Poster Presentations (P)

P001

Quantifying The Impact of Inhalational Burns

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Introduction: Inhalational injury is a major cause of morbidity and mortality in burns patients. This study aims to analyze the incidence rate, clinical outcomes and bacteriology of inhalational burns patients.
Methods: A prospective study was done on consecutive admissions to a major burns centre over 15 months from January 2015 - March 2016. Presence of inhalational injury, demographics, TBSA, complications and outcomes were recorded. Diagnosis of inhalational injury was based on history, symptoms and prior diagnosis in referred patients. ARDS was defined using the Berlin definition and AKI was defined as AKIN stage 2 and above. Data was analyzed using SPSS statistical software, Chi-square analyses on categorical variables and Mann Whitney U test for non-parametric continuous variables.
Results: A total of 202 patients were identified and comprised of a 63.4 percent male, 57.4 percent Chinese population. The average age was 43 y (range, 16 – 86) and TBSA was 12.1% (range, 0 – 88). 35 patients (17.3%) had inhalational burns.
Compared to patients with cutaneous injury alone, patients with inhalational burns had significantly more surgeries (3 vs 1 p=0.003), increased length of stay (21 days vs 8 days, p=0.004) and higher in-hospital mortality rate (17.1 % vs 0.6% p=0.000).
Incidence of AKI and ARDS was 48.6% and 37.1% compared to 0.6% and 1.2% in the patients without inhalational injury (p=0.000). Patients with inhalational injury had increased incidence of bacteraemia (31.4% vs 2.4 %, p= 0.000), pneumonia (37.1% vs 1.2%, p=0.000) and burn wound infection (51.4% vs 25.1%, p=0.004). Acinetobacter baumannii was the most frequently cultured bacteria in sputum, blood and tissue cultures with inhalational injury.
Conclusions: The data confirms and quantitates that inhalation injury accompanying thermal trauma significantly increases the length of stay, mortality and occurrence of infective and non-infective complications.

P002

ABDOMINAL COMPARTMENT SYNDROME: Presentation of a case series and proposal of UK Guidelines

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Introduction: The 2015 and 2016 National Burns Mortality Audits identified abdominal compartment syndrome (ACS) as the most common cause of death in patients with significant burns. The occurrence of ACS appears to be directly related to visceral, abdominal wall and retroperitoneal oedema and ascites induced by over-resuscitation. We identified paediatric and adult patients who developed abdominal catastrophe (defined as ACS or ischaemic bowel), and propose a guideline for Significant Burn Injury Fluid Management in adults to mitigate against ACS.
Methods: A retrospective review of all patients who developed abdominal catastrophe in the Burns unit at Alder Hey Children's Hospital and the University Hospital of South Manchester from January 2011 to December 2016 was conducted. Case notes were obtained and evaluated to calculate fluid balance with respect to the Parkland's formula. This was compared with the Ivy score.
Results: In adults, the average Parkland's formula rate was 6.14mls/kg/TBSA burns (range 3.7-10). The average resuscitation fluid administered was 0.26L/kg (range 0.15-0.3) over 24h. Of the five adults, one patient died following the diagnosis of small bowel ischaemia and another from an unrelated cause. The remaining three patients are being followed up with outpatient care. The paediatric case received 12,706mls over 24h (1.5times over the Parkland formula). This child died from multiple ischemic insults.
Discussion: In this case series, we demonstrate the development of abdominal compartment syndrome in patients over-resuscitated with fluids in excess of Parkland's formula and elevated Ivy score (>0.25L/kg over 24h). We posit that patients requiring fluid resuscitation with crystalloids in excess of 4ml/kg/TBSA should be considered for 5% Human Albumin solution boluses in the early post burn period (>8h). We recommend that the measurement of IAP is standardized and propose a guideline for significant burn injury fluid management in adults to mitigate and monitor against the development of ACS.

P003

Correlation of hypothermia and cytokines in burned patients

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Inroduction: Burns generate a local or systemic inflammatory response according to the degree of breadth, depth, agent that burns the skin, age and/or comorbidities; causing an increase in body temperature within the first 24 to 48 hours. It has been observed that patients who present hypothermia are associated with increased morbidity and mortality and no levels of pro-inflammatory and anti-inflammatory cytokines in these circumstances are known, and their possible relationship.
Method: Prospective study was performed from April 2014 to December 2015, to determine the concentration of cytokines in a group of burn patients admitted to a Center

for Specialized Care for Burn with extensions between 15% to 60% of TBSA. Gender indistinct; from zero to 75 years old; hypothermia (≤ 36.5 degrees) during admission or hospital stay. Determination of cytokines IL-6, IL-10, IL-2, INF-Æ', IL1-α and TNF was performed by quantitative immunoassay method. Statistical analysis was performed using descriptive statistics and Spearman correlation.
Results: A group of 10 patients were studied; 60% (n = 6) for the male. The age range was 1-60 years; 30% was pediatric population ≤ 18. 70% by direct fire and 30% scald. TBSA range was 15 to 60%. 90% patients survived. The range of temperatures was 33 to 38.9°C. In the descriptive analysis of one sample had significance of p ≤ 0.001. In the study Spearman correlation with significance of p ≤ 0.5 and 0.1. The older and death patient showed higher levels of IL-6 and IL-10 compared to the rest of the population, lower levels of temperature as the rest of the population with Burn extension of 20%.
Discussion: Hypothermia in trauma patients increase mortality and in burns is no difference.
Conclussion: Interleukins levels are different in the states of hypothermia in this study, we need more investigation studies with burn hypothermic population.

P004

Clinical characteristics of critical burn injury at Vall d`Hebrón University Hospital: a retrospective analysis

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Introduction: Critical Burn patients care requires a highly specialized and complex healthcare service (1). Even though some efforts in Spain has been done to report incidence and outcome of this patients (2,3) these data in our environment is unknown.
Objective: To describe clinical characteristics and outcome of critical burn injury in adults admitted to the burn intensive care unit (BICU) at Vall d' Hebrón University Hospital at Barcelona, Spain between February-13 until January-17. METHODS Retrospective monocentric analysis of adult patients admitted to BICU during the study period. Date, gender, age, cause of admission, total burn body surface (TBBS), ICU length of stay (LOS), Mechanical ventilation (MVLOS) and mortality were recorded. Data is presented as absolute numbers and percentage or median and interquartile range as required.
Results: 148 patients were admitted, 120 (81%) were male. Median age was 47.5 years (IQR25-75:33-60.7). Principal cause of admission was burned by flame in 72 patients (48.6%), followed by deflagration in 56 (37.8%), electrocution 8 (5.4%), hot liquids 7 (4.7%) and other causes 5 (3.4%). Median TBBS was 22% (IQR25-75:15.2-35.7). 44 patients (29.7%) had inhalation smoke injury. ICULOS median was 19 days (IQR25- 75: 8-33.5) and MVLOS median 13 days (IQR25-75: 3-27). Patients were divided according to distribution in: less than 15%TBBS, between 15.1-35.7%TBBS, and over 35.7%TBBS. 26 patients (17.6%) were dead globally. Relation between TBBS and mortality was higher in the over 35.7%TBBS group: 17 patients (65,4% p=<0,001 RR 9.63 CI95%:3.76-24.74).
Discussion/Conclusion: Patients admitted to this BICU during the study period were predominantly middle age men burned by flame with a TBBS between 15.2-35.7%TBBS. High mortality rate is observed globally specially in those with a TBBS over 35.7% of TBBS.
References: 1.American Burn Association.Advanced Burn Life Support Providers Manual.Chicago,IL. 2.Fernández Morales E et al.Burns 1997; 23:323-332. 3.Goméz-Cía T et al Burns 1999;25:317- 323.

P005

Algorithm for airway management in critically ill burn patients with smoke inhalation injury at emergency room.

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Introduction: Mortality related to smoke inhalation injury (SII) remains high despite medical advances mostly due to respiratory complications. (1) Airway management (AM) in these patients is a matter of current debate going from observation to prophylactic tracheal intubation (2,3) To date, no such algorithm for identifying SII patients at risk for respiratory complications has been described.
Objective: To describe a bedside clinical algorithm for AM in critically ill burn patients with SII at Vall d'Hebron University Hospital Burn Unit.
Methods: Review of existing AM approach in these population was performed on principal electronic medical databases (PubMed, EMBASE and Medline). Development of clinical algorithm with fast and bedside approach was intended, consensus on medical staff was achieved.
Results: Immediate intubation is indicated if upper airway is threatened, gas exchange mandate mechanical ventilatory support or mental status is inadequate for airway protection. Early elective intubation is performed in case of extensive and deep facial burn with nasogenic affectation and circular neck burn, total body surface affectation >50% or when SII is highly suspected with thermal damage of upper airway (intraoral burn or soot in oral cavity or sputum). However, if low suspicion of SII, thermal damage or face or neck burns are not severe, a direct laryngoscopic evaluation is advised. In case of glotic or supraglotic involvement immediate intubation is indicated, if not present usual A,B,C,D,E approach is advised.

Conclusion: Early identification of SII patients who will require intubation is crucial. Challenge relies in predicting which patients requires intubation. With this bedside algorithm, we aim to unify intubation criteria and approach to the airway management of burned patient in the safest way.

