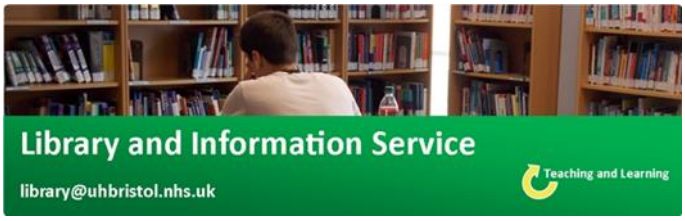
University Hospitals Bristol NHS
NHS Foundation Trust

Burns

Current Awareness Newsletter

May 2017 (Quarterly)

Respecting everyone
Embracing change
Recognising success
Working together
Our hospitals.



Training Calendar 2017

All sessions are 1 hour

May	**(13.00)**
Fri 26th	**Interpreting Statistics**
Wed 31st	**Critical Appraisal**
June	**(12.00)**
Thurs 1st	**Literature Searching**
Thurs 8th	**Interpreting Statistics**
Tues 13th	**Critical Appraisal**
Thurs 29th	**Literature Searching**
July	**(13.00)**
Mon 3rd	**Interpreting Statistics**
Wed 12th	**Critical Appraisal**
Fri 21st	**Literature Searching**
Wed 26th	**Interpreting Statistics**

Your Outreach Librarian: Jo Hooper

Whatever your information needs, the library is here to help. Just email us at library@uhbristol.nhs.uk

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

Contents

Updates

NICE National Institute for Health and Care Excellence

Guidelines for the Provision of Anaesthesia Services for Burn and Plastics Surgery 2017 **[PDF]**
Source: Royal College of Anaesthetists - 15 March 2017

Efficacy of dermal substitute on deep dermal to full thickness burn injury: a systematic review
Source: PubMed - 17 March 2017 - Publisher: Anz Journal Of Surgery

The effects of music intervention on burn patients during treatment procedures: a systematic review and meta-analysis of randomized controlled trials
Source: PubMed - 17 March 2017 - Publisher: Bmc Complementary And Alternative Medicine

The Efficacy of Versajet Hydrosurgery System in Burn Surgery. A Systematic Review
Source: PubMed - 04 April 2017 - Publisher: Journal Of Burn Care & Research : Official Publication Of The American Burn Association

Systematic Reviews in Burns Care: Poor Quality and Getting Worse
Source: PubMed - 01 March 2017 - Publisher: Journal Of Burn Care & Research : Official Publication Of The American Burn Association

Protective isolation precautions for the prevention of nosocomial colonization and infection in burn patients: A systematic review and meta-analysis
Source: PubMed - 04 April 2017 - Publisher: Intensive & Critical Care Nursing

Cochrane Library

No up to date relevent evidence

UpToDate®

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

Treatment of minor thermal burns

- Oral burns
- Minor burns
- Summary and recommendations
- Superficial partial thick burn (Pictures)
- Deep partial thickness burn (Pictures)

Overview of the management of the severely burned patient

- Severe burn injury
- Summary and recommendations

Local treatment of burns: Topical antimicrobial agents and dressings

- Local treatment of burn scars
- Burn blisters
- Summary and recommendations

Emergency care of moderate and severe thermal burns in children

- Evaluation of burn injury
- Summary and recommendations

Burn pain: Principles of pharmacologic and nonpharmacologic management

- Children
- Adults
- Summary and recommendations

Overview of nutritional support for moderate to severe burn patients

- Children
- Summary and recommendations

BBA: British Burn Association

Friday 26th May 2017 Changing Faces: Face Equality Day

For further information and to get involved, please visit: **http://www.changingfaces.org.uk** or email: **faceequality@changingfaces.org.uk**

A flyer for the Face Equality Day is available below: **Face Equality Day Generic Poster 26.5.17.pdf**

BURNS COURSES

Please note that these are not endorsed by the BBA unless specifically mentioned.

4th October 2017: **An Introduction to Burn Care Broomfield - 4-6.10.17.docx**

STUDY DAYS

22nd June 2017 **Minor Burns Study Day Broomfield - 22.6.17** FREE STUDY DAY

2nd October 2017 **BBA BTIG Neck Training Day 2.10.17.pptx**

6th November 2017 **2nd Mngt of Children with Burns - Anaesthetist Study Day.pdf**

The Burns Game

Developed by the BBA, Focus Games and Birmingham City University. This educational board game is designed to help anyone working with burn injured patients to improve their skills and knowledge around the initial management of burns.

UpToDate is the leading evidence-based clinical decision support system, designed for use at the point of care.

It contains more than 9,500 searchable topics across the following specialities:

- Adult and paediatric emergency medicine
- Allergy and immunology
- Cardiovascular medicine
- Dermatology
- Drug therapy
- Endocrinology and diabetes mellitus
- Family medicine
- Gastroenterology and hepatology
- General surgery
- Geriatrics
- Haematology
- Hospital Medicine
- Infectious diseases
- Nephrology and hypertension
- Neurology
- Obstetrics and gynaecology
- Oncology
- Paediatrics
- Primary care internal medicine
- Psychiatry
- Pulmonary, critical care and sleep medicine
- Rheumatology

How to access UpToDate

You can access UpToDate from any computer via www.uptodate.com. You will need your NHS Athens username/password (register through http://openathens.nice.org.uk/).

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 (Elsevier)
June 2017, Volume 43, Issue 4

Journal of Burn Care & Research
May/ June 2017, Volume 38, Issue 3

Injury Prevention (BMJ)
April 2017, Volume 23, Issue 2

Plastic and Reconstructive Surgery
May 2017, Volume 139, Issue 5

Journal of Plastic, Reconstructive & Aesthetic Surgery (Elsevier)
June 2017, Volume 70, Issue 6

Archives of Disease in Childhood (BMJ)
May 2017, Volume 102, Issue 5

Pediatrics (HighWire)
May 2017, Volume 139, Issue 5

Injury (Elsevier)
May 2017, Volume 48, Issue 6

Trauma (Sage)
April 017, Volume 19, Issue 2

Current Awareness 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

Functional Exercise Capacity in Children With Electrical Burns.

Author(s): Foncerrada, Guillermo; Capek, Karel D; Wurzer, Paul; Herndon, David N; Mlcak, Ronald P; Porter, Craig; Suman, Oscar E

Source: Journal of burn care & research : official publication of the American Burn Association; ; vol. 38 (no. 3); p. e647

Abstract: Electrical burns are a severe form of thermal injury extending deep into tissue. Here, we investigated the effect of electrical burns on metabolic rate, body composition, and aerobic capacity. We prospectively studied a cohort of 24 severely burned children. Twelve patients had a combination of electrical and flame burns and 12 matched controls had only flame burns. Endpoints were cardiopulmonary fitness (maximal oxygen consumption [VO2]), muscle strength (peak torque per body weight), body mass index, lean body mass index, and days of myoglobinemia (≥500 mg/dl). Demographics of both the groups were comparable. The electrical burn group had more days of myoglobinemia during acute hospitalization than the flame burn group (3.6 ± 1.8 days vs 0.3 ± 0.5 days, P < .0001). Maximal VO2 was significantly lower in the electrical burn group than in the flame burn group at intensive care unit discharge (27 ± 6 ml/kg/min vs 34 ± 5 ml/kg/min, P < .0014). Electrical burns are associated with myoglobinemia and decreased cardiopulmonary fitness.

Burns in Children.

Author(s): Sheridan, Robert L

Source: Journal of burn care & research : official publication of the American Burn Association; ; vol. 38 (no. 3); p. e618

Abstract: Children have a great deal to gain from recent and future advances in burn care. A very broad range of realized and potential developments are involved. These will be very briefly reviewed within the context of four areas: 1) early evaluation and care issues, 2) acute surgical and critical care issues, 3) rehabilitation and reconstruction issues, and 4) organizational and outcomes issues.

Randomized Comparison of Packed Red Blood Cell-to-Fresh Frozen Plasma Transfusion Ratio of 4: 1 vs 1: 1 During Acute Massive Burn Excision.

