

## INTERNATIONAL ABSTRACTS

### **ONE WORLD ONE BURN REHABILITATION STANDARD**

According to the World Health Organization (WHO) burns are a huge global health problem resulting in death and devastation to those who survive large burns as they are faced with significant functional limitations that prevent purposeful and productive living. Members of the International Society for Burn Injuries (ISBI) Rehabilitation Committee conducted a needs assessment survey in order to characterize how burn rehabilitation is implemented worldwide and how the international burn rehabilitation community can help improve burn rehabilitation in identified geographic locations which need assistance in rehabilitating burn survivors successfully. The results of this survey indicated that poor and in some cases resource limited environments (RLEs) around the world seem to lack the financial, educational and material resources to conduct burn rehabilitation successfully. It appears that there are vast discrepancies in the areas of education, training and capacity to conduct research to improve the care of burn survivors as evidenced by the variation in responses between the RLEs and developed countries around the globe. In some cases, the problem is not knowledge, skill and ability to practice burn rehabilitation, but rather having the resources to do so due to financial difficulties.

M.A. Serghiou et al.  
Burns, 42(5): 1047-1058, 2016

### **REAL-TIME PREDICTION FOR BURN LENGTH OF STAY VIA MEDIAN RESIDUAL HOSPITAL LENGTH OF STAY METHODOLOGY**

Hospital length of stay (LOS) after burn injury is commonly estimated as 1 day per percent burn, but LOS often exceeds that estimate. The authors of this paper used the American Burn Association National Burn Repository from 2000 to 2009 to directly estimate the median residual LOS (MRLOS) of patients hospitalized for burn injuries and who survived to discharge. The MRLOS is the median of how many more days a burn patient will be hospitalized given that the person has been in hospital for a specified time period. The authors also estimated the 25th and 75th percentiles of residual life and quantified the relationship between MRLOS and LOS with ordinary least squares for all burn patients, by burn size and by presence of inhalation injury. They found that MRLOS increased with increasing LOS, confirming that discharge estimates change over time. Patients with inhalation injury had longer MRLOS than patients without inhalation injury in the first 100 hospital days. Patients with large burns (>25%) had large MRLOS consistent with prolonged hospitalization, but patients with small burns (<25%) also had steadily increasing MRLOS during hospitalization (i.e. the longer the patient was

in the hospital, the longer the predicted LOS regardless of initial LOS estimate). They conclude that MRLOS can be used to provide an estimate of remaining hospital LOS and resource utilization to families, administrators and other medical professionals.

S.L. Taylor et al.  
Journal of Burn Care & Research, 37(6): 379-387, 2016

### **EMERGING FROM THE TRAUMA BUBBLE: REDEFINING 'NORMAL' AFTER BURN INJURY**

This study, conducted in Australia, looks at the experience of hospitalisation and recovery following a burn injury. It is common for patients and their families to experience emotional trauma in the aftermath of injury, and incidence may be unrelated to burn size and severity. In the paper, the authors look at how people begin to redefine normality during the recovery process and the support they need while doing so. They used Heideggerian phenomenology, framed by Merleau-Ponty's philosophy of the body. They conducted in-depth, semi-structured interviews with 18 patients 1–3 weeks after they had been discharged from hospital, and with family members. The authors conclude that normality is gradually redefined through practices that keep family close, engage patients in early self-care and allow time, space and support for their return to work. Patients, initially confronted by their own physical otherness, share their recovery with fellow burns survivors and seek affirmation from family to negotiate a 'different' normal, integrated into a new self-concept. Early rehabilitation can be strengthened by promoting carer involvement, patient self-efficacy and peer support.

R.A. Johnson et al.  
Burns, 42(6): 1223-1232, 2016

### **PEDIATRIC BURN RESUSCITATION**

Burn is one of the leading causes of injury or death in children under 9 years old. Initial burn resuscitation influences the long-term outcome of children with burn injury therefore it is essential that they receive the appropriate treatment. In this paper, the authors look at the unique physiologic, physical, psychological and social needs of children compared with adults. Children's airway anatomy is different to that of adults, resulting in a higher incidence of upper airway obstruction due to edema. Also, children have a greater body surface area to volume ratio therefore they have higher intravenous fluid requirements per percent burn and are prone to hypothermia. Moreover, they are often unable to verbalise their needs, making pain management difficult. Although adhering to the basic tenets of burn resuscitation, resuscitation of the burned child

should be modified based on the child's age, physiology, and response to injury. This article outlines the unique characteristics of burned children and describes the fundamental principles of pediatric burn resuscitation in terms of airway, circulatory, neurologic and cutaneous injury management.