References: Walker et al. Critical Care, 2015; 19:351.
https://www.ncbi.nlm.nih.gov/pubmed/?term=Madnani%20DD%5BAuthor%5D&cauthor=true&cauthor_uid=16696366et al. Ear Nose Throat J. 2006;85(4):278-80.
Cancio CL. Clin Plast Surg. 2009;36(4):555-67

P006

Pain management in burns and during application of enzymatic escharolisis

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Objective: Pain associated with burn trauma is one of the most dramatic events involving the burn patients.Nociception and peripheral hyperalgesia are considered the major causes of burn pain.We have also the procedural pain that is the most intense pain and sometime is the undertreated pain. It is described after dressing changes or physiotherapy. This pain is often associated with anxiety and distress.A new aspect in the treatment of pain is during the enzymatic escarolysis

Methodology: in this treatment are highlighted 3 moments: the application of the product, the period of action (about 4 hours), the removal. For each of these moments and rated the pain with the numeric scale and, at the end of the procedure, patient's impressions about the procedure were collected.

Results: Local anesthetics , locoregional and deep sedation were used. Patients were evaluated with pain scores during treatment. For the patients with local o regional aneshesia there were no pain in the in -between period. For the patients treated with deep sedation the problems was expecially in the first 2 hours after the application when they describe a burning pain expecially in the first treatment.

Then we improved analgesia introducing benzodiazepine well to opioids and this has enabled us to achieve a better result. Also important is the contact with the patient and to make the person aware of the benefits associated with the procedure.

Discussion: the treatment of procedural pain in burn patient has to take into account that part of this patient with a painful trigger that are already underway analgesics. Information and patient involvement in the procedures is essential. Also important are the resources (regional anesthesia or sedation) and the presence of several figures of specialists. In our experience it is crucial also anxiety sedation to be made early, before starting the procedures.

P007

Deep venous thrombosis in burn patients: a retrospective analysis

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Objective: Deep venous thrombosis (DVT) is a well-known cause of major morbidity in the surgical patient population. The objective of this retrospective study is to evaluate the incidence of DVT in our burn centre, identify burn-related risk factors as well as risk factors for bacterial surinfection of DVT.

Methods: All adult burn patients, with total body surface area more than 10%, diagnosed with DVT and admitted between 2008 and 2016 in our burn centre were retrospectively evaluated. The analysis included demographics, location of central lines, number of surgeries, blood transfusions, pre-existing medical conditions and inhalation injury. DVT patients were matched on age, gender and TBSA with our general burn unit population.

Results: During the study period 611 patients were admitted to the burn unit. All patients received either routine weight-adjusted subcutaneous low-molecular weight heparin (LMWH) prophylaxis or intravenous heparin. 27 patients were diagnosed with DVT (4.4%). The average length of stay in the DVT group was 56 days, compared to 27 days in the control group ($P < 0.01$). No increased mortality was found ($P= 0.34$). Pre-existing medical conditions, inhalation trauma nor blood transfusion were associated with a higher incidence of DVT ($P > 0.05$). DVT was associated with a sub therapeutic daily dose of LMWH, adjusted for length of stay or time to diagnosis ($P < 0.05$). A total of 11 (41%) patients had surinfected DVT, with either bacteria (6/11, 54%) or yeasts (5/11; 46%). In all patients a central line was located on the DVT location, with a more frequent femoral site (18/27, 67%).

Conclusion: This study stresses the importance of routine and correctly dosed LMWH administration in burn patients. It highlights the presence of a central line as a major risk factor and the additional hazard of thrombus surinfection.

P009

Dexmedetomidine vs Midazolam for sedation during prolonged mechanical ventilation in burn patients

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Goal: Long-term sedation with midazolam or propofol in intensive care units (ICUs) has serious adverse effects. Dexmedetomidine, an α2 agonistis, may reduce the dura-

tion of mechanical ventilation and enhance patient comfort. The goal of the study was to determine the efficacy of dexmedetomidine vs midazolam in reducing duration of mechanical ventilation in patients with severe burn injury.
Method: All adult ICU patients receiving mechanical ventilation who needed light to moderate sedation for more than 72 hours and admitted in 2015-2016 were included in this retrospective study. We tested whether dexmedetomidine was superior to midazolam with respect to the duration of mechanical ventilation at the target sedation level measured by Richmond Agitation-Sedation Scale, RASS.
Results: Data of 27 patients were evaluated retrospectively (14 patients in dexmedetomidine group (age 39.4±17, TBSA 42.8±15, SOFA score 2.8±1.1) and 13 patients in midazolam group (age 48±20, TBSA 35.3±10, SOFA score close cardiovascular monitoring median infusion dose was 0.55 µg/kg/hr (range 0.10-1.1µg/kg/hr) and median treatment duration of 6.9±4 days. There was no difference in mean duration of mechanical ventilation between patients with midazolam and dexmedetomidine (11.5±4.9 days vs. 10.8±5.9 days, p >0.05). Similar length of ICU stay was observed (25±18 days vs. 21±10 days). Dexmedetomidine patients had more bradycardia episodes in comparison to the patients with midazolam sedation (3/14 [21%] vs 0/13). There was no difference in percentage of time within the target RASS range. No unplanned extubations were observed in both groups. Conclusions: Dexmedetomidine did not reduce duration of mechanical ventilation compared with midazolam among burn ICU patients receiving prolonged mechanical ventilation. Dexmedetomidine seems to be safe and effective for sedation of burn patients, however close cardiovascular monitoring should be used to detect bradycardia.

P010

Clinical evaluation of the Flotrac/Vigileo™ system for continuous cardiac output monitoring in burn patients.

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Evaluation and management of hemodynamic status are a central challenge in caring for the critically ill burn patients. The aim of this study was to evaluate cardiac output and other hemodynamic parameters obtained by FloTrac/Vigileo™ system during the early postburn period.
Methods: A prospective study enrolling 23 patient with severe burn injury was performed. Hemodynamic parameters were continuously obtained at admission, additional measurements were performed and recorded every 8 hours. Treatment was guided by the combination of dynamic and static parameters. A repeated ANOVA was used for data analysis.
Results: All patients were resuscitated successfully. There was a significant increase in cardiac index (CI) and a decrease in stroke volume variation (SVV) and systemic vascular resistance index (SVRI), ($p < 0.01$) during the first 36 hours after the injury. Cental venous pressure (CVP) showed significant changes over this time period (7.7±3mm Hg vs. 11±4 mmHg, p=0.04). Mean fluid volume of 3.7ml/kg/%TBSA were administered during the first postburn day. Significant decrease in lactate levels was also observed, 3.7 ± 2.7mmol/l vs. 1.8±0.7 mmol/l. However we did not observe any significant change in oxygen delivery index (DO2I, 680±247ml/min/m2 vs. 665±262ml/min/m2) which was within physiological range during the early postburn period.
Discussion and conclusions: Significant positive hemodynamic effects on static and dynamic parameters of initial fluid resuscitation were observed in burn patients. Oxygen delivery index was whithin physiological range during the investigation period.

P011

Detection and parenteral treatment of iron deficiency in anemia of major burns

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Introduction: Classically, anemia of burns has been considered a combination of blood loss and anemia of critical illness. Blood loss is considered a relevant etiology of iron deficiency and anemia. Recent studies established that 17% of all units are transfused after last surgery. Deleterious effects of transfusions are widely accepted, and confirmed in burn population.
Objectives: To determine if progressive anemia in patients after last surgery could be related to iron deficiency. To analyze if parenteral iron supplementation, in patients with iron deficiency after last surgery, would stop anemia progression and diminished transfusion requirements.
Methods: In a period of ten months we detected 12 patients with progressive anemia after last surgery. Serum iron, serum ferritin and transferrin saturation were measured. As serum ferritin was frequently elevated, measurement of serum soluble transferrin receptors (STfR) was added, with the purpose of differentiate anemia of critical illness from iron deficiency. If iron deficiency was suspected, a dose of ferric carboxymaltose was intravenously administered. Hemoglobin evolution and transfusion requirements were recorded.
Results: In ten of the twelve patients studied the results of tests suggested iron deficiency. Eight of them were treated with progressive recovery of hemoglobin levels, avoiding new transfusions. Two of them had very high levels of ferritin, contraindicating iron administration.
Discussion: Nonsurgical transfusions account for the 52% of the transfusions administered to major burns. They are usually related to anemia of critical illness. However, we found that progressive anemia after surgical phase of major

burns can be related to iron deficiency. Parenteral iron is indicated when blood loss exceeds the absorptive capacity for iron. Supplying ferric carboxymaltose allowed to administer high doses of parenteral iron in a single dose, and seemed to stop the process avoiding new transfusions.