Author(s): Galganski, Laura A; Greenhalgh, David G; Sen, Soman; Palmieri, Tina L

Source: Journal of burn care & research : official publication of the American Burn Association; ; vol. 38 (no. 3); p. 194-201

Abstract: This prospective randomized controlled trial compared 1:1 vs 4:1 packed red blood cell with fresh frozen plasma (PRBC/FFP) transfusion strategy on outcomes in children with >20% TBSA burns. Children with >20% TBSA burns were randomized to a 1:1 or 4:1 PRBC/FFP transfusion ratio

during burn excision. Parameters measured included demographics, TBSA burn, and Pediatric Risk of Mortality scores. Laboratory values recorded preoperatively, 1 hour, 12 hours, 24 hours, and 1 week postoperatively included prothrombin time, partial thromboplastin time (PTT), international normalized ratio, fibrinogen, protein C, and antithrombin C (AIII). Total number of blood products transfused intraoperatively and during hospitalization was recorded. Forty-five children were enrolled, 22 in the 1:1 and 23 in the 4:1 group. Groups were similar in age, TBSA, and Pediatric Risk of Mortality score. Preoperative fibrinogen, AIII, protein C, hemoglobin, PTT, international normalized ratio, and platelets were similar. In the first two excisions, the 1:1 group received significantly more FFP per patient. Volume of PRBC and overall product transfused did not differ between groups. At 1 hour postoperatively, prothrombin time and PTT were lower and protein C and AIII were higher in the 1:1 group. The 4:1 group was more significantly acidotic 1 hour postexcision. A 1:1 PRBC/FFP transfusion strategy, compared with a 4:1 strategy, decreased postoperative markers of coagulopathy and acidosis immediately after surgery. The strategy did not change the total volume of blood product transfused. This interim analysis was not powered to detect differences in wound healing and length of stay.

Does Overestimation of Burn Size in Children Requiring Fluid Resuscitation Cause Any Harm?

Author(s): Sadideen, Hazim; D'Asta, Federica; Moiemen, Naiem; Wilson, Yvonne

Source: Journal of burn care & research : official publication of the American Burn Association; ; vol. 38 (no. 2); p. e546

Abstract: Overestimation of burn size especially in children is common. It is unclear if this may cause harm. This study was designed to assess the accuracy of burn size estimation by referring non-burn clinicians and investigate whether inaccurate estimates caused any harm. Three and a half years retrospective review of pediatric resuscitation burns (ie, ≥10% TBSA) referred to a tertiary burns center from other hospitals was performed. This included basic demographics, data from referring emergency departments (initial TBSA estimations and fluid volumes prescribed), and data on arrival to the burn center (actual burn TBSA sustained, fluid volumes given prior to arrival, and actual fluid volumes required). Clinical parameters at 8 and 24 hr after injury were also examined. Forty-six patients were identified. Mean age was 3.9 years and weight 18 kg. Mean time to arrival from initial burn injury to our tertiary center was 5 hr. Thirty-two children (70%) had their burns overestimated, seven (15%) underestimated, and another seven (15%) were correctly estimated. After accurate calculations of the burn size and the required resuscitation fluids on arrival to the burns center, only five children of the entire cohort of 46 patients (11%) had received more fluids than required. These five children were in the overestimated burn size group. Only three children received the appropriate amount of fluid prior to arrival to the burns center. There were no mortalities or significant clinical adverse events in any of the children. Overestimation led to overprescription of fluid volumes, but this did not translate into over-resuscitation, and in most cases was in fact associated with inadequate fluid administration. Although 70% of the children in our cohort had the burn size overestimated, only 11% had actually received more fluids than required before arrival. None of these children went on to have any significant complications as a result of overestimation. Training and education is essential for clinicians in emergency departments. However, estimation of size in pediatric burns, in particular scalds, is challenging and the importance of early transfer to a specialist service cannot be overemphasized.

Cutaneous Functional Units Predict Shoulder Range of Motion Recovery in Children Receiving Rehabilitation.

Author(s): Parry, Ingrid; Sen, Soman; Sattler-Petrocchi, Kelly; Greenhalgh, David; Palmieri, Tina

Source: Journal of burn care & research : official publication of the American Burn Association; ; vol. 38 (no. 2); p. 106-111

Abstract: Cutaneous functional units (CFUs) are fields of skin that functionally contribute to range of motion (ROM) at an associated joint. When replaced with scar tissue, the skin is less extensible and may result in loss of movement at the joint. Consideration of the amount of CFU affected by burn injury is increasingly being used to predict the development of burn scar contracture (BSC) in burn survivors. Previous work established that, in adults, burn rehabilitation time per CFU was the greatest predictor of preventing BSC. Our study aimed to examine the direct relationship between percent involvement of CFU and ROM achieved in children with BSC who received 6 months of rehabilitation therapy services. ROM was measured at baseline and throughout the study period using traditional methods of goniometry as well as three-dimensional motion capture during the performance of functional tasks. Burn extent and distribution were mapped using an electronic diagram to calculate the percentage of CFU affected by scarring or skin grafts. Pearson's correlations and multivariate linear regression analyses were performed to determine associations between variables. Results showed that percent CFU involvement was negatively correlated with maximal goniometric and functional shoulder ROM achieved. That is, the amount of a given CFU scarred was predictive of less ROM achieved in the associated area. Percentage of CFU involved did not significantly correlate with baseline shoulder ROM, suggesting that other factors may be associated with initial limitations in ROM. Evaluation of the percentage of CFU scarred is useful for predicting shoulder ROM recovery with rehabilitation and may be used to help guide clinical decision making and allocation of time and resource for therapy services.

Incidence and Clinical Outcome of Hypophosphatemia in Pediatric Burn Patients.

Author(s): Leite, Heitor Pons; Pinheiro Nogueira, Larissa Araújo; Teodosio, Ariane Helena Calassa

Source: Journal of burn care & research : official publication of the American Burn Association; ; vol. 38 (no. 2); p. 78-84

Abstract: The objective of this study is to investigate the factors associated with serum phosphate concentrations in severely burned children and whether hypophosphatemia is associated with outcome. Seventy-eight children with a total body surface area of 24% (6.0-68.5) were retrospectively analyzed for serum phosphate concentrations during the first 10 days of stay in the intensive care unit (ICU). The method of generalized estimating equations was used to evaluate the effect of the exposure variables for serum phosphate concentrations during the study period. Outcome variables were the probability of ICU discharge at 30 days and time on mechanical ventilation. Potential explanatory variables for clinical outcome were hypophosphatemia (serum phosphate <3.8 mg/dL for children <2 years and <3.5 mg/dL for older children), age, sex, percent total body surface area burn, inhalation injury, and severe sepsis and/or septic shock. Competing-risk analysis was applied to calculate the probability of ICU discharge at 30 days, and death was assumed as the competing event. The rate of hypophosphatemia was 79.5%. Serum phosphate concentrations were associated with C-reactive protein (coefficient: -0.63; 95% confidence interval [CI]: -0.96 to -0.30; P = .001). Hypophosphatemia was independently associated with a 68% decrease in the probability of ICU discharge at 30 days (subhazard ratio: -0.32; 95% CI: 0.20, 0.53; P = .001) and an increase of 2.9 days in mechanical ventilation (coefficient: 2.91; 95% CI: 1.16, 4.66; P = .001). Serum phosphate concentrations in pediatric burn patients are associated with the magnitude of inflammatory response. Hypophosphatemia is associated with decreased probability of ICU discharge and increased time on mechanical ventilation.

Randomized, Paired-Site Comparison of Autologous Engineered Skin Substitutes and Split-Thickness Skin Graft for Closure of Extensive, Full-Thickness Burns.

Author(s): Boyce, Steven T; Simpson, Peggy S; Rieman, Mary T; Warner, Petra M; Yakuboff, Kevin P; Bailey, J Kevin; Nelson, Judith K; Fowler, Laura A; Kagan, Richard J

Source: Journal of burn care & research : official publication of the American Burn Association; ; vol. 38 (no. 2); p. 61-70

Abstract: Stable closure of full-thickness burn wounds remains a limitation to recovery from burns of greater than 50% of the total body surface area (TBSA). Hypothetically, engineered skin substitutes (ESS) consisting of autologous keratinocytes and fibroblasts attached to collagen-based scaffolds may reduce requirements for donor skin, and decrease mortality. ESS were prepared from split-thickness skin biopsies collected after enrollment of 16 pediatric burn patients into an approved study protocol. ESS and split-thickness autograft (AG) were applied to 15 subjects with full-thickness burns involving a mean of 76.9% TBSA. Data consisted of photographs, tracings of donor skin and healed wounds, comparison of mortality with the National Burn Repository, correlation of TBSA closed wounds with TBSA full-thickness burn, frequencies of regrafting, and immunoreactivity to the biopolymer scaffold. One subject expired before ESS application, and 15 subjects received 2056 ESS grafts. The ratio of closed wound to donor areas was 108.7 ± 9.7 for ESS compared with a maximum of 4.0 ± 0.0 for AG. Mortality for enrolled subjects was 6.25%, and 30.3% for a comparable population from the National Burn Repository ($P < .05$). Engraftment was 83.5 ± 2.0% for ESS and 96.5 ± 0.9% for AG. Percentage TBSA closed was 29.9 ± 3.3% for ESS, and 47.0 ± 2.0% for AG. These values were significantly different between the graft types. Correlation of % TBSA closed with ESS with % TBSA full-thickness burn generated an R value of 0.65 ($P < .001$). These results indicate that autologous ESS reduce mortality and requirements for donor skin harvesting, for grafting of full-thickness burns of greater than 50% TBSA.