T.L. Palmieri

Critical Care Clinics, 32(4): 547-559, 2016

### **CHARACTERISTICS AND OUTCOMES OF SELF-INFLICTED VERSUS ACCIDENTAL BURNS**

In this paper, the authors aim to identify the differences in characteristics and outcomes of self-inflicted compared to accidental burns. Self-inflicted burns are complex and require intense management in hospital and the community. A single regional burns centre conducted a retrospective analysis on data obtained from the International Burns Database from April 2013 to March 2014. Demographics, burn characteristics and overall mortality of all acute burn admissions via self-inflicted or accidental modes were statistically analysed. Out of a total of 336 patients, 24 had sustained self-inflicted burns. Male to female ratio was 1.3:1 with no significant difference in mode of injury ( $P = 0.448$ ). The self-inflicted group was more likely to have a prior psychiatric history ( $P < 0.001$ ), higher TBSA ( $P < 0.001$ ), repeat admissions and longer length of stay. The cause of burn was consistently flame burns in the self-inflicted group ( $P = 0.003$ ) with associated inhalational injury compared to scald/contact burns in the accidental group. The overall probability of death was 20.8% in the self-inflicted group vs. 2.6% in the accidental group. The authors conclude that self-inflicted burn patients are a vulnerable group and more attention needs to be focused on developing strategies to reduce their morbidity and mortality, with the collaboration of general practitioners, psychologists and psychiatrists.

O. Ali and A. Farroha

International Journal of Surgery, 23 (Supplement 1): S91-S92, 2015

### **WHICH BURN OUTCOMES DO PATIENTS ANTICIPATE AS MOST LIKELY TO BE IMPORTANT**

The authors of this paper conducted a survey to identify which outcomes are most important to newly burned patients, and explored the association between demographic/burn characteristics and patient preferences. The survey involved 753 of 776 patients seen by their burn service from 2008 to 2013 during the initial encounter. Patients were asked to rate the anticipated importance of several burn outcomes including cosmetic appearance, resumption of normal function, and the lack of pain/itching on a four-item Likert scale (not important, somewhat important, important, and extremely important). The association between demographic and burn characteristics with patient views on the importance of various outcomes was explored with  $\chi^2$  and nonparametric tests. Patient mean (SD) age was 30 (22) years, 58% were males, 69% were white. Overall, function was extremely important to 96% of patients, lack of pain/itching was extremely important to 85%, and cosmesis was extremely important to 59%. Cosmesis was extremely im-

portant to more females than males (69 vs. 52%;  $P < .001$ ) and the mean age of patients in whom cosmesis was extremely important was lower than those in whom it was not (25 vs. 40;  $P < .001$ ). Cosmesis was more commonly extremely important in patients with head/neck than extremity burns (67 vs. 57%;  $P < .001$ ). Levels of importance for function and lack of pain/itching did not differ by gender, age, TBSA or burn location. Thus, return to normal function and lack of pain and itching appear to be more commonly very important to burn patients than the cosmetic appearance of their burns. Cosmesis was of greater importance to younger patients, female patients, and those with head/neck burns. Burn therapies should focus on achieving the outcomes that patients anticipate as most important.

S. Sandoval et al.

Journal of Burn Care and Research, 37(6): e515-518, 2016

### **THE BURNED EAR: POSSIBILITIES AND CHALLENGES IN FRAMEWORK RECONSTRUCTION AND COVERAGE**

In this review, the authors look at clinical challenges and current ear reconstruction options for burn patients. The ear is particularly vulnerable to thermal injury because of its location and thin integument. Thermal injury could subsequently include skin and the deeper located auricular cartilage framework and have long lasting mutilating effects. Each burned ear is a unique case requiring different reconstructive treatment. Grafts of costal cartilage or synthetic materials might replace missing cartilage. The quality of adjacent tissue is of paramount importance for burn reconstruction. If quality is poor, the reconstruction of a burned ear can be an even more daunting procedure than that for congenital or many oncologic indications. The choice of framework depends mainly on the availability of transplantable tissue. As such, regeneration of the skin will be the next step in reconstruction of the burned ear. There is still much development and research to be done, but encouraging results have been shown in tissue engineering of skin and cartilage. Furthermore, 3D (bio)printing of cartilage to facilitate reproduction of the ear's complex shape certainly has potential and might have an interesting role in the future of ear reconstruction. Although still far from large scale clinical application, state of the art developments in the field of tissue engineering and 3D (bio)printing are also discussed.

