

Minor Pediatric Burns



By Doug Baron

The management of pediatric burn injuries can be challenging for the wound-care practitioner. This article outlines strategies for the effective management of minor pediatric burns.

The Extent of the Problem

In a retrospective analysis of Canadian hospital data from 1994 to 2003, Spinks et al.¹ found that hospital admissions due to burn injuries declined by approximately 4.8 per cent per year during that time. Even so, an estimated 40 children will die from burns this year in Canada and nearly 800 will be admitted to hospital with significant burn injuries.²

Major and Minor Burns

It is important for the clinician to immediately assess the burn to determine if it is major or minor, as this information will direct treatment decisions. The American Burn Association³ has described major burns as meeting at least one of the following criteria and therefore requiring referral to a burn centre:

- Partial-thickness burns on >10 per cent of the total body surface area (TBSA) (the surface area of one's palm is approximately one per cent of the TBSA)
- Burns involving the patient's face, hands, feet, genitalia, perineum or major joints
- Full-thickness burns in any age group
- Electrical or chemical burns
- Any suspected inhalation injury
- Any co-existing medical conditions that could complicate burn management
- Any concomitant trauma associated with the burn injury
- Any burns of children in a facility without the equipment for or expertise in the care of children
- Burns in any person requiring special social, emotional

or rehabilitative intervention

Burns not falling into any of the above categories are considered to be minor in nature.

Common Causes of Minor Burns in Children

Children aged less than five years are at the highest risk for scald injuries, and there is a high prevalence of contact burns in children aged less than 12 months.¹ In my own practice, I tend to see contact burns more often during the colder months of the year, mainly from contact with glass-enclosed fireplaces. Burns from fire and/or flame tend to occur more frequently in the summer months and in children aged less than five years.¹

In Calgary, we have seen an increase over the past year in the incidence of friction-type burn injuries from children touching moving treadmills. Fortunately, the majority of burn injuries seen in children are minor and can be managed on an ambulatory basis.

Treatment of Minor Burns

Referral to our outpatient burn clinic is most often from our own Alberta Children's Hospital emergency department, but we also receive some patients directly from adult emergency departments and community physicians. Assessment and treatment of these injuries requires a holistic approach to care. Figure 1 shows how you can adapt the wound-bed preparation paradigm designed by Sibbald et al.⁴ to a child with a burn injury.

Take a Thorough History

The severity of a burn injury is dependent upon a number of factors, and it is important to take a detailed history from the patient (or parent, in the case of a young child). This includes the mechanism of injury and the immediate post-burn first aid applied, which can determine the extent or depth of the heat injury

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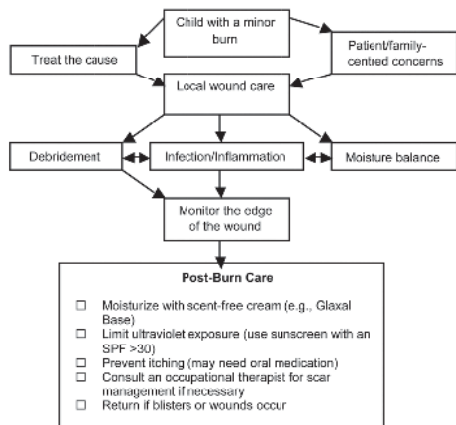


To view a practice enabler developed by Doug Baron, please visit the **Wound Care Canada** section of the CAWC Web site at www.cawc.net.



FIGURE 1

A wound-bed preparation paradigm for burn injury



Adapted from Sibbald et al.⁴ and Alsbjorn et al.⁵

sustained. It is well known that the thickness of a child's skin is less than that of an adult, and children thus have deeper injuries from the same thermal exposure. As well, the combined surface area of the head and neck compared with the rest of the body in a child is larger than in an adult. Thus, a small burn on a child could be much more severe than the same size burn on an adult.

Co-morbid diagnoses can also have an effect on the expected wound-healing time. A quick review of the child's social situation can reveal whether the parents are smokers (inside vs. outside), if there are other siblings in the home and if there are any pets (some toddlers like to play in the dog's water dish!). A current medication list can indicate whether the child is being given any medications that could interfere with wound healing.

Treat the Cause

If we follow the paradigm of Sibbald et al.,⁴ we should teach families about the prevention of burn injuries. While it might be a bit late for the current injury, one can certainly educate parents on the risks of burns in and around the home. The Safe Kids Canada Web site (www.safekidscanada.ca) includes a comprehensive review of burn injury prevention.