Extensive Chest Wall Tissue Loss and its Management by Vertical Rectus Abdominis Myocutaneous Flap.

Author(s): Basu, Sandip Kanti; Bain, Jayanta; Chattopadhyay, Debarati; Majumdar, Bijay Kumar

Source: Journal of Indian Association of Pediatric Surgeons; 2017; vol. 22 (no. 1); p. 43-45

Abstract: Extensive electric burn around the chest in children is rare and this type of injury always poses a great challenge for its management. A 12-year-old male child with extensive electric burn of the chest wall was admitted to hospital. It was a neglected case of 9 days old burn; the young boy was in critical condition having systemic features of toxemia with widespread necrosis of the skin, subcutaneous tissues, and muscles along with exposed bones (ribs and sternum) with the risk of impending rupture of pleura through the exposed intercostal spaces. After initial resuscitation, a thorough debridement of all necrotic tissues was done. Thereafter, a superiorly based vertical rectus abdominis myocutaneous flap was harvested to cover the exposed bones and intercostal spaces. The remaining raw areas were skin grafted. The child made an excellent recovery with good outcome.

A prospective study of time to healing and hypertrophic scarring in paediatric burns: every day counts.

Author(s): Chipp, Elizabeth; Charles, Lisa; Thomas, Clare; Whiting, Kate; Moiemen, Naiem; Wilson, Yvonne

Source: Burns & trauma; 2017; vol. 5 ; p. 3

Abstract:BACKGROUNDIt is commonly accepted that burns taking longer than 3 weeks to heal have a much higher rate of hypertrophic scarring than those which heal more quickly. However, some of our patients develop hypertrophic scars despite healing within this 3-week period.METHODSWe performed a prospective study of 383 paediatric burns treated non-operatively at a regional burns

centre over a 2-year period from May 2011 to April 2013. Scar assessment was performed by a senior burns therapist using the Vancouver Scar Scale.RESULTSOverall rates of hypertrophic scarring were 17.2%. Time to healing was the strongest predictor of developing hypertrophic scarring, and the earliest hypertrophic scar developed in a patient who was healed after 8 days. The risk of hypertrophic scarring was multiplied by 1.138 for every additional day taken for the burn wound to heal. There was a trend towards higher rates of hypertrophic scarring in non-white skin types but this did not reach statistical significance.CONCLUSIONSThe risk of hypertrophic scarring increases with every day and, therefore, every effort should be made to get the wound healed as quickly as possible, even within the traditional 3-week period usually allowed for healing. We believe that the traditional dogma of aiming for healing within 3 weeks is overly simplistic and should be abandoned: in paediatric burns, every day counts.TRIAL REGISTRATIONNot applicable.

Negative wound pressure therapy is safe and useful in pediatric burn patients

Author(s): Ren Y.; Chang P.; Sheridan R.L.

Source: International Journal of Burns and Trauma; 2017; vol. 7 (no. 2); p. 12-16

Abstract: Introduction: Negative Pressure Wound Therapy (NPWT) has proven to be a powerful tool in facilitating healing of difficult wounds of a variety of etiologies. The pediatric experience with NPWT has been limited due to concerns about vascular compression and pain associated with treatment. Method: A retrospective review was performed to evaluate the therapeutic effect of NPWT on children with difficult wounds due to burns or soft-tissue trauma. NPWT was instituted in the operating room under general anesthesia using a commercially available system. NPWT was not initiated until all necrotic material was removed from the wounds. Negative pressure applied ranged from 50-125 mmHg continuous suction, with younger children being prescribed less negative pressures. NPWT dressings were changed every 5-7 days, in the operating room. When wounds were clean and had granulated they were closed with split-thickness skin grafts. Results: 29 children with an average age of 9.34 +/- 1.95 years (range 2 months to 18 years) were treated with NPWT. Average total wound size was 24.8 +/- 8.9 (range 0 to 95) percent of the body surface in those patients who had suffered burns and non-burn injuries. Injury mechanisms included hot liquid (2 children), contact with hot object (4 children), electricity (7 children), flame (9 children), and other non-burn injuries such as abrasion and Stevens-Johnson syndrome (7 children). Over 90% of the patients required central venous or bladder catheters. Perceived benefits of the treatment included reduced numbers of dressing changes and more rapid wound granulation. There were no episodes of bleeding associated with NPWT. All patients healed their wounds, were successfully grafted, and survived. Conclusion: NPWT has a useful role in the pediatric burn unit in facilitating wounds healing and improving life qualities. We also found that a significant correlation between third degree burned wound size and the number of negative pressure therapies received, which indicated that NPWT could be more effective in treating complicated burned wounds. NPWT seems safe and effective when applied to well-debrided wounds. It does not seem to be associated with excessive bleeding or discomfort in children.

Tissue perfusion assessment of paediatric burns by laser doppler imaging (LDI)

Author(s): Mermod T.; Kolly S.; El Ezzi O.; Roessingh A.S.B.; Raffoul W.

Source: Current Pediatric Research; 2017; vol. 21 (no. 1); p. 69-76

Abstract: Introduction: The indication for performing autologous skin grafts in cases of burns in children is based on the clinical examination by trained surgeons and on the progression of spontaneous healing during the first seven to ten days. Spontaneous regeneration of the skin after a

burn depends on the presence of tissue microcirculation. Laser Doppler Imaging (LDI) is a non-invasive method for assessing tissue perfusion. The objective of this pilot study was first, to measure tissue perfusion by LDI over the course of the first few days after a burn and second, to show the usefulness of LDI when having to decide whether or not to perform a skin graft. Materials and methods: A prospective pilot study involving children with second-degree burns covering a minimum of 10% of the Total Body Surface Area (TBSA) was conducted over 14 months from May 2012 to July 2013. The treatment of the lesions followed the typical pattern of showers every other day and the use of hydrofibre dressings. LDI images of the burned skin were made under standardized conditions during hydrotherapy over the first ten days and also, at the same time, of healthy skin in order to obtain a reference value. A clinical assessment determining the degree of severity of the burns of each patient was carried out by the paediatric surgeon. The analysis of the results was performed with the EasyLDI Studio program. Results: This pilot study included seven patients. Our results show a correlation between the numerical perfusion values obtained by LDI and the depth of the burn as determined by the surgeon. The perfusion threshold requiring treatment by skin grafting is set at 74% of the perfusion of healthy skin. In 70% of the cases, the sensitivity of the Laser Doppler imager helps determine during the first few days after the burn whether a skin graft will be necessary. Discussion and conclusion: Laser Doppler Imaging (LDI) helps to numerically objectify the residual perfusion of burned tissue. In 70% of the cases, it makes it possible to estimate at an early stage whether a skin graft will be necessary.

Even Better Than the Real Thing? Xenografting in Pediatric Patients with Scald Injury

Author(s): DiEgidio P.; Ortiz-Pujols S.; Jones S.; Cairns B.A.; Hultman C.S.; Hermiz S.J.; van Duin D.; Weber D.

Source: Clinics in Plastic Surgery; 2017

Abstract: This article reviews a single burn center experience with porcine xenografts to treat pediatric scald injuries, over a 10-year period. The authors compare xenografting to autografting, as well as wound care only, and provide outcome data on length of stay, incidence of health care-associated infections, and need for reconstructive surgery.

Two-year follow-up of outcomes related to scarring and distress in children with severe burns.

Author(s): Wurzer, Paul; Forbes, Abigail A; Hundeshagen, Gabriel; Andersen, Clark R; Epperson, Kathryn M; Meyer, Walter J; Kamolz, Lars P; Branski, Ludwik K; Suman, Oscar E; Herndon, David N; Finnerty, Celeste C

Source: Disability and rehabilitation; Aug 2017; vol. 39 (no. 16); p. 1639-1643

Abstract:PURPOSEWe assessed the perception of scarring and distress by pediatric burn survivors with burns covering more than one-third of total body surface area (TBSA) for up to 2 years post-burn.METHODSChildren with severe burns were admitted to our hospital between 2004 and 2012, and consented to this IRB-approved-study. Subjects completed at least one Scars Problems and/or Distress questionnaire between discharge and 24 months post burn. Outcomes were modeled with generalized estimating equations or using mixed linear models. Significance was accepted at $p < 0.01$.RESULTSResponses of 167 children with a mean age of 7 ± 5 years and burns covering an average 54 ± 14% of TBSA were analyzed. Significant improvements over the 2-year period were seen in reduction of pain, itching, sleeping disturbance, tightness, range of motion, and strength ($p < 0.01$). There was a significantly increased persistent desire to hide the scarred body areas over time ($p < 0.01$). The perception of mouth scarring, inability to portray accurate facial expressions, and skin coloration did not improve over the follow-up period.CONCLUSIONSAccording to self-assessment questionnaires, severely burned children exhibit significant improvements in their

overall perception of scarring and distress. However, these patients remain self-conscious with respect to their body image even 2 years after burn injury. Implications for Rehabilitation According to self-assessment questionnaires, severely burned children perceive significant improvements in scarring and distress during the first 2 years post burn. Significant improvements were seen in reduction of pain, itching, sleeping disturbances, tightness, range of motion, and strength ($p < 0.01$). Burn care providers should improve the treatment of burns surrounding the mouth that with result in scarring, and develop strategies to prevent skin discoloration. Careful evaluation of pain and sleeping disorders during the first year post burn are warranted to improve the patient rehabilitation. Overall, significantly more female patients expressed a persistent desire to hide their scarred body areas. The rehabilitation team should provide access to wigs or other aids to pediatric burn survivors to address these needs.

