, a Lund and Browder chart (1944) is used for a more accurate assessment (Fig. 2). When assessing children, two qualified staff should undertake the calculation as there is less margin for error than with adults.

A more crude method of assessment is to use the patient's palmar surface, with fingers closed as approximately 1 per cent of TBSA. The latter is useful for parts of the body with small burn areas, or in the early assessment at the scene of the accident or by non-burn trained healthcare workers. Simple erythema is never included in these estimations, nor is it documented on the charts. Adults with burns exceeding 15 per cent TBSA, and children with burns exceeding 10 per cent, must be admitted to a hospital and have immediate treatment of intravenous fluid replacement – these patients are usually referred to a specialist burns unit.

NOW DO TIME OUT 2

Revise the anatomy and function of the skin. Relate this to the classification of depth of the burn. Find out what happens to the skin when it suffers a burn.

Depth of burn Classification of burn depth is based on:

- Clinical observation and examination
- Knowledge of the burning agent and its temperature

- History of the burn, time it occurred, and length of exposure or contact time
- Any first aid measures used.

The depth of the burn is defined by using descriptive terms of: superficial, partial thickness, deep partial thickness (deep dermal) and full thickness (Table 2). Damage to the outer stratum of the epidermis results in a superficial reddened area with minimal tissue damage. This heals within three to seven days. In partial thickness burns the thermal damage extends through the epidermis to the upper third of the dermis. The epithelium lining the shafts of the hair follicles and sweat glands in the dermis are still intact, but the capillary network damage allows for release of serous exudate that causes blistering. The nerve endings are exposed and results in the acute pain felt by patients. These should heal spontaneously unless complicated by infection or pressure.

Deeper burns extend to the deeper dermal elements. Healing can be prolonged with subsequent poor skin quality and significant scarring if grafting

Table 2. Classification of burn depth

Superficial	Skin appears bright pink or red, dry, intact, with/without oedema, painful to touch, blanches and refills quickly under light pressure. Heals spontaneously within three to seven days with minimal intervention. No scarring
Partial thickness	Skin is red, blistered (under the blister the surface appears wet, swollen and pink), extremely painful, brisk capillary refill. Heals within 10-21 days. Some scarring depending on patient's genetic disposition
Deep dermal	Appears mottled/white or deep red, waxy dry surface, has diminished sensation, slower capillary refill, feels firmer when touched, less exudate and blisters than superficial-partial thickness burns. Slightly painful-sensation but not able to discriminate between sharp and blunt on pin prick test. May heal within 30 days or more, usually grafted, otherwise there is a high risk of severe hypertrophic scarring. Scars visible, extent dependant on grafting and patient's genetic disposition
Full thickness	Black, dark brown/tan, white or cherry red, dry leathery surface, may have visible thrombosed veins, no sensation, no capillary refill. Requires grafting to heal. Scarring influenced by early excision and grafting, and genetic disposition

Fig. 1. The Rule of Nines

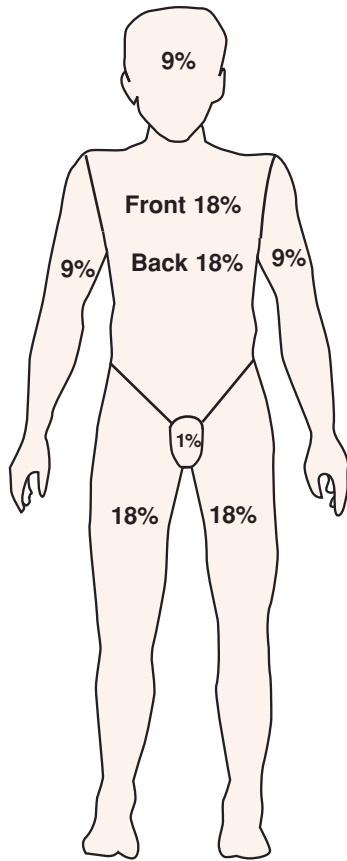
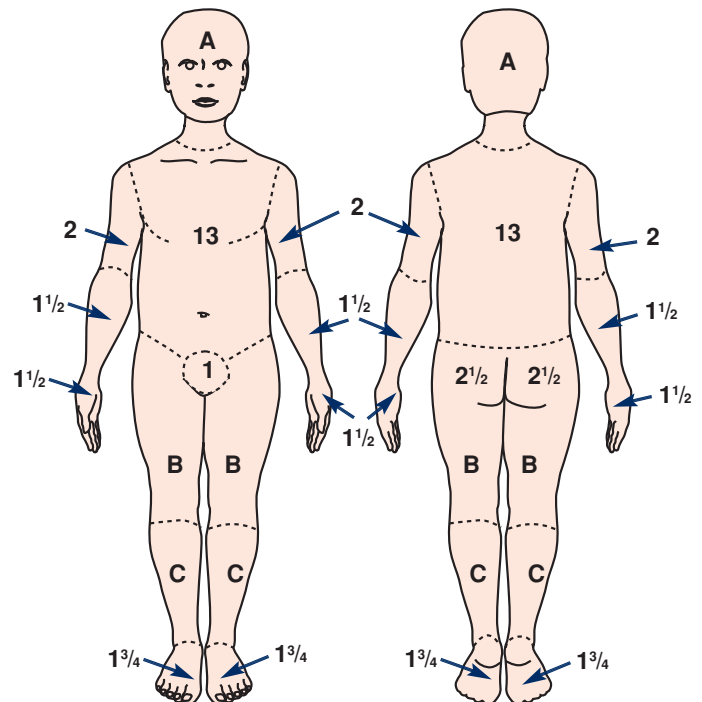