P012

Microbiological photograph of the burn center: a standard for targeted antibiotic therapy. Experience 10 years

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Objective: Italy appears to be one of the countries defined as endemic for multi-resistant germs. This situation, as well as for environmental, social factors, etc. depends for the not appropriate due in using antibiotic therapy. Milan burn centre carried out a control in microbiological samples to identify colonization, infection and sepsis for about 12years. Then a restrictive policy should be targeted about the use of antibiotic therapy.
Method: it is performed a retrospective data collection from 2005 with regard to infections detected with blood cultures, the consumption of antibiotics, the determination of colonizing pathogens, preoperative antibiotic therapy.
Results: you have identified three important moments: 1) antibiotic therapy targeted on culture and the patient's blood chemistry results, according to the Microbiology Department; 2) stop with the antibiotic therapy "in preventing" or based only on colonization results without biochemical response; 3) standard antibiotic therapy preoperatively. These were 3-step of growth in our reality that has been able to reduce antibiotic therapy and resistances. Adequate monitoring of colonization and infection has also allowed the identification of a broad-spectrum antibiotic therapy specific to be administered in case of sepsis for the completion microbiological findings.
Discussion: the path of antibiotics careful prescribing has been a growth in the burn center and has also led to a greater focus on contact with the patient as well as a critical evaluation of microbiological and biochemical results. This has led to a decrease in the use of antibiotics and to decrease the resistances of the individual germs.The colonization with multiresitenti germs that requires isolation of the patient, remains an important problem.

P013

Analgesia, sedation and delirium management in adult critically ill burns: a survey

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Objectives: This study aims to assess the current practices of analgesia, sedation and delirium monitoring and treatment strategies in burn ICUs.
Methods: We designed a web survey consisting of four parts: physician and institutional demographics, management of pain, sedation and delirium in burn patients. The questionnaire was distributed by email to 230 burn specialists worldwide.
Results: Physician and Institutional demographics. A total of 40 respondents worldwide submitted valuable data in the 2 months period, equivalent to a response rate of 16%.Of all respondents, 20 (50%) were from Europe, 7 (17.5%) from North America, 6 (15%) from Africa and 12 (30%) from other regions (including Western Pacific, Southeast Asia, Central and South Americas and Eastern Mediterranean). 20 (50%) respondents were intensivists/anaesthesists, 18 (45%) surgeons and 2 (5%) other professionals.
Analgesia: The vast majority (92.5%) reported they routinely screen severe burns for pain, but 27.5% declared no specific score is used. The most popular analgesics were opioids, specifically morphine (75%) and fentanyl (72.5%). Among non-pharmacological approaches, the most used were psychological support (62.5%). Only a minority of respondents apply hypnosis (12.5%).
Sedation: A significant percentage (70%) affirmed they routinely screen their patients for sedation, but 30% do not use a specific scale. The sedatives used more often were midazolam (72.5%) and propofol (55%). 20% of specialists affirmed to use dexmedetomidine frequently in their routine practice.
Delirium: The majority (70%) affirmed to routinely assess burn patients for delirium, but 57.5% do not use a specific score. Burn specialists affirmed to prevent delirium in their patients combining pharmacological and non-pharmacological approaches (62.5%).
Conclusions: Awareness concerning pain, sedation and delirium is increasing among burn specialists. Efforts are still needed to implement guidelines and best practices.

P014

The secondary transfer of burn patient in Tunisia: status of the situation

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Introduction: Early burn resuscitation is the cornerstones of burn care and aims to improve outcome and decreases morbidity and mortality rates. The goal of this study was to examine characteristics of burn patients acutely transferred to our intensive burn care unit and to assess their prognosis.
Materials and methods: A prospective study was conducted in intensive burn care center in Tunis. All consec-

utive adult burned patients acutely transferred to our burn center, from January 1st to December 2016 were included in the study. Demographic and biological data of patients were recorded.
Results: 323 patients were admitted among which 146 patients were acutely transferred from other hospitals (44.6%). The mean age was 37±16 yr. The mean surface burned area announced was 44 ± 22%. Patients were transferred with a delay of 38 H after burns [H1- H264]. Burn injuries were caused by domestic accidents in 44%, self immolation in 28% and work related burns in 14%. Transfer with medical agreement was noted in 58% of cases. At admission, 12% of patients had burn shock and 44,7% had endotracheal intubation. A central venous catheter was placed in 53% of cases, nasogastric tubes in 12% and urinary devices in 58% of cases. Dressing were performed in 72% of cases. Fluid resuscitation was initiated in 75% of cases with crystalloid : Ringer lactate (46%) and/or normal saline (17%).Initial lactate level was 3.65 ± 2 mmol [1- 8.8] with pH at 7.37 [6.6- 7.51] and bicarbonates at 20.8±5 [9-32]. We noted that patients transferred without medical agreement had more burn shock (16.2% vs 8.6%) and a higher mortality (25.5% vs 17,2%).
Conclusion : Early critical care of severely burned patients, especially, fluid resuscitation and monitoring, coupled with appropriate early referral to a specialist, greatly help in minimizing complications and optimizing prognosis.

P015

Stevens Johnson syndrome and toxic epidermal necrolysis: a single center review.

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Objectives: Stevens Johnson syndrome (SJS), toxic epidermal necrolysis (TEN) and their overlap (SJS/TEN) are severe acute mucocutaneous diseases, triggered manly by a newly administered drug, life threatening and rare, which still lack a definite treatment method. Our aim was to describe the clinical aspects and etiologic factors of SJS, SJS/TEN and TEN in order to evaluate treatment responses and different outcomes in morbidity and mortality regarding the therapeutic options.
Materials and Methods: This is a retrospective study of patients with the diagnosis described above, who were admitted to our center between 2000 and 2016 in order to characterize their clinical evaluation, treatment, mortality and morbidity. Detached BSA% was used to categorize the disorder. Logistic regression was used to identify predictive variables of mortality.
Results: The final diagnosis was 18 patients with SJS, 34 patients with TEN and 06 patients with SJS/TEN, with ages comprised between 15 and 91 years old, mainly females. The majority of patients with SJS were treated in the Dermatology Department and the majority of patients with TEN were treated in our Burn Center Unit. The most commonly reported causative agent was antibiotics. Oral erosion was the most reported mucosal erosion and ocular involvement was reported in 47% of patients.
There was no statistical difference in mortality between patients treated with corticosteroids or intravenous immunoglobulin but the use of this agents and plasmapheresis had a positive outcome in mortality.
Conclusions: Although the majority of patients with SJS can be treated outside an intensive care unit like our Burn Center Unit, TEN remains a challenging life-threatening disease and many questions regarding best treatment strategies are still without an answer. In the mean time we can state that the discontinuation of the suspected drug, wound care, early supportive therapies and immunosuppression contribute to lowering the morbidity and mortality rates.

P016

Recruitment of extravascular fluid by hyperoncotic albumin in volunteers

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Background: Hyperoncotic albumin may be used to recruit oedema from the interstitial fluid space, but its effectiveness is unclear. This question was studied during infusion experiments in healthy volunteers.
Method: Fifteen healthy volunteers received an infusion of 3 ml/kg of 20% albumin over 30 minutes. The urinary excretion was measured and venous samples were taken for measurement of haemoglobin (Hb), haematocrit, colloid osmotic pressure and albumin on 15 occasions over a period of 5 hours. Based on these data, mass balance calculations were used to estimate the plasma dilution and the mobilisation of fluids from the tissues.
Results: Maximum effect of plasma dilution was reached 20 minutes after the end of the albumin infusion. Plasma volume dilution and total diuresis during the 5 hours of blood sampling was effectively increased by Albumin 20%. The plasma dilution after 300 minutes correlated inversely to the total diuresis. Total mobilised fluid from the tissues at 300 minutes was 3.4 ± 1.2 ml for every infused ml of albumin 20%.
Conclusion: 20% Albumin significantly increases the blood volume by recruiting interstitial fluid as well as increasing the diuresis. There is a delay of 20 minutes, after the end of the infusion, until maximum plasma dilution is reached.
The duration of the dilution effect expands beyond the 5 hours measuring time.

P017

Assessing the value of the Neaman scale for Bariatric Burn resuscitation

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Objectives: The UK population has demonstrated increasing body mass indexes over the past 20 years. The aim of this study was to determine the value of using the bariatric specific Neaman TBSA scale (NS) compared to the current standard of Lund & Browder charts (LB) for the resuscitation of bariatric (BMI≥30) patients with a burn involving >15% of their total body surface area.
Methods: A retrospective review was conducted of all consecutive adult bariatric patients with a burn >15% admitted to the Burn Centre at the Queen Elizabeth Hospital, UK between Jan 2010 to May 2016. Exclusions were made for death within 24hrs or missing records. The burn percentage was calculated with reference to the admission chart, operative notes and clinical photography. The Neaman TBSA scale was then compared to that of the Lund and Browder charts. The Neaman fluid resuscitation was then compared to the Lund & Browder calculation and actual resuscitation.
Results: We identified 31 patients. The mean and median Lund & Browder burn percentages were 28% and 19.5% respectively. Comparison of the Neaman scale to the Lund & Browder chart revealed differences in burn % calculation ranging from -12.6 to + 6%. Over 90% of differences were within the range +/-7%. The Wilcoxon signed rank test of the burn percentage differences was 0.375, indicating the absence of a statistically significant difference. Whilst the differences in fluid resuscitation ranged from -10,500 to 3169mls, there was only 1 complication of renal failure from under resuscitation in relation to the Lund & Browder calculation. The urine output was >0.5ml/kg/hr in over 75% of cases resuscitated with the Lund & Browder calculation.
Conclusion: The value of the Neaman scale as a tool to resuscitate the obese has not demonstrated any benefit over the Lund & Browder chart in this cohort.