Effects of different duration exercise programs in children with severe burns.

Author(s): Clayton, Robert P; Wurzer, Paul; Andersen, Clark R; Mlcak, Ronald P; Herndon, David N; Suman, Oscar E

Source: Burns : journal of the International Society for Burn Injuries; Jun 2017; vol. 43 (no. 4); p. 796-803

Abstract:INTRODUCTIONBurns lead to persistent and detrimental muscle breakdown and weakness. Standard treatment at our institution includes a voluntary 12-week rehabilitative exercise program to limit and reverse the effects of increased muscle catabolism. In the present work, we investigated if different durations of exercise, 6 or 12 weeks, produce comparable improvements in muscle strength, body composition, and cardiopulmonary fitness.METHODSWe prospectively enrolled and randomized patients with ≥30% total body surface area (TBSA) burned to receive 6 or 12 weeks of exercise rehabilitation. Patients were evaluated for muscle strength, oxygen consumption capacity, and lean body mass at discharge (n=42) and after exercise. After 6 weeks (n=18) or 12 weeks (n=24) of exercise training, leg muscle strength was assessed as peak torque per body weight using a Biodex isokinetic dynamometer. Oxygen consumption capacity, measured as peak VO2, was studied using a standard treadmill-based test, and lean body mass was determined using dual-energy X-ray absorptiometry.RESULTSSignificant improvements in muscle strength, peak VO2, and lean body mass were seen after 6 weeks of exercise training ($p<0.001$), with only significant improvements in peak VO2 being seen after 6 weeks more of training.CONCLUSIONThese data suggest that a 6-week rehabilitative exercise program is sufficient for improving muscle strength, body composition, and cardiopulmonary fitness in pediatric burn patients. However, continuation of at- or near-home cardiopulmonary training following the 6 weeks of at-hospital rehabilitation may be useful.

Dressing changes in a burns unit for children under the age of five: A qualitative study of mothers' experiences.

Author(s): Morley, Jessica; Holman, Natalie; Murray, Craig D

Source: Burns : journal of the International Society for Burn Injuries; Jun 2017; vol. 43 (no. 4); p. 757-765

Abstract: This study aimed to investigate the experiences of mothers who had attended their child's burn dressing changes. Participants were recruited from a burns unit based within a children's hospital. Face-to-face interviews were conducted with five mothers of children under the age of five who had undergone a series of dressing changes taking place on the burns unit. The interview guide explored parents' experience of initial and subsequent dressing changes. Participants were prompted to explore their expectations, thoughts, feelings and behaviours associated with these experiences. The interviews were recorded and transcribed verbatim. Transcripts were analysed

using interpretative phenomenological analysis. The analysis identified four themes: 'needing to fulfil the responsibilities associated with being a mother'; 'emotional synchrony between mother and child'; 'being informed and knowing what to expect'; and 'the importance of establishing rapport with nurses performing dressing changes'. Findings from this research can inform services to help optimise mothers' experiences of dressing changes in this stage of pediatric burn care.

Partial-thickness scalds in children: A comparison of different treatment strategies.

Author(s): de Graaf, E; van Baar, M E; Baartmans, M G A; Scholten-Jaegers, S M H J; Nieuwenhuis, M K; Eshuis, J; Hiddingh, J; Beerthuizen, G I J M; van der Vlies, C H; Dutch Burn Repository group, Martini Hospital and Maasstad Hospital

Source: Burns : journal of the International Society for Burn Injuries; Jun 2017; vol. 43 (no. 4); p. 733-740

Abstract:AIMThe aim of this study was to compare the clinical outcomes of different treatment strategies for children with partial-thickness scalds at two burn centers. At the first burn center, these burns were treated with a hydrofiber dressing (Aquacel®, Convatec, Inc.®, Princeton, NJ, USA) or silver sulfadiazine (SSD, Flammazine®, Sinclair IS Pharma, London, UK Pharmaceuticals), while at the second burn center, cerium nitrate-silver sulfadiazine (CN-SSD, Flammacerium®, Sinclair IS Pharma, London, UK Pharmaceuticals) was used.METHODSA two-center retrospective study was conducted of children admitted between January 2009 and December 2013 for partial-thickness scalds up to 10% TBSA who were treated primarily with a hydrofiber dressing or silver sulfadiazine (Burn Center Rotterdam) vs. cerium nitrate-silver sulfadiazine (Burn Center Groningen). The Dutch Burn Repository R3 and the electronic medical records of the study population were used for data extraction. The primary outcome was the time to wound healing. The secondary outcomes were the length of hospital stay, wound infection, and surgical treatment.RESULTSThe time to wound healing differed between the groups (HR=1.46, 95%CI 1.17-1.82); the shortest time to wound healing was observed in the patients treated with CN-SSD (median 13 days), compared with 15 days for the patients treated with hydrofiber and 16 days for the patients treated with SSD ($p<0.01$). The length of stay was significantly shorter for the hydrofiber patients (medians: hydrofiber 3 days, SSD 10 days and CN-SSD 7 days; $p<0.01$), but their outpatient treatment period was significantly longer (medians: hydrofiber 12 days, SSD 6 and CN-SSD 4 days; $p<0.01$). The proportion of surgeries and the mean time to surgery was similar between the burn centers.CONCLUSIONSThis study compared different burn centers' treatment strategies for children with partial-thickness scalds and found a shorter time to wound healing in the CN-SSD group. Patients treated with hydrofiber had a shorter clinical period in comparison with the SSD and CN-SSD patients. The results of CN-SSD are promising and warrant further study. A prospective study is needed to gain full insight into the merits and drawbacks of the treatment strategies. This will allow clinicians to make full use of the strengths of particular treatments to benefit specific patients.

Cost-effectiveness of silver dressings for paediatric partial thickness burns: An economic evaluation from a randomized controlled trial.

Author(s): Gee Kee, E; Stockton, K; Kimble, R M; Cuttle, L; McPhail, S M

Source: Burns : journal of the International Society for Burn Injuries; Jun 2017; vol. 43 (no. 4); p. 724-732

Abstract:BACKGROUNDPartial thickness burns of up to 10% total body surface area (TBSA) in children are common injuries primarily treated in the outpatient setting using expensive silver-containing dressings. However, economic evaluations in the paediatric burns population are lacking to assist healthcare providers when choosing which dressing to use. The aim of this study was to

conduct a cost-effectiveness analysis of three silver dressings for partial thickness burns ≤10% TBSA in children aged 0-15 years using days to full wound re-epithelialization as the health outcome.METHODThis study was a trial based economic evaluation (incremental cost effectiveness) conducted from a healthcare provider perspective. Ninety-six children participated in the trial investigating Acticoat™, Acticoat™ with Mepitel™ or Mepilex Ag™. Costs directly related to the management of partial thickness burns ≤10% TBSA were collected during the trial from March 2013 to July 2014 and for a one year after re-epithelialization time horizon. Incremental cost effectiveness ratios were estimated and dominance probabilities calculated from bootstrap resampling trial data. Sensitivity analyses were conducted to examine the potential effect of accounting for infrequent, but high cost, skin grafting surgical procedures.RESULTSCosts (dressing, labour, analgesics, scar management) were considerably lower in the Mepilex Ag™ group (median AUD$94.45) compared to the Acticoat™ (median $244.90) and Acticoat™ with Mepitel™ (median $196.66) interventions. There was a 99% and 97% probability that Mepilex Ag™ dominated (cheaper and more effective than) Acticoat™ and Acticoat™ with Mepitel™, respectively. This pattern of dominance was consistent across raw cost and effects, after a priori adjustments, and sensitivity analyses. There was an 82% probability that Acticoat™ with Mepitel dominated Acticoat™ in the primary analysis, although this probability was sensitive to the effect of skin graft procedures.CONCLUSIONThis economic evaluation has demonstrated that Mepilex Ag™ was the dominant dressing choice over both Acticoat™ and Acticoat™ with Mepitel™ in this trial-based economic evaluation and is recommended for treatment of paediatric partial thickness burns ≤10% TBSA.

