Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/burns

Insurance coverage of pediatric burns: Switzerland versus USA

Lina Deghayli [a,1], *Sara Moufarrij* [a,1], *Michael Norberg* [b], *Robert Sheridan* [c], *Wassim Raffoul* [a], *Anthony de Buys Roessingh* [d], *Nathalie Hirt-Burri* [a], *Lee Ann Applegate* [a,*]

[a] *Plastic and Reconstructive Surgery, Unit of Regenerative Medicine, University Hospital of Lausanne, Switzerland*
[b] *Lavey Medical Center, Lavey-les-Bains, Switzerland*
[c] *Shriners Childrens Hospital, Boston, USA*
[d] *Paediatric Surgery, University Hospital of Lausanne, Switzerland*

ARTICLE INFO

Article history:
Accepted 22 October 2013

Keywords:
Pediatric burns
Burn centers
Insurance coverage
Medicare
Shriners
American Burn Association
LaMal/LAA
Quality assessment criteria
Rehabilitation

ABSTRACT

Burn care and research have significantly improved over the past years. However, insurance coverage of such treatments does not reflect the improvements in this multi-disciplinary field. Government insurance policies in first world countries renown for burn care treatment, such as Switzerland and the United States, have not adapted to the complexity and longitudinal nature of burn care. Using case studies from both countries, we have analyzed both the institutional and policy approach to pediatric burn treatment coverage. Subsequently, by presenting the Shriners burn care model, we offer a policy recommendation to both the Swiss and the American governments to better their present legislation and infrastructure on pediatric burn coverage.

1. Introduction

Pediatric burn treatment is a complex and multifaceted field that has grown tremendously in the past decades. Between the two World Wars, children burned at 30% total body surface area (TBSA) faced a mere 50% chance of survival. By the late 1990s, 50% of pediatric patients were expected to survive 91–95% TBSA burns [1]. The implementation of an integrative and holistic approach to burn care and rehabilitation in children is key to the success of the treatment, since such injuries can be as corporal as they can be psychological. The continued follow-up of children as they grow, in addition to the subsequent reconstruction procedures and rehabilitation over several years, is of utmost importance. The treatment of young victims with burns must be undertaken by a dynamic, patient-centered medical team comprised of nurses, surgeons, intensive care specialists, anesthesiologists, psychiatrists, occupational and physical therapists, infectious disease specialists and others, with thorough treatment provided at the onset of ambulatory care up to post-rehabilitation [2]. However, despite the clear medical advances that this field has encountered, support for such comprehensive care remains stifled on the policy front. Due to the specialized and

* *Corresponding author at*: Unit of Regenerative Therapy, Service of Plastic and Reconstructive Medicine, Department of Musculoskeletal Medicine, CHUV/EPCR02/Ch. Croisettes 22, 1066 Epalinges, Switzerland. Tel.: +41 21 314 3510; fax: +41 21 887 84 14.
E-mail address: Lee.Laurent-Applegate@chuv.ch (L.A. Applegate).

[1] Contributed equally for first authorship.

0305-4179/$36.00
http://dx.doi.org/10.1016/j.burns.2013.10.024

expensive nature of burn care, it is crucial that policy work provides the necessary legal framework, facilitated infrastructure and centralized collaborative tools to allow for the medical advances to effectively reach all children in need. This paper evaluates the insurance coverage of pediatric burns in two countries with highly advanced burn care: the United States and Switzerland. By using case studies unique to the United States and the francophone cantons (states) in Switzerland, this article will delve into the advantages and setbacks that pertain to each government's public insurance policies toward pediatric burns. Additionally, government agencies, especially in the United States, have had difficulties supporting those in need of burn care. This has caused private institutions to step in and become major contributors to the treatment of burns in children. One such private institution, the Shriners Hospitals for Children, will be analyzed as a solution to government policy loopholes. Finally, this paper will offer policy recommendations to both nations by advocating for a synergy of the American approach, the Shriners model and the Swiss system of burn care. By placing insurance coverage improvements, infrastructural changes and collaboration between burn centers at the forefront of the agenda, policy can become a buttressing force rather than an obstacle to the advancement of burn care.