P018

Dexmedetomine and ketamine for procedural pain in children

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Objectives: To change the method for analgosedation to children in the out patient clinic of Uppsala Burn Centre from midazolam/ketamine to dexmedetomidine/ketamine
Methods: Healthy children scheduled for outpatient change of dressings and cleaning of burn wounds were included. Much effort is put on creating a calm and safe environment for children and their parents. BSA was 1-10 %, a majority scalds. Preparations included prescribed analgesics and fasting according to local routines. Dex 1-2 microg/kg nasally, and, 15-20 minutes later, ketamine 5-7 mg/kg rectally was given.
Before, during and after the procedure grade of sedation, pain (FLACC, 0-10), SpO2 and heart rate were recorded. In the case of unsufficient analgesia an additional dose of ketamine (3 mg/kg) was given.
Results: 31 children, age 21,8 months (range 12-69 months) were included. Before the procedure mean FLACC was 0,2. After dexmedetomidine 1,3 microg/kg and ketamine 5,9 microg/kg (mean values) wound care could be performed in 20 of the children. In 6 children an additional dose of ketamine was added and the procedure could be completed. In 5 children medication was not sufficient and was completed with nitrous oxide (50%) or intravenous sedation. After the procedure FLACC was 2 in one child and 0 in all other children. Airway, breathing and circulation was stable in all children. Time to complete recovery from the time of arrival to the clinic, was 128 minutes (range 30-210). No side effects like agitation, nausea or signs of hallucinations were observed.
Discussion/Conclusion: The combination of dexmedetomidine and ketamine for treating procedural pain in children with burns shows high medical safety and high efficacy. Often the bothersome and painful insertion of an iv cannula could be avoided. In addition we have a sense that children comes to rest faster and also wakes up faster without ensuing symtoms of sedation.

P019

Use of bacteriophages in the treatment of extensively drug-resistant Pseudomonas aeruginosa septicemia in a patient with acute kidney injury - a case report

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A 62-year-old man was hospitalized for severe abdominal sepsis with disseminated intravascular coagulation, secondary to a diaphragmatic hernia with bowel strangulation. The patient had a prolonged hospital course complicated by gangrene, resulting in the amputation of the lower limbs and two fingers and the development of large necrotic pressure sores on the back. Three months later, the patient was transferred to the burn wound center of the

Queen Astrid military hospital for surgical management of the pressure sores. Wound cultures on admission revealed MRSA, MDR *P. aeruginosa*, *E. cloacae*, *Klebsiella pneumoniae* and *Candida albicans* colonisation. The patient developed septicemia with extensively drug-resistant (XDR), colistin-only-sensitive, *P. aeruginosa*. Intravenous (IV) colistin and sulfamethoxazole/trimethoprim combination therapy was started. Ten days later, the patient developed acute kidney injury, probably caused by drug-induced acute interstitial nephritis. The patient was in a coma and antibiotic therapy was stopped. Unfortunately, XDR *P. aeruginosa* septicemia re-emerged with positive hemocultures for three consecutive days. Upon expert advice and informed consent from the patient's family, IV and topical bacteriophage therapy were initiated under the umbrella of Art. 37 of the Declaration of Helsinki. Fifty ml of purified bacteriophage cocktail BFC1 (Merabishvili *et al*. 2009), containing two active *P. aeruginosa* bacteriophages in sodium chloride 0,9% at a concentration of 10^7 plaque forming units (PFU) per ml were administered as a 6h IV infusion for 10 days. Wounds were washed with bicarbonate buffer and irrigated with 50 ml BFC1 every 8h for 10 days. Immediately, blood cultures turned negative, CRP levels dropped and the fever disappeared. Kidney function recovered after a few days. Hemodialysis was avoided and no clinical abnormalities related to the application of bacteriophages were observed. This is, as far as we know, the first documented report of intravenous bacteriophage monotherapy against *P. aeruginosa* septicemia in humans.

P020

Burns: a global health burden.

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Rationale: The rationale behind this piece of research is to describe the extent of the burden of burns in both the developing and developed world. The research focuses on comparisons in burn epidemiology across the globe, and reasons to explain these statistics. The secondary focus is upon the management of burns in high and low resource settings.
Methodology: The methodology initially involved analysis of epidemiological data from the World Health Organization (WHO). In addition, it utilized systematic reviews, which looked specifically at management of burns in locations such as Sub-Saharan Africa, including first aid methods commonly employed and management in formal healthcare facilities.
Results: Results show burns as the fourth most common type of trauma worldwide with 90% of the 300,000 annual deaths occurring in developing countries. Global trends show a decrease in mortality rates from burns in developed countries, but rates are stagnant in the developing world. Paediatric burns are of huge concern with children under five in Africa having seven times a higher incidence of burn related deaths than other under fives worldwide. Inadequate resources, lack of personnel and poor initial management limit lower-income localities. Cold water is rarely applied to burns in the developing world due to poor awareness and reliance on traditional healers and remedies leading to an exacerbation of morbidity and mortality rates.
Conclusion: Overall this research has exposed the gravity of the situation of burns worldwide including reasons for the differences in incidence between high and low income countries. It has also identified simple interventions such as educational programs that could play a crucial role in improving survival from burns in low resource settings.

P021

Changes in Biochemical Parameters - pH, PO2, PCO2, Na+, K+, Cl- & HCO3- within 96 Hours of Inhalation Burn Injury

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Objectives: Burn is a common injury in Bangladesh due to varieties of reasons – most importantly lack of awareness. Burn incidence inside a closed place is increased in recent years, which leads to inhalation injury. This may increase the mortality upto 60% according to some research in advanced countries. In inhalation burn injury, biochemical parameters are altered. They are pH, PO_2, PCO_2, Na^+, K^+, Cl^-, & HCO_3^-. The findings in 24, 48, 72 & 96 hours will help the patient management. This study focuses on the alteration of biochemical parameters in inhalation injury patients within 96 hours.
Methods: A prospective, observational study was carried out in the Department of Burn & Plastic Surgery of Dhaka Medical College Hospital from November 2014 to October 2015. Here 40 patients with burn with inhalation injury were selected as per inclusion and exclusion criteria. Investigations of biochemical parameters were done. Information were recorded in data collection sheet and compiled in a master table.
Results: Most of the cases with altered biochemical parameters had increased pH and decreased pCO_2 which were the features of respiratory alkalosis. Because inhaled injured burn patient had received high flow oxygen in first 24 hours to 72 hours. Decreased Na^+ & Cl^- due to shifting ions from blood vessels to ECF due to the porous leaky blood vessels in burn patients. K^+ was normal in maximum patients. In most cases pH, pO_2 & pCO_2 were not significantly changed. It might be due to upper respiratory tract injury.
Conclusions: Most of the cases with altered biochemical parameters had features of respiratory alkalosis. Hyponatraemia associated with hypochloraemia was noted in first 96 hours. K^+ was normal in maximum patients.

P022

The Effect of Mature Adipocyte-Derived Dedifferentiated Fat (DFAT) Cells on Ischemic Tissue.

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Dedifferentiated fat (DFAT) cells, isolated from mature adipose cell, have high proliferative potential and pluripotency. In this paper, we examined whether the flap survival area could be enlarged by administering autologous and allogenic DFAT cells to random pattern skin flaps in back of rats. Methods DFAT cells were isolated and cultured through ceiling cultures of intra-abdominal adipocytes from Sprague-Dawley (SD) and Wistar rats. Random-pattern flaps (2 × 9 cm) were lifted in the back of SD rats. A control group (n = 10) and a DFAT-cell-treated group (DFAT) (1 × 10^6 cells/0.1 mL) were prepared. Two DFAT-treated groups were created; namely, the autologous DFAT (SD rats) injection group (n = 10) and allogenic DFAT (Wistar rats) injection group (n=10) in which cells were injected at 2 cm from the base of the flap. On postoperative day 14, the flap survival area was measured and tissues were collected. Histological analysis was carried out by hematoxylin and eosin (H&E) staining, India ink staining. Results The mean flap survival rate was 53.8 ± 6.5% in the control group, 65.8 ± 2.4% in the autologous DFAT injection group, and 62.8 ± 5.9% in the allogenic DFAT injection group. The flap survival area was significantly enlarged in the autologous and allogenic DFAT injection group ($p < 0.05$). In H&E and India ink staining, increase of the blood vessels was observed in DFAT injection group. Discussion The injection of autogenic and allogenic DFAT cells into the flap base promoted the expansion of survival areas. DFAT has potential for clinical application such as emergency reconstruction of burn wound and reconstruction of chronic scar contracture.