Burn patients' return to daily activities and participation as defined by the International Classification of Functioning, Disability and Health: A systematic review.

Author(s): Osborne, Candice L; Meyer, Walter J; Ottenbacher, Kenneth J; Arcari, Christine M

Source: Burns : journal of the International Society for Burn Injuries; Jun 2017; vol. 43 (no. 4); p. 700-714

Abstract: The World Health Organization's International Classification of Functioning, Disability and Health (ICF) is a universal classification system of health and health-related domains. The ICF has been successfully applied to a wide range of health conditions and diseases; however, its application in the field of burn recovery has been minimal. This systematic review uses the domains of the ICF component 'activities and participation' to explore: (1) the extent to which return to daily activities and community participation after burn has been examined in the pediatric population, (2) the most common assessments used to determine activity and participation outcomes, and (3) what activity and participation areas are most affected in the pediatric burn population after discharge from acute care. Results determined that it is difficult to draw overarching conclusions in the area of return to 'activities and participation' for children with burn based on the paucity of current evidence. Of the studies conducted, few examined the same subtopics or used similar measurements. This suggests a need for more robust studies in this area in order to inform and improve burn rehabilitation practices to meet the potential needs of burn patients beyond an acute care setting.

Cryopreserved cultured epithelial allografts for pediatric deep partial dermal burns: Early wound closure and suppression of scarring

Author(s): Yanaga H.; Koga M.; Yanaga K.; Udoh Y.; Yoshii S.; Mori S.; Yamauchi T.; Kiyokawa K.; Yamamoto M.

Source: Regenerative Therapy; Jun 2017; vol. 6 ; p. 74-82

Abstract: Background In deep partial thickness dermal burns (DDB) where greater than 50% of the dermis is lost, severe pain, scarring and contractures occur. Therefore, skin grafting may be required.

In children, scar contracture occurs because scarred skin does not stretch with growth creating the need for additional scar-releasing or skin-grafting surgeries. In order to resolve this problem, we used cryopreserved cultured epithelial allograft (cryopreserved allo-CEG), which can be grafted shortly after sustaining a wound. We reevaluated the promotion of early wound closure of burns and suppression of scarring by this treatment. Methods Cryopreserved allo-CEGs were used to treat 50 cases of pediatric DDB from 1992 to 2000. These cases were reviewed with regard to the time until epithelialization, take percentage, and pain level. Also, in order to examine why cryopreserved allo-CEG promotes healing of burns and suppresses scarring, growth factors and cytokines in the cryopreserved allo-CEG were measured. Cryopreserved allo-CEG sheets were solubilized and concentrations of TGF-alpha, TGF-beta1, IL-1alpha, IL-1beta, PDGF-AA, VEGF, KGF, IL-6, b-FGF, as well as metalloprotease-1 (MMP-1) and HGF, which are noted to have scarring suppression effects, were measured before grafting. Results Grafting of cryopreserved allo-CEGs in 50 cases of childhood DDB resulted in early epithelialization (9.32 +/- 3.63 days on the average) and an almost 100% take rate. Also, pain relief (pain reduction or elimination, reduced need for anesthetics) was seen in all cases. Although 15-23 years have now elapsed, adverse events have not been observed. Cryopreserved allo-CEG contains IL-1alpha, IL-1beta, PDGF-AA, TGF-alpha, TGF-beta1, VEGF, and IL-6 have wound healing effects. The concentration of IL-1alpha was higher than the concentrations of other components, and this was followed by TGF-alpha, TGF-beta1, b-FGF and VEGF. Although the concentration of MMP-1, which has a scarring suppression effect, was high, HGF was not detected. Conclusion Cryopreserved allo-CEG contains growth factors that promote wound healing and factors that suppress scarring. Three effects, namely (1) early wound closure, (2) scarring suppression, and (3) pain relief were seen with grafts of cryopreserved allo-CEG in cases of childhood DDB. These observations show that cryopreserved allo-CEG is clinically useful and effective for the treatment of childhood DDB.

The occurrence of single and multiple organ dysfunction in pediatric electrical versus other thermal burns.

Author(s): Hundeshagen, Gabriel; Wurzer, Paul; Forbes, Abigail A; Voigt, Charles D; Collins, Vanessa N; Cambiaso-Daniel, Janos; Finnerty, Celeste C; Herndon, David N; Branski, Ludwik K

Source: The journal of trauma and acute care surgery; May 2017; vol. 82 (no. 5); p. 946-951

Abstract:BACKGROUNDMultiple organ failure (MOF) is a major contributor to morbidity and mortality in burned children. While various complications induced by electrical injuries have been described, the incidence and severity of single organ failure (SOF) and MOF associated with this type of injury are unknown. The study was undertaken to compare the incidence and severity of SOF and MOF as well as other complications between electrically and thermally burned children.PATIENTS AND METHODSBetween 2001 and 2016, 288 pediatric patients with electrical burns (EB; n = 96) or thermal burns (CTR; n = 192) were analyzed in this study. Demographic data; length of hospitalization; and number and type of operations, amputations, and complications were statistically analyzed. Incidence of SOF and MOF was assessed using the DENVER2 classification in an additive mixed model over time. Compound scores and organ-specific scores for lung, heart, kidney, and liver were analyzed. Serum cytokine expression profiles of both groups were also compared over time. Significance was accepted at $p < 0.05$.RESULTSBoth groups were comparable in age (CTR, 11 ± 5 years, vs EB, 11 ± 5 years), percent total body surface area burned (CTR, 33% ± 25%, vs EB, 32 ± 25%), and length of hospitalization (CTR, 18 ± 26 days, vs EB, 18 ± 21 days). The percentage of high-voltage injury in the EB group was 64%. The incidence of MOF was lower in the EB group (2 of 96 [2.1%]) than the CTR group (20 of 192 [10.4%]; $p < 0.05$). The incidence of single organ failure was comparable between groups. Incidence of pulmonary failure was comparable in both groups, but incidence of inhalation injury was significantly higher in the CTR group ($p < 0.0001$). Patients in the EB group had more amputations ($p < 0.001$), major amputations ($p = 0.001$), and combined major

amputations ($p < 0.01$). Mortality was comparable between the groups. Serum cytokine expression profiles were also comparable between the groups.CONCLUSIONSIn pediatric patients, electrical injury is associated with a lower incidence of MOF than other thermal burns. Early and radical debridement of nonviable tissue is crucial to improve outcomes in the electrical burn patient population.LEVEL OF EVIDENCERetrospective chart review, level III.

Laundry Detergent Pods Linked to Increased Eye Injuries in Children.

Author(s): Halpern, Lucy Wang

Source: The American journal of nursing; May 2017; vol. 117 (no. 5); p. 15

Abstract: Pods are responsible for over a quarter of toddlers' chemical ocular burns.

Verrucae Planae Within Previous Xenograft Sites of Burn Wounds.

Author(s): Chen, Olivia; Pearlstein, Michelle Vernali; Morrell, Dean S; Corley, Sarah B

Source: Pediatric dermatology; May 2017; vol. 34 (no. 3); p. e130

Abstract: Burn injuries are known to compromise host immune defenses through disruption of mucocutaneous barriers and suppression of cell-mediated immune responses, which may render patients with burn injuries susceptible to viral infections in the days to years after an initial insult. We report a case of verrucae planae developing as a secondary condition confined to former xenograft sites in a child, appearing more than 3.5 years after initial second-degree burn injuries. Only a few reports have previously described the development of verrucae in former burn sites, with most reporting latency to onset of verrucae appearance of months rather than years. Current hypotheses suggest that the postburn immune response shifts from an early proinflammatory to a late antiinflammatory response characterized by altered cytokine profiles and diminished cellular cytotoxicity mediated by cytotoxic T-lymphocytes, natural killer cells, and epidermal antigen-presenting cells, which together likely contribute to an enduring postburn regional immunosuppression that allows for the seeding and proliferation of viral agents.

β-Adrenergic blockade does not impair the skin blood flow sensitivity to local heating in burned and nonburned skin under neutral and hot environments in children.

Author(s): Rivas, Eric; McEntire, Serina J; Herndon, David N; Mlcak, Ronald P; Suman, Oscar E

Source: Microcirculation (New York, N.Y. : 1994); May 2017; vol. 24 (no. 4)

Abstract:OBJECTIVEWe tested the hypothesis that propranolol, a drug given to burn patients to reduce hypermetabolism/cardiac stress, may inhibit heat dissipation by changing the sensitivity of skin blood flow (SkBF) to local heating under neutral and hot conditions.METHODSIn a randomized double-blind study, a placebo was given to eight burned children, while propranolol was given to 13 burned children with similar characteristics (mean±SD: 11.9±3 years, 147±20 cm, 45±23 kg, 56±12% Total body surface area burned). Nonburned children (n=13, 11.4±3 years, 152±15 cm, 52±13 kg) served as healthy controls. A progressive local heating protocol characterized SkBF responses in burned and unburned skin and nonburned control skin under the two environmental conditions (23 and 34°C) via laser Doppler flowmetry.RESULTSResting SkBF was greater in burned and unburned skin compared to the nonburned control (main effect: skin, P.05) under either condition.CONCLUSIONTherapeutic propranolol does not negatively affect SkBF under neutral or hot environmental conditions and further compromise temperature regulation in burned children.