Fig. 2. The Lund and Browder chart



Relative percentages affected by growth

AREA	AGE 0	1	5	10	15	ADULT
A= $\frac{1}{2}$ of head	$9\frac{1}{2}$	$8\frac{1}{2}$	$6\frac{1}{2}$	$5\frac{1}{2}$	$4\frac{1}{2}$	$3\frac{1}{2}$
A= $\frac{1}{2}$ of one thigh	$2\frac{3}{4}$	$3\frac{1}{4}$	4	$4\frac{1}{4}$	$4\frac{1}{2}$	$4\frac{3}{4}$
C= $\frac{1}{2}$ of one leg	$2\frac{1}{2}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{1}{2}$

is not performed. Full thickness tissue loss involves the destruction of all dermal structures and may extend into subcutaneous tissue. These injuries usually require grafting. It may be difficult to distinguish clearly between deep dermal and full thickness at the initial assessment. Burn wounds are rarely a uniform depth and may consist of varying amounts of tissue destruction, hence the need for regular review and re-assessment.

The clinical examination includes applying pressure to assess capillary refill, and using a sterile needle and a pin prick test to assess the damage to nerve endings. The observation of the wound includes the colour, absence or presence of blisters, signs of patent or thrombosed veins, and the texture of the skin. With more superficial burns, there will be increased exudate and blistering. Deeper burns are firmer to touch and local hair loss may be visible. Most burns have areas of erythema surrounding the wound – this is not included in calculating the surface area or depth of burn.

Location of the burn Burns to the face, hands, feet and perineum produce specific problems in patient management – even if classified as a minor injury. Burns in close proximity to the eyes, ears, nose or mouth have the potential for airway

difficulties and delayed respiratory distress. Patients should be assessed by experienced burns personnel and, ideally, are not managed on an outpatient basis.

Hand burns can make self-care very difficult for patients living on their own. Patients with these injuries require close observation, splinting, elevation, physiotherapy, analgesia and appropriate wound care to ensure restoration of full function. Injuries to the feet or lower legs can interfere with mobility; any associated oedema might delay healing.

Burns of the perineum and buttocks pose greater problems with hygiene, mobilisation and wound care. Hospitalisation would provide these patients with a better quality of care and improve their outcome.

NOW DO TIME OUT 3

Reflect on burn patients you have previously assessed. What could you do or ask to improve your assessment of their needs?

MINOR BURNS

The most frequently used definitions of a minor burn are identified in Box 1. These burns can

easily be dealt with on an outpatient basis either by the A&E service, minor injury unit, general surgical outpatient departments, GP practice or attendance at the outpatient clinic of a reconstructive and plastic surgery unit. As identified by Marsden (1996) the term 'minor' can be misleading and not all minor burns are straightforward, some are tricky and merit reasonable discussion and none should be dismissed as insignificant. Equally important is to be aware of the potential for a particular burn to evolve into a major wound or problem.

Once the patient's injury is confirmed as minor, and is suitable for outpatient management, an assessment of the homecare situation is required. The patient may need help, support or supervision by family, friends or neighbours.

GENERAL CARE AND TREATMENT OF MINOR BURNS

General care and treatment of minor burns are based on four basic principles:

- Pain relief
- Infection control
- Wound care
- Realistic follow up.

