

ABC of burns

First aid and treatment of minor burns

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This is the third in a series of 12 articles

Some 250 000 burns occur annually in the United Kingdom. About 90% of these are minor and can be safely managed in primary care. Most of these will heal regardless of treatment, but the initial care can have a considerable influence on the cosmetic outcome. All burns should be assessed by taking an adequate history and examination.

First aid

The aims of first aid should be to stop the burning process, cool the burn, provide pain relief, and cover the burn.

Stop the burning process—The heat source should be removed. Flames should be doused with water or smothered with a blanket or by rolling the victim on the ground. Rescuers should take care to avoid burn injury to themselves. Clothing can retain heat, even in a scald burn, and should be removed as soon as possible. Adherent material, such as nylon clothing, should be left on. Tar burns should be cooled with water, but the tar itself should not be removed. In the case of electrical burns the victim should be disconnected from the source of electricity before first aid is attempted.

Cooling the burn—Active cooling removes heat and prevents progression of the burn. This is effective if performed within 20 minutes of the injury. Immersion or irrigation with running tepid water (15°C) should be continued for up to 20 minutes. This also removes noxious agents and reduces pain, and may reduce oedema by stabilising mast cells and histamine release. Iced water should not be used as intense vasoconstriction can cause burn progression. Cooling large areas of skin can lead to hypothermia, especially in children. Chemical burns should be irrigated with copious amounts of water.

Analgesia—Exposed nerve endings will cause pain. Cooling and simply covering the exposed burn will reduce the pain. Opioids may be required initially to control pain, but once first aid measures have been effective non-steroidal anti-inflammatory drugs such as ibuprofen or co-dydramol taken orally will suffice.

Covering the burn—Dressings should cover the burn area and keep the patient warm. Polyvinyl chloride film (cling film) is an ideal first aid cover. The commercially available roll is essentially sterile as long as the first few centimetres are discarded. This dressing is pliable, non-adherent, impermeable, acts as a barrier, and is transparent for inspection. It is important to lay this on the wound rather than wrapping the burn. This is especially important on limbs, as later swelling may lead to constriction. A blanket laid over the top will keep the patient warm. If cling film is not available then any clean cotton sheet (preferably sterile) can be used. Hand burns can be covered with a clear plastic bag so as not to restrict mobility. Avoid using wet dressings, as heat loss during transfer to hospital can be considerable.

Use of topical creams should be avoided at this stage as these may interfere with subsequent assessment of the burn. Cooling gels such as Burnshield are often used by paramedics. These are useful in cooling the burn and relieving pain in the initial stages.



A superficial scald suitable for management in primary care

Benefits of cooling burn injuries with water

- Stops burning process
- Reduces pain
- Minimises oedema
- Cleanses wound

Cling film for dressing burn wounds

- Essentially sterile
- Lay on wound—Do not wrap around
- Non-adherent
- Pliable
- Transparent for inspection



Burnshield is a cooling gel used to cover burn and reduce pain

Management of minor burns

The cause of injury and depth and extent of burn should be assessed in the same way as for more major burns and recorded. Similarly, associated illness or injuries must be considered (such as small burns as a result of fits, faints, or falls). Burns suitable for outpatient management are usually small and superficial and not affecting critical areas. Home circumstances should be considered, as even small injuries to the feet will progress if the legs are not elevated for at least 48 hours; this is rarely possible at home. Always consult a burns unit if in doubt about management

Once the decision has been taken to treat a burn patient as an outpatient, analgesia should be given and the wound thoroughly cleaned and a dressing applied (except on the face). Ensure that a follow up appointment is made.

There are a vast range of acceptable options in the outpatient management of minor burns. The following should be used as a guide

Cleaning the burn

It is important to realise that a new burn is essentially sterile, and every attempt should be made to keep it so. The burn wound should be thoroughly cleaned with soap and water or mild antibacterial wash such as dilute chlorohexidine. Routine use of antibiotics should be discouraged. There is some controversy over management of blisters, but large ones should probably be de-roofed, and dead skin removed with sterile scissors or a hypodermic needle. Smaller blisters should be left intact.

Dressings

Many different dressings are in use, with little or no data to support any individual approach. We favour covering the clean burn with a simple gauze dressing impregnated with paraffin (Jelonet). Avoid using topical creams as these will interfere with subsequent assessment of the burn. Apply a gauze pad over the dressing, followed by several layers of absorbent cotton wool. A firm crepe bandage applied in a figure of eight manner and secured with plenty of adhesive tape (Elastoplast) will prevent slippage of the dressing and shearing of the wound.

An elastic net dressing (Netelast) is useful for securing awkward areas such as the head and neck and chest. Limb burns should be elevated for the duration of treatment.