Reconstruction of the Adult and Pediatric Burned Hand.

Author(s): Cauley, Ryan P; Helliwell, Lydia A; Donelan, Matthias B; Eberlin, Kyle R

Source: Hand clinics; May 2017; vol. 33 (no. 2); p. 333-345

Abstract: Thermal injuries of the hand can have a great impact on function. Initial treatment should focus on the prevention of contracture through the use of tissue-sparing techniques and optimized occupational therapy. Surgical intervention should follow the standard reconstructive ladder and can involve several techniques from simple to complex including minimally invasive techniques, such as laser and steroid injection, contracture release and skin grafting, and local tissue rearrangement and regional flaps as well as distant pedicled and free flaps. Reconstructive surgery of the hand, when performed well, can lead to meaningful functional improvement in severe burns.

Management of Acute Pediatric Hand Burns.

Author(s): Norbury, William B; Herndon, David N

Source: Hand clinics; May 2017; vol. 33 (no. 2); p. 237-242

Abstract: Worldwide, approximately 500,000 children are admitted to the hospital with burn injuries every year. Referral to an accredited burn center is required for burns that involve the hand regardless of age. As with most burn injuries, a multidisciplinary approach is important; however, in the younger pediatric patient, extra resources such as child life services, pediatric psychotherapy, and music therapy all play major roles alongside the nurse, physical therapists, and psychiatrists so that together with the appropriate support for the family involved, a successful outcome can be achieved.

Chemical and Common Burns in Children.

Author(s): Yin, Shan

Source: Clinical pediatrics; May 2017; vol. 56 (no. 5)

Abstract: Burns are a common cause of preventable morbidity and mortality in children. Thermal and chemical burns are the most common types of burns. Their clinical appearance can be similar and the treatment is largely similar. Thermal burns in children occur primarily after exposure to a hot surface or liquid, or contact with fire. Burns are typically classified based on the depth and total body surface area, and the severity and onset of the burn can also depend on the temperature and duration of contact. Chemical burns are caused by chemicals-most commonly acids and alkalis-that can damage the skin on contact. In children, the most common cause of chemical burns is from household products such as toilet bowl cleaners, drain cleaners, detergents, and bleaches. Mild chemical burns generally cause redness and pain and can look similar to other common rashes or skin infections, whereas severe chemical burns are more extreme and may cause redness, blistering, skin peeling, and swelling.

3D-printed transparent facemasks in the treatment of facial hypertrophic scars of young children with burns.

Author(s): Wei, Yating; Li-Tsang, Cecilia W P; Liu, Jun; Xie, Lihua; Yue, Shukai

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. e19

Abstract:INTRODUCTIONFacial burns could create serious scar problems resulting disfigurement particularly on children. The conventional methods of producing transparent face masks for scar control remains complex and require dexterous skills of experienced clinician and patients'

compliance during fitting. In this study, we adopted a portable 3D scanning and Computer-Aided Design (CAD) to produce 3D-printed transparent facemasks. Its efficacy was tested on two children with facial burns resulting hypertrophic scars.METHODThis study adopted a longitudinal case follow up research design. Two children with facial burns were recruited in the study upon consent. Their facial features were scanned with a portable 3D scanner and then edited and converted to the target files: the customized printable facemask files. The transparent facemask was directly printed out on the transparent biocompatible material followed by adding the medical grade silicone gel to provide extra pressure on the scar site. The facemasks were fitted to the patients with elastic straps connecting the printed anchoring bolts. Both children and family were instructed to wear the facemask for at least 20h per day and they were assessed before treatment, one month and three months after treatment on the facial scar conditions.RESULTSAt the one-month and three-month assessments after treatment, a decrease in average scar thickness was shown and the facial appearance was satisfactory. The 3D-printed facemasks were well fitted on both patients. The treatment was well-tolerated and no complication was reported.CONCLUSION3D-printed transparent facemask is convenient and efficient to fabricate, and is suitable for treating pediatric facial hypertrophic scars after burn.

Infection in burn patients in a referral center in Colombia.

Author(s): Ramirez-Blanco, Carlos Enrique; Ramirez-Rivero, Carlos Enrique; Diaz-Martinez, Luis Alfonso; Sosa-Avila, Luis Miguel

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 642-653

Abstract:INTRODUCTIONWorldwide, burns are responsible for more than 300,000 deaths annually; infection is a major cause of morbidity and mortality in these patients. Early identification and treatment of infection improves outcome. Toward this end it's necessary to identify the institutions flora and organisms that most frequently produces infection.OBJECTIVESTo characterize infections developed by burn patients hospitalized at the University Hospital of Santander (HUS).METHODOLOGYBurn patients hospitalized in the HUS from January 1 to December 2014 were followed. Medical information regarding infections, laboratory and pathology reports were obtained. Statistical analysis with measures of central tendency, proportions, global and specific incidence density plus overall and specific incidence was obtained. For the microbiological profile proportions were established.RESULTS402 burn patients were included, 234 (58.2%) men and 168 (41.8%) women, aged between 6 days and 83 years, median 12.5 years. The burn agents include scald (52.5%), fire (10.0%), gasoline (9.2%), electricity (7.5%), among others. Burn area ranged from 1% to 80% TBS. Cumulative mortality was 1.5%. 27.8% of burned patients had one or more infections. Identified infections include folliculitis (27.0%), urinary tract infection (19.0%), infection of the burn wound (10.4%), pneumonia (8.6%), Central venous catheter (7.4%), bloodstream infection (7.4%) and skin grafts infection (4.3%) among others. Bacteria were responsible for 88.5% of the cases and fungi 11.5%. The most frequently isolated germs were P. aeruginosa, A. baumannii, E. coli, S. aureus and K. pneumoniae. Most gram-negative bacteria were sensitive to Amikacin, gram positive bacteria were sensitive to multiple antibiotics.CONCLUSIONBurns is a severe trauma that occurs in adult and pediatric patients, has several causative agents and can compromise the patient's life. The burned patient is at risk for a variety of infections. According to the type of infection it is possible to infer the most common causative organisms and their antibiotic sensitivity/resistance which allow a directed early empiric treatment.

Bathroom scald burns in Queensland Children.

Author(s): Gole, Hobia; Kimble, Roy; Stockton, Kellie

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 638-641

Abstract:AIMTo evaluate the current characteristics of bathroom scald injuries in Queensland Children.METHODData was collected from patients who presented with a bathroom scald injury to the Stuart Pegg Paediatric Burns Centre at the Royal Children's Hospital and Lady Cilento Children's Hospital, Brisbane from January 2013 to December 2014.RESULTSBathroom scald burns represented 2.6% of total burns cases with an inpatient rate of 39%. The family home is the location of injury in 84% of cases and in 79% the patient was aged 2 years of age or younger. Total body surface area ranged from 0.5% to 20% with a median of 1.75% (IQR 0.63, 3.38%). In our study 8% of patients underwent grafting and 24% received follow up for scar management. Injuries occurred in rental properties in 47% of tempering valve survey respondents. The rate of installation of tempering valves was 23%.DISCUSSIONBathroom scald burns continue to be over-represented in inpatient data. Tempering valves were not consistently installed after injury, this intervention would require further legislation to be an effective prevention strategy.CONCLUSIONThis study provides important insights into paediatric bathroom scald injuries and will assist with the development of prevention strategies.

A 10 year epidemiological study of paediatric burns at the Welsh Centre for burns and plastic surgery.

Author(s): Sanyaolu, Leigh; Javed, Muhammad Umair; Eales, Micheal; Hemington-Gorse, Sarah

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 632-637

Abstract: Paediatric burns make up a significant proportion of burn injured patients seen within the hospital setting and worldwide account for a significant proportion of unintentional deaths. Currently there is limited data on severe paediatric burns requiring intensive care support. Our study aimed primarily to describe the epidemiology of severe burns admitted to the intensive care unit at our centre receiving fluid resuscitation over a 10 year period. A secondary aim was to describe the referrals patterns in general over the same time period. A retrospective analysis was performed for paediatric patients referred to our centre receiving fluid resuscitation and intensive care support from 2003 to 2013. We also analysed the patterns of referrals, admissions and need for surgical intervention over the same time period retrospectively. Children less than 5 years old made up 65% of admissions to intensive care and scald injuries (56%) were the commonest aetiology. Both total length of stay (25 days in 2003 to 10 days in 2013) and intensive care length of stay (7.2 days in 2003 to 3 days in 2013) decreased during the study and less patients underwent operative intervention. Referrals to our centre increased from 261 in 2003 to 366 in 2013, however admission rates declined from 145 to 85 during that time period. Currently there is limited data on severe burns within the paediatric population. Our study provides epidemiological data in this area, an important step for developing future prevention strategies.