E.J. Bos et al.

Burns, 42(7): 1387-1395, 2016

### **THE MANAGEMENT OF PAIN ASSOCIATED WITH WOUND CARE IN SEVERE BURN PATIENTS IN SPAIN**

In this multi-centre, observational, cross-sectional, descriptive study the authors describe the management of pain prevention associated with burn care. Patients attending the BUs of four centres in Spain between November 2012 and April 2013 were sequentially included in the study. Only patients of legal age ( $\geq 18$ ) with severe burns that presented with severe baseline pain and were to receive local wound care that was expected to cause pain were invited to participate. A total of 55 patients underwent 64 procedures. Burns were classified

as severe (90.4%), third-degree (78.2%) and caused by thermal agents (81.8%). Background analgesia consisted of non-opioid drugs (87.5%) and opioids (54.7%) [morphine (20.3%), morphine and fentanyl (14.1%) or fentanyl monotherapy (15.6%)]. Burn care was provided by experienced nurses (96.9%); 36.5% followed guidelines. The mean duration of procedures was 44 minutes (Statistical Deviation, SD: 20.2) and the mean duration of pain was 27 minutes (SD: 44.6). Procedural pain was primarily managed with opioid analgesics: fentanyl monotherapy and in combination (84%) and fentanyl monotherapy (48%) administered sublingually (89.1%). Patients described pain as different to usual baseline pain (97%), with a mean maximum intensity score of 4.2 points (SD: 3.3) on the VAS scale and a 34% increase in the intensity of pain. The mean patient and healthcare professional satisfaction score per procedure was 6/10 (SD: 1.9) and 5.5/10 (SD: 1.7), respectively. The authors conclude that ineffectively managing procedural pain or the lack of an appropriate pain management plan may lead patients to lose trust in healthcare professionals (HCP), increase pain perception and affect wound healing. Therefore pain management should be integrated as an essential component of the wound management plan in patients with severe burns. However this should involve a multidisciplinary approach that ensures all the components of pain perception and distress suffered by the burn patient are adequately addressed.

A. Mendoza et al.

International Journal of Burns and Trauma, 6(1): 1-10, 2016

### **COLD BURN INJURIES IN THE UK: THE 11-YEAR EXPERIENCE OF A TERTIARY BURNS CENTRE**

Guidance for the management of cold burn injuries is not widely available. The management of these burns differs from the standard management of thermal injuries. This study aimed to review the etiology and management of all cold burns presenting to a large regional burn centre in the UK and to provide a simplified management pathway for cold burns. The authors conducted an 11-year retrospective analysis of all cold injuries presenting to the burn centre from 1st January 2003 to 31st December 2014. Patient case notes were reviewed for injury mechanism, first aid administered, treatment outcomes and time to healing. An anonymized nationwide survey on aspects of management of cold burns was disseminated between 13th July 2015 and 5th October 2015 to British Association of Plastic Reconstructive and Aesthetic Surgeons (BAPRAS) and Plastic Surgery Trainees Association (PLASTA) members in the UK. Electronic searches of MEDLINE, EMBASE and the Cochrane Library were performed to identify relevant literature to provide evidence for a management pathway for cold burn injuries. The authors conclude that in the UK, a disproportionate number of cold burn injuries are deliberately self-inflicted, especially in the younger patient population. These findings reflect a gap in clinical knowledge and experience. They propose a simplified management pathway for managing cold burn injuries, consisting of adequate first aid using warm water, oral prostaglandin inhibitors, deroofing of blisters and topical antithromboxane therapy.

M. Nizamoglu et al.

Burns & Trauma, 4: 36, 2016.