Pain relief Regardless of the severity of injury, burns patients require comfort and pain-relieving measures. This can initially be achieved by first aid measures, such as cooling the area, or by simply covering the exposed wound with a sterile theatre drape or polyvinylchloride (PVC) Cling film/wrap (Wilson and French 1987). This is especially useful while preparing treatment to relieve their pain, prior to cleaning and dressing the wound. Covering the burn prevents excess evaporation from the exposed surface, and stops the patient or other healthcare professionals from touching or applying pressure to the wound. Cling film wrap should not be applied circumferentially like a bandage as this can cause constrictions. Ideally, it should be applied in small, overlapping sections. The patient should be assessed in a warm room, well lit and free of draughts. The use of narcotics or Entonox will allow for a thorough assessment of the patient and the wound, with minimal discomfort and distress for the patient. Fear and discomfort will only heighten the patient's

Box 1. Definition of a minor burn

- Simple erythema
- Superficial burns on any part of the body
- TBSA of less than 5 per cent superficial partial thickness in a fit individual aged between five and 60 years
- An adult with a TBSA less than 5 per cent whose burn does not require a skin graft
- Deep burns (other than electrical) less than 2.5cm diameter on trunk, arm(s) or leg(s)

pain, therefore the nurse should keep the patient informed of any interventions required, plan of treatment and potential outcome from the injury. If a patient finds any part of his or her management or wound care uncomfortable, compliance might be affected. Wound care measures also influence the pain and discomfort experienced.

Infection control It is common knowledge that the

NOW DO TIME OUT 4

Consider your own working environment, local policies and guidelines. What analgesia and sedation can you administer to burn patients?

main vectors of cross-infection in hospitals are the hands of the healthcare professionals. Therefore, prior to and after examining the patient and his or her wounds, all healthcare workers should wash and dry their hands thoroughly, whether or not gloves are used. The risk of infection in a minor burn is no greater than a minor abrasion, therefore prophylactic systemic antibiotics are not required, nor are the use of topical antibacterial agents that are routinely applied to major burns (Mertens *et al* 1997). No wound, however minor, can be considered safe from tetanus, therefore antitetanus prophylaxis should be given, as for any traumatic injury (Lindsey 1984). Vaccination status in children should be checked with the parents where there is any lapse to a course or immunisations are due, this should wait until the child has fully recovered from the burn injury and the wound is healed prior to administering the course of treatment.

Wound care The first action in burn wound care is

NOW DO TIME OUT 5

Analyse your typical working day. How often do you wash your hands? Can you identify ways with your colleagues to improve this practice in your working area?

appropriate first aid measures. The principle of first aid treatment for burns is to remove the injured person from the source of heat and to pour cool water over the affected area (Lawrence 1987). This not only reduces the tissue destruction, it also aids in the initial pain relief. Treatment prior to dressing the burn, and at subsequent dressing changes, includes cleansing the wound with warmed sterile saline, sterile water or tap water depending on local wound care policies. Gentle irrigation with warmed solutions prevents further unnecessary cooling of the patient and the wound site, and aids wound healing. The initial wound

product can be paraffin gauze, as it is inexpensive and will only be used for the first two to three days. For most minor burns, planning appropriate wound care is not complicated. Complications arise from 'over treatment' – too frequent dressings, use or misuse of antiseptics and or the inappropriate use of topical or systemic antibiotics. It is important to maintain the wound in a clean, moist environment, offer protection from trauma, promote optimal activity and friction, and be acceptable to the patient. A review of the wound should be performed at 48 to 72 hours, once the exudate and oedema have settled, to allow for a more definitive assessment of depth and to plan a wound regime to meet the patient's needs. The dressing needs to be durable and remain in place for several days at a time. Typical dressings used on superficial partial thickness to deep dermal wounds, without an eschar, are non-low adherent dressings, films, hydrocolloids, hydroactives or hydrogel products (Table 3).

There is still controversy over burn-blister management and whether to remove blisters or to leave them intact (Rockwell 1990, Swain *et al* 1987, Uchinuma *et al* 1988). Blister fluid can be aspirated and the skin left *in situ* until the first review, small blisters should be left intact. If the blister is causing restriction in movement, it may be removed – but de-roofing blisters increases the patient's pain.

If the patient has a deep or full thickness burn but is unfit or refuses surgery, the need for alternative dressings – such as a topical antimicrobial – might be indicated; hydrogels may be used to rehydrate the eschar.

Realistic follow up Reassessment of the wound at each review should include documenting the depth

NOW DO TIME OUT 6

Ask your colleagues what they consider is the correct management for burn blisters. Is there any literature or research to base your practice on? Discuss how to implement a policy to standardise the approach used within your working environment.

and size of the wound to measure the progress of healing. After the second review, an appropriate dressing can be left for between five and seven days and the patient can expect to attend the clinic once a week. Instructions regarding the wound should include: elevation of the part (if appropriate); returning to the relevant clinic within 48-72 hours; the use of pain medication; who to contact if he or she feels feverish or unwell; and to keep the dressing clean and dry. More specific instructions might be required once a longer term dressing is used. The patient should contact the clinic if the smell of the wound/dressing changes from when last seen, if there is seepage that is brown/greenish in colour, or if the dressing slips or moves.

