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# Paediatric post-burn scar management in the UK: A national survey



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## ABSTRACT

Thermal injuries affect 250,000 people annually in the United Kingdom. As burn survival improves, good scar management is paramount to help individuals living with the resultant scars lead a life without restrictions. Post-burn hypertrophic scars can limit growth in children, interfere with function and cause psychological problems. In the current literature there is great variation in post-burn scar management across the world and in the evidence available for the efficacy of these management modalities.

The aim of this study was to investigate the variances if any, in the management of post-burn scarring in children across the UK. A telephone survey of UK paediatric burn services was conducted to obtain information on post-burn scar management and advice given to patients/carers. Of the 19 burn services that participated, all advised moisturising of scars but with variable emphasis on massaging. Silicones and pressure therapy were used by 18 services but commencement of use varied from soon after healing to onset of hypertrophic scarring. Laser therapy, ultrasound therapy and steroid therapy were used sporadically.

This study highlights the common modalities of post-burn scar management in children across the UK. However, there is marked variation in timing and selection of the commonly used modalities. Although this study did not investigate the outcomes of scar management, it clearly identifies the need for a well-designed multi-centred study to establish evidence-based best practice in the management of post-burn scarring in children as these modalities are time consuming and not without potential complications. Evidence based practice could potentially lead to significant financial savings to the health service.

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## 1. Introduction

"If the scar be too big, or high, it shall be planed by making convenient ligation and straight binding to the part, a plate of lead rubbed over with quicksilver." Ambroise Pare, 1678 [1].

The problem of poor quality scarring is not new [1], yet the mystery surrounding the pathophysiology and management

of post-burn scarring still exists. Scarring remains an extensive problem: in the UK alone 250,000 people suffer a thermal injury each year including 37,000 children [2,3]. In the developed world four million people suffer post-burn hypertrophic scarring, 70% in children [4].

Apart from the aesthetic problems burn scars present for those affected, burn scars cause significant functional problems too. The loss of adnexal elements such as sebaceous glands, leads to dry, itchy skin and this, combined with a

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fragile neoepidermis, causes the scar to breakdown easily, particularly if scratched.

Many previous authors have investigated the pathophysiology of hypertrophic burn scars and multiple interventions are commonly used worldwide in the management of post-burn scarring across the world [5]. However, there is minimal evidence for their use, an apparent variability between centres and barely any evidence for their efficacy. The mainstay of managing post-burn hypertrophic scarring is: alleviate symptoms of dryness and itch, address lumpiness, redness and stiffness of the scars and prevent contractures, disabilities and reduced mobility.

With the variability in evidence and conflicting findings from studies to date, it seems likely there may exist wide variability in practice between centres treating burns. Even the most common interventions such as use of emollients and moisturisers advocated for scarring have variable evidence of efficacy [6]. Similarly, multiple clinical trials into silicone use have had highly variable results [7]. Furthermore, it is generally agreed that for pressure garments to be maximally effective, they need to be worn for 23 h per day until the scar has fully matured [8,9]. However, this is open to interpretation and individual user bias [8]. With these factors in mind, the aim of this study was to investigate the variation, if any, in post-burn scar management of paediatric patients across the United Kingdom.

## 2. Methods

### 2.1. Telephone survey

UK paediatric burn services were identified through the British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS) 2005 members' booklet and The National Burn Care Review [2]. Two of the thirty-one services identified were excluded as they were in the Republic of Ireland. Of the remaining twenty-nine services, ten no longer had a paediatric burns service, leaving a sample size of nineteen services. At each service verbal consent was taken from the individual deemed most appropriate by their own staff to answer a questionnaire about local post-burn scar management. The survey consisted of a mixture of open and closed questions and was based on the common modalities identified from a review of the literature. Responses were qualitatively analysed, grouped and variation displayed graphically.

## 3. Results

All 19 paediatric burn services approached participated in the survey.

### 3.1. Demographics

Ten of the nineteen paediatric burn services managed children up to the age of 18 years; seven services up to the age of 16 years and the remaining two services managed children up to the age of 13 years for acute burn management. The extent of

injury treated in each of these services depended on the size, age and need for ventilation of the child. These services managed post-burn scarring of all complexity except one service which only dealt with after-care of minor burns.

Post-burn scar management was led by different disciplines of health professionals in the services. They included occupational therapists ( $n = 9$ ), burn nurses ( $n = 9$ ) and a tissue viability nurse ( $n = 1$ ). All services benefited from multi-disciplinary input.

When asked an open question of what advice for scar management, if any, was given to patients once the burn had healed, sixteen services provided general advice on sun care, moisturising scar, swimming, activities and fragility of healed burn. Ten services tailored their advice based on the time to healing and whether or not the patient had undergone skin grafting. Only three services adjusted their advice after the development of hypertrophic scarring.

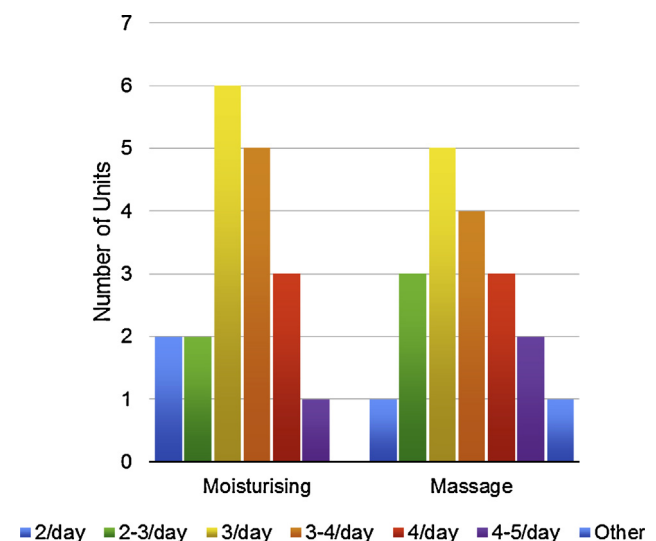
All nineteen services ran outpatient clinics for scar management, with eleven services providing additional outreach services, closer to home. Sixteen services provided written information for parents or carers.

### 3.2. Modalities used for scar management

#### 3.2.1. Moisturising and scar massage

All 19 services recommended both moisturising and massaging of the post-burn scar but the recommended frequency for each varied (Fig. 1). The type(s) of emollient used also varied (Fig. 2) and were often advised in combination.

The majority of services used a combination of techniques for scar massage which included rolling (circular motion) and stretching of the scar ( $n = 12$ ); two services said they used a rolling technique alone whilst two services' stated it depended on the type of scar (with no further detail provided). Three services stated the technique did not matter as long as adequate pressure was applied.



**Fig. 1 – Frequency of massaging and moisturising recommended by UK paediatric burn units. All 19 services recommended scar moisturising and massage but there was high variation in the recommended frequency for each.**

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