### **THE USE OF BLOOD PRODUCTS IN ADULT PATIENTS WITH BURNS**

Burn anaemia is a common complication following a burn injury. In this study conducted in Finland, the authors aimed to analyze the use of blood components in burn victims and to identify patient- and injury-related factors influencing their use. They collected data from the Optimal Use of Blood registry, developed through co-operation between 10 major hospital districts and the Finnish Red Cross Blood Service.

Burn patients over 18 years old, who were treated at the Helsinki University Hospital between 2005 and 2011, had been admitted to hospital for at least 1 day and had received at least one transfusion during their hospital stay were included in this study. Out of a total of 558 burn patients, 192 (34%) received blood products during their hospital stay. The transfused cohort of 192 burn patients received a total of 6087 units of blood components, 2422 units of leukoreduced red blood cells, 1728 units of leukoreduced platelets, and 420 units of single-donor fresh frozen plasma or, after 2007, 1517 units of Octaplas® frozen plasma.

All three types of blood components were administered to 29% of patients, whereas 45% received only red blood cells and 6% received only Octaplas.

Transfused patients were significantly older ( $p < 0.001$ ), had experienced fire-/flame-related accidents and suffered burns to multiple locations ( $p < 0.001$ ), and their in-hospital mortality exceeded that for non-transfused burn patients five-fold ( $p < 0.05$ ). Results show that Finnish adult burn patients received ample transfusions.

The number of blood components transfused varied according to the anatomical location of the injury and patient survival. Whether the additional mortality is related directly to transfusions or is merely a manifestation of the more severe burn injury remains unknown.

V. Koljonen et al.

Scandinavian Journal of Surgery, 105(3): 178-185, 2016

### **MANAGING BURN WOUNDS WITH SMARTPORE TECHNOLOGY POLYURETHANE FOAM: TWO CASE REPORTS**

Successful wound healing depends on various factors, including exudate control, prevention of microbial contaminants, and moisture balance.

In this case report the authors describe the clinical presentation, objective findings, and outcomes of burn wound management for one pediatric and one adult patient using SMARTPORE Technology polyurethane foam dressing.

They conclude that managing burn wounds with SMARTPORE Technology polyurethane foam resulted in reduced pain during dressing changes and the successful healing of partial and mixed thickness wounds. The use of SMARTPORE Technology polyurethane foam dressings showed encouraging results and requires further research as a desirable management option in burn wounds.

Imran F.H. et al.

Journal of Medical Case Reports, 10:120, 2016

## **TELEHEALTH FOR PAEDIATRIC BURN PATIENTS IN RURAL AREAS: A RETROSPECTIVE AUDIT OF ACTIVITY AND COST SAVINGS**

This paper reports the results of an audit of a paediatric burns telehealth service set up in Western Australia in 2005. The service provides a state-wide clinical consultancy and support service for the assessment and management of acute and rehabilitative burn patients. Primarily, it involves acute and long-term patient reviews conducted by the metropolitan-located burn unit in contact with health practitioners, advising patients and their families residing outside the metropolitan area thereby avoiding unnecessary transfers and inpatient bed days. The aim of the retrospective audit was to calculate avoided transfers and bed days in 2005/06–2012/13 as a result of the use of the paediatric Burns Telehealth Service and estimate cost savings in 2012/13. It identified activity, avoided unnecessary acute and scar review patient transfers, inpatient bed days and their associated avoided costs to the tertiary burn unit and patient travel funding. Over the period 2005/06–2012/13 the audit identified 4,905 avoided inpatient bed days, 364 avoided acute patient transfers and 1,763 avoided follow up review transfers for a total of 1,312 paediatric burn patients as a result of this telehealth service. Cost savings in 2012/13 were estimated to be AUD 1.89 million.