ADDITIONAL FACTORS

There are many other factors that need to be taken into consideration for the management of minor burns.

Nutritional needs The basal metabolic rate of patients with minor burns is not elevated to the extent of those with major burn injuries (Norman 1997). Normal dietary intake will typically meet the patient's nutritional needs. The goal should be for the patient to achieve and maintain an ideal body weight. But young children or elderly patients must be monitored to ensure they meet their hydration and calorific intake needs. Maintaining an adequate protein intake and adequate haemoglobin levels are also important in treatment of all wounds. Patients with a potential for decreased serum albumin levels, or poor protein intake, need a nutritional evaluation to ensure proper calorie intake. A simple method of monitoring the patient's nutritional intake is by weighing him or her at each review.

Mobility Simple exercises, and occasionally splinting, may be required to allow the patient to resume normal functioning as soon after the injury as possible.

Rest and sleep Wound dressings, positioning with splints, elevation of the affected part, pain or anxiety, may interfere with the patient's normal sleeping pattern, and disturb the healing process.

Table 3. Suggested wound dressings

DEPTH OF BURN	DRESSING	RATIONALE
Simple erythema	Watergel Aloe Vera and after sun lotions	Does not necessarily require an occlusive dressing but these measures may be used for initial pain relief
	Non-medicated paraffin gauze	To protect areas subject to trauma or pressure.
	Non/low adherent dressings	These areas heal spontaneously within 3 to 7 days
	Vapour permeable film Foams Hydrocolloids	Some products require secondary dressings
Superficial partial thickness	Non-medicated paraffin gauze for first 48-72hr	To allow for early inspection, without altering the appearance of the wound
Once depth confirmed	Low-non adherent dressing Vapour permeable Foams Hydrocolloids	Some products meet the ideal characteristics of a dressing All dressings should be easy to apply and remove

Appropriate advice The nurse should give the patient appropriate advice on oral fluid supplementation, diet, the need to rest and exercise appropriately, and how to care for the wound site, as well as any dressings used. It is important not to minimise the patient's concerns regarding scarring or eventual appearance of the wound. The damage to the melanocytes in the basal layer of the epidermis may be the cause of permanent pigmentation changes in the skin. It is not possible to predict which patients will be affected.

Each patient and his or her relatives should be made aware of these issues – as these areas can be interpreted as unsightly. After-care and scar management should also be discussed with the patient from the beginning.

After-care and scar management Recently healed skin is very fragile and should be protected from

Accident prevention The majority of burn accidents are accidental in nature and, therefore, could be seen as preventable; at least 85 per cent of accidents occur in the home. In order to reduce the number of burn- and scald-related accidents, it is important to help patients identify potential hazards in the home, particularly in the kitchen and bathroom.

Flame burns can be caused by poorly extinguished cigarettes, bonfires and barbecues, unattended fires or chip pans. On discharging a burns patient from formal care, you should ensure they have sufficient knowledge and understanding to prevent a similar injury re-occurring.

CONCLUSION

The management of a patient with a minor burn injury is frequently a nursing responsibility and one that entails more than simply applying a dressing. An accurate assessment of the patient and his or her burn is essential to enable the most appropriate and effective care to be delivered. Many factors need to be considered before applying the term 'minor' to a burn-injured patient. It is important that patients with minor burns receive adequate post injury care, so the quality of outpatient care equals the quality of care provided for inpatients (Dimick and Loring 1988) ■

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NOW DO TIME OUT 7

Analyse information you give patients at work. Is the information written? Is it user-friendly in language and content? What do you provide for patients whose first language is not English?

trauma, such as sun, pressure or contact sports. Massaging the healed wound with skin moisturisers is useful to prevent dryness, flakiness and itching that occur in freshly epithelialised wounds. These symptoms are as a result of lessened production of skin oils. Superficial and partial thickness burns eventually recover the ability to produce skin oils – however deeper burns do not. Patient preference and advice on using hypoallergenic, non-alcohol, non-perfumed creams, assist the nurse in suggesting the most appropriate choice for each individual patient. Sun protection, such as sunscreens with a protective factor of 15 or more, is necessary. This should be used in conjunction with sun hats and appropriate clothing, such as cotton clothing with long sleeves.

Realistic follow up The patient's ability to understand and comply with treatment, and attend regular follow-up appointments needs to be addressed. Transport difficulties and financial issues may preclude certain patients from being able to travel long distances for appointments. Child care arrangements, loss of work, or presence at school/university, may interfere with attendance. Appropriate times and transport arrangements should be included in the patient's documentation. It is not always necessary to bring patients back on a daily basis, as this interferes with their daily routine and activities. Patients should be encouraged to return to work or school as appropriate and clinic appointments should be made accordingly, where possible.