Why burn patients are referred?

Author(s): Latifi, Noor-Ahmad; Karimi, Hamid

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 619-623

Abstract:BACKGROUNDMany burn patients are needed to be referred to a tertiary burn hospital according to the American Burn Association (ABA) criteria. The purpose of this study was to verify the reasons for referring of the burn patients to the hospital.MATERIALS AND METHODSFor 2 years, we prospectively surveyed the burn patients referred to a tertiary teaching burn hospital. Data for the following variables were collected and analyzed with SPSS software V21.0: causes of burn; age;

gender; total body surface area (TBSA) measured at the referring center; TBSA measured at the receiving center; concomitant diseases and traumas; the reason for referral; condition of patients before and during the transportation; transportation time; presence of infection; presence of inhalation injury, electrical injury, and chemical injury; child abuse; insurance coverage; and results and outcomes of patients.RESULTSA total of 578 burn patients (33.6% of the total admissions) were referred in the study period. Among these patients, 70.9% were females. The mean (SD) age of the patients was 35.3 (19.69) years. The mean (SD) of TBSA was 45.2 (26.3). Of the 578 patients, 45% were referred by request of the family or patients; 9% were referred because lack of diagnostic facility, approximately 43% were referred because of the need to be admitted in a tertiary burn center, 0.7% were referred because of a lack of capacity at other hospitals, and 0.5% were referred because of an error in the estimation of TBSA.CONCLUSIONSA total of 45% of the referrals were by request of the family and patients. Tele-medicine may help to establish a direct contact between expert burn physicians and the patients and thus reduce unnecessary transfers. Approximately 9% of the referrals were because of lack of some diagnostic facilities.

Qualitative analysis of a psychological supportive counseling group for burn survivors and families in Malawi.

Author(s): Barnett, Brian S; Mulenga, Macjellings; Kiser, Michelle M; Charles, Anthony G

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 602-607

Abstract:OBJECTIVEWhile psychological care, including supportive group therapy, is a mainstay of burn treatment in the developed world, few reports of support groups for burn survivors and their caregivers in the developing world exist. This study records the findings of a support group in Malawi and provides a qualitative analysis of thematic content discussed by burn survivors and caregivers.MATERIALS AND METHODSWe established a support group for burn survivors and caregivers from February-May 2012 in the burn unit at Kamuzu Central Hospital in Lilongwe, Malawi. Sessions were held weekly for twelve weeks and led by a Malawian counselor. The group leader compiled transcripts of each session and these transcripts were qualitatively analyzed for thematic information.RESULTSThematic analysis demonstrated a variety of psychological issues discussed by both survivors and caregivers. Caregivers discussed themes of guilt and self-blame for their children's injuries, worries about emotional distance now created between caregiver and survivor, fears that hospital admission meant likely patient death and concerns about their child's future and burn associated stigma. Burn survivors discussed frustration with long hospitalization courses, hope created through interactions with hospital staff, the association between mental and physical health, rumination about their injuries and how this would affect their future, decreased self-value, increased focus on their own mortality and family interpersonal difficulties.CONCLUSIONSThe establishment of a support group in our burn unit provided a venue for burn survivors and their families to discuss subjective experiences, as well as the dissemination of various coping techniques. Burn survivors and their caregivers in Malawi would benefit from the establishment of similar groups in the future to help address the psychological sequelae of burns.

Internet-based information and support program for parents of children with burns: A randomized controlled trial.

Author(s): Sveen, Josefin; Andersson, Gerhard; Buhrman, Bo; Sjöberg, Folke; Willebrand, Mimmie

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 583-591

Abstract:BACKGROUNDThe aim of the study was to evaluate the feasibility and effects of an internet-based information and self-help program with therapist contact for parents of children and

adolescents with burns. The program aimed to reduce parents' symptoms of general and posttraumatic stress.METHODSParticipants were parents of children treated for burns between 2009-2013 at either of the two specialized Swedish Burn centers. Sixty-two parents were included in a two-armed, randomized controlled trial with a six-week intervention group and a wait-list control group, including a pre and post-assessment, as well as a 3 and 12-month follow-up. The intervention contained psychoeducation, exercises and homework assignments, and the intervention group received weekly written feedback from a therapist. The main outcome was stress (post-traumatic stress, general stress and parental stress).RESULTSThe program had a beneficial effect on posttraumatic stress in the short term, but did not affect general stress or parental stress. The parents rated the program as being informative and meaningful, but some of them thought it was time-consuming.CONCLUSIONThe program has the potential to support parents of children with burns. The intervention is easily accessible, cost-effective and could be implemented in burn care rehabilitation.

Healing time and incidence of hypertrophic scarring in paediatric scalds.

Author(s): Lonie, Sarah; Baker, Paul; Teixeira, Rodrigo P

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 509-513

Abstract:INTRODUCTIONScald burns, which heal in less than 14 days, are seen to be at low risk of hypertrophic scar (HTS) formation. Consequently surgery is usually reserved for scalds likely to take more than 14 days to heal. With the use of silver based dressings over the past few years, anecdotally, we have observed a tendency to improved healing of scalds with conservative management and reduced need for surgical intervention. We aimed to investigate the effect of overall healing time of paediatric scalds on HTS formation over a five-year period (2011-15).METHODSWe retrospectively identified all new patients attending the Royal Children's Hospital (RCH) burns clinic from 31st January 2011-31st July 2015. Medical histories were reviewed for burns caused by scalds. Scar quality was determined from written records or clinical photographs. Patients were compared in groups based on healing time of 30 days.RESULTSWe studied 322 children, of which 52 (16.1%) developed HTS. There was a significantly higher incidence of HTS with increased time to healing (mean 34.5 days compared to 12.1 days, $p<0.01$). There were 25 patients that underwent surgical treatment with excision or debridement and split thickness skin graft of which 21 (84%) developed HTS. Grafting offered no benefit in HTS rate in the 22-30 days to heal group.CONCLUSIONSOur study confirms that there is a link between prolonged healing time of scald wounds and HTS. The danger of slow healing for scarring despite grafting, suggests this operation should be performed earlier than current practice to allow complete healing in less than 3 weeks.

Autologous fat grafting does not improve burn scar appearance: A prospective, randomized, double-blinded, placebo-controlled, pilot study.

Author(s): Gal, Shaili; Ramirez, Jesus Ignacio; Maguina, Pirko

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 486-489

Abstract:OBJECTIVEIt has been proposed that fat grafts can improve the appearance of mature burn scars. The pluripotent progenitor cells contained within autologous adipose tissue grafts are believed to induce skin repair and improve scar appearance. We conducted a prospective, randomized, double-blinded, placebo-controlled study to evaluate the effects of fat grafts on the appearance of mature burn scars.METHODSPediatric burn survivors with mature scars were recruited for this study. A homogeneous scar measuring 10×5cm was randomized into two halves:

one was injected with autologous fat graft and the other with normal saline. Scar injection was performed using standard Coleman technique. Appearance of the two scar halves was assessed, six to twelve months later by the operating surgeon, by blinded observers and by the blinded patients.RESULTSEight patients completed the study pilot with 6-12 month follow-up. Assessment by the patients did not clearly favor fat grafts or saline injections; the operating surgeon did not identify any differences on any of the patients; the blinded observers measured all scars using Vancouver Scar Scale and noticed no differences in pigmentation, vascularity and height; differences in pliability showed similar changes in both the fat grafted and control arms. After the pilot was completed, decision was made to stop enrolling patients for this study since no benefit to fat grafting was observed.CONCLUSIONSSingle treatment with autologous fat grafts did not improve mature pediatric burn scars when compared to normal saline injections.

Life-long relationships? The future of pediatric burn care and research.

Author(s): Hundeshagen, Gabriel; Wurzer, Paul; Herndon, David N

Source: Burns : journal of the International Society for Burn Injuries; May 2017; vol. 43 (no. 3); p. 457-458

Developmental and behavioural associations of burns and scalds in children: a prospective population-based study.

