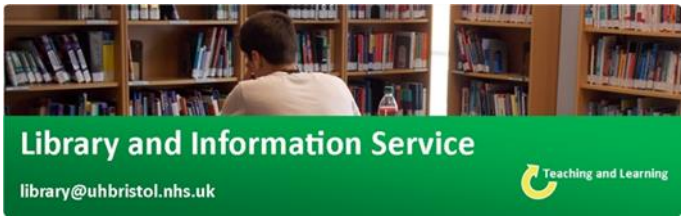
University Hospitals Bristol NHS
NHS Foundation Trust

Burns

Evidence Update

May 2018 (Quarterly)

Respecting everyone
Embracing change
Recognising success
Working together
Our hospitals.



Contents

Training Calendar 2018

All sessions are one hour

May (13.00-14.00)
3rd (Thu) Critical Appraisal
11th (Fri) Statistics
14th (Mon) Literature Searching
22nd (Tue) Critical Appraisal
30th (Wed) Statistics

June (12.00-13.00)
7th (Thu) Literature Searching
11th (Mon) Critical Appraisal
20th (Wed) Statistics
28th (Thu) Literature Searching

Your Outreach Librarian: Jo Hooper

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Outreach: Your Outreach Librarian can help facilitate evidence-based practice for all in the team, as well as assisting with academic study and research. We also offer one-to-one or small group training in **literature searching, critical appraisal and medical statistics**. Get in touch: library@uhbristol.nhs.uk

Literature searching: We provide a literature searching service for any library member. For those embarking on their own research it is advisable to book some time with one of the librarians for a one-to-one session where we can guide you through the process of creating a well-focused literature research. Please email requests to library@uhbristol.nhs.uk

Updates

NICE National Institute for Health and Care Excellence

Guidelines for the Provision of Anaesthesia Services for Burn and Plastics Surgery 2018 [PDF]
Source: Royal College of Anaesthetists - 16 March 2018

Revised SPC: Imnovid (pomalidomide) 2mg Source: electronic Medicines Compendium - eMC - 09 May 2018 - Publisher: electronic Medicines compendium Read Summary

An Overview of the use of Bromelain-Based Enzymatic Debridement (Nexobrid(R)) in Deep Partial & Full Thickness Burns: Appraising the Evidence Source: PubMed - 22 March 2018 - Publisher: Journal Of Burn Care & Research : Official Publication Of The American Burn Association Read Summary

Cochrane Library

No new relevent evidence

UpToDate®

OpenAthens login required. Register here: https://openathens.nice.org.uk/

Treatment of minor thermal burns
- Summary and recommendations

Overview of the management of the severely burned patient
- Summary and recommendations

Treatment of deep burns
- Summary and recommendations

Topical agents and dressings for local burn wound care
- Summary and recommendations

Overview of nutritional support for moderate-to-severe burn patients
- Summary and recommendations
-

Treatment of superficial burns requiring hospital admission
- Summary and recommendations

Overview of surgical procedures used in the management of burn injuries
- Summary and recommendations

BBA: British Burn Association

The BBA 2017 Newsletter is available to download HERE

BBA EVENTS

MAY

Minor Burns Study Day @ Medical Academic Unit, Broomfield Hospital

May 22 all-day

JUN

Introduction to Burn Care Course @ Medical Academic Unit, Broomfield Hospital

Jun 6 @ 9:00 am – Jun 8 @ 5:00 pm

Royal College of Emergency Medicine: How to Successfully Manage the Transition from Trainee to Consultant @ Octavia House

Jun 14 all-day

BBA Emergency Management of Severe Burns (EMSB) Course @ Chelmsford, London

Jun 16 all-day

Monor Burns Injury Management Free Study Day @ Medical Academic Unit, Broomfield Hospital

Jun 22 all-day

BBA Emergency Management of Severe Burns (EMSB) Course @ Nottingham

Jun 29 all-day

AUG

BBA Emergency Management of Severe Burns (EMSB) Military Course @ Strensall, Yorks

Aug 23 – Aug 24 all-day

SEP

Manchester Burns Course – Critical Care and Rehabilitation Units @ Wythenshawe or Oxford Road Manchester University NHS Foundation Trust

Sep 6 @ 9:00 am – Nov 16 @ 5:00 pm

Royal College of Emergency Medicine & European Society of Emergency Medicine Scientific Conference @ Scottish Event Campus (SEC)

Sep 8 @ 9:00 am – Sep 12 @ 5:00 pm

BBA Emergency Management of Severe Burns Instructor Course @ Bristol

Sep 14 all-day

Journal Tables of Contents

Click on the hyperlinked journal title (+Ctrl) for the most recent tables of contents. If you would like any of the papers in full text then please email the library: library@uhbristol.nhs.uk

Burns

June 2018 Volume 44, Issue 4, p731-1024

Journal of Burn Care & Research

Volume 39, Issue 3 May/June 2018

Injury Prevention

April 2018 - Volume 24 – 2

Plastic and Reconstructive Surgery

May 2018 - Volume 141 - Issue 5

Journal of Plastic, Reconstructive & Aesthetic Surgery

May 2018 Volume 71, Issue 5, p615-784

Archives of Disease in Childhood

May 2018 - Volume 103 – 5

Pediatrics

May 2018, VOLUME 141 / ISSUE 5

Injury

May 2018 Volume 49, Issue 5, p883-1000

Trauma

Volume 20, Issue 2, April 2018

Library Clinic

Stop by and find out more about our services. We will be here to answer any questions you may have!

June 6th: **Terrace (Level 4, Education Centre)** *12.00-14.00*

June 19th: **Welcome Centre, BRI** *10.00-16.00*

July 3rd: **Welcome Centre, BRI** *10.00-16.00*

July 4th: **Canteen (Level 9, BRI)** *12.00-14.00*

August 8th: **Foyer, Education Centre** *12.00-14.00*

August 29th: **Foyer, St Michael's Hospital** *12.00-14.00*

September 5th: **Canteen (Level 9, BRI)** *12.00-14.00*

September 11th: **Welcome Centre, BRI** *10.00-16.00*

October 3rd: **Terrace (Level 4, Education Centre)** *12.00-14.00*

November 7th: **Canteen (Level 9, BRI)** *12.00-14.00*

December 5th: **Foyer, Education Centre** *12.00-14.00*

December 11th: **Welcome Centre, BRI** *10.00-16.00*

Departmental News

News, Research, Conferences, Training etc

Please contact us with any departmental news you wish to share with your colleagues in your Evidence Update bulletin.
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Use of procalcitonin as a biomarker for sepsis in moderate to major paediatric burns

Linda Hollén, Ryan Hughes, Nick Dodds, Karen Coy, Karen Marlow, Nicola Pullan, Julie Davies, Narges Dailami, Katrina Keating, Sian Falder, Mamta Shah, Amber Young

First Published March 27, 2018 Research Article **Download PDF**

Database Articles

Below are a selection of articles on burns recently added to the healthcare databases. If you would like any of the following articles in full text, or if you would like a more focused search on your own topic, then get in touch: library@uhbristol.nhs.uk

Effectiveness of virtual reality-based pain control as compared to standard pain management in children with acute burns: A meta-analysis

Author(s): Semas, Melissa

Source: Dissertation Abstracts International: Section B: The Sciences and Engineering; 2018; vol. 78 (no. 10)

Publication Type(s): Dissertation Abstract Dissertation

Abstract: Each year approximately 250,000 children require medical attention for burns. Burn pain is often severe and unrelenting, which can lead to a multitude of secondary problems such as long term sensory issues, chronic pain, and debilitating psychological conditions. Although improvements have been made, there is a consensus that burn pain remains grossly undertreated. Virtual reality (VR) has been shown to be effective for pain management in adults with burns, but its effectiveness has not yet been proven in a pediatric population. The U.S National Library of Medicine National Institutes of Health (PubMed), CINAHL Plus, and ScienceDirect databases were searched systematically using the following search terms: pediatric burns AND virtual reality AND pain. Eight studies met inclusion and exclusion criteria and were analyzed through OpenMeta[Analyst] software using a 2 group design. Statistical analysis demonstrated heterogeneity with statistical significance in favor of the virtual reality group (Q=103.21, p<0.001) with a combined effect size of -1.39 (95% CI: -1.16, -1.63). VR is a safe and efficacious treatment for pain in children with burns and despite heterogeneity between articles, it was found to be superior to standard care for burn pain management. Research in the future should further examine the correlation between level of immersion in VR and level of pain reduction as well as the correlation between pain reduction and faster re-epithelialization times. (PsycINFO Database Record (c) 2017 APA, all rights reserved)

An evaluation of management of transferred paediatric burn patients

Author(s): Naumeri F.; Ahmad A.I.; Ahmad H.M.; Malik U.; Sarwar M.Z.

Source: Journal of the Pakistan Medical Association; May 2018; vol. 68 (no. 5); p. 787-789

Publication Type(s): Article

Abstract: The aim of study was to evaluate whether adequate initial management and safe transfer of paediatric burn patients was carried out in our setup. Patients transferred from other hospitals/ cities to Paediatric Surgery Department, Mayo Hospital were evaluated in this prospective study. Data was entered in a proforma. Around 90.4% patients on presentation had discrepancy in their burn percentage calculation. No intravenous fluids were administered to 75.4% patients and 71.1% patients did not have any intravenous access. Foley's catheter was inserted in 2 patients only though 72.8% needed it. No fasciotomy was performed in 10.5% patients needing it. Two patients needed endotracheal intubation but it was not passed, 49.1% patients were transferred by ambulance and 28.9% patients presented with sepsis. The mortality rate was 38.2%. Initial fluid resuscitation was compared with survival and found significant (p=0.000). This shows that initial burn management, transfer system and referral system is full of errors.

Improving mortality outcomes of Stevens Johnson syndrome/toxic epidermal necrolysis: A regional burns centre experience

Author(s): Nizamoglu M.; Ward J.A.; Frew Q.; Gerrish H.; Martin N.; Shaw A.; Barnes D.;

Source: Burns; May 2018; vol. 44 (no. 3); p. 603-611

Publication Type(s): Article

Abstract: Introduction: Stevens Johnson Syndrome/toxic epidermal necrolysis (SJS/TEN) are rare, potentially fatal desquamative disorders characterised by large areas of partial thickness skin and mucosal loss. The degree of epidermal detachment that occurs has led to SJS/TEN being described as a burn-like condition. These patients benefit from judicious critical care, early debridement and meticulous wound care. This is best undertaken within a multidisciplinary setting led by clinicians experienced in the management of massive skin loss and its sequelae. In this study, we examined the clinical outcomes of SJS/TEN overlap & TEN patients managed by our regional burns service over a 12-year period. We present our treatment model for other burn centres treating SJS/TEN patients. Methods: A retrospective case review was performed for all patients with a clinical diagnosis of TEN or SJS/TEN overlap admitted to our paediatric and adult burns centre between June 2004 and December 2016. Patient demographics, percentage total body surface area (%TBSA), mucosal involvement, causation, severity of illness score (SCORTEN), length of stay and survival were appraised with appropriate statistical analysis performed using Graph Pad Prism 7.02 Software. Results: During the study period, 42 patients (M26; F: 16) with TEN (n = 32) and SJS/TEN overlap (n = 10) were managed within our burns service. Mean %TBSA of cutaneous involvement was 57% (range 10-100%) and mean length of stay (LOS) was 27 days (range 1-144 days). We observed 4 deaths in our series compared to 16 predicted by SCORTEN giving a standardised mortality ratio (SMR) of 24%. Conclusion: Management in our burns service with an aggressive wound care protocol involving debridement of blistered epidermis and wound closure with synthetic and biological dressings seems to have produced benefits in mortality when compared to predicted outcomes.

The effectiveness and cost-effectiveness of first aid interventions for burns given to caregivers of children: A systematic review

Author(s): Nurmatov U.B.; Quinn-Scoggins H.; Kemp A.; Mullen S.; Mann M.