T. McWilliams et al.  
Burns, 42(7): 1487-1493, 2016

## **SURGICAL BURN CARE BY MÉDECINS SANS FRONTIÈRES-OPERATIONS CENTER BRUSSELS: 2008 TO 2014**

Humanitarian organizations care for burn victims during crisis and support healthcare facilities in low-income and middle-income countries. This paper presents the results of a review of procedures performed in operating theatres run by Médecins Sans Frontières-Operations Centre Brussels (MSF-OCB) from July 2008 to June 2014. Surgical specialist missions were excluded. Burn procedures were quantified, related to demographics and the reason for humanitarian response, and described. A total of 96,239 operations were performed during 27 MSF-OCB projects in 15 countries between 2008 and 2014. Of the 33,947 general surgical operations, 4,280 (11%) were for burns. The proportion of procedures for burns steadily increased from 3% in 2008 to 24% in 2014. People receiving surgical care during conflict relief missions had nearly twice the odds of having a burn operation compared with people requiring surgery in communities affected by natural disaster (adjusted odds ratio, 1.94; 95% confidence interval, 1.46–2.58). Nearly 70% of burn procedures were planned serial visits to the theatre. A diverse skill set was required. Unmet humanitarian assistance needs increased by US\$400 million dollars in 2013 in the face of an increasing number of individuals affected by crisis and a growing surgical burden. Given the high volume of burn procedures performed at MSF-OCB projects and the resource intensive nature of burn management, requisite planning and reliable funding are necessary to ensure quality burn care in humanitarian settings.

B.T. Stewart et al.  
Journal of Burn Care & Research, 37(6): 519-524, 2016

## **PRACTICE GUIDELINES FOR CARDIOVASCULAR FITNESS AND STRENGTHENING EXERCISE PRESCRIPTION AFTER BURN INJURY**

The objective of this review was to systematically evaluate clinical evidence for the prescription of strength training and cardiovascular endurance exercise programs for pediatric and adult burn survivors in order to propose practice guidelines. It provides evidence-based recommendations specifically for rehabilitation professionals who are responsible for burn survivor rehabilitation.

The literature was retrieved by systematic review, was critically appraised by multiple authors, and the level of evidence was determined in accordance with the Oxford Centre for Evidence-based Medicine criteria. Summary recommendations were then made. Although gaps in the literature persist and should be addressed in future research projects, current research evidence supports the prescription of strength training and aerobic conditioning exercise programs for both adult and pediatric burn survivors when in the presence of strength limitations and/or decreased cardiovascular endurance after evaluation.

B. Nedelec et al.  
Journal of Burn Care & Research, 37(6): 539-558, 2016

## **EXPLORING THE ACCEPTABILITY OF A CLINICAL DECISION RULE TO IDENTIFY PAEDIATRIC BURNS DUE TO CHILD ABUSE OR NEGLECT**

The authors of this paper developed an evidence-based clinical decision rule (CDR) from a systematic review and epidemiological study to identify burns due to child maltreatment (abuse or neglect).

The aim here was to explore clinicians' views of the CDR, the likelihood that it would influence their management and factors regarding its acceptability. A semi-structured questionnaire on demographics, views of the CDR and data collection pro forma, ability to recognise maltreatment and likelihood of following CDR recommended child protection (CP) action was administered to 55 doctors and nurses in eight emergency departments and two burns units.

Recognition of maltreatment was assessed via four fictitious case vignettes. The majority of participants found the CDR and data collection pro forma useful (45/55, 81.8%). Only five clinicians said that they would not take the action recommended by the CDR (5/54, 9.3%). Lower grade doctors were more likely to follow the CDR recommendations ( $p=0.04$ ) than any other grade, while senior doctors would consider it within their decision-making. Factors influencing uptake include: brief training, background to CDR development and details of appropriate actions. The authors conclude that clinicians are willing to use a CDR to assist in identifying burns due to child maltreatment.

However, an implementation evaluation must encompass the influential variables identified to maximise uptake.

Johnson E.L.  
Emergency Medicine Journal,  
doi:10.1136/emermed-2014-204568

### **CLINICAL EFFICACY TEST OF POLYESTER CONTAINING HERBAL EXTRACT DRESSINGS IN BURN WOUND HEALING**

In this paper from Thailand, the authors describe a study to report the clinical efficacy of using polyester dressings containing herbal extract to heal second-degree burns. Today there is a variety of wound products that help to heal and prevent infection, providing comfort and reducing pain during application. However, in Thailand most of these wound-healing products are imported at high cost to patients. Therefore, research into herbs that could provide successful wound care is increasing.

Herbal wound products are currently being introduced as alternatives to imported dressings. In this study, volunteers were divided into a study group of patients treated with polyester dressings containing herbal extract and a control group of patients treated with commercially available and commonly used dressings. The standard treatment protocols were performed every 3 days at dressing change. Time of healing, length of hospital stay, pain analog score, percentage of infection and descriptive notification of unfavourable clinical symptoms or signs or side effects were evaluated.