P023

Decellularized Human Dermal Matrices for the Treatment of Burn Patients: development of production process and quality control methods

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Objectives: A novel cryopreserved human dermal substitute, having both 3D structure and composition well preserved, was recently developed at the Queen Astrid Military Hospital in Brussels, Belgium. This Decellularized Human Dermal Matrix (DHDM) can be repopulated *in vitro* by adult human dermal fibroblasts and it permits the proliferation and remodelling activity of the fibroblasts. The main objective of this work was the development of the skin decellularization method (up-scaling) to allow the preparation of sufficient amount of the DHDM to treat patients with large burns.
Methods: Cryopreserved allogeneic human skin (about 0.4 mm thick) was obtained from deceased human donors and was used to prepare DHDMs. A two-steps decellularization method was developed to prepare the DHDMs. The epidermis of allogeneic skin samples was removed after a first incubation in NaCl (1M) at 37°C for 24h. The resulting dermal samples were subsequently incubated in 0.5% Triton X-100 for 96h at room temperature with continuous agitation for the removal of cell debris. After this incubation, the decellularized dermal samples were washed in PBS to remove the detergent and thereafter were cryopreserved. In addition to bacteriological/mycological testing and histological evaluation, MTT viability testing and High-Definition Optical Coherence Tomography (HD-OCT) imaging methods were developed to evaluate the quality of the manufactured dermal matrices.
Results: Results showed that MTT test was useful to evaluate the removal of living cells and histology was useful to evaluate the removal of cell and cell debris. HD-OCT imaging was helpful to evaluate the 3D architecture of the DHDMs (dermal papillae and vascular spaces). Repeated washes (n=6) were necessary to decrease the detergent concentration to about 1 ppm in the washing solution.
Conclusion: Conclusively, the selected DHDM production process and the quality control methods used were found to be appropriate to prepare sufficient amount of DHDMs to treat burn patients.

P024

Estimation of vitamin D3 level in children with burns - Preliminary report.

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Aim: Estimating the level of vitamin D3 in children with burns during healing process and recovery.
Methods: Studies were carried out on the group of 157 children with burns, aged 6 months - 15 y.o., from 05.09.2015 to 25.02.2017. Burns' area varied from 1 to 50% tbs. Blood for studies was collected, depending on the hospitalization duration: on the 1st , between 3rd-5th, between 5th-10th day, between 1-3rd month since the accident.
Evaluation method ELFA (Enzyme Linked Fluorescent Assay).
Research results were compared to the control group of healthy children, admitted for scheduled surgeries.

Vitamin D3's level was stated as optimal (>30ng/ml), low (20-30ng/ml), and very low (<20ng/ml).
Results: Within the studied group, on the first day children with low and very low level accounted for 52% of all children, between 3rd - 5th day - 80.95%, between 5th - 10th - 63.64%, and between 1st - 3rd month - 83.33%
In the control group, children with low level accounted for 58,33% and there were no children with a very low level.
Conclusions: Comparing to the control group, on the first day of the burn, low level of vitamin D3 occurred more often.
Despite the implementation or modification of the supplementation with a vitamin, its level often remained below the optimal level for a long time during the healing and recovering. Studies, however, covered too small group of seriously burned children to be able to indicate dependence between burn severity, healing time and the level of vitamin D3.
Due to reported contribution of vitamin D in wound healing processes and immune responses, it's important to define how its content is formed in the burned children's organisms. It could determine its routine level control and introducing the adequate supplementation. The studies are in progress.
Authors don't declare any conflict of interests.

P025

The exposure of the theatre personnel to the volatile compounds produced during the operation of burn tissue with the use of diathermy

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Objectives: The exposure to the volatile compounds produced during the operation is particularly significant for personnel operating on patients with massive burns, since the optimal procedure for treating massive and deep burns is the early removal of tissue necrosis. For this purpose i.a. electrosurgery is used. The use of such instruments generates high temperature and increases exposure to harmful volatile agents in the smoke discharged from the tissues that are being removed. Our aim of study was qualitative and semi-quantitative analysis of non-polar volatile compounds released during burned tissue excision using cutting diathermy.
Methods: The study was conducted during resection of patient's burned tissue on the first day after the burn (30% TBSA, depth third degree). The analyzed compounds were being absorbed by solid state extraction, using SPME fibers. Exposure time of the fibers was 30 minutes and began with the start of the procedure. The fibers were analyzed by gas chromatography coupled with mass spectrometry.
Results: In our pilot studies which employed SPME technique to test surgical smoke composition, we have demonstrated the presence of several hundred of non-polar organic compounds. They were identified as simple aliphatic and aromatic hydrocarbons, such as acid ester, hexane, acetone and complex organic derivatives of unknown toxicology.
Conclusions: The current tests of electrosurgical smoke and fumes have been connected with the resection of healthy tissue. Our research, for the first time, shows the analysis of smoke resulting from the burned tissue resection. The majority of detected compounds has a potentially toxic effect and may constitute risk factors for the theatre personnel, that had not been previously taken into account.

P026

Fire-related injuries and their burden in Finland 2000-2010

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Objectives: The incidence of fire-related deaths in Finland has been higher than in majority of the westernized countries. In addition, hundreds of severe injuries occur annually. This study attempts to provide comprehensive overview on injuries due to fire and deaths due to fire during 2000-2010 and their costs in Finland as the previous knowledge was very scarce.
Methods: The study is register-based synthesizing several administrative registers which have nationwide coverage such as the Finnish Hospital Discharge Register, data on social security compensations due to injury, Causes of Death register and a sample of cases from Helsinki Burn Centre.
Results: During the study period, the incidence of severe fire-related injuries was some 6 per 100 000 persons-years (males 76%, females 24%) yielding some 300 cases annually. Additionally, some 99 deaths cumulated annually with the same gender profile. Inpatient care cost for those sustained fire-related burn injury was some EUR 25 400 while it was some EUR 3 600 for those with combustion gas poisoning without burn injury. Therefore, annual care costs reached some EUR 6.2 million. Additionally, some EUR 5.7 million annually was lost due to productivity losses induced by the injuries. Mean productivity loss for a fire-related death was some EUR 315 000 and it ranged from some 800 000 among young to less than 100 000 among elderly.
Discussion: Tens of millions of Euros are lost annually due to injuries and deaths from fires. House fires tend to cause large burns that are costly to treat and on the other hand, fire-related deaths occur usually due to house fires. Treatment cost of a very large burn may exceed EUR 500

000. Targeting preventive efforts to house fires substantial burden could be avoided.

P027

Childhood burns - What extent can Emergency Department clinicians identify risk factors for child maltreatment compared to what is known to the child's Health visitor?

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Objectives: To explore the extent to which risk factors for maltreatment were identified by Emergency Department (ED) staff when the child presented with a burn injury in comparison to what is known by the child's Health Visitor (HV). Would access to community child health records in the ED be beneficial?
Methods: The Burns & Scalds Assessment Template (BaSAT) was used to assess children < 16 yrs. of age who attended the ED with a burn.
A standardised questionnaire, based on a validated family risk assessment tool, was then used to follow up children < 4 yrs. with their HV.
HV's were asked about information they held regarding: prior injuries, concern about: care, supervision and discipline and parental mental health issues.
Three questions were common to both the BaSAT and the HV questionnaire: history of social care involvement, history of interpersonal violence. Both proforma were completed for 218 children
Results: Social Care involvement was identified 5% in the ED compared to 18% by the HV. Interpersonal violence was reported for 2% in the ED and 21% known to the HV. Other risk factors known to the HV included prior injury, parental mental health issues, past or current interpersonal violence, with 18% of children were found to be living in homes with three or more risk factors.
Discussion: Data collected in the ED is self-reported by the parent/carer therefore it is not surprising that they may be reluctant to disclose sensitive issues to ED staff afraid of any repercussions and allegations of abuse or neglect, therefore it is important that ED staff have access to additional information that the child's HV holds. This would help to support their assessment of safeguarding risks and to refer appropriately.

P028

Alteration of biomechanical properties of burned skin

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Background: The prevalence of burns in the general population is high. Despite new research findings, skin burns and its resulting tissue damage are still not entirely understood. In particular, little is known about the depth-dependent alteration of skin biomechanical properties of these wounds.
Methods: Thirty-six burn wounds with six different depths were generated on the abdomen of six Go¨ ttingen minipigs. The alteration of skin biomechanical properties was evaluated objectively after 15 and 360 min using a Cutometer device. Biopsies for histological evalua-tion were taken and the depth of burn was correlated with biomechanical properties.
Results: Firmness of skin (R0), overall elasticity (R8) and calculated elasticity (Ue) demon-strated a continuous decrease with an increasing depth of burn 15 min after wound generation. Gross elasticity (R2), net elasticity (R5) and amount of elasticity of the whole curve (R7), however, showed an increase of values with increasing depth of injury. A further decrease of elasticity was demonstrated 360 min after wound generation.
Conclusion: The alteration of skin biomechanical properties is a function of damaged tissue structures. The presented results demonstrate a depth-dependent decrease of principal elastic parameters with an increasing depth of burn and the results indicate progressive tissue damage over the time.