Source: Burns; May 2018; vol. 44 (no. 3); p. 512-523

Publication Type(s): Review

Abstract: Objectives: the effectiveness and cost-effectiveness of burns first-aid educational interventions given to caregivers of children. Methods: Systematic review of eligible studies from seven databases, international journals, trials repositories and contacted international experts. Results: Of 985 potential studies, four met the inclusion criteria. All had high risk of bias and weak global rating. Two studies identified a statistically significant increase in knowledge after of a media campaign. King et al. (41.7% vs 63.2%, p < 0.0001), Skinner et al. (59% vs 40%, p = 0.004). Skinner et al. also identified fewer admissions (64.4% vs 35.8%, p < 0.001) and surgical procedures (25.6% vs 11.4%, p < 0.001). Kua et al. identified a significant improvement in caregiver's knowledge (22.9% vs 78.3%, 95% CI 49.2, 61.4) after face-to-face education intervention. Ozyazicioglu et al. evaluated the effect of a first-aid training program and showed a reduction in use of harmful traditional methods for burns in children (29% vs 16.1%, p < 0.001). No data on cost-effectiveness was identified. Conclusion: There is a paucity of high quality research in this field and considerable heterogeneity across the included studies. Delivery and content of interventions varied. However, studies showed a positive effect on knowledge. No study evaluated the direct effect of the intervention on first aid administration. High quality clinical trials are needed.

Emergency Care of Pediatric Burns

Author(s): Strobel A.M.; Fey R.

Source: Emergency Medicine Clinics of North America; May 2018; vol. 36 (no. 2); p. 441-458

Publication Type(s): Review

Abstract: Although the overall incidence of and mortality rate associated with burn injury have decreased in recent decades, burns remain a significant source of morbidity and mortality in children. Children with major burns require emergent resuscitation. Resuscitation is similar to that for adults, including pain control, airway management, and administration of intravenous fluid. However, in pediatrics, fluid resuscitation is needed for burns greater than or equal to 15% of total body surface area (TBSA) compared with burns greater than or equal to 20% TBSA for adults. Unique to pediatrics is the additional assessment for non-accidental injury and accurate calculation of the percentage of total burned surface area (TBSA) in children with changing body proportions are crucial to determine resuscitation parameters, prognosis, and disposition.

Below the surface: Parents' views on the factors that influence treatment adherence in paediatric burn scar management - A qualitative study

Author(s): Andrews N.; Jones L.L.; Calvert M.; Kinghorn P.; Litchfield I.; Bishop J.; Deeks J.J.

Source: Burns; May 2018; vol. 44 (no. 3); p. 626-635

Publication Type(s): Article

Abstract: Introduction: Parents have a crucial role to play in burn scar management for their children at a time that is extremely stressful for them and their child. Scar management treatments such as pressure garment therapy (PGT) require high levels of adherence. There has been a lack of research into the factors that may influence adherence in paediatric burn scar management. This qualitative research study has investigated parents' experiences of scar management and their attempts to adhere to treatment at home. The aim of this paper is to outline parents' views on the factors that influence adherence. Methods: 25 parents of paediatric and adolescent burn patients took part in semi-structured interviews. Participants were recruited from three UK burns services. Interviews were conducted in a participant-focussed manner and topics for discussion included parents'

accounts of treatment and their experience of PGT. A thematic analysis was undertaken. Results: Four overarching themes describe parents' views and experiences of scar management and adherence. These are the transition from hospital to home; the practical realities of treatment; the emotional labour involved in treatment and; negotiating treatment and regime. The transition from hospital to home is a significant event for parents. They may be apprehensive about this at the same time as they desire that they and their child return to some sense of normality following the burn injury. Parents are required to adopt the role of therapeutic caregiver upon transition from hospital to home. Adherence to scar management is influenced by the practical realities of maintaining treatment (routine, division of care labour, hospital appointments) and the emotional labour involved in doing so. The latter demands that parents manage their own and their children's emotions. Approaches to adherence were often described as flexible in response to these influences. Conclusions: Some parents negotiate the realities and demands of scar management successfully, whereas others do not. The emotional labour experienced by parents and their ability to cope with this is often a strong influence on their views regarding adherence to scar management. Further research is needed to explore how burns services and staff manage this at present, and whether simple interventions can help with the key practical and emotional influences on treatment adherence.

Outcomes of post burn flexion contracture release under tourniquet versus tumescent technique in children

Author(s): Bashir M.M.; Sohail M.; Wahab A.; Iqbal U.; Qayyum R.; Jan S.N.

Source: Burns; May 2018; vol. 44 (no. 3); p. 678-682

Publication Type(s): Article

Abstract: Objective: To compare the clinical outcomes of release of flexion contractures after burn of the hand in children using tourniquet or tumescent technique in terms of operative time, postoperative pain score, and percentage of graft take. Methods: Patients aged 3 to 12 years who required release of post-burn flexion contractures involving volar aspect of palm and fingers were enrolled from outpatient clinic. Patients were randomized in 1:1 ratio to the use of either tumescent technique or tourniquet during contracture release. Duration of procedure, postoperative pain score, percentage of graft take, and any complications were assessed and analyzed in both groups by a blinded observer. Results: Of the 160 patients randomized in the study (80 in each group), 84 (52.5%) were males. The mean +/- SD age of participants was 7.84 +/- 3.49 years, with no statistically significant difference in gender and age distribution between the groups. Similarly, there was no statistically significant difference in duration of surgery in both groups. However, there was a statistically significant difference in percentage of graft take at the 14th postoperative day; significantly more graft take was noted in the tumescent group (8.97 +/- 3.7 cm vs. 7.26 +/- 2.6 cm; P = 0.001). Mean analgesia consumed in the tumescent group was significantly less than that of the tourniquet group (6.26 +/- 1.9 mg vs. 9.41 +/- 2.2 mg; P <= 0.001). Similarly, statistically significant difference in the mean FLACC pain score was noted, with remarkably low pain score in the tumescent group. Conclusion: We found that the use of the tumescent technique for the release of flexion contracture resulted in better graft take, lower pain scores, and lesser consumption of analgesic than the use of tourniquet.

Complex Intraoral Reconstruction Using a Single Free Anterolateral Thigh Flap and Supermicrosurgery After Corrosive Ingestion in a 14-Month-Old Child.

Author(s): El Fahar, Mohammed H

Source: Annals of plastic surgery; May 2018; vol. 80 (no. 5); p. 500-502

Publication Type(s): Journal Article

Abstract: Oral chemical burn injuries induce more damage to the underlying tissues with extensive scarring. It is very well known that alkali causes severe liquefaction necrosis and injury to the deeper tissues. Pediatric facial burns must be managed thoroughly and always require complex reconstruction, which is a challenging process. So, any reconstructive surgeon must be aware of all the deformities that may have significant functional and aesthetic impact on the burn survivors especially children. Few medical studies addressed pediatric microsurgical reconstruction for oral burn injuries induced by chemical materials. Anterolateral thigh (ALT) free flap is a common flap with a multitude of indications. The purpose of this article is to present the youngest case in the medical literature of caustic intraoral scarring managed with a very thin free anterolateral thigh flap in a 14-month-old child who underwent reconstruction of his inner cheek, the angle of the mouth and tongue using supermicrosurgery techniques. Further development of the surgical techniques is required to establish early and safe intraoral pediatric microsurgery with a long-term follow-up.

Photobiomodulation effect on children's scars

Author(s): Alsharnoubi J.; Mohamed O.

Source: Lasers in Medical Science; Apr 2018; vol. 33 (no. 3); p. 497-501

Publication Type(s): Article

Abstract: The management of burn scars has become one of the major clinical challenges in the developing countries which involve enormous treatment cost; this needs new methods for better cost benefit relationship. The objective of the study is to analyze the effectiveness of low-level laser therapy on post-burn scar tissue in children. A randomized controlled study included 15 children, ranging from 2 to 10 years of age, presenting with burn scars. They received diode laser and topical treatment. Each scar was divided into two halves. One half was treated with laser therapy and topical treatment (study area), and the other half was treated with topical treatment only (control area). The children were evaluated before and after 3 months of the study by Vancouver Scar Scale (VSS), ultrasonography (U/S), and laser Doppler perfusion imaging. Significant improvement was reported in the studied area compared to the control area for patients with P values (P = 0.005) and (P = 0.0001) for VSS and U/S scores, respectively. No difference was detected for blood perfusion to the scar between both areas (P = 0.18). In addition, no adverse effect was reported. Photobiomodulation is an efficient and safe therapeutic modality for post-burn hypertrophic scars in children and should be considered a part of combination therapy for better results.

A Pediatric Burn Outpatient Short Stay Program Decreases Patient Length of Stay with Equivalent Burn Outcomes

Author(s): Zens T.; Lee C.W.; Schmitz C.; Faucher L.; Gibson A.; Yan A.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39 (no. 3); p. 353-362

Publication Type(s): Conference Paper

Abstract: Traditionally, small pediatric burns are managed with inpatient admission and daily dressing changes. In 2011, our burn center implemented an outpatient short stay (OSS) program in which small pediatric burns were managed as an outpatient utilizing Mepilex Ag TM dressings changed under moderate sedation every 5 to 7 days. Pediatric burn cases were queried for 2 time periods: before the OSS program (2009-2010) and after the OSS program (2013-2014). Burns > 15% total body surface area (TBSA), children with polytrauma, and children > 10 years old were excluded. Independent t tests and chi-square tests were conducted to analyze differences in patient demographics, burn management, and burn outcomes between these groups. Two hundred nineteen cases were included in the analysis (77 pre-OSS and 142 post-OSS). There was no difference in patient age (P = 0.872) or TBSA (P = 0.786) between the groups. The post-OSS group

had shorter inpatient length of stay (2.93 days vs 5.21 days; P < 0.001) and fewer dressing changes (2.32 vs 4.71; P < 0.001). There were no changes in readmission rates (P = 0.375) or burns requiring grafting (P = 0.155). Although not reaching statistical significance, less children in the post-OSS group had infectious complications (P = 0.054) or required reoperation in a 2-year follow-up period (P = 0.081). Patient and family satisfaction with the program was high. Children treated after the implementation of an OSS burn program at the University of Wisconsin had decreased inpatient length of stay and fewer painful burn dressing changes. These patients exhibited equivalent, if not superior burn outcomes.

Resting beta-Adrenergic Blockade Does Not Alter Exercise Thermoregulation in Children with Burn Injury: A Randomized Control Trial

Author(s): Rivas E.; Herndon D.N.; Suman O.E.; McEntire S.J.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39 (no. 3); p. 402-412

Publication Type(s): Article

Abstract: The objective of this study was to test the hypothesis that propranolol, a commonly prescribed beta-blocker to burned children, in combination with exercise-heat stress, increases the risk of heat illness and exercise intolerance. In a randomized double-blind study, propranolol was given to 10 burned children, and placebo was given to 10 additional burned children (matched for TBSA burned; mean +/- SD, 62 +/- 13%), while nonburned children served as healthy controls. All groups were matched for age and body morphology (11.2 +/- 3.0 years; 146 +/- 19 cm; 45 +/- 18 kg; 1.3 +/- 0.4 m 2). All children exercised in hot conditions (34.3 +/- 1.0degreeC; 26 +/- 2% relative humidity) at 75% of their peak aerobic capacity. At the end of exercise, none of the groups differed for final or change from baseline intestinal temperature (38.0 +/- 0.5degreeC; 0.02 +/- 0.01 "degreeC.min -1), unburned (37.0 +/- 0.6degreeC) and burned skin temperatures (36.9 +/- 0.7degreeC; nonburn group excluded), heat loss (21 +/- 18 W m -2), whole-body thermal conductance (118 +/- 113 W m -2), or physiological strain index (5.6 +/- 1). However, burn children exercised less than nonburn group (21.2 +/- 8.6 vs 30 +/- 0.0 min; P <.001) and had a lower calculated exercise tolerance index (1.0 +/- 0.0 vs 6.7 +/- 4.3; P <.01). Burned children had lower peak heart rates than nonburned children (173 +/- 13 vs 189 +/- 7 bpm; P <.01), with greater relative cardiac work rates at the end of exercise (97 +/- 10 vs 85 +/- 11% peak heart rate; P <.01). Resting beta-adrenergic blockade does not affect internal body temperature of burned children exercising at similar relative intensities as nonburn children in the heat. Independent of propranolol, a suppressed cardiac function may be associated to exercise intolerance in children with severe burn injury.