2. Defining pediatric burns

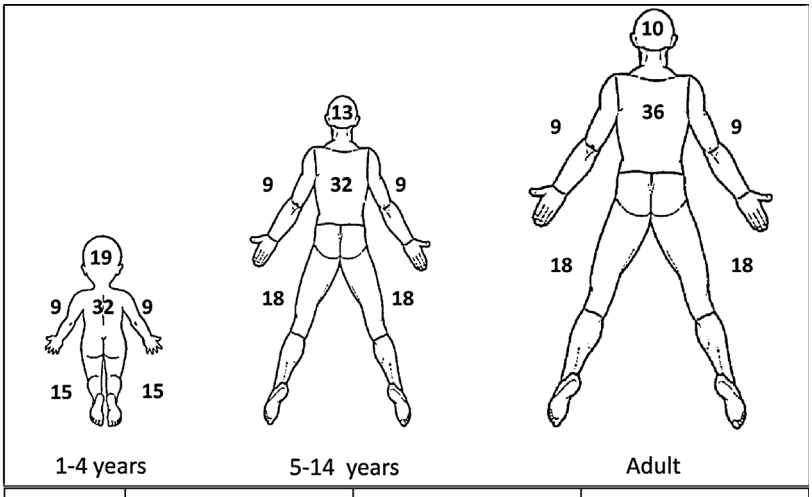
The skin is the largest multifunctional organ in the human body [3]. Burns, which represent the third most frequent fatal injuries in children, jeopardize our first line of defense against the outside world, leaving victims exposed to pathogens, suffering from water loss, impaired body thermoregulation, and UV radiation among many others [4]. When a patient arrives to the emergency room with a burn, it is necessary to accurately assess the depth of a burn wound and its healing potential at an early time point. This will help determine the treatment plan that will minimize scarring and pain, reduce the psychological impact of the injury and allow the patient to be fully reintegrated into society once his or her wounds have healed.

Thermal burns, resulting from contact with flames, heat or scalding liquids, are the most frequent type of burns. According to the 2012 Burn Awareness Campaign, approximately 65% of children under the age of 4 years who were hospitalized for burns were scalded by hot liquids and 20% were hospitalized for contact burns. Chemical and radiation burns have been found to be less common in children.

It is important to stress that burn treatments vary depending on the affected skin layers (Fig. 1B). Determining the TBSA is a crucial step in the diagnosis, and thus, when assessing a pediatric burn, the anatomy of a child's body plays a large role in determining the severity of the burn (Fig. 1A). Children have bigger heads and smaller limbs and thus the method that is commonly used to assess TBSA in adults cannot be applied to children. In the case of a pediatric burn, medical practitioners use the Lund and Browder chart, approximating the burned surface using the child's palm (including the fingers) as a representation for 1% TBSA [4].

A pediatric victim is considered a severely burned patient when the burns affect over 10% TBSA, requiring immediate hospitalization. Skin grafting is required for 2nd degree deep and 3rd degree burns. Surgeons first resort to epithelial autologous grafting, if possible, to cover the burned areas. In

A.



B.

	Affected skin layers	Healing potential	Treatments
1st degree	Epidermis	4 to 5 days with no scarring	Disinfecting creams and viscous cream formulations
2nd degree superficial	Epidermis and superficial layer of the dermis	12 to 15 days with no deep scarring	Bandages with disinfecting creams, viscous creams, and silver hydrofibers
2nd degree deep	Epidermis and deep dermis	Probable surgical treatment	Skin grafting
3rd degree	Epidermis, dermis, hypodermis, and sometimes the underlying structures like muscle and bone	Mandatory surgical treatment	Skin grafting

Fig. 1 – Lund and Browder chart used to approximate the TBSA in children (A) and definition of burn severity in terms of skin depth, healing potential and necessary treatment plan (B).