P029

FMS-like Tyrosine Kinase-3 Ligand (Flt3L) reduces Systemic Infection in a Model of Post-burn Pneumonia

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Background: Following burn injury, pneumonia worsens morbidity and mortality. The dendritic cell growth factor Flt3L enhances resistance to bacterial wound infection and abdominal sepsis of burned mice, but concerns were raised towards its safety and efficacy in models of pneumonia. This study examines the effect of Flt3 L on survival, local and systemic bacterial burden in a murine model of burn injury and pneumonia.
Methods: Anesthetized mice received a 35% total body surface area full-thickness scald burn and daily i.p.-injec-

tions of Flt3L (10µg/day) or Ringer's lactate (CTR) for 4 days post-burn. On day 5, pseudomonas aeruginosa pneumonia was induced by intranasal inoculation with doses ranging from 10^5 to 10^8 colony forming units (CFU), representing non-lethal to LD100 models of infection. Survival was monitored for 14 days (n=20). At 24 and 48 hours post inoculation, lung, spleen and blood were harvested to determine bacterial burden and systemic spread of infection (n=40).
Results: At 24h post inoculation with $5x10^5$CFU, lung bacterial burden was lower in Flt3L -treated mice compared to CTR and the incidence of severe lung infection (>10^4CFU/g) was reduced ($p<0.01$). By 48h, pulmonary bacterial burden in the CTR group was comparable to Flt3L. Splenic bacterial burden was significantly reduced in the Flt3L group compared to CTR at 24h (>10-fold, $p<0.05$) and 48h (100-fold, $p<0.01$) and incidence of bacteremia was reduced ($p<0.05$). At highly lethal (10^8CFU), intermediate ($5x10^5$CFU) and nonlethal (10^5CFU) doses, survival of Flt3L and CTR groups was comparable
Conclusion: Bacterial burden and mortality were not worsened and Flt3L may be advantageous in prevention or resolution of systemic infection in post-burn-pneumonia. In support of previous findings regarding improved immune responses and survival after Flt3L-administration in wound infection and abdominal sepsis, we propose continuing investigations into the use of Flt3L as an auxiliary immunomodulatory agent for prevention of post-burn bacterial infections.

P030

Chemical burns; 17-year epidemiological study and evolution in Bilbao, Spain

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Objectives: Chemical burns accidents have decreased in our area during the last years. Our aim with this study is to show the decreasing tendency of chemical burns and to analyze the distinctive features of this type of burns compared with all burns admitted to Burn Unit at Cruces University Hospital (Bilbao).
Methods: 17-year retrospective study including all the patients with chemical burns admitted to our Burn Unit (group A). Epidemiological and demographic data were collected and compared with all burnt patients treated at the same unit (group B).
Results: A total of 35 patients were included in group A in the study. During 2000-2007 25 patients were admitted and 10 during 2008-2016. Sodium hydroxide was the most frequent agent involved (25.71%), followed by sulfuric acid (20%). 17.14% associated some kind of flame. The most injured parts of the body were upper extremities (71.43%) and face (68.57%).
Comparing the two samples, 88.57% of group A were labor accidents while in group B involved 29.3%. The mean age in group A was 42.1 years, and 51.6 in group B. In group A, 94.29% were men and 73.30% in group B. A mean of 18.01% of total body surface (TBSA) was burnt, in group B was 21.6%. The mean stay at the Burn Unit was 18.51 days for group A and 20.27 for group B. ABSI score was 5.86 for group A, and 7.28 for group B.
Discussion/conclussion: We have observed that most of chemical burn accidents involved male younger patients at work, with smaller ABSI and less TBSA than burnt patients globally. We have also seen a decreasing rate of chemical burns probably due to appropriate equipment, employee awareness and regulation laws. Furthermore, the socio-demographic change for a less industrial area has been a decisive factor for the drop of chemical burns.

P031

Clinical Consideration of Contact Burn Caused by Hair Straightener

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Purpose: Hair straightener is a common tool among various household electric appliances used for hair styling. Hair straightener has plate consists of metal or ceramic, which lead to possible burn if contacted. Main users of hair straightener are young women whereas main victims of hair straightener caused-burn are infants. Among patients visiting our burn medical center, the case of attending hospital due to contact burn by hair straightener tends to increase.
Methods: Retrospective research was conducted 72 patients with contact burn by hair straightener among patients admitted to our burn medical center from Jan 2012 to Dec 2014. Subjects were classified by age, gender, affected site and degree and treatment method.
Results: 72 subjects consisted of 39 infants, 9 children, adolescence and 24 adults. Affected sites were presented as hands in 31, face in 21, foot in 13, arms in 5 and legs in 2 subjects. Degree of burn was presented as deep second degrees in 67 and third degrees in 5 subjects; 70 subjects were cured through conservative treatment whereas 2 subjects had local flap.
Conclusion: Contact burn by hair straightener can be ranged from partial to full thickness skin defect. It is important to note this kind of burn develops more frequently in infants and is preventative. Education for young women who use hair straightener is crucial. Training regarding function and design improvement of hair straightener is also essential. Uncovering the heated plate after use through a separate lock device might be great help for prevention of contact burn if develope.

P032

A novel pre-clinical attenuated wound healing model - the partial thickness excision of a porcine full thickness burn

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Introduction: Appropriate pre-clinical models are critical in the development of new rational therapies. Attenuated wound healing is a clinical challenge with limited effective treatment options. However, to date, there has not been a predictable and reproducible animal model of attenuated wound healing to support research (Seaton *et al.,* 2015).
Aims: To create a novel attenuated wound healing model in porcine skin that is predictable and reproducible.
Methods: 6 full thickness contact burn wounds were created on pigs using a 4cm diameter solid stainless steel cylinder heated to 150 degrees centigrade in oil, on experiment day -1. This was held to the marked area for 60 seconds on the skin of the anaesthetized pigs' flanks (after shaving and cleaning). At 24hr (day 0) the central zone of necrosis was excised, leaving the zone of stasis intact. For controls, full thickness excisions of 4cm diameter were also created in unburnt areas. Split thickness skin grafts were applied to both wound groups on day 0 (n=12). Wound healing parameters were observed at 7 day intervals until day 42.
Results: Compared to acute full thickness wounds, the partial thickness excision of the full thickness burn showed a 14-day delay in contraction of the wound edges, a 21-day delay in the vascular ingress of the wound, new capillary formation and vascular perfusion. Skin graft adherence was also delayed. Oedema was persistent in the wound bed until day 28 with a delayed and prolonged inflammatory cell infiltrate. This pattern was seen consistently across the sample of animals.
Conclusions*:* Partial thickness excision of a burn wound delays the healing response. The partial thickness excision of a full thickness burn wound may be a useful experimental model of attenuated healing to develop and study wound treatments.

P033

Key issues in phage therapy

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Phage therapy is increasingly highlighted as a promising 'new' treatment option for bacterial infections, *inter alia* during the recent UN General Assembly on antimicrobial resistance. Countries that had less access to antibiotics during the cold war, such as Georgia, have years of data on the efficacy of phage therapy, but authorities in the Western world hesitate to consider the potential of phage therapy, mainly because research performed in the former Soviet Union is perceived as 'academically inferior'. Meanwhile, in the face of an uncurbed antimicrobial resistance crisis, phage therapy is sporadically applied in the Western world (also in the Burn Wound Center of the Queen Astrid military hospital), often under the umbrella of Article 37 (Unproven Interventions in Clinical Practice) of the Declaration of Helsinki. These cases, however, do not allow for an appropriate evaluation of the efficacy of phage therapy. In 2013, the European Commission decided to fund the first major phage therapy study under modern regulatory standards: PhagoBurn, an ambitious phase I/II clinical trial. Public perception, unnecessarily stringent pharmaceutical requirements, phage specificity and intellectual property protection issues hamper the reintroduction of phage therapy in the Western world. In addition, little is known about the impact of a massive use of phages in the agriculture, aquaculture, food, and human and animal health sectors on the ecology and evolution of bacteria. Upon analysis of these key issues, we argue that the re-introduction of efficient and sustainable phage therapy approaches will require a paradigm shift in our pharmaco-economic model as well as in the treatment of infectious disease.

P034

Dressilk®: a series of case reports on partial thickness burns and donor sites

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Objectives: The management of both split thickness donor sites and partial thickness burns with healing potential within 21 days is often considered to be similar. A suitable dressing should at least promote wound healing, take into account patient and nurse comfort, and be cost effective.
Methods: In a preliminary test, split thickness donor sites and partial thickness burns with healing potential within 21 days were treated with Dressilk®. Healing potential of partial thickness burns was assessed by means of laser Doppler imaging. Dressilk® was applied directly on the donor site or burn and covered with a secondary gauze dressing. Dressilk® was left in situ until it separated spontaneously from the healed wound. Parameters taken into account for dressing evaluation were pain (assessed by the patient), bacterial load, time to wound healing, ease of use and general satisfaction (assessed by nurses).
Results: In total 4 patients with partial thickness burns and 4 patients with donor sites had their wounds treated with Dressilk®. On average patients found Dressilk® to be com-

fortable and only reported no or mild pain with the dressing. Maximum pain observed was assessed as moderate pain. Bacterial problems were mainly caused by Staphylococcus Aureus, but easy to deal with by applying an antiseptic solution on the primary dressing. Average time to wound healing was 18 days in case of the donor sites and 11 days for the burn wounds treated in this test. Nurses were satisfied about the dressing and assessed Dressilk® as easy to use.

Discussion/conclusion: In this preliminary test Dressilk® was assessed as a suitable dressing for both split thickness donor sites and partial thickness burns with healing potential within 21 days. A more elaborate study, also investigating cost effectivity, will be performed in the near future.