Laser Therapy for Pediatric Burn Scars: Focusing on a Combined Treatment Approach

Author(s): Zuccaro J.; Muser I.; Singh M.; Yu J.; Kelly C.; Fish J.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39 (no. 3); p. 457-462

Publication Type(s): Article

Abstract: Treatment with laser therapy has the potential to greatly improve hypertrophic scarring in individuals who have sustained burn injuries. More specifically, recent research has demonstrated the success of using pulsed dye laser therapy to help reduce redness and postburn pruritus and using ablative fractional CO 2 laser therapy to improve scar texture and thickness. This study describes our early experience using laser therapy in our pediatric burn program and details our specific treatment approach when using each laser individually and in combination during the same procedure. A retrospective before-after study of patients with hypertrophic burn scars who were treated with laser therapy at our pediatric institution was performed. One hundred and twenty-five patients were treated over a total of 289 laser sessions with more than 50% of patients under the

age of 5 years at the first treatment. The majority of procedures were performed using both the pulsed dye and CO 2 lasers in combination. Before-after Vancouver Scar Scale scores decreased from 7.37 (SD, 2.46) to 5.76 (SD, 2.29) after a single treatment. The results obtained from this study support the use of laser therapy to improve hypertrophic burn scars in the pediatric population. Rigorous randomized controlled trials are needed to confirm the effectiveness of this therapy.

Burns in the middle belt of Ghana: A systematic review

Author(s): Bayuo J.; Agyei F.B.; Baffour P.K.

Source: Burns Open; Apr 2018; vol. 2 (no. 2); p. 85-89

Publication Type(s): Review

Abstract: Background: Burns are a major global public health issue affecting persons of all ages. Various studies have indicated that developing countries share a greater burden of the injury. Despite this fact, Ghana as a developing country lacks a burn repository and that makes it difficult to clearly understand the bigger picture of the injury. To this end, this study aimed to systematically review primary studies of burn occurrence in the country. Methodology: A comprehensive literature search was undertaken using PubMed, ScienceDirect, Google Scholar, MEDLINE and EMBASE. The keywords used were "burns, epidemiology, Ghana, injury, flame burn, scald burn, electric burn, chemical burn, contact burn and explosion". Additional articles were identified by reviewing reference lists. The local journals such as the Postgraduate Medical Journal of Ghana were searched for the articles not indexed in PubMed or EMBASE. MOOSE guidelines were followed in executing this review. At the end of the selection process, seven papers remained and included in the study. Findings: Findings from this review identified that more males than females were involved in burn injuries. Persons within the paediatric age group (particularly those under 10 years of age) were particularly susceptible to burns. This notwithstanding it was noted that there is an increasing occurrence of burns among persons in the working class group (15 years-59 years). Scald was the most common injury among the paediatric age group whilst flame burn was most common among the adult population. The home was noted to be the commonest place for burn occurrence though some disasters at fuel filling stations were recorded. The occurrence of burn was associated with various burned surface area and from the studies reviewed it was noted that higher total burned surface area (TBSA) may be linked to increasing mortality rates. Length of hospitalisation ranged from less than 10 days to 760 days. Epilepsy was reported by one study as a pre-morbid condition. Conclusion: Burns represent a significant public health problem in Ghana and there is a need for the design of more effective intervention to reduce the occurrence of the injury. A larger scale research is imperative to investigate burns epidemiology from a national perspective.

Clotted central lines and tissue plasminogen activator (TPA) in burned children

Author(s): Arredondo O.; Palmieri T.; Greenhalgh D.; Sen S.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Children with major burn injury frequently require prolonged central venous access to assure appropriate fluid management and pain control. Central venous catheters in children frequently develop clots that prevent drug administration. Tissue plasminogen activator (TPA) is one of the methods employed to relieve the catheter obstruction, yet the frequency and efficacy of TPA use in central line infections in burned children is not well defined. The purpose of this study was to identify the frequency and efficacy of TPA use in burned children with central lines. Methods: This retrospective chart review evaluated all children admitted to our tertiary pediatric

burn center in 2016 who required central venous catheters. Data collected included patient factors (age, burn size, hospital length of stay), catheter-related data (number of central lines, lines replaced due to clotting prior to scheduled changes), TPA administration (number of times administered, how many administrations successful, how many times repeated), and line clotting data (time from insertion to clot, interval between TPA order and administration). Results: A total of 156 lines were place in 48 children with mean age of 7 years and mean burn size of 33% TBSA, LOS was 31 days in the PICU. TPA was used in 12.8% of lines to relieve obstruction. TPA use was successful in relieving the clot 20% of the time (4/20). The interval between identification of the obstructed line to TPA order was 96 minutes, with the administration of TPA 181 minutes after the order was placed. The average time from identification of obstruction to TPA administration was 227 minutes. Conclusions: The incidence of obstruction in pediatric central venous catheters in our unit was approximately 12%, and 20% of those obstructions were cleared with TPA. Based on our results we have targeted areas for improvement including: charting documentation, frequency of flushing unused central venous catheter lumens, reeducating the staff on TPA usage and decreasing our average times to identify, order, and administer TPA. Applicability of Research to Practice: Optimizing and maintaining central line patency.

Significant increase in sepsis as a cause of death after pediatric burn injury: A 3 decade autopsy cohort

Author(s): Capek K.D.; Clayton R.P.; Herndon D.N.; Hawkins H.K.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Enhanced survival in children with severe burns may be attributed to improvements in resuscitation, early excision and grafting, improved nutritional support, modulation of the hyper-metabolic response, and multidisciplinary rehabilitation. Together with treatment of inhalation injury and management of respiratory failure, these advances have led to quantified improvements in patient outcomes. Multi-drug resistant opportunistic infections and post injury altered immunity are intertwined problems facing burn patients that increasingly demand attention. To better understand contemporary pediatric burn mortality, we examined the recorded causes of death for a consecutive cohort of pediatric burn autopsies at our institution for changes over time. Methods: We reviewed summary pediatric autopsy data for the period 1989-2015. State law applicable to deaths occurring at our facility requires medical examiner review of all unnatural deaths, which by definition includes all burn injuries. We divided the patients into two groups based on year of burn, 1989-2001 (first group) and 2002-2015 (second group). We tabulated the number of occurrences for the causes of death, and compared the first group with the second. Statistical significance was assessed via Fisher's exact test. Results: A total of 160 autopsies were performed between 1989-2015; 82 of these were in the first period and 78 in the second. Age was 5.9+/-0.6 years in the first group and 7.8+/-0.6 years in the second. Sex and percent total body surface area burned were not significantly different between the groups, nor was the incidence of inhalation injury (59% in the first group and 62% in the second). Sepsis was more frequently a cause of death in the second period (OR 4.0, 95% CI 2.0-7.9, p=0.000048). Respiratory failure was less frequently reported as a cause of death in the second period (OR 0.48, 95% CI 0.25- 0.92, p=0.03). Conclusions: These data indicate that treatment of inhalation injury and respiratory management of burned children have improved. More importantly, they highlight the need for continued efforts to address post-burn infection and altered immunity. Future gains in the survival of severely burned children may depend on advances in these areas. Applicability of Research to Practice: This study identifies significant shifts in the predominant causes of death after pediatric burn injury, including a significant increase in deaths attributed to sepsis. These findings help to prioritize research and clinical quality improvement work to maximize survival benefit.

Does inhalation injury have an impact on the blood transfusion after burn injury in children?

Author(s): Song B.; Sen S.; Greenhalgh D.; Palmieri T.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Blood transfusion is often required in burn injury management. Several factors, including burn size, have been associated with the need for blood transfusion. However, the impact of inhalation injury, which is associated with adverse outcomes in burns, on blood transfusion has had limited study. The purpose of this study was to delineate the impact of inhalation injury on pediatric burn patients' blood transfusion rates and outcomes. Methods: A retrospective study was conducted for all pediatric burn cases that required blood transfusion from November 2005 to May 2017 at our burn center. Patients were assigned into two groups: inhalation injury and non-inhalation injury groups. Patient demographics, total body surface area (TBSA) burn, blood transfusions and outcomes were reviewed. Results: A total of 460 patients with burn injury receiving blood transfusion were included. Median patient age was 6.00 (IQR 2.59, 12.2) years in the inhalation group vs 5.35 (IQR 2.1, 11.4) years in non-inhalation group. The inhalation group had longer ICU stay (26 vs. 16days, respectively; P<0.001), higher ratio of ICU stay per TBSA (0.8 vs. 0.58, respectively; P<0.001), longer mechanical ventilation duration (18 vs. 4 days, respectively; P<0.001), higher ratio of mechanical ventilation duration per TBSA (0.56 vs. 0.12, respectively; P<0.001) and higher mortality rate (0.24 vs. 0.03, respectively; P<0.001). The median number of blood products transfusion, including RBC, FFP, platelets and Cryoprecipitate, and the ratio of blood products transfusion per percentage TBSA were noted to be significantly higher in inhalation injury group (See Table 1). A multivariate linear regression analysis was run to predict the amount of RBC transfusion from inhalation, age and TBSA. Inhalation Injury independently associated with more RBC transfusion per percentage TBSA (P<0.05). Conclusions: Inhalation injury increases blood transfusion needs in pediatric burn patients. Further study is indicated to determine if this discrepancy is due to burn injury extent or the pathophysiologic changes associated with inhalation injury. Applicability of Research to Practice: This result would be helpful to form burn blood transfusion practice. (Table Presented).

Treatment of full-thickness genital burns in male children: A retrospective cohort study

Author(s): Al-Karmi M.; Blears E.E.; Capek K.D.; Zapata-Sirvent R.; Herndon D.N.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Full-thickness tissue loss due to male genital burns presents unique challenges. Beyond wound closure, reproductive, urinary, renal, and social consequences attend these injuries. These challenges may be further magnified by developmental disruption when the injury is sustained in childhood. There is limited evidence to support the clinician treating these injuries or attempting to meaningful outcome evaluation. Here, we report a consecutive cohort of male children who sustained full-thickness genital burns and retrospectively evaluate the hypothesis that the inner prepuce flap leads to fewer postoperative complications and/or fewer subsequent reconstructive surgeries as compared with splitthickness skin autografting. Methods: Patients eligibility was determined by recorded diagnosis and surgical procedure. The injury factors, surgical procedure, postoperative course, and any long-term follow-up information were reviewed by 3 burn reconstructive surgeons. The patients were divided into two groups based on type of surgery: inner prepuce flap or split-thickness skin autografting. Because of the nature of this analysis, masking was not feasible. Statistical testing was performed by t-test for continuous data and Fisher's exact test for categorical data as appropriate. Results: From 2005-2017, a total of 18 patients underwent acute

treatment for full-thickness male genital burns. Of these, 9 underwent inner prepuce flap closure after burn excision (Flap group), and 9 underwent autografting (Graft group). Age was 8.7+/-2 years in the Flap group and 9.2+/-2 years in the Graft group. Percent total body surface area burned was 39 +/-7% in the Flap group and 48 +/-7% in the Graft group. Length of stay was 28+/-5 days in the Flap group and 38+/-9 days in the Graft group. There were no significant differences, as 1 patient each in the Flap and Graft groups underwent re-operation. Conclusions: Perhaps surprisingly, neither group exhibited a high rate of postoperative complication or need for further reconstructive surgery. These data do not identify an obvious difference in the need for further surgery or postoperative complications between the Flap and Graft groups. The retrospective nature of this study is limited in its ability to associate subtle functional differences which may significantly impact patient and family quality of life. Applicability of Research to Practice: This study did not identify a significant difference in postoperative complication or need for additional reconstruction between the inner prepuce flap and split-thickness skin autografting. Since the inner prepuce flap method avoids the donor site morbidity inherent in split-thickness autografting and may simplify wound care, it is our preferred method of treatment.