P. Muangman et al.  
International Journal of Lower Extremity Wounds,  
15(3): 203-212, 2016

### **INTERNATIONAL OBSERVATIONAL STUDY OF NUTRITIONAL SUPPORT IN MECHANICALLY VENTILATED PATIENTS FOLLOWING BURN INJURY**

It has been proposed that nutritional therapy in critically ill patients after major burn reduces mortality. However, the actual practice of nutrient delivery and the effect on outcome has not been described. The objective of this study was to evaluate international practices related to nutritional support and outcomes in mechanically ventilated patients with burn injury. The authors extracted and analysed data from the International Nutrition Surveys (2007–2011) for patients with a primary diagnosis of burn. Eighty-eight out of 90 patients (aged 16–84 years) received enteral nutrition. The median time for initiation of enteral feeding was 17 h [range 0–65]. Fifty patients (57%) had interruptions to nutrient delivery, most often due to the need to fast before an operation. There were substantial energy and protein deficits [943 (654) kcal/day and 49 (41) g/day, respectively; mean (SD)]. Nineteen (21%) patients died within 60 days of admission, and the energy and protein deficits were greater in those who died than in survivors [died vs. survived, energy: 1251 (742) vs. 861 (607) kcal/d;  $p = 0.02$ ; and protein 67(42) vs. 44(39) g/d;  $p = 0.03$ ]. Energy and protein deficits were associated with increased mortality, with the greater the deficit, the stronger the association with death (odds ratio for death: energy deficit/100 kcal 1.10 (1.01, 1.19);  $p = 0.028$  and protein/10 g 1.16 (1.01, 1.33);  $p = 0.037$ ). Results were similar and remained significant after adjusting for severity of illness. The authors conclude that mechanically-ventilated burn patients develop substantial energy and protein deficits, with lesser deficits observed in survivors.

Adam Czupran  
Burns 41(3): 510-518, 2016

### **USING ONLINE BLOGS TO EXPLORE POSITIVE OUTCOMES AFTER BURN INJURIES**

This study uses blog analysis, a new and novel technique, to explore the positive outcomes experienced by burn survivors. The authors examined 10 burn survivor blogs to offer a unique, longitudinal insight into burn survivor recovery. Using thematic analysis, three themes emerged: shift in self-perception, enhanced relationships and a change in life outlook. Many of these themes contained stories and experiences unique to a traumatic burn injury, suggesting that standardised trauma scales are not effectively measuring the impact of a burn in this population. Reflections on blog analysis are discussed, along with a recommendation that health researchers utilise the vast amount of data available from online blogs.

K. Garbett et al.  
Journal of Health Psychology,  
2016 Mar 27. pii: 1359105316638549.

### **ASSESSMENT OF DEPRESSION AND THE QUALITY OF LIFE IN BURN PATIENTS SEEKING RECONSTRUCTION SURGERY**

Thanks to progress in the field of burns treatment, the outcome of extensive burns has improved significantly. The increased likelihood of survival of a burn victim heightens concerns for potential psychological morbidity. The aim of this study was to identify the magnitude of depression in burn patients, quality of life (QOL), the correlation between depression and QOL, and the predictive factors for QOL in burns. Sixty burn patients aged from 18 to 65 years seeking consultation for reconstructive surgery were included in the study. An equal number of healthy controls of similar age and sex were enrolled for comparison.

Participants were assessed for depression and QOL using a patient health questionnaire (PHQ-9) and the World Health Organization quality of life-BREF scale, respectively. The authors found that depression was statistically significant in burn patients compared to controls. Overall QOL was found to be significantly lower. A significant inverse fair correlation existed between the PHQ-9 and QOL. Lower QOL in burn patients positively associated with multiple factors like female patients, the involvement of an exposed part, facial burn, etc. The authors conclude that the high prevalence of clinically significant depression and lower QOL in burn reconstruction patients and their relationship with body image indicate the importance of routine psychological screening for patients seeking reconstruction surgery.

Akhilesh Jain et al.  
Indian Journal of Burns, 23(1): 37-42, 2016