Author(s): Emond, Alan; Sheahan, Clare; Mytton, Julie; Hollén, Linda

Source: Archives of disease in childhood; May 2017; vol. 102 (no. 5); p. 428-483

Available in full text at Archives of disease in childhood - from Highwire Press

Abstract:OBJECTIVETo investigate child developmental and behavioural characteristics and risk of burns and scalds.DESIGNData on burns in children up to 11 years from 12 966 participants in the Avon Longitudinal Study of Parents and Children were linked to developmental profiles measured before the burn injury.MEASURESPreinjury profiles of the children derived from maternal questionnaires completed in pregnancy, and at 6, 18, 42, 47 and 54 months. Injury data collected by questionnaire at 6, 15 and 24 months and 3.5, 4.5, 5.5, 6.5, 8.5 and 11 years of age.RESULTSIncidence: Burn rates were as follows: birth-2 years 71.9/1000/year; 2-4.5 years 42.2/1000/year; 5-11 years 14.3/1000/year. Boys <2 years were more likely to sustain burns, and girls had more burns between age 5 and 11 years. Medical attention was sought for 11% of burn injuries. Development: Up to age 2 years, burns were more likely in children with the most advanced gross motor developmental scores and the slowest fine motor development. Children with coordination problems at 4.5 years of age had increased risk of burns between 5 and 11 years. No associations were observed with cognitive skills. Behaviour: At 3.5 years, the Strengths and Difficulties Questionnaire scores and reported frequent temper tantrums predicted subsequent burns in primary school age. After adjustment for confounders, burns in the preschool period were related to gender and motor development, and in school-aged children, to frequent temper tantrums, hyperactivity and coordination difficulties.CONCLUSIONChild factors associated with increased risk of burns were male gender in infancy and female gender at school age, advanced gross motor development, coordination difficulties, hyperactivity and problems with emotional regulation.

ESTABLISHING AN EMERGENCY DEPARTMENT PROTOCOL FOR MANAGING TRAUMA WOUNDS.

Author(s): Harrison, Janis E.

Source: Journal of Wound, Ostomy & Continence Nursing; May 2017; vol. 44

Abstract:CLINICAL PROBLEM: Four adults and 1 pediatric patient presented with painful trauma wounds managed in an emergency department (ED). Patient 1: right foot crush injury affecting the first and second toes. Patients 2 and 3: second-degree burns affecting the face near the eyes. Patient 4 (2-year-old): first-and second-degree burns affecting the hands and legs. Patient 5: second-degree burns affecting the right arm and hand. All patients' pain rated from 3 to 10 initially (0-10 scale). INITIAL MANAGEMENT AT ED VISIT: Patient 1: standard Polymeric Membrane Dressings (PMDs) wrapped around the toes. Patient 5: silver PMDs applied. Patients 2, 3, and 4: silver sulfadiazine (SSD) applied. CURRENT CLINICAL APPROACH: After discharge, all were referred to the outpatient wound clinic and seen within 1 to 3 days. PMDs replaced SSD to help reduce patients' wound pain. There were concerns regarding SSD migrating into patient 2's and 3's eyes and with patient 4 (2-year-old) rubbing her eyes and putting fingers in her mouth. SSD can damage eyes and mucus membranes and may be harmful if swallowed. Patients had silver PMDs applied. No further manual cleansing was required after initial removal of SSD, as PMDs continuously cleanse. Dressing changes were decreased from 2 to 3x per day with SSD to every 2 to 3 days with PMDs. PATIENT OUTCOMES: All wounds reached closure with PMDs. Pain was reduced to 3 to 0 (0-10 scale) for all patients. Once PMDs were applied, patient 4 (2-year-old) was no longer in emotional distress, stopped crying, and allowed the dressings to be changed. Reduced frequency of PMD changes reduced disruption of the wound bed. PMDs facilitated blister reabsorption, debridement, and reduced scarring. CONCLUSIONS: PMDs provided an optimal healing environment. PMDs are the standard protocol of care in the ED.

UTILIZING A UNIQUE BURN AND WOUND DRESSING IN PEDIATRIC PATIENTS TO FACILITATE A MOIST WOUND ENVIRONMENT FOR AUTOLYTIC DEBRIDEMENT.

Author(s): Amaya, Rene

Source: Journal of Wound, Ostomy & Continence Nursing; May 2017; vol. 44

Abstract: The first step in wound care is debridement, which can be done in a number of ways. However, with pediatric patients, the debridement method of choice must not only be effective but also as gentle as possible. A new burn and wound dressing has a surfactant component that provides unique micelle properties. This dressing is also cell-friendly, biocompatible, and 100% water soluble. This combination allows for gentle dressing application and changes, as the water-soluble translucent gel dissolves for less crusting, fast dressing changes, and less pain. Due to the unique properties of the dressing, it was evaluated on pediatric patients with wounds with nonviable, necrotic tissue that required autolytic debridement. A convenience sample of patients whose injuries required debridement was included in the study. Wounds of various etiologies were included in the study. At presentation, the burn and wound dressing was applied directly to the wound and covered with a secondary dressing. The parents were then instructed to do the dressing changes at home between weekly clinic visits. At the weekly clinic visits, mechanical debridement was performed on all loose, nonviable tissues. Time to resolution was tracked. The burn and wound dressing with micelle technology promoted a moist wound-healing environment and less painful dressing changes. The dressing changes were easy for the parents. No adverse events, such as skin irritation, were seen.

Fireworks type, injury pattern, and permanent impairment following severe fireworks-related injuries.

Author(s): Sandvall, Brinkley K; Jacobson, Lauren; Miller, Erin A; Dodge, Ryan E; Alex Quistberg, D; Rowhani-Rahbar, Ali; Vavilala, Monica S; Friedrich, Jeffrey B; Keys, Kari A

Source: The American journal of emergency medicine; Apr 2017

Abstract:BACKGROUNDThere is a paucity of clinical data on severe fireworks-related injuries, and the relationship between firework types, injury patterns, and magnitude of impairment is not well understood. Our objective was to describe the relationship between fireworks type, injury patterns, and impairment.METHODSRetrospective case series (2005-2015) of patients who sustained consumer fireworks-related injuries requiring hospital admission and/or an operation at a Level 1 Trauma/Burn Center. Fireworks types, injury patterns (body region, injury type), operation, and permanent impairment were examined.RESULTSData from 294 patients 1 to 61years of age (mean 24years) were examined. The majority (90%) were male. 119 (40%) patients were admitted who did not undergo surgery, 163 (55%) patients required both admission and surgery, and 12 (5%) patients underwent outpatient surgery. The greatest proportion of injuries was related to shells/mortars (39%). There were proportionally more rocket injuries in children (44%), more homemade firework injuries in teens (34%), and more shell/mortar injuries in adults (86%). Brain, face, and hand injuries were disproportionately represented in the shells/mortars group. Seventy percent of globe-injured patients experienced partial or complete permanent vision loss. Thirty-seven percent of hand-injured patients required at least one partial or whole finger/hand amputation. The greatest proportion of eye and hand injuries resulting in permanent impairment was in the shells/mortars group, followed by homemade fireworks. Two patients died.CONCLUSIONSSevere fireworks-related injuries from homemade fireworks and shells/mortars have specific injury patterns. Shells/mortars disproportionately cause permanent impairment from eye and hand injury.

Exercise: Heterogeneity

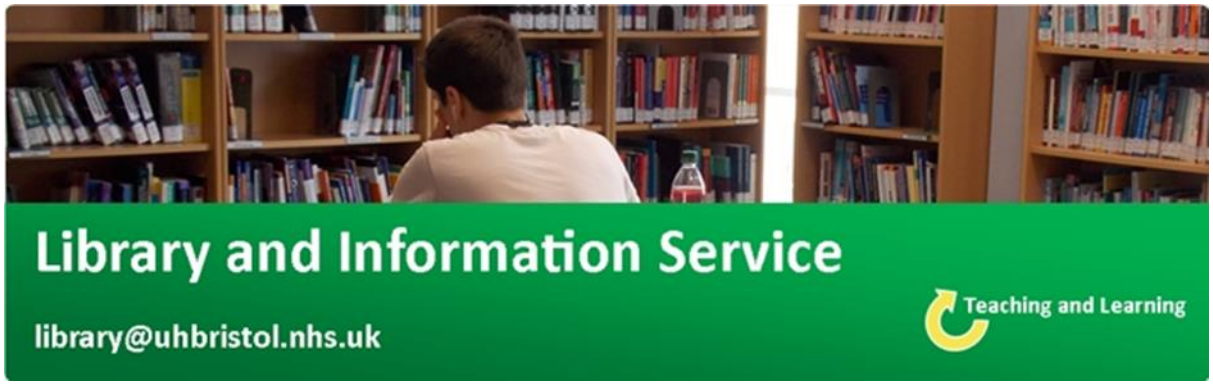
Heterogeneity is the extent to which studies brought together in a systematic review demonstrate variation across a range of key variables.

Match the different types of heterogeneity:

1. Statistical heterogeneity (conventionally just known as 'heterogeneity')
2. Methodological heterogeneity
3. Clinical heterogeneity

A. Variability in the participants, interventions and outcomes studied
B. Variability in study design and risk of bias
C. Variability in the intervention effects being evaluated in the different studies

Answers: 1C, 2B, 3A



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