Variations and indications for inpatient admission following evaluation in an outpatient burn clinic

Author(s): Young B.; Ladhani H.; Coffee T.; Khandelwal A.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Most burn injuries are managed in the outpatient setting; however, there is insufficient literature on patterns of injury and reasons for admission from the clinic. Our institution operates a 24hr burn clinic managed by advanced practice providers and attending physicians during weekdays and by residents on weeknights and weekends, leading to considerable provider variability. The objective of this study was to determine injury characteristics and primary reasons for admission from the outpatient clinic. Methods: We performed a single-center retrospective analysis of an ABA-verified burn clinic serving adult and pediatric populations. All patients admitted from the outpatient clinic from 2009-2017 were identified using daily inpatient census. Planned admissions and readmissions were excluded. Bivariate analysis compared patients who were initially seen by advanced providers vs residents. Analysis between adult vs pediatric patients, and short vs long (2 or more midnights) length of stay (LOS) was also performed. Results: A total of 415 consecutive patients were included with mean age of 31 years and median TBSA of 4%; 29.2% of patient had full thickness burns with median full thickness TBSA of 1.1%. Lower extremity was the most common location of injury (39.5%), and scald was the most common mechanism (50.1%). Median LOS was 2 days, with 42.4% of patients having short stays. Burn severity (46.3%) was the most common cited reason for admission followed by social factors (18.1%) and infection (13.3%). Most patients were seen after hours and initially evaluated by residents (59.5%). Although no significant differences existed in demographics and injury patterns, patients evaluated by residents had shorter median LOS (1 vs 4 days; $p<0.001$) and different reason for admission ($p<0.01$). Difference in LOS persisted when only admission from first visit was considered. Pediatric patients sustained greater median TBSA burns (5% vs 3%; $p<0.001$) but required shorter LOS (1d vs 3d $p<0.001$). Scald burns were more common in children (74.5% vs 35.3%; $p<0.001$). While burn severity was the most common indication for admission in both groups, social factors were more common in children, and infection was more common in adults. Conclusions: In a 24-hour burn clinic model, indications for admission and subsequent length of stay varied significantly between advanced providers vs residents. Failure or complications of outpatient management was not a common indication for admission, suggesting that outpatient management for many burns is safe and effective. Applicability of Research to Practice: Patients evaluated by resident physicians had a significantly shorter length of stay that may prompt the need for a telemedicine system to prevent unnecessary admissions.

Trends in ed discharge of pediatric minor burns - A review of CA's office of statewide health planning & development (OSHPD)

Author(s): Sheckter C.C.; Pirrotta E.; Curtin C.; Wang N.E.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Minor burns (<20% TBSA) in children are recommended for burn center evaluation, and a select cohort may be treated on an outpatient basis. Innovations in topical burn care, along with a push towards value-based care are steering burn treatment towards the outpatient setting. Little is known regarding what characteristics predict outpatient treatment of pediatric minor burns and whether there is a temporal trend towards this treatment paradigm. Methods: A retrospective cohort study was performed using California's Office of Statewide Health Planning & Development linked ED and inpatient database, 2005-2013. All patient's under 18 years of age with a primary burn diagnosis were extracted. Patients missing TBSA were excluded. Variables included demographics, burn characteristics, new injury severity score (NISS), distance from hospital to patient, and burn center status. We used logistic modeling to evaluate predictors of outpatient burn treatment, and Poisson regression to evaluate temporal trends. Results: 50,643 pediatric minor burns presented to EDs during the period. 54.6% were male, 93.6% were <10% TBSA, 79.1% were scald or contact, 25.1% were deepest depth 2nd degree, and 2% were deepest depth 3rd degree. Multiple variables predicted a lower likelihood of discharging home including: younger age ($p<0.001$), TBSA 10-19% ($p<0.001$), 3rd degree burns ($p=0.018$), NISS score ($p<0.001$), and non-accidental injury ($p=0.008$). Hispanic and black race were less likely to discharge home compared to white, $p=0.045$ & $p=0.027$. Patients treated at burn centers were less likely to discharge home ($p<0.001$). There were no differences for gender, mechanism of burn, or distance between burn center and patient home. On multivariate regression, the incidence rate ratio over the 9-year period for home discharge was 1.004 (95% CI 1.001-1.008, $p=0.032$). Conclusions: As anticipated in the pediatric minor burn population, younger patients, deeper burns, greater TBSA, non-accidental injury, and higher trauma scores were less likely to discharge home. Surprisingly, white patients were treated as outpatients more frequently than minorities. There is a growing trend towards ambulatory treatment of smaller burns in the pediatric population. Further research is needed to assess whether outpatient treatment of pediatric minor burns is safe and effective. Applicability of Research to Practice: Make providers aware of trends in the outpatient treatment of pediatric minor burns. (Figure Presented).

. Burns in children with myelomeningocele are different: A case control study

Author(s): Shanti C.; Bustamante L.A.; Borg B.; Klein J.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Myelomeningocele is a congenital disorder resulting in motor and sensory deficits in the lower extremities. Due to their deficits, these patients are at high risk for burns. Our hospital is a referral center for patients with myelomeningocele. This presents our burn center a unique opportunity to study this particular population. We hypothesize that the characteristics of these burns and their healing times are different from those in children with normal sensory and motor function. Methods: The medical records of pediatric patients seen at our verified burn center between 2011 and 2017 were examined. All cases of burns in patients with a comorbidity of myelomeningocele were included in the study. These cases were closely matched to a comparison cohort without myelomeningocele according to age, race, location, depth and size of burn. Length of hospital stay, total healing time and number of follow-up visits were recorded for both groups and analyzed using independent t-tests. Results: We identified 11 burn cases in 8 patients with

myelomeningocele with an average age of 8 years (range 3 to 16 years). There were 5 males and 3 females. The burn etiology was scald in 46%, contact in 36%, flame in 9% and friction in 9%. The total burn surface area average was 2.1% (range 0.25% - 5.5%). Burns were deemed second degree in 73% of the cases and third degree in 27% of the cases. All burns were limited to the insensate areas in the lower extremities. Independent-samples t-tests were conducted to compare the hospital of length of stay, healing time, and number of post-discharge clinic visits for myelomeningocele patients and the comparison cohort. The hospital length of stay was not significant between groups. The healing time was significantly longer for the myelomeningocele patients (M=61 days, SD=28.7), versus the comparison cohort (M=29 days, SD=21.2), p <0.05. Furthermore, frequency of post discharge visits for myelomeningocele patients (6 visits) was significantly higher than the comparison cohort (2) with p <0.001. Conclusions: All patients with myelomeningocele presenting to our burn center were burned exclusively in the insensate lower extremities, illustrating this population's vulnerability for burns. Because of these patient's deficits, burn injuries manifests and heal differently. These burns take longer to heal, require more follow-up visits, and subsequently, incur higher cost of care. Applicability of Research to Practice: Our findings will be used to provide specific education to patients with myelomeningocele.

Bridging burn care

Author(s): O'Rourke C.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: The Rhode Island Burn Center is a hybrid program where high-quality burn care is delivered on many units, both pediatric and adult, throughout our hospital campus. With pressure from health insurances, patients are being discharged more frequently from the Emergency Department with larger burns than in the past, as well as more quickly after an acute hospital admission. Many patients when discharged from the hospital, require ongoing dressing changes at home with help from various community nursing agencies throughout the region. Due to the smaller number of patients with burns, community nursing agencies are infrequently exposed to burn care and therefore have limited experience with burn dressings, including types of dressings and functional application of dressings. Bridging Burn Care was implemented to address this need. Methods: A lecture titled "Basics of Burn Care" was offered to community nursing agencies by our Burn Program Manager (BPM). This lecture reviewed classification and current treatment for burns, recommendations for patient centered dressing removal, and practical application of burn dressings to encourage function. A questionnaire was distributed to the nurses to assess their comfort with burn care before and after the lecture. Co-visits to patients' homes with a nurse from the community nursing agency and the BPM were also offered to support the nurses in the home in applying the knowledge provided by the lecture. Results: Nurses were variable in their comfort and experience with burn care with scores of 1-3 (Ave 2.1) on a 5 point scale (1 = Not at All Comfortable, 5 = Extremely Comfortable) prior to the lecture. Their comfort with burn care increased after the lecture to an average of 3.6 on the same scale. Co-visits with a nurse from the community nursing agency and the BPM have occurred for 3 patients to-date and have been well received by both the community nurses and the patients/families. This bridge provides continuity of the patient's burn care during the transition from the hospital to home, supports the community nurses knowledge/application of burn care, and promotes ongoing communication with the Burn Center. Conclusions: With the smaller volume of patients with burns that our region receives, it is difficult for community nurses to remain up-to-date with the latest treatments for burns and maintain their confidence and competence with burn dressings. Providing a "Burn Care Bridge" between the hospital and the community, which supports both the patient/family and community nursing agencies, improves the continuity of care and quality of the burn care that takes place in the community. Applicability of Research to Practice: These types of programs have the potential to

decrease return visits to Emergency Departments, improve healing, and optimize function allowing patients with burns to return to activities of daily living sooner.

Does clonidine have an antipyretic effect in pediatric burn patients?

Author(s): Hursey D.; Song D.; Sheridan R.L.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Fever management with antipyretics in acutely ill patients after source identification is limited to acetaminophen or NSAIDs. However, the potential antipyretic effect of clonidine in critically ill adults has been described in the literature. Animal research has demonstrated mild hypothermia and decreased febrile response. The mechanism of action is believed to be mediated through agonizing the alpha-2 adrenoceptor located in the hypothalamus. Clonidine is used at our institution for narcotic and sedative withdrawal management. In this retrospective cohort study, we reviewed the effects of clonidine on fever response in our pediatric burn population to determine utility as a third line antipyretic. Methods: Thirty-six patients aged 0-18 years, acutely admitted to our institution for burn injury from January 2012 to August 2016 who received enteral clonidine for at least 7 consecutive days during their admission were included. Each identified patient was matched for age and total burn surface area (TBSA) to a patient not treated with clonidine. Primary endpoints were total number of febrile events (>=38.3degreeC) and daily average maximum body temperature during that 7 day period. Secondary endpoints included total doses of antipyretics administered and doses of clonidine held. Data was collected on potential confounders including length of stay (LOS), positive blood cultures and antibiotic days. Data are presented as means (+/- standard deviation). Comparisons are made using Student's t-test. Results: Eighteen patients were treated with clonidine during the study period. Table 1 shows baseline subject characteristics. There was no significant difference in total number of febrile events 32.2 +/- 40.3 vs. 22.7 +/- 36.1 (p>0.05). Nonsignificance was maintained for all days studied. There was no significant difference in daily average maximum body temperature 38.0 +/- 1.5 vs. 38.2 +/- 0.8 (p>0.05) or total antipyretic doses 12.9 +/- 11.3 vs. 10.2 +/- 11 (p>0.05) used during the 7 days. There were a total of 5 clonidine doses held for all subjects (1.7%), 2 for hypotension and 3 for surgical operation. Conclusions: Preliminary data suggests clonidine administered to acute pediatric burn patients does not have a significant effect in decreasing total febrile events, lowering the daily maximum body temperature or decreasing total antipyretic doses used. Applicability of Research to Practice: In our study design and population, clonidine does not appear to provide a clinical benefit when considering as a potential last line antipyretic. (Table Presented).

A comparison of antibiotic ointment vs. A silver-based dressing for children with upper extremity burns: A randomized controlled study

Author(s): Choi Y.; Recicar J.; Moulton S.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Antibiotic or silver-impregnated dressings are widely used in burn wound care. Our standard method of dressing pediatric upper extremity burn wounds consists of a primary antibiotic ointment or Nystatin ointment-impregnated non-adherent gauze layer, followed by rolled gauze, cast pad, plaster and soft casting material. The aim of this study was to compare two different primary dressing layers in the management of pediatric upper extremity burns: ointment vs. an active silver-based dressing, keeping all the other dressing layers the same. Methods: Children <= 18 years old with upper extremity burns who would be managed with our soft casting technique, between September 2016 and September 2017, were eligible for enrollment in the study. Burn

depth was assessed by two providers. Subjects were then randomized and placed into our primary ointment-based dressing (control) or the primary silver-based dressing (intervention). The primary layer was secured with our soft cast dressing. Dressings were changed twice-weekly or weekly until the burn wound was healed or grafted. The primary outcome was time to reepithelization of the wound. P-value <0.05 was considered significant. Results: A total of 76 children with burns to 91 upper extremities were enrolled in the study. In the intention to treat analysis, time to re-epithelization was significantly shorter in the control group (12 +/- 4 vs 15 +/- 6 days; P=0.03). There were no differences in the incidences of grafting (5% vs 4%; P=0.73) or yeast infections between the two groups (8% vs 9%; P=0.8). Conclusions: This study shows that antibiotic or Nystatin ointment-impregnated dressings are more effective at burn wound healing than silver-based dressings when combined with our soft casting technique. Applicability of Research to Practice: Standard antibiotic or Nystatin ointment-impregnated dressings are more effective at burn wound healing than silver-based dressings for management of upper extremity burns in children. (Table Presented).