Address Patient/Family-centred Concerns

It is very important to address the concerns of the patient and family as this will foster adherence to the plan of care that is eventually developed with them. Many parents are very concerned about the cosmetic appearance of a burn injury and, invariably, we have to

answer the question "Is it going to leave a scar?" Education about the depth of the injury and expected wound-healing timeframes will give them a better idea of what to expect. From our experience, we know that burn injuries requiring longer than two to three weeks to achieve closure have an increased risk for the development of hypertrophic scar tissue. This is especially true in people of non-Caucasian races, who can produce more scar tissue even with a seemingly minor injury.

This is where effective communication with other members of the team is so important. (Our burn team includes plastic surgery, nursing, physical therapy, occupational therapy, social work, psychology and medical photography.) Those injuries tending toward the deep partial- to full-thickness end of the depth spectrum should have an assessment by a plastic surgeon and longer-term follow-up by an occupational therapist for burn scar management.

Manage pain

Management of pain in the pediatric patient is paramount, and it is always recommended that parents provide some form of analgesia for their child prior to a visit for a dressing change. This is done over the phone on the first contact with the family. That first experience with burn pain during a dressing procedure can certainly have a lasting effect on future visits. Distraction in any form is an effective method to assist the child in coping with the dressing change routine. We use anything from toys to light projectors to children's television shows and movies with good effect.

Local Wound Care

Wound cleansing

It is essential to cleanse burn wounds with low-toxicity solutions such as sterile water or saline. Potable tap water with mild baby soap is also an option. We have the luxury of access to a fluid and blanket warmer to ensure patient comfort. Minimizing desiccation of the burn wound can certainly help to prevent depth conversion to a deeper burn injury. This is a point that I have addressed with our own emergency department physicians and nurses when children first present to our facility.

Debridement

Debridement of nonviable tissue is important to ensure that the bacterial burden is minimized. Debridement

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can take a number of forms, the discussion of which is beyond the scope of this paper. However, conservative sharp debridement with forceps and scissors or simple gauze with fingertips (some children are very fearful of shiny instruments) are the two most common methods. It is very important to have an assistant to help with debriding burn wounds in patients who are awake to ensure that the area is stabilized in order to prevent further injury.

Debridement of burn blisters remains a topic of controversy in the literature. Sargent⁶ has developed some guidelines surrounding this issue, which a number of my burn-care colleagues reviewed using the Appraisal of Guidelines for Research and Evaluation tool⁷ as part of my International Interprofessional Wound Care Course selective paper. As a result, I developed a practice enabler for my physical therapy colleagues at Alberta Children's Hospital (see Web Connect).

Inflammation/infection and moisture balance

Preventing infection and managing inflammation are very important, and there are many different types of advanced wound dressings available that are useful for these purposes. In my own practice I tend to rely on these advanced dressings (hydrocellular foam impregnated with silver, silver hydrofibre dressing, nanocrystalline silver or simply topical antibiotic* and foam) more than the common silver sulfadiazine (SSD) and gauze-type dressings. If SSD is used, dry gauze is rarely used as a cover dressing. Instead we use foam (or a diaper in the case of burns in the groin area in infants). These types of advanced dressings tend to maintain an appropriate moisture balance to ensure proper migration of the wound edge. In a true superficial partial-thickness burn injury, the silver hydrofibre is allowed to dry out and adhere to the burn wound, and the edges are trimmed as the epithelial cells migrate beneath. This can be very helpful as the number of dressing changes required is significantly reduced.

Minor burns to the head and neck are usually treated with regular cleansing and frequent application of a topical antibiotic ointment without a dressing. Parents are instructed to watch for signs that wound infection may be approaching. These include an increase in pain (or irritability), wound exudate and/or odour, high fever, decreased appetite and lethargy. This is a rare occurrence in minor burn injuries, but awareness is important.

Post-healing and Rehabilitation

As a physical therapist, I aim to ensure that my clients can maintain adequate range of motion and function of the affected area. This may include providing parents with home exercise programs but, fortunately, children are naturally inquisitive, tactile individuals and tend to be very active. This makes the physical therapy part of rehabilitation relatively easy, but can make life difficult for the occupational therapist if splinting and garments are used in the post-burn period. Alsbjörn et al.⁵ recommend that once wound closure is achieved, parents should be reminded of the importance of moisturizing the burn scar with a scent-free cream as well as providing ultraviolet protection in the form of sunscreen or clothing. Medications can be required if the burn scar becomes itchy or irritated. Some become so irritated that children can scratch open new wounds in the fragile burn scar, requiring them to return for further treatment.

In conclusion, the management of minor burns in the pediatric population represents a challenge, but a multidisciplinary team of dedicated professionals following the wound-bed preparation paradigm can effectively execute best-practice-based prevention, assessment, treatment and follow-up. This will certainly provide the child with the best possible opportunity to maximize his or her outcome.

*Note: The risk of developing resistance/sensitization is low in the acute burn wound due to the fact that the topical antibiotic is used for only a very short time period and only in those burns with an intact blood supply (i.e., superficial partial thickness).

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