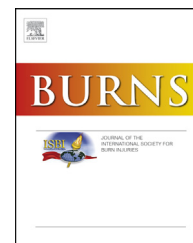


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A review of campfire burns in children: The QLD experience

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ABSTRACT

Introduction: Campfire burns in children are a significant health issue. It is imperative that the extent of the problem is examined and strategies discussed to inform future prevention campaigns.

Method: A retrospective review of data from the Queensland Paediatric Burns Registry for all children presenting with campfire burns between January 2013 and December 2014 (inclusive). Information collected included patient demographics, detail regarding mechanism of injury, first aid, Total Body Surface Area (TBSA), burn depth, and treatment.

Results: Seventy-five children with campfire burns were seen in our paediatric burns centre during this 2-year period. The median age of patients was 3 years (range 10 days–14 years). The hands and feet were the areas most commonly affected. Eleven percent of patients suffered flame burns, whilst 89% suffered contact burns from the hot coals or ashes. Of the latter group, approximately half experienced burns from campfires that had been extinguished for at least one night. Thirteen percent of patients underwent split thickness skin grafting. The incidence of burns was increased during school holiday months.

Discussion: We have previously demonstrated the effectiveness of targeted campaigns in reducing the incidence of campfire burns. A significant portion of patients sustained burns from incorrectly extinguished campfires. These injuries are likely to be preventable with ongoing public awareness campaigns.

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1. Introduction

Camping is a popular recreational activity in Australia. In Queensland alone, there are approximately 430,000 individual campers who spend 1.1 million camper nights annually [1]. Campfires are often an integral component of the camping

experience. Unfortunately, burn injuries from campfires can cause significant morbidity with resultant scarring and loss of function. The temperature required to cause a significant burn in one second is 70°C [2]. We have previously shown that campfires covered with sand (in an attempt to extinguish) retain the ability to cause significant burns even after 8h, due to both residual heat and to continued burning of embers and

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fuel products [3]. Meanwhile, campfires properly and completely extinguished with water are rendered relatively harmless after 10 min.

Our centre has previously reported on children presenting with campfire burns [4]. Between January 1999 and February 2005, 56 children presented with campfire burns injuries. In October 2001, we released the first public awareness campaign on the potential dangers of campfires, and how to correctly extinguish them. This campaign was predominantly targeted at campers, and involved displaying 2000 posters in campsites, national parks and camping shops, as well as printing and distributing one million flyers to campers who bought permits and goods at camping stores. There was also an initial media campaign where the message was featured on radios, televisions and newspapers. As a result of this, there followed a 10-month period where our department did not treat any campfire burns. After this period the incidence slowly rose to previous numbers.

Following the success of our first campaign we ran a second campaign for two months commencing from November 2003. This was a more widespread campaign involving a television commercial that demonstrated the correct method of extinguishing a campfire. This campaign had little effect on reducing the numbers of children presenting with campfire burn injuries — primarily due to the campaign being generic rather than specifically targeted at campers.

It is now over a decade since our previous study and campaign, and we have revisited the issue to see if anything has changed.

2. Methods

The Pegg Leditschke Paediatric Burns Centre is one of the largest paediatric burns centres in Australasia, treating over 700 new burns patients per year. Patients are referred to the centre from across Queensland, northern New South Wales, the Northern Territory, as well as the regional Pacific. The centre was located at the Royal Children's Hospital (RCH) in Brisbane until November 2014, where following the closure of the RCH, moved to Lady Cilento Children's Hospital.

Ethics approval was obtained prior to commencing this study from the Children's Health Services Human Research Ethics Committee (HREC/14/QRCH/114). Data were obtained from the Queensland Paediatric Burns Registry, a database containing patient information collected with the consent of their parents or guardians. A detailed pro forma is completed at the time of admission for both inpatients and outpatients including the following information:

- Demographic data.
- Events leading up to and surrounding the burn injury.
- Type of first aid provided at the scene of the injury.
- Depth and body surface area of burns.

Additional information is recorded on the database including length of treatment, need for skin grafting, outcome and need for scar management. Children who sustained a campfire burn injury between January 2013 and December 2014 were identified using this database. Patients were

excluded if the injury occurred due to flame burns from burn-offs or other fires, or from ashes/coal burns from other sources (e.g. barbecues), or from cases where the source of the flame or ashes/coals was not adequately described.

3. Results

A total of 75 patients were treated for campfire-related burns during the study period, with 73.3% male and 26.7% female. The median age of the patients was 3 (range 10 days–14 years), with 80% (n=60) aged 6 or younger (Table 1). Whilst campfire burns occur throughout the year there appears to be a spike in the number of presentations in the months of January, April, July and October which coincide with Queensland school holidays (Fig. 1).

Of the 75 patients, 8 (10.7%) sustained flame burns, while 67 (89.3%) were burnt by hot coals or ashes from the campfires. Of the latter group, 34 patients suffered burns from campfires that had been incorrectly extinguished at least one night prior (Fig. 2). Eighty-nine percent of all injuries involved the child either falling into, or stepping on hot ashes/coals (Table 2).

Twenty-three injuries (30.7%) were sustained at a campsite, and 41 (54.7%) were sustained at the patient's home or at the residence of a third party. The injuries of 36 patients (48%) were directly witnessed at the time by a supervising adult.

Some form of first aid was provided at the scene of injury in 72 out of the 75 patients. Fifty-three patients (70.7%) received cool running water at the scene, with 30 (40%) having ≥ 20 min, and 22 (29.3%) being < 20 min. Twenty-two patients (29.3%) did not receive cool running water. Fourteen patients had the injured area submerged in water, four received ice and one had a hydrogel dressing applied.

Table 3 shows the anatomical regions affected, and the extent of these injuries. A number of children sustained injuries to multiple regions. The hands and feet were the areas most commonly injured. The percentage of TBSA ranged from 0.5% to 14% (median 1%, IQR=0.5, 1.5), with 47 patients (62.7%) sustaining a TBSA of 1% or less. Sixty-one percent of children sustained an injury deeper than superficial partial thickness only.

Table 1 – Patient demographics.

Patient details	Number	Percentage
Total number of patients=75		
Gender		
Male	55	73.3%
Female	20	26.7%
Ages		
0–24 months	19	25.3%
25–48 months	24	32.0%
4–5 years	11	14.7%
6–7 years	7	9.3%
8–9 years	6	8.0%
10–11 years	4	5.3%
12+ years	4	5.3%

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