Evaluation of satisfaction and clinical improvements of healing touch services in a burn and surgery hospital for children

Author(s): Cone L.C.; Jackson F.; Smith M.; James L.E.; Warner P.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Healing Touch (HT), credentialed by the National Commission of Certifying Agencies, is a professional, holistic, non-pharmacological therapy purported to promote relaxation, pain management and reduce stress. Since April 2013, 279 HT treatments were provided to three groups of recipients experiencing discomfort: pediatric patients, their guardians and employees. The purpose of this evaluation was to assess the satisfaction and clinical improvements this service provides. Methods: IRB exempt review and approval was obtained for a prospective de-identified survey evaluation of data from 105 HT recipients, guardians and clinicians who observed their patients, from 2015-2017. Guardian and recipient surveys consisted of questions to evaluate calmness, relaxation, interest in repeat sessions and whether HT had a positive effect. Clinicians who observed their patients documented changes in heart rate, blood pressure and respiratory rate. A validated observational pain assessment scale (OPAS) was used to compare pre- and post- treatment pain status and was analyzed by the nonparametric Wilcoxon signed rank test. Practitioners were HT certified or level 1-5 trained staff. Results: For the recipient survey findings, 96% (n=29) of responders indicated that HT was beneficial, 100% said they would return for additional sessions, and 100% reported improved relaxation and calmness. Ninety-four percent of guardians (n=32) found HT to be beneficial by documenting that they strongly agree or agree that HT had a positive effect. The clinician survey (n=44) revealed that heart rate either decreased or was neutral 100% of the time as did blood pressure, O2 saturation and respiratory rate most of the time for whom it was assessed. Eighty-two percent of clinicians found HT to be beneficial. There were statistically significant differences in OPAS scores from pre-HT to post-HT for both the clinician (p<.0001) and HT practitioner (p<.0001). No adverse effects were reported. Conclusions: HT provided by a well-organized program and an interdisciplinary team of credentialed providers represents an effective means to improve clinical and satisfaction measures for patients, guardians and employees, especially when applied during times of anxiety and pain. Applicability of Research to Practice: This HT evaluation forms the basis for continuing the use of HT in a burn and surgery hospital for children. HT is a helpful modality to enhance patient and guardian satisfaction.

Sedation and analgesia for adult outpatient dressing change: A survey of American burn association (ABA) burn centers

Author(s): Voss J.; Salerno S.; Lozenski J.; LacKamp A.; Parks J.; Bhavsar D.; Kovac A.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Management of pain and sedation for adult outpatients undergoing burn dressing change can be difficult. This study aimed to determine institutional variations in selection and use of analgesics and sedation medications for adult outpatient burn dressing changes. Methods: A 23-question online survey was sent to ABA Burn Center physicians, nurses, and physician assistants involved with care of burn patients having dressing change. The study received exempt status from our IRB and was approved by the ABA Survey Committee. Results: Of 131 respondents, 46% were RNs, 27% surgeons, 11% NPs, 7% Allied Health Clinicians (PT, OT, Rehab Med), 5% PAs, and 4% non-surgeon MDs. While 77% treated both adult and pediatric patients, 23% treated adults only. Most centers (66%) had >400 patients/year. Most common non-pharmacological interventions were music (46%) and movies/TV (44%), most often administered by nursing staff without formal training (53%). To premedicate, 81% used PO opioids (oxycodone or hydrocodone combination), 32% used IV opioids (morphine or fentanyl), and 45% used anxiolytics (IV midazolam or lorazepam). Medication regimen was decided based on existing PO pain meds 59% of the time. The most common options for inadequate pain control on PO meds were admission (20%) or IV opioids (18%). Approximately 56% of respondents felt pain during dressing change was adequately controlled 75-100% of the time, and 32% felt it was adequately controlled 50-75% of the time. Most respondents did not use moderate sedation (40.5%). Nitrous oxide was used by 8% of respondents. Monitors used, from most to least common, were pulse oximetry, BP, Temperature, ECG, and ETCO2. Consult of a dedicated anesthesiologist to assist occurred rarely or never 86% of the time. Use of acute pain service occurred rarely or never (88%). Conclusions: Burn pain remains undertreated in a significant number of cases in the outpatient setting. Variations in approach to pain and sedation medications exist among burn centers in the US. Burn patients' sedation and analgesia for dressing change requires individualized care. There was increased interest and use of non-pharmacologic approaches, and the use of nitrous oxide deserves further evaluation. Applicability of Research to Practice: Consult of acute pain or anesthesia may be needed for difficult patients with comorbidities, drug dependence or prior analgesia, or sedation medication failure.

High fidelity simulation and burn education

Author(s): Hanson L.M.; Kroschel T.G.; Kipper K.I.; Mohr W.J.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: The evolving world of burn care presents unique challenges when creating education for nurses. The use of high fidelity simulation is one way to meet that challenge. By collaborating with the organizational Simulation Center, we address high risk situations, enhance communication between nurses and physicians, and focus on specific patient needs in hopes of improving nursing knowledge and skills. Methods: Fluid resuscitation of adult and pediatric burn patients was chosen as an area of focus based on physician and nursing input. The burn physicians, nurse educator, and simulation educators collaborated to create a simulationbased course. In addition, pharmacists, respiratory therapists, dieticians and other members of the interdisciplinary team were consulted. Class sizes were kept small to ensure each attendee participated in an active role. Each simulation consisted of 2-3 participants completing a 10 minute scenario followed by debrief. The debrief was a reflective discussion which included a focus on specific topics facilitated by the simulation and burn educators as well as a Burn Attending. Surveys were sent to attendees to examine the effectiveness of the content following class completion. Results: Survey results showed participants found the use of simulation beneficial to their overall knowledge of complex burn patient management. Over 87% of respondents agreed or strongly agreed that they felt better prepared to care for the complex burn patient, including an improved understanding of initiation

and management of burn resuscitation per hospital protocol. Over 90% of respondents agreed or strongly agreed that their ability to perform specific skills related to the management of the complex adult burn patient improved, whereas 83% of respondents agreed or strongly agreed that their skills related to the management of the pediatric burn patient improved. Additionally, burn physicians saw improvements in charting accuracy and adherence to the organization's resuscitation protocol in patient care situations. Conclusions: The classes enhanced nursing preparedness and skill level when caring for a complex adult and/or pediatric burn patient. A significant advantage to this type of education was the involvement of the burn physician during the scenario debrief. Future classes will focus on low frequency, high risk situations as identified by nurses and physicians. Applicability of Research to Practice: The use of high fidelity simulation has been proven effective in many domains of health care. It allows nurses to practice and improve upon their skills in a safe environment which translates to their daily practice. Engaging multiple disciplines in the creation and execution of the scenarios enriches the multidisciplinary approach, which is vital to the short and long term care of burn survivors.

Implementation of a burn care process model in a pediatric emergency department

Author(s): Marx D.; Crandon S.; Hansen K.; Erkmann E.; Jayamaha D.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Often times the census and acuity of an Emergency Department (ED) determines wait times and care patients receive. This can be confounded by unclear care processes and work flow. Varied management can create delays in care and lead to increased ED length of stay for patients and families. This quality improvement (QI) project aims to decrease time from patient arrival in the ED to burn treatment by 25%. Methods: A trend was noticed of increasing ED length of stay for burn patients with less than 10% Total Body Surface Area (TBSA) involvement. A multidisciplinary team assembled to study the current state of burn care in a pediatric academic medical center. Time from patient arrival to the ED, arrival to triage, triage to burn treatment and burn treatment to disposition were measured. Using these time studies, the team created a Burn Care Process Model for the ED. This model defines role responsibility and work flow, maps the care of a burn patient from door to disposition, and leverages the capabilities of the hospital's electronic health record. ED burn triage and documentation was improved. The use of photography was implemented by allowing providers to take pictures of the burn injury and upload these to the patient's medical record. This allows the burn staff and ED providers to create a mutually agreed upon care plan. Prior to implementation of the care process model, multidisciplinary consensus was obtained and education was provided to all necessary staff. Results: Current state, time from patient arrival in ED to start of burn treatment averages 135 minutes. The QI project is collecting data with study completion in January 2018. Current preliminary data is proving a decrease in time from patient arrival in ED to start of burn treatment and an overall decrease in ED length of stay for burn patients. Staff response to care process model implementation has been positive, stating: reduced confusion of care plan, improved work flow, and increased patient satisfaction. Conclusions: Regardless of TBSA, burns are painful injuries. Working to eliminate barriers and improve wait time, decreases delays in pain management and medication administration. Implementation of a Burn Care Process Model in the ED will reduce time from patient arrival to burn treatment, increase patient and staff satisfaction, and enhance care coordination. These measures are paramount to providing excellent burn care to our patients and community.

Bromelain based enzymatic debridement in burns: An european consensus

Author(s): Hirche C.R.; Ziegler B.J.; Kneser U.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Bromelain based Enzymatic Debridement (ED) of deep thermal burns has been introduced as an additional technique to the burn surgeon's armamentarium. There is increasing evidence that ED is a powerful instrument to completely remove eschar while preserving more viable dermis, and in addition reduces blood loss, and the need for autologous skin grafting. The aim of this project was to generate detailed user-orientated recommendations within and beyond the scope of the literature, based on the growing experience with ED in Europe. Methods: A European Consensus Workshop was held in January 2017 to define user-orientated consensus statements based on the combined experience of more than 500 patients treated by the panelists from 10 European burn centers with Bromelain based ED. Various aspects of ED were discussed and addressed for statements, including indications, timing of application, preparations and application technique, pain management, blood loss, post ED wound diagnosis and management including skin grafting, scar prevention, training strategies and areas of future research. The statements included tips and pitfalls for implementation and application that may help to optimize the learning curve. Discussions lead to the generation of consensus statements which were voted upon. Results: Sixty-eight consensus statements were generated. The degree of consensus was remarkably high, with a unanimous 10/10 agreement on 60 of the 68 statements (88.2%), a 9/10 agreement on 5 statements (7.4%), and a 7/10 agreement on 3 statements (4.4%) Examples of unanimous consensus statements include: 1. ED being a safe and reliable alternative tool for early eschar removal in adults; 2. application in children as well but currently as off-label use; 3. application up to 30% TBSA but currently as off-label use (label up to 15% TBSA); 4. application for circumferential extremity burns to prevent surgical escharotomy; 5. pretreatment with silver-sulfadiazine or betadine should be avoided; 6. wound assessment should be performed within 2 hours after ED; 7. prolonged application of a post ED soaking up to 18 hours may improve results. Examples of 70% consensus include: 1. time point of autologous skin grafting (at PBD 21); 2. use of regional anesthesia for ED in extremity burns. Conclusions: The consensus statements contain detailed, user-orientated recommendations aiming to align current and future users and prevent unnecessary pitfalls. The importance of this work is the magnitude of patient experience behind it, larger than the total number of patients treated in all published ED clinical trials. Applicability of Research to Practice: These consensus guidelines may serve as preliminary user-orientated recommendations for implementation and successful application for the use of ED until further evidence is available.