Dressing changes

The practice of subsequent dressing changes is varied. Ideally the dressing should be checked at 24 hours. The burn wound itself should be reassessed at 48 hours and the dressings changed, as they are likely to be soaked through. At this stage the depth of burn should be apparent, and topical agents such as Flamazine can be used.

Depending on how healing is progressing, dressing changes thereafter should be every three to five days. If the Jelonet dressing has become adherent, it should be left in place to avoid damage to delicate healing epithelium. If Flamazine is used it should be changed on alternate days. The dressing should be changed immediately if the wound becomes painful or smelly or the dressing becomes soaked ("strike through").

Any burn that has not healed within two weeks should be seen by a burn surgeon.

Specialist dressings

Many specialist dressings are available, some developed for specific cases, but most designed for their ease of use. The following are among the more widely used.

Minor burns suitable for outpatient management

- Partial thickness burns covering < 10% of total body surface area in adults
- Partial thickness burns covering < 5% of body surface area in children
- Full thickness burns covering < 1% of body surface
- No comorbidity



Large blister on thenar eminence restricting movement of hand (top). Blister is de-roofed using aseptic technique (bottom)



Superficial scald burn on side of neck (top left) is cleaned and then a layer of Jelonet applied over it (top right). Gauze square dressings on top of the Jelonet (bottom left) are held in place with a Netelast type of dressing (bottom right)

Dressing changes for burns

- Use aseptic technique
- First change after 48 hours, and every 3-5 days thereafter
- Criteria for early dressing change:
 - Excessive "strike through" of fluid from wound
 - Smelly wound
 - Contaminated or soiled dressings
 - Slipped dressings
 - Signs of infection (such as fever)

Flamazine is silver sulfadiazine cream and is applied topically on the burn wound. It is effective against gram negative bacteria including *Pseudomonas*. Infection with the latter will cause the dressing to turn green with a distinctive smell. Apply the cream in a 3-5 mm thick layer and cover with gauze. It should be removed and reapplied every two days. There is a reported 3-5% incidence of reversible leucopenia.

Granulflex is a hydrocolloid dressing with a thin polyurethane foam sheet bonded onto a semipermeable film. The dressing is adhesive and waterproof and is therefore useful in awkward areas or where normal dressings are not suitable. It should be applied with a 2 cm border. By maintaining a moist atmosphere over the wound, it creates an environment suitable for healing. It usually needs to be changed every three or four days, but it can be left for seven days. A thinner version (Duoderm) is also available.

Mepitel is a flexible polyamide net coated with soft silicone to give a Jelonet-type of dressing that is non adhesive. It is a useful but expensive alternative to Jelonet when easy removal is desirable, such as with children.

Facial burns

Facial burns should be referred to a specialist unit. However, simple sunburn should be left exposed as dressings can be awkward to retain on the face. The wound should be cleansed twice daily with mild diluted chlorohexidine solution. The burn should be covered with a bland ointment such as liquid paraffin. This should be applied every 1-4 hours as necessary to minimise crust formation. Men should shave daily to reduce risk of infection. All patients should be advised to sleep propped up on two pillows for the first 48 hours to minimise facial oedema.

Follow up

Burns that fail to heal within three weeks should be referred to a plastic surgery unit for review. Healed burns will be sensitive and have dry scaly skin, which may develop pigmental changes. Daily application of moisturiser cream should be encouraged. Healed areas should be protected from the sun with sun block for 6-12 months. Pruritis is a common problem.

Physiotherapy—Patients with minor burns of limbs may need physiotherapy. It is important to identify these patients early and start therapy. Hypertrophic scars may benefit from scar therapy such as pressure garments or silicone. For these reasons, all healed burns should be reviewed at two months for referral to an occupational therapist if necessary.

Support and reassurance—Patients with burn injuries often worry about disfigurement and ugliness, at least in the short term, and parents of burnt children often have feelings of guilt. It is important to address these issues with reassurance.

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Flamazine

- Silver sulfadiazine cream
 - Covers gram negative bacteria including *Pseudomonas*
 - Needs to be changed every 24-48 hours
 - Makes burn seem white and should be avoided if burn needs reassessment
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Management of facial burns

- Clean face twice a day with dilute chlorohexidine solution
 - Cover with cream such as liquid paraffin on hourly basis
 - Men should shave daily
 - Sleep propped up on two pillows to minimise oedema
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Pruritis

- Common in healing and healed burn wounds
 - Aggravated by heat, stress, and physical activity
 - Worst after healing
 - Massage with aqueous cream or aloe vera cream
 - Use antihistamines (such as chlorphenamine) and analgesics
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Key points

- Initial first aid can influence final cosmetic outcome
 - Cooling with tepid tap water is one of the most important first aid measures
 - Routine use of antibiotics should be discouraged
 - Simple dressings suffice
 - Aseptic technique should be used for dressing changes
 - If in doubt, seek advice from regional burns unit or plastic surgery department
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Further reading

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