P035

A novel keratinocytes and autologous microskin techniques to treat full-thickness skin defect wounds

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The main reason for the high mortality of patients with large deep burns is the lack of autologous skin for wound coverage. This study aims to investigate how to effectively use the limited remaining autologous skin to repair the large deep wound. The human keratinocytes harvested from foreskin were cultured and transfected with EGF by adenovirus vector (Ad-EGF). The full-thickness skin defect wound (3.3cm×3.0cm) was made on the back of rats and EGF gene modified human keratinocytes suspension and autologous microskin covered with allogeneic skin were transplanted on the wound The results show that the EGF gene modified human keratinocytes highly expresses EGF. In addition, CK10, CK14 and CK19 as keratinocyte differentiation markers were elevated in the EGF gene modified human keratinocytes. Wound healing was accelerated noticeably when grafting autologous microskin and EGF gene modified human keratinocytes were combined in vivo. The results suggest that EGF gene modified human keratinocytes suspension might contribute as promising seed cells which can effectively secrete
EGF to accelerate wound repair with the grafting of autologous microskin while reducing the amount of autologous skin used.

P036

Burn Patterns and Seasonal Change at a Specialized Burn Facility - 5 years review

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Objectives: In Portugal there are many burn victims, some of them having to be admitted at dedicated Burn Centres. This leads to great social and economic costs. Even though several studies investigated the impact of temporal factors on the incidence of trauma admissions, hardly any data exists concerning the impact of seasonal change on burn profile.
The main purpose of this study is trying to understand the real importance of the "temporal" factor on burn patients, correlating it with other epidemiological data and trying to establish preventive strategies.
Methodology: This retrospective analysis included all burn patients (≥18 years; 420 patients) admitted to the Burn Unit at Hospital São José (Lisboa) between December 2010 and December 2015 (5 years). Data was extracted from medical records and included age, gender, etiology, circumstance, depth and extension of burn. This information was then grouped in 4 temporal categories: Summer, Autumn, Winter, Spring.
Results: This study demonstrates that the number of patients admitted to this Burn Unit didn't show seasonal variation. Females were significantly older than men. The majority of burns was caused by fire and hot liquids. Winter seems to be associated with greater depths of burn and Summer with higher body surface area injured. Fire burns were less predominant during Spring.
Conclusion: The number of burns in Portugal is still very high and preventive measures are sometimes ineffective. With this study, we intended to understand better the burn profiles, establishing patterns of injury and searching for any seasonal variations. It is essential to anticipate all these variables to delineate more effectively the preventive strategy.

P037

Antimicrobial properties of blood-derived products against biofilm-forming bacteria commonly found in burn wounds

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Objectives: Platelet-Rich Plasma(PRP) is widely used to promote wound healing and tissue regeneration. The aim of the study was to explore the antimicrobial properties of blood products against free bacteria and bacteria-forming biofilm commonly found in burn wound.
Methods: *In vitro* studies were conducted to test isolated neutrophils, PRP, Platelet Poor-Plasma (PPP) and Leucocyte and PRP(L-PRP)against planktonic *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Acinetobacter bau-*

mannii.Blood products were obtained from eight healthy volunteers. Neutrophils were isolated using a Percoll density gradient method, PRP products were obtained using a sterile centrifugation technique. Components of products were confirmed using a full blood analyser(Sysmex XN1000).Assays to determine microbicidal and cytostatic properties of the preparations included disk diffusion, and growth kinetics. The ability of the blood-derived products to prevent *P. aeruginosa* and *A. baumannii* biofilm formation was tested using crystal violet biofilm formation assays and the biomass read as level of absorbance.Linear mixed models, ANOVA, Levene's test were used.

Results: Isolated neutrophils did not show bacterial growth inhibition compared to control. The only preparation showing growth control of *S. aureus* was the L-PRP preparation, where the leukocyte and neutrophil content of the preparation both significantly slowed bacterial growth kinetics.PRP and PPP preparations significantly reduced *Pseudomonas* and *Acinetobacter* growth over a 12-hours period compared to the positive control(p-value <0.0001). Against the Gram-negative bacteria, all the biomaterials tested gave a reduced level of biofilm biomass formation compared to positive control(Donor 1: activated L-PRP, L-PRP, PRP vs *Acinetobacter i*n broth $p < 0.0001$, and PPP $p < 0.05$. All blood-derived products vs *Pseudomonas* p <0.0001).

Discussion: Blood-derived products showed different antimicrobial properties according to the bacterial target and the cellular composition of the product tested. This in-vitro study provides preliminary evidence that blood-derived products can inhibit growth of key burn wound pathogens, both in their planktonic and biofilm forms.

P038

Does Polyacrylate polymer dressing reduce inflammatory response in a partial thickness burn wound?

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Introduction: Previous studies have demonstrated that polyacrylate polymers are highly charged and can bind ions, water and protein rendering them potential anti-inflammatory agents. A burn wound is characterised by a massive inflammatory response and lends itself as an ideal target for clinical application of such polymers. Hypothesis: A polyacrylate polymer dressing reduces post-burn inflammatory response and improves wound healing

Method: 12 Partial thickness burn wounds were created on the backs of 9 large white pigs under home office approval. 4 wounds were treated with a standard silver dressing, 4 wounds with a nonadherent dressing (control) and 4 wounds with a polyacrylate polymer dressing. Wounds were dressed every 3 days and harvested at 7 10 and 14 days post injury under terminal anaesthesia. Wounds were processed for histology and immunohistochemistry (myeloperoxidase, cd163, cd8, alphasmooth muscle actin and PCNA). Quantitative analyses were performed and data subjected to non-parametric statistical analyses.

Results: At 7 days, it was evident that the wounds treated with the polyacrylate polymer had less inflammatory infiltrate and more advanced re-epithelialisation compared to the control or the silver treated wounds. Cell prolieration in the keratinocytes of the neo-epidermis of polymer treated wounds was significantly higher than that seen in the silver or the control wounds. By 14 days, all woundswerealmost completely re-epithelialised. We did not see any increase in wound infections despite reduction of inflammatory response in the polymer treated burn wounds.

Conclusion and discussion: Polyacrylate polymer dressing reduces the post-burn inflammatory response and facilitates early re-epithelialisation of the wounds.

Post-burn inflammatory response both local and systemic, has been correlated with increased catabolic response, poor quality of wound healing and problem scarring. This study highlights the need for clinical investigation into use of polyacrylate polymer dressings in reducing the negative effects of post-burn inflammatory response and improving post-burn scarring.

P039

A Novel Keratinocyte delivery system to burn wounds.

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Objectives: Tailored spray devices can play an important role in improving spray cell delivery to burn wounds. The aim of this study is to develop an effective carrier system for spray cell transplantation to burn wounds and provide a novel spray assessment method.

Methods: Spray characteristics of a potential cell carrier (Gellan® hydrogel) were compared to other hydrogels and water. Spray application through an airbrush with standardized spray angle, distance and delivered air pressure was performed. Expansion rate, droplet size, relative span factor and percentage of surface area covered were determined utilizing a gelatin gel substrate and water-sensitive paper (measuring 26 x 76mm) on a flat and tilted receiving surface. Sprayed paper was scanned and analysed with Image J software. Furthermore, cell viability was assessed following Gellan encapsulation with

live/dead staining.
Results: Our preliminary results demonstrate that Gellan hydrogel shows reduced runoff compared to other hydrogels and water. Gellan expansion rate was 2.74 times and 1.7 times less than water when applied to a flat and tilted surface respectively.Following spray application of 50µl fluid volume, hydrogel droplets preserve structural stability and demonstrate a higher relative span factor (Gellan 5.0 and water 2.4) which potentially explains lower mean percentage area covered (24%, range 22-27%) compared to water (44%, range 40-48%). Cells maintained high viability (84%, range 83-85%) after encapsulation in Gellan for at least 4 days.
Conclusion: Water-sensitive paper is a useful addition to assess spray characteristics. Preliminary *in vitro* results from our studies show that cells tolerate Gellan encapsulation and spray assessment of Gellan demonstrates limited expansion and runoff to the receiving surface. Therefore, Gellan hydrogel seems a promising candidate for both cell encapsulation and spray application.