Changing the way we think about burn size estimation

Author(s): Pham C.H.; Collier Z.J.; Gillenwater J.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Burn size estimation is a crucial component of acute burn management that guides burn center referral, fluid resuscitation, and other interventions. Referring providers often miscalculate the total body surface area (TBSA) of burn injury which contributes to unnecessary healthcare costs, misappropriation of resources, and delayed patient care. As a result, we conducted a systematic review to clearly define the problem of TBSA miscalculation, highlight the clinical and systems-based sequelae of such errors, identify factors contributing to this error, and develop a new way of approaching TBSA estimation for providers of all expertise levels. Methods: Systematic review using PubMed, Scopus, Google Scholar, OvidSP Medline, and Web of Science was performed. Keywords utilized in the search process included burn, surface area, size, estimation, accuracy, error, and calculations. All articles were evaluated by a panel of reviewers to assess eligibility. Excluded articles included reviews, case reports, independent abstracts, consensus and opinion papers. Results: Thirty-two relevant articles were identified by systematic review. The majority of studies

found that inexperienced physicians and pre-hospital providers disproportionately overestimate burn TBSA in 31-94% of cases and underestimate 6-38% of cases with the over-to-underestimation ratio averaging 8.5:1. Small burns (<20% TBSA) were most often overestimated and over-resuscitated whereas larger burns were frequently under-estimated and under-resuscitated. Degree of error was inversely proportional to burn experience but all skill levels benefit from computer-assisted methods. Depending on gender, race, and BMI, PSA represents 0.5% to 1.2% TBSA with the greatest deviations occurring with BMI > 30. The Rule of 9s must be age and BMI adjusted. Failure to consider the influence of these demographic factors on burn size estimation methods results in miscalculations as great as 230% for adults and 450% for children. Conclusions: TBSA misestimation is a common error leading to inappropriate burn center transfers, increased healthcare costs, unnecessary interventions, and excessive fluid resuscitation. Large burns should be assessed with the Rule of 9s (BMI<30), modified Lund-Browder (BMI 30-39.9), or Rule of 7s (BMI>40). Scattered, smaller burns are best estimated with PSA adjusted for BMI (<30: 0.8%, 30-39.9: 0.7%, >=40 0.6%). Given the significant impact of demographics on TBSA estimation accuracy, it is critical that burn providers educate referring providers on appropriate applications for each method to improve patient care. Applicability of Research to Practice: Different TBSA estimation methods need to be applied thoughtfully with attention to patient demographics to accurately estimate TBSA.

Proposal for an integrated, outpatient burn clinic

Author(s): Elisseou N.; Mouradian G.; Harrington D.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: The majority of burns are evaluated and treated in the outpatient (OP) setting. With the advent of new wound care products this number is increasing. While OP care eliminates the cost burden of inpatient (IP) treatment, a significant mobilization of resources is necessary to provide appropriate care, including visiting nurses (VNA), rehabilitation services, and mental health counselors. Many centers, including ours, outsource these functions to providers that do not have expertise in treating burn patients, at the expense of quality control and lost revenue. The goal of this study is to explore the financial viability of a comprehensive, fully integrated, OP burn clinic. By capturing revenue currently lost to external providers, we aim to provide better access to centralized, specialized, OP burn care. Methods: We performed a retrospective cohort study on pediatric and adult patients to characterize OP volume and revenue. Using Current Procedural Terminology, we crossreferenced patient encounters with expected Medicaid and Medicare reimbursement fees. Commercial insurance reimbursement rates were conservatively simplified to match Medicare rates. We assumed a 95% compliance with a no show rate of 16%. Prospective patients will, on average, attend four OP visits weekly for two weeks rather than alternating-day home visits by VNA. Costs were extrapolated and over-estimated based on current clinic expenses. Results: Between 2014-2016, we had 200 IP burns with nearly 1000 OP burn encounters yearly. By converting VNA visits to burn center appointments, there would be a 72% increase in OP volume necessitating an expansion of the clinic from 2 half-day sessions to 5 half-day sessions. Yearly revenue would increase by 50% for pediatric and by 59% for adult populations. The expansion of clinic appointments would allow for the decrease in the no-show rate from 16% to 12%. This translates to an additional 9% increase in revenue. While our calculated increased expenses would cut into the surplus revenue, the expanded clinic would be, at worst, revenue neutral. Conclusions: Our proposed OP Burn clinic would provide a daily clinic for regular follow-up and dressing care, and would allow for better quality control of the specialized need of our patients. The cost of this expansion with fully specialized staff is offset by revenue currently being lost to VNA services. Future studies need to explore the opportunity for nutritional and psychological services in the OP center. Applicability of Research to Practice: This model benefits patients and providers by increasing access to specialized burn care without increasing the burden on the hospital system. We

expect this model to be readily applicable to similarly structured burn centers across the country, with the goal of increasing access to burn care.

Quantification of brown-like adipose changes in adult burn patients

Author(s): Neuenschwander A.; Zhai Y.; Khanderao G.; Hillas E.; Seipp M.; Kohan J.; Zhang C.; Presson A.; Firpo M.; Salama M.; Lewis G.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Both muscle and brown adipose depots are implicated in sustaining the hypermetabolic state after burn injury. Previous research has described the morphological and metabolic changes of peripheral white adipose tissue (WAT) after burn injury in the pediatric burn population. Pediatric post-burn WAT demonstrates brown-like changes, including up-regulation of uncoupling protein 1 (UCP-1), a marker of increased thermogenesis, and decreased vacuole size, an indicator of increased metabolic load. Clinical management of burn hypermetabolism in adults has been extrapolated from studies in children; however, significant differences exist between pediatric and adult adipose metabolism. Our study aimed to characterize peripheral adipose browning in adult patients following burn injury. Methods: Under an institutional IRB approved protocol, discarded adipose tissue was collected, de-identified, and evaluated over a two-year period. Patients under age 18 were excluded. H&E stained tissue sections were scanned with whole slide imaging and analyzed with a vacuole algorithm. Adjacent tissue sections were immunohistologically evaluated for UCP-1 and scored for intensity and percent cell staining. Statistical analysis included univariate and multivariate analyses controlling for patient demographic and burn characteristic data. Results: Of the burn samples collected, 72 burn samples (57 patients) and 15 control samples (15 non-burn patients) were examined. Demographic data was similar in both groups except gender (64% men burn, 27% men non-burn, p= 0.011) and collection site (23% torso burn, 87% torso non-burn, p<0.001). Average vacuole area was similar between burn and non-burn samples; however, average vacuole diameter was significantly different (3.4 vs. 3.1, p=0.038). Burn samples showed greater intensity and percentage of UCP-1 expression than nonburn samples (p <0.001). Adjusting for other patient characteristics, samples collected 8-14 days post-burn had an increase in UCP-1 intensity compared to samples collected 1-7 post-burn. Moreover, increased UCP-1 expression was associated with a larger vacuole diameter (p<0.001) and area (p<0.001). Conclusions: Consistent with previous studies, our findings indicate browning of adult WAT post burn, as indicated by increased UCP-1 expression. Unlike pediatric burn WAT, adult burn WAT has fewer and larger lipid droplets per cell, suggesting brown-like cells in adult burn WAT have differing morphology than what has been shown in pediatric studies. Applicability of Research to Practice: Understanding adult burn fat morphology and UCP-1 expression may impact current standard treatment of hypermetabolism after burn injury.

American Burn Association 50th Annual Meeting

Author(s): anonymous

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Review

Abstract: The proceedings contain 461 papers. The topics discussed include: revisiting extracorporeal membrane oxygenation for severe ARDS in burns; an adjusted ideal body weight index formula with FFP rescue decreases fluid creep during burn resuscitation; prevalence of burnout syndrome in burn center clinical staff; quality of life and community integration in military and civilian burn survivors; clinical evaluation of burn nursing competency domains; pressure ulcer prevention: knowledge assessment and education of firefighters; need for mechanical ventilation is more predictive of

mortality than age, %TBSA, and frailty score in elderly burn patients; does the storage age of blood transfused to burn patients matter?; preventing unnecessary intubations: use of flexible fiber-optic laryngoscopy for airway evaluation in patients with suspected airway or inhalation injury; trend analysis of current modalities for monitoring fluid therapy in patients with large burns: echoing the call for better resuscitation indices; admission heart rate reserve is associated with clinical response to propranolol in severely burned children; revisiting extracorporeal membrane oxygenation for severe ARDS in burns; an adjusted ideal body weight index formula with FFP rescue decreases fluid creep during burn resuscitation; bolus and continuous infusion of antibiotics achieves effective therapeutic levels of antibiotics better than traditional dosing in burn patients; and risk factors and outcomes of renal injury in patients with a major burn: an historical cohort study.

Cost-effectiveness (CE) of an autologous regenerative epithelial suspension (RES) versus standard of care (SOC) for treatment of severe burns in the United States

Author(s): Foster K.; Bilir P.; Kruger E.; Kowal S.; Holmes J.H.; Hickerson W.; Nystrom S.; Turley D.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Burns require costly care, due to the need for complex and individualized treatment. Despite known economic burdens, the assessment of costs and benefits for new therapies is rarely performed as they are challenging. An RES device has been developed that allows rapid creation of an autologous RES at point-of-care to treat acute thermal injuries. RES is used either as a primary intervention for indeterminate partial-thickness burns (iPT) or as an adjunct to widely meshed split-thickness skin grafts (STSG) for deep partial-thickness (DPT) burns without continuous dermis as well as full-thickness (FT) burns. RES significantly minimizes donor skin requirements, enhances epithelialization of widely-meshed skin grafts, and may reduce hospital length of stay (LOS) and follow-up reconstructive procedures. A CE model was developed to evaluate the economic value of RES versus SOC. Specifically, the modeling tool projects incremental costs and CE of using RES vs STSG, to treat iPT and FT/DPT burns with total body surface area of 15%, 30% and 50%. Methods: A hospital-perspective CE model, developed in MS Excel, uses sequential decision trees to depict a 4-module acute burn care pathway (wound assessment, debridement/excision, temporary coverage, and permanent closure (PC)). Clinical inputs were derived from randomized controlled trials, ABA National Burn Registry (NBR) database analyses, and interviews with burn surgeons. LOS for STSG was estimated using an NBR database regression, controlling for age (child/adult), diabetes, inhalation injury, and infection status (burn wound or hospital-acquired infection). Impact of RES on LOS was derived from the literature. Hospital resource use (e.g. materials, procedure time) and unit costs were derived from three US burn care hospitals. For this analysis, intervention differed only in the PC module, with RES or RES + STSG (depending on burn depth) vs STSG. Univariate sensitivity and scenario analyses were performed across key variables. Results: RES and RES + STSG were cost-saving and resulted in lower LOS compared to STSG in all base case patient profiles. Results were consistent for patients with comorbidities (inhalation injury, diabetes), and within the pediatric population. One-way sensitivity analyses were performed on all variables. The model results were most sensitive to relative impact of RES use on LOS, procedure time, number of procedures, and number of devices used. Conclusions: Using RES alone or in combination with STSG has potential to reduce hospital costs and LOS of serious burns in the US. Applicability of Research to Practice: Burn care hospitals may consider using RES to manage serious burns and reduce LOS and costs for patients.

Subjective vs objective assessment of physical activity in burn patients

Author(s): Bores J.M.; Glover S.Q.; Gutierrez I.; Stevens P.; Andersen C.R.; Herndon D.N.; Suman O.E.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Physical activity (PAC) improves fitness and muscle strength. In youth national PAC guidelines recommend 60 min/day of aerobic and muscle strengthening PAC. After a severe burn children engage in significantly less PAC than healthy controls. Exercise rehabilitation (ExR) programs can mitigate lean mass losses and reductions in fitness post burn, and subjective measurements such as patients' perceptions of activity are important to maximize benefits of ExR. The Patient-Reported Outcomes Measurement Information System (PROMIS) by the National Institutes of Health are valid and reliable questionnaires for non-burn populations and include PAC engagement. In burn patients PROMIS PAC has not been evaluated. This study compared subjective PROMIS PAC findings to objective PAC levels in burn patients to better guide individualized ExR prescription. Methods: This study, approved by the Institutional Review Board, had 74 severely burned patients (16 F, 58 M; 13 +/- 4 yr, mean +/- SD; 46 +/- 15% total body surface area [TBSA] burn; 33 +/- 19% TBSA 3rd degree) and 21 healthy controls (9 F, 12 M; 19 +/- 5 yr). Each burn patient received an outpatient standard of care ExR program at discharge (DC) from the ICU. The PROMIS Pediatric Short Form v1.0 - Physical Activity 8a questionnaire was administered to patients during return hospital visits. Spanish language questionnaires were administered as necessary. Individual PROMIS questions/ total scores were analyzed in patients at DC, 6 wks, 6 mo, 12 mo, 18 mo, and 2-5 yr post burn, and compared to healthy controls. Subjective results were analyzed in relation to published objective measures. Scores were modeled by a mixed multiple analysis of variance model with relation to sex, age at measure, TBSA, group (healthy vs burn) and time, blocking on subject to account for repeated measures. Significance was set at $p<0.05$. Results: Individual PROMIS PAC answers/total scores did not differ significantly between burns and controls at any time ($p>0.05$ in all but one case). At 18 mo burn subjects reported significantly fewer days than controls of exercising to the point of heavy breathing ($p=0.04$), however this result was considered spurious due to increased variability at the time point. Previously published objective measures showed decreased PAC levels in severely burned children after an ExR program relative to healthy controls, yet this study found no evidence of a difference in PAC levels as reported by the patient compared to healthy controls. Conclusions: Burn patients' perceptions of PAC may not match objective PAC levels underscoring the need for more research and understanding in this area. Applicability of Research to Practice: Future research should blend objective and subjective patient-centered PAC outcomes to maximize benefits of ExR programs for severely burned children.

A quality improvement project to increase deep sedation for initial burn wound debridement

Author(s): Giles S.A.; Thakkar R.; Noffsinger D.; Fabia R.; Groner J.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Over ninety percent of pediatric burn inpatients have burn injuries that are less than 20% TBSA. The majority of these are scald injuries that result in second degree burns which require painful wound debridement. This is traumatic for the pediatric patient and their families. Optimal pain management is an essential element of effective burn wound care; however medical management of these patients varies by practitioner and available resources. The purpose of this quality improvement (QI) project was to standardize the delivery of the initial burn wound care for pediatric burn patients with < 15% TBSA burn injury. Methods: A retrospective chart review was conducted of burn patients with < 15% TBSA burn injury admitted to an ABA verified burn center from January 2015 - August 2016. We sought to establish whether TBSA was a determining factor for sedating the burn injured child for their initial dressing change. TBSA was found not to be a determining factor for deep sedation. Therefore, the burn center leadership decided that all burn patients admitted to the burn unit who require debridement should receive deep sedation. A

multidisplinary team of practitioners developed a QI process with measurable goals, key drivers, and interventions. These interventions included a debridement guideline and patient flow diagram to articulate sedation options for the initial burn wound debridement. Extensive education was provided to Emergency Department (ED) staff, burn nurses, burn team members, and nurse practitioners impacted by the newly developed guidelines. Results: From January 2015 to August 2016, deep sedation was provided to only 50% (118/238) of patients for their initial burn wound debridement. After the implementation of the QI process, deep sedation was provided to 85% (139/162) of burn patients for their first burn debridement. Conclusions: Our ambitious collaborative QI process increased deep sedation for our pediatric burn patients, demonstrating that burn care delivery can be safely standardized to enhance wound care delivery and reduce patient, family, and provider stress. Applicability of Research to Practice: Procedural burn pain is a known contributor to post traumatic stress disorder (PTSD). This project adds to the existing pain literature, enhances burn care delivery, and potentially reduces PTSD in pediatric burn patients.

Utilization of Z-scores to identify malnutrition in the pediatric burn abuse and neglect population

Author(s): Sunderman C.; Gottschlich M.; Allgeier C.; James L.; Boerger L.; Warner P.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Nutritional management of a burn injury is a complexity that is challenged further in the presence of malnutrition. Appropriate nutrition screening techniques are imperative to perform identification and documentation of malnutrition, especially in vulnerable pediatric populations. The purpose of this study was to assess the prevalence and severity of malnutrition among pediatric burn patients with a history of maltreatment. Methods: A retrospective chart review was conducted on patients (<=18 yo) admitted for treatment of a burn injury between 2011-2015 with a history of maltreatment. The existence of abuse and/or neglect was identified and documented through interdisciplinary assessment involving both social work and psychology. Demographics, clinical and discharge disposition data were obtained. Anthropometric z-score data were generated from standardized growth charts and analyzed to identify malnutrition using the current 2015 guidelines from the Academy of Nutrition and Dietetics and American Society for Parenteral and Enteral Nutrition. Statistical procedures included Student's t-tests and chi2 tests. Results: Eighty-eight pediatric burn patients with a history of maltreatment were admitted during the 5-year period with a mean age of 3.0 +/- 0.4 years and burn size of 20.4 +/- 2.0% TBSA, with scald being the primary mechanism of injury. Malnutrition was identified in 21 (23.8%) patients, with the highest occurrence (95%) in the youngest age group (0-3 yo). Despite the non-malnutrition group having a significantly higher %TBSA 3rd degree burn size (p=0.0487), both groups had similar lengths of stay (25.4 +/- 2.5 vs 21.7 +/- 5.3 days). The malnutrition group had significantly lower z-scores for weight, BMI and weight for length, however they gained significantly more weight (p=0.0144) than the non-malnutrition group during their hospital course. Conclusions: Appropriate screening for malnutrition in pediatric burn patients can proliferate awareness, especially in young vulnerable children with a history of maltreatment and can assist in the tailoring and implementation of medical nutrition therapy to support both wound healing and growth. Applicability of Research to Practice: Utilizing established diagnostic criteria to detect malnutrition is an important component of the nutrition care plan in the pediatric burn population. (Table Presented).

Combination of oxandrolone and propranolol decreases cardiac work compared to propranolol alone in severely burned children

Author(s): Sommerhalder C.; Ross E.; Hundeshagen G.; Suman O.E.; Herndon D.N.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: It has been reported that burns cause a hypermetabolic state. Propranolol, a non-selective beta1 and beta2 antagonist, decreases cardiac work in pediatric burn patients. It has also been reported that androgens may or may not have a cardio-protective effect against oxidative stress by reducing apoptotic death. The aim of this paper is to assess cardiac work in patients receiving Oxandrolone and Propranolol in combination(Ox/Prop) compared to either treatment alone. Methods: Secondary analysis of a randomized prospective study of 636 pediatric patients admitted to our center. Outcomes included rate pressure product(RPP), heart rate, systolic blood pressure. We compared controls to Propranolol alone, Oxandrolone alone, and Ox/Prop. Outcomes were compared using two-way ANOVA with Dunn's multiple comparisons, and one-sample t-test for comparison against normal values. Demographics were compared with one-way ANOVA and chi-squared tests for categorical values. Results: Combined use of Ox/Prop decreased RPP (as percentages compared to normal, 100% being equivalent to normal) during the acute phase post-burn through one-year post-burn (Control: 157.6% +/-28.6% Oxandrolone: 146.6% +/-21.7%, Ox/Prop: 97.6% +/-8.8%, Propranolol: 122.4% +/-16.5%; p<.001). Ox/Prop also significantly decreased heart rate compared to other treatment groups between 3 months to one-year post-burn (Control: 144.2% +/-17.4% Oxandrolone: 136.1% +/-16.5%, Ox/Prop: 117% +/-25.1%, Propranolol: 127.7% +/-16.4%; p<.001). Lastly, the Ox/Prop group was the only group which was not statistically different from normal systolic blood pressure as related to age (97.6%, 95% CI: -7.5% to 2.6%; P=.32). Conclusions: Oxandrolone and Propranolol combined appears to decrease cardiac work over Propranolol or Oxandrolone alone over the first year post burn in the parameters of heart rate, blood pressure, and RPP. Applicability of Research to Practice: Knowledge of the effects of adding Oxandrolone to Propranolol on cardiac work in burned children allows one step further in the prevention of acute cardiac strain which can lead to long term cardiac fibrosis in pediatric burn patients. It also highlights that Propranolol and Oxandrolone should be used long term (>3 months) to truly have long-lasting cardio-protective effects.

Narcotic control measures in the midst of an opioid crisis

Author(s): Circo K.; Reilly D.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Narcotic use and misuse has become an epidemic across the United States. In burn care, narcotic use is commonly used for pain control in both inpatient and outpatient care. Methods: Case study: Seven-year-old child post skin grafting procedures denied having refill of Hydrocodone elixir due to the insurance company's policy for quantity limit requirements of no more than 236ml in a 14-day period. Patient taking medication at appropriated intervals and amounts. Results: Physician attempted prior authorization request to insurance company for approval of refill of pain medication. Insurance company when called stated that due to the narcotic epidemic issues they are now requiring pain contract signed from patient and provider as well as a prior authorization request for continued refills. Insurance company denied prior authorization request due to Nebraska Medicine Burn Clinic called pain service to obtain pain contract for future use. Conclusions: Nebraska Medicine is continuing to investigate other insurance companies to find out if this is common practice beginning in all insurance companies. Nebraska Medicine burn clinic is currently working on policy and pain contract finalization as well as patient education for those patients needing narcotic pain medication. Applicability of Research to Practice: FDA and insurance companies are going to continue to create restrictions on narcotic use for all patients as the rate of misuse continues to rise in the United States. Burn pain is difficult to manage and treat especially without the ability to use opioids. Standardization in care and prescribing algorithms would be ideal to create for all burn providers for management of burn pain with opioids. Patient education is

crucial to setting expectations in the early phases of care to prevent long term use of opioids for burn pain.

Parental satisfaction with soft casting technique in management of pediatric extremity burns

Author(s): Choi Y.; Nederveld C.; Moulton S.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Soft casting is an effective method for managing upper and lower extremity burns in the pediatric population. Soft casting involves placing a dressing over the burn wound(s), wrapping the extremity using rolled gauze, applying soft cast pad, plaster, soft cast tape and an elastic bandage. Unlike traditional dressing methods, this technique allows for weekly dressing changes while keeping the affected extremity in an optimal position. However, parental perception of burn dressing using the soft casting technique has never been assessed. The aim of this study was to evaluate parental satisfaction in burn injured children undergoing soft casting to manage their burn wounds. Methods: This study was part of an IRB approved, randomized controlled trial of two different burn dressings at our institution. Parents of children who underwent soft casting for upper or lower extremity burns in the outpatient setting were approached during follow up visits between September 2016 and September 2017. The parents were asked if they were satisfied and to describe their opinion of the soft casting technique. Data collection was carried out by one designated researcher. Results: Out of the of 89 subjects (median age 19 months, IQR 14-60) approached during the study period, parents of 84 subjects (94%) said they were satisfied with the soft casting technique. Of the 26 subjects who described their opinion of the soft cast, the most commonly stated reason for satisfaction was the ability of the soft cast to protect the wound (65%). Other comments included its durability (38%), the ability to perform normal activities such as crawling and playing (31%), reduction in pain (27%) and lack of need for dressing changes by the parents (19%). Parents who were not satisfied with the soft cast (6%) mentioned the inability to shower and concern with rubbing of the proximal aspect of the soft cast on the skin. Conclusions: Parental satisfaction is important for adherence with their child's plan of care. This study confirmed that most parents were satisfied with the soft casting technique for the management of their child's upper or lower extremity burn injury. Applicability of Research to Practice: Soft casting technique is optimal for managing upper and lower extremity burn injuries in children and has high parental satisfaction.

Expert outpatient burn care in the home through mobile health technology

Author(s): Howard H.R.; Lesher A.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: In the United States, approximately 450,000-500,000 patients sustain burns requiring medical treatment every year, with nearly 10 million world-wide. Ninety percent of burns are treated primarily in the outpatient setting. Burns are uniquely suited to the use of telemedicine because burn wound assessment is primarily a visual skill. Evaluation of key burn characteristics, such as percent total body surface area (%TBSA) and burn depth, using both store-and-forward digital imaging and videoconferencing, is comparable to standard wound examination. Unfortunately, despite adequate feasibility data, clinical studies demonstrating a benefit of telemedicine in clinical burn care outcomes are lacking. Higher quality research is desired. Methods: The TeleBurnApp allows the provision of tertiary clinical burn care directly in the patient's home through text and image messaging, video conferencing and instructional videos. After IRB approval, we retrospectively reviewed clinical outcomes and usability in partial thickness burn patients treated using the TeleBurnApp with standard therapy (APP) compared to standard therapy alone (ST).

Results: Burn wound care was provided to 32 patients via the APP and 35 patients with ST. 74% of patients used the TeleBurnApp, with no burn wound infections or unexpected returns to clinic or ED. Patients and providers sent 239 store-and-forward pictures (mean, range: 6, 0-34), 529 text messages (16, 0-162), and four patients utilized the video calls (11%). The instructional videos were accessed a total of 155 times (4.2, 0-10). When compared to a group of patients treated with ST, the APP patients had similar burn injury severity (mean %TBSA; ST vs APP: 3.1 +/- 2.9 (range: 1-15) vs 3.75 +/- 4.5 (range: 1-14) (p=0.48) Age, ethnicity, and burn mechanism did not differ. The mean time to healing was shorter in the APP group (days, STvsBA: 14.3 +/- 5.4 (range: 6-25) vs 11.6 +/- 4.7(range: 5-22)(p=.03) with fewer clinical encounters, STvsBA: 3.3 +/- 1.0 (range 2-6) vs 0.93 +/- 0.6 (range 0-2) (p=0.001). Compliance with completion of therapy with patients using APP was 80% vs 64% compliance with ST. Conclusions: We describe a functional, scalable TeleBurnApp in clinical use in a pediatric burn program. Further prospective, randomized studies may validate this mobile health platform, improving access to expert burn care to a vulnerable population.

Using dehydrated amniotic membrane skin substitute in facial burn: Is there a safety difference between adults vs. pediatric patients?

Author(s): Elkbuli A.; Puyana S.; Benson B.; Young E.; Hai S.; McKenney M.; Askari M.; Mir H.

Source: Journal of Burn Care and Research; Apr 2018; vol. 39

Publication Type(s): Conference Abstract

Abstract: Introduction: Facial burns are devastating injuries that can have lasting physical and psychological effects on patients. Proper management of facial burns to minimize such morbidities continues to challenge reconstructive surgeons. The main objective of our study is to compare safety in use of amniotic membrane skin substitute in treating adult versus pediatric facial burn. Methods: Data from our institution's burn registry in the period from March 2015 through March 2017 was retrospectively reviewed. We compared the safety of using amniotic membrane allografts in treating patients with facial burn (adults >=16 years old versus pediatrics <16 years old) to comparing incidence of complications in each group. Data were collected from demographic information as well as outcome measures including healing at 2 weeks and complications. Paired sample t-test and Chi Squared analyses were used with significance defined as $p < 0.05$. Results: A total of 77 adults and 13 pediatric patients with facial burns received amniotic membrane skin substitute were included. The mean age for adults was 40.8 years (16-88) compared to 5.6 years (0-15) in the pediatric group. The percent total body surface area burn (TBSA) range was between 1 to 57% with an average 9. 6% in the adult group compared to 2 to 14% with an average of 6.0% in the pediatric group. Injury severity score (ISS) average was 4 in adults versus 2.2 in pediatric patients. Pediatric trauma patients with facial burn had greater incidence of complications compared to the adult patients group 46.2% vs 18.2% ($p = 0.02$) while all patients in both groups healed at a rate of 100% by the second week after the primary procedure. Conclusions: Use of amniotic fluid membrane skin substitute is safe in treatment of pediatric facial burn and may result in fewer complications than in adults. Applicability of Research to Practice: Is to improve outcomes particularly healing and reduce complication rate in patients with facial burns. (Table Presented).

Genital burns in the United States: Disproportionate prevalence in the pediatric population

Author(s): Tresh A.; Baradaran N.; Gaither T.; Fergus K.; Liaw A.; Balakrishnan A.; Hampson L.;

Source: Journal of Urology; Apr 2018; vol. 199 (no. 4)

Publication Type(s): Conference Abstract

Abstract:INTRODUCTION AND OBJECTIVES: To describe the epidemiology of genital burns (GB) in the United States and investigate the underlying etiology and causative agents. METHODS: The National Electronic Injury Surveillance System database was queried for individuals who sustained a GB from

2000- 2016. We collected data on age, gender, injury diagnosis, disposition, and causative agents. Multivariate analysis was performed to determine predictors of hospitalization. RESULTS: A total of 585 raw cases were analyzed to estimate the weighted projections of GBs nationally. We estimate 17,026 (95% CI 16,649 - 17,404) cases of GBs presented to Emergency Departments nationally. GBs occurred more commonly in males than females (12,295 vs 4,731, table 1). The mean age at the time of injury was 26.5 years (SD 21.7, range 1 month - 96 years). The mechanisms of GBs were scalding (57.9%), chemical (22.4%) and thermal (19.7%). The most common causative agents stratified by age are summarized in figure 1. Of the injured patients, 66.5% received outpatient care, 21.7% were transferred to higher-level care and 9.1% were hospitalized. Most burns occurred at home (69.4%). Significant predictors of hospitalization on multivariate analysis were multi-organ burns (OR 4.4), scalding (OR 11.5) and thermal burns (OR 27.9). Children ages 0-2 had the highest prevalence of GBs out of all age groups, and children ages 0-12 comprised 37.1% of the study cohort. For children <5 years of age, a majority of the burns were caused by hot water in the bathroom. Most of these injuries occurred when children or caretakers accidentally turned the hot water on or the cold water off. In age group 6-12, the most common causes of GBs were cooking-related scalds due to hot foods or water. CONCLUSIONS: Children sustain GBs at a higher rate than adults and many appear to have a preventable mechanism. Improved product design for safety and educating caregivers about potential hazardous situations are needed.

Ketamine procedural sedation in the emergency department of an urban tertiary hospital in Dar es Salaam, Tanzania

Author(s): Coralic Z.; Reynolds T.A.; Sawe H.R.; Mfinanga J.A.; Cortez A.; Koehl J.; Siroker H.

Source: Emergency Medicine Journal; Apr 2018; vol. 35 (no. 4); p. 214-219

Publication Type(s): Article

Available at Emergency medicine journal : EMJ - from BMJ Journals - NHS

Abstract: Study objective We describe ketamine procedural sedations and associated adverse events in low-acuity and high-acuity patients in a resource-limited ED. Methods This was a prospective observational study of ketamine procedural sedations at the Emergency Medical Department at the Muhimbili National Hospital in Dar es Salaam, Tanzania. We observed consecutive procedural sedations and recorded patient demographics, medications, vital signs, pulse oximetry, capnography and a priori defined adverse events (using standard definitions in emergency medicine sedation guidelines). All treatment decisions were at the discretion of the treating providers who were blinded to study measurements to simulate usual care. Data collection was unblinded if predefined safety parameters were met. For all significant adverse and unblinding events, ketamine causality was determined via review protocol. Additionally, providers and patients were assessed for sedation satisfaction. Results We observed 54 children (median 3 years, range 11 days-15 years) and 45 adults (median 33 years, range 18-79 years). The most common indications for ketamine were burn management in children (55.6%) and orthopaedic procedures in adults (68.9%). Minor adverse events included nausea/vomiting (12%), recovery excitation (11%) and one case of transient hypertension. There were nine (9%) patients who had decreased saturation readings (SpO 2 <=92%). There were three deaths, all in severely injured patients. After review protocol, none of the desaturations or patient deaths were thought to be caused by ketamine. No patient experienced ketamine-related laryngospasm, apnoea or permanent complications. Overall, ketamine was well tolerated and resulted in high patient and provider satisfaction. Conclusion In this series of ketamine sedations in an urban, resource-limited ED, there were no serious adverse events attributable to ketamine.

Prevalence of Hypersensitivity Reactions in Children Associated with Acetaminophen: A Systematic Review and Meta-Analysis

Author(s): Gabrielli S.; Langlois A.; Ben-Shoshan M.

Source: International Archives of Allergy and Immunology; Apr 2018

Publication Type(s): Article In Press

Abstract: Background: Acetaminophen is the most commonly used antipyretic in children. However, there are limited data assessing hypersensitivity reactions related to acetaminophen usage. Objectives: To conduct a systematic review to characterize reported reactions to acetaminophen in adults and children, and perform a meta-analysis to assess the prevalence of acetaminophen hypersensitivity in children with a suspected acetaminophen allergy. Methods: We performed a systematic review of studies reporting hypersensitivity reactions to acetaminophen by searching 2 electronic databases. From the selected studies, we included those assessing the prevalence of acetaminophen hypersensitivity by performing oral challenge in our meta-analysis. Results: Eighty-five studies were included in the systematic review, assessing a total of 1,030 participants. Immediate (within 1 h of exposure) hypersensitivity reactions were reported in > 25% of the articles, while cutaneous nonimmediate reactions were similarly reported in about 25% of the articles. The remaining articles reported Steven-Johnson syndrome/toxic epidermal necrolysis, fixed drug eruptions, and cross-intolerance reactions. Five pediatric studies were included in our meta-analysis. The prevalence of acetaminophen hypersensitivity reaction among children undergoing oral challenge was 10.1% (95% confidence interval 4.5-15.5). Conclusion: Future studies assessing the risk of immediate and nonimmediate hypersensitivity reactions to acetaminophen and elucidating the mechanism of acetaminophen hypersensitivity reactions are required.

Special traumatized populations : Burns and Hypothermia.

Author(s): Mehrotra, Shruti; Misir, Amita

Source: Current pediatric reviews; Apr 2018

Publication Type(s): Journal Article

Abstract: It is important for physicians treating children to be aware of unique presentation that require expertise and knowledge. Two areas of importance when caring for traumatized children are Thermal Burn Injuries, and Hypothermia. Burns commonly result in morbidity in children; as such, the appropriate identification of the severity of the burn and appropriate management are integral to minimize the complications of burns during the acute phase. Attention to proper fluid management is paramount. Knowledge of types of solutions to use during Burn treatment is important. The evolution of wound management with newer biologic dressings and skin analogues for optimal skin recovery is discussed. Likewise, knowledge of treatment of accidental hypothermia with and without an asphyxial event is important. Clinicians needs to identify hypothermia immediately and be aware of the overall management utilizing aggressive rewarming and cardiopulmonary resuscitation to help improve the survival of these critically ill children.

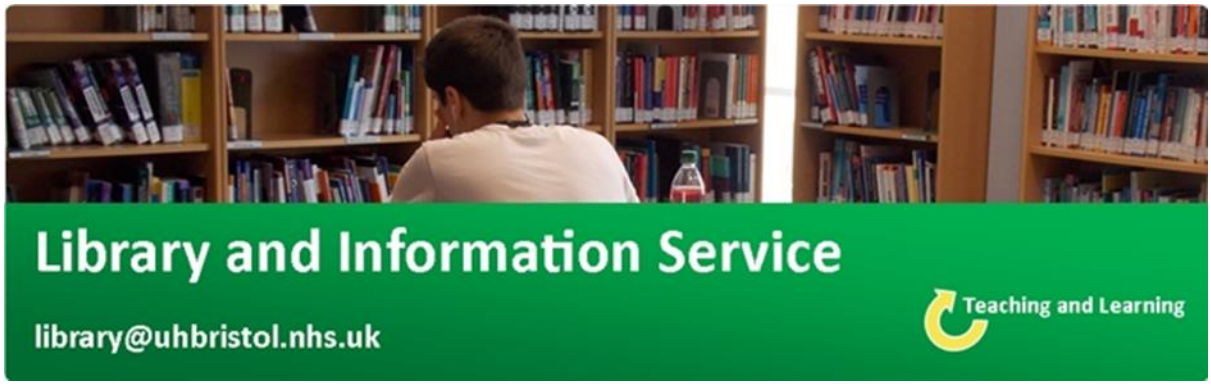
A Soft Casting Technique for Managing Pediatric Hand and Foot Burns.

Author(s): Choi, Young Mee; Nederveld, Cindy; Campbell, Kristen; Moulton, Steven

Source: Journal of burn care & research : official publication of the American Burn Association; Apr 2018

Publication Type(s): Journal Article

Abstract: Hand and foot burns in children are difficult to dress. The authors have developed a soft casting technique to manage burns to these areas. The aim of this study is to report the outcomes using weekly dressing changes with a soft casting technique to manage pediatric hand and foot burns in the outpatient setting. A retrospective chart review was performed on children with burns to the hands or feet, who underwent dressing changes with a soft casting technique at the Children's Hospital Colorado Burn Center. Soft casting was performed by placing antibiotic ointment-impregnated nonadherent gauze over the burn wound(s), wrapping the extremity using rolled gauze, applying soft cast pad, plaster, soft cast tape, and an elastic bandage. This was changed weekly. Two hundred ninety-eight children with hand burns had a mean age of 16.8 ± 2 months. Two hundred forty-eight children had partial thickness burn injuries (83%), 50 had full thickness burn injuries (17%), and the mean total body surface area (TBSA) was 1 ± 2.4%. The mean time to heal was 10.1 ± 1.7 days for all subjects. Sixty-six children with foot burns were identified with a mean age of 24 ± 2.6 months. Forty-six children had partial thickness injuries (70%), 20 had full thickness burn injuries (30%), and the mean TBSA was 2.3 ± 2.9%. The mean time to heal was 14.1 ± 2.2 days for all subjects. Weekly dressing changes using a soft casting technique are effective for the outpatient management of pediatric hand and foot burns. This method avoids costly inpatient hospital care, reduces the number of painful dressing changes, and allows children to heal in their own environment.



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