P040

The Use of a 3-dimensional Biofilm-Infected Wound Model to Test Concentrated Surfactant Technology (CST)-Based Wound Dressings

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Objectives: Biofilms are hypothesized to impede wound healing. Although research of biofilms in chronic wounds is growing, there is still a distinct lack of *in vitro* biofilm-infected wound models to test antimicrobials and wound dressings. The aim of this study was to develop biofilms in a wound based 3-dimensional model and assess the application of wound dressings and antimicrobials.
Methods: The reproducible 3-D *in vitro* skin model was commercially obtained and consisted of a human keratinocyte-rich epidermal layer and a human fibroblast-containing dermal layer. The skin was cultured overnight with supplied cell culture medium and incubated at 37°C, 5% CO_2 in humidified conditions. Wounding was performed using a sterile scalpel blade that cut through the epidermis and partially penetrated the dermis. *Staphylococcus aureus* ATCC 29213, *Pseudomonas aeruginosa* NCTC 10662 and/or MRSA ATCC BAA-43, *S. epidermidis* ATCC 29212 were grown in Tryptone Soya Broth (TSB) overnight at 37°C before being diluted to 10^4 CFU/mL. The microorganisms were then added to the wounded skin and incubated for 24-72 hours at 37°C and 5% CO_2. Immature and mature wound biofilms were treated with a non-antimicrobial and antimicrobial concentrated surfactant wound dressing for 24 hours. To assess biofilm prevention, some skin wounds were pre-treated with the dressings before inoculation. The wounded models were fixed in 10% formalin and processed for histological assessment. ELISA was used to assess the secretion of inflammatory cytokines.
Results: Histology demonstrated a visible reduction in microorganisms within the biofilm when treated with the antimicrobial-containing wound dressing. The pre-treatment of wounds with the non-antimicrobial wound dressing resulted in the sequestration of microorganisms. ELISA showed a significant change in inflammatory cytokines.
Conclusions: The study highlighted the efficacy of concentrated surfactant-based wound dressings against microbial biofilms in an *in vitro* wound model.

P041

The Effectiveness of a Next Generation Anti-biofilm Complex in the Treatment of Biofilms and Inflammation

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Objective: Biofilms have been associated with persistent infection and prolonged inflammation, particularly in wounds, which present with delayed wound closure. There is great demand for products that can manage both biofilm and the effects of biofilm such as inflammation. The aim of this study was to investigate the efficacy of a newly developed, smart, trigger-releasing antimicrobial, anti-biofilm and anti-inflammatory complex on both planktonic microorganisms and biofilms.
Methods: Anti-inflammatory capability of the complexes were evaluated in two *in vitro* wound models: A) Monolayer fibroblast scratch wound model treated with biofilm-conditioned medium and B) 3-dimensional wounded skin model with biofilm growth. The secretory levels of pro-inflammatory cytokines were measured in the cell culture supernatant using ELISA kits. Direct and indirect cytotoxicity tests were performed using L929 fibroblasts to evaluate the cytotoxicity of the complexes. Direct cytotoxicity was measured using the Neutral Red uptake assay and indirect cytoxicity was measured using microscopy.
Results: Histology showed a reduction in the presence of biofilm in the 3D biofilm-infected wound model. ELISA results showed changes in detectable secreted pro-inflammatory cytokines. Cytotoxicity studies revealed that some complexes, but not all, were cytotoxic, and in some cases this was alleviated in lower concentrations. However we clearly identified a smart complex that was not cytotoxic at all concentrations.
Conclusions: This study highlights the effectiveness of our next generation smart, trigger-releasing complexes against biofilms and biofilm-associated inflammation. These complexes can be incorporated into an array of different platforms with significant benefit to the prevention and control of biofilms.
*Asepticate Plus

P042

Insulin therapy in severe Burns - methods of glicemic control and intensive insulin protocol.

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Objectives: The goal of the study was to compare the clinical impact of different methods of glicemic control and intensive insulin protocol. Maintenance of controlled blood glucose levels results in fewer complications (eg. Bacteremia) and reduces mortality in critically ill patients.The accuracy of blood glucose measurement and adopted insulin protocol results in reaching target blood glucose level.
Methods: The analysis of glucose levels measured from capillary blood and/or venous blood according to the tabular method protocol (SPIRINT-Specialised Relative Insulin and Nutrition Table) and computerized intensive insulin dosing (Gluco Stabilizer Program). Any other factors affecting the instability of glucose level [like: healing manipulations, dressings/bandages, surgical procedures] were not analyzed.
Results: Levels of glucose in the venous blood and capillary blood for ICU patients, were compared. On the basis of glucose levels the dose of insulin was calculated - based on the tabular method [SPIRINT Specialised Relative Insulin and Nutrition Table] and using computer analysis method [Gluco Stabilizer Program, computerized intensive insulin dosing]. Cases of hyperglycemia and hypoglycemia where analysed as well.
Conclusion: There is no optimal method for assessing blood glucose levels in patients with severe burns.
In the tabular method [SPIRINT Specialised Relative Insulin and Nutrition Table] the insulin therapy is interrupted as a result of achieving the expected level of glucose. In the computer method [Gluco Stabilizer Program] the insulin therapy is maintained for several hours despite achieving the desired level of glucose. The computer method results may be disturbed by the computer malfunction/computer comptation failure.
Keywords: Severe Burns, Hypergycemia, Insulintherapy

P043

The use of low-intensity laser irradiation of blood in children of early age in the treatment of thermal burns of the skin

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Aim: To evaluate the results of treatment in young children with thermal burns of the skin when included in therapy, nizkointensivnogo laser irradiation of blood.
Material and methods: 47 children were surveyed, from them 32 patients aged from 8 till 36 months with an area of burns from 8 to 25% passing treatment in Children's regional clinical hospital of Grodno of 100% of cases the burn of skin was got owing to effect of hot liquid. All patients were divided into 3 clinical groups: 1st group (n=15): the conditionally healthy; the 2nd group (n=21) - patients to whom treatment according to the protocol was carried out; 3 (n=11) - patients to whom except standard therapy conducted a course of intravenous laser radiation of blood.
Results: Burns 1st degree there is complete epithelialization, and in the case of deeper tissue damage (burns 2nd, 3rd degree) the wound was cleansed from necrotic masses. At the same time (2nd phase of wound process) used wet-drying dressings with antiseptics and antibacterial ointments. After 2-3 dressings were observed in the healing of burn wounds (2nd degree) by the insular and marginal epithelization due to restoration of ischemic tissue and skin derivatives. The duration of the cleansing of wounds from necrotic tissues to the epithelialization when using complex treatment is faster 66.3% ($p<0.05$) than in the group of standard therapy, as the inclusion intraintestinal blood irradiation, provides direct stimulation of reparative processes in the wound. This leads to a reduction of the stages of wound healing, and more rapid epithelialization of wounds (30%, $p<0.01$).
Conclusion: The use of standard therapy with inclusion of sessions of intravenous laser irradiation of blood as we developed the technique is well tolerated by infants, does not cause any adverse reactions and complications, improves reparative processes in the burn wound.

P044

Additional fluid brings better outcomes in burn-blast combined injury resuscitation in a canine model

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Objective: Fluid resuscitation is crucial for the acute management of burn-blast combined injury (BBCI). Patients' requirement on fluid volume remains to make clear.
Methods: 24 beagle dogs were randomly allocated into 3 groups and were subjected to 35%TBSA full-thickness burn followed by moderate primary blast injury. They were then resuscitated with different volume of lactate ringer's solution – parkland formula (group C), parkland formula with a 20% increase (group I) and parkland formula with a 20% decrease (group D). The observation was 24hs. Urine of each dog was collected to calculate hourly urinary output (UOP). Cardiac index (CI), mean arterial pressure (MAP), intrathoracic blood volume (ITBV), extravascular lung water (EVLW), partial pressure of oxygen (P_aO_2) and

arterial serum lactate acid concentration (LAC) were determined 30min pre- and 4h, 8h and 24h post-injury.
Results: UOP in group I was considerably higher than those in the other two groups and was the only one who reached the recommended range within the first 4h post injury (0.77±0.17 $ml \cdot kg^{-1} \cdot h^{-1}$). Group I also demonstrated advantages on hemodynamics and blood gas over the other two groups. In the meanwhile, the increased fluid volume didn't aggravate pulmonary edema as presented by the EVLW (e.g. at 24h group D 126.35±14.80ml, group C 126.01±13.52ml, group I 126.54±11.95ml).
Conclusion: Fluid requirement for BBCI resuscitation exceeds the Parkland formula prediction. Additional fluid is associated with better outcomes while won't exacerbate lung edema.

P045

Characterization of immune and inflammatory responses by using open flow microperfusion in the dermis after burn injuries

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The immune and inflammatory response of burn injuries is commonly measured in blood serum and used to optimize therapeutic treatments. In this project we aimed to investigate the local dermal reaction in burn injuries which is currently poorly understood due to a lack of appropriate sampling methods. Open flow microperfusion (OFM) allows sampling of the interstitial fluid (ISF) directly in the dermal tissue and can thus be used to investigate the inflammatory processes in burn injuries directly in the skin. The minimally invasive OFM sampling technique allows time resolved sampling of ISF in the dermis and in adipose tissue. OFM probes feature a linear design with an outer diameter of 0.5 mm.
Macroscopic openings form the exchange area and constitute the interface to the tissue at a length of 15 mm. OFM probes are certified for human use and permit use of the same experimental design for preclinical and clinical studies as well as for explanted human skin samples. ISF is sampled by continuous perfusion of OFM probes with a physiological solution and OFM samples are subsequently analyzed regarding inflammation markers and immune competent cells for up to 46 hours. Pathophysiological changes caused by a thermic burn stimulus can also be investigated by measuring altered skin penetration of substances.
OFM offers new experimental possibilities for the investigation of burn injuries and the characterization of different burn injuries for an optimization of therapeutic treatments.

P046

Dermabrasion: completing with topical therapy in pediatric patients with type-AB burns

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Introduction: Burns in pediatric patients are a public health problem at the global level, and Type-AB burns with indication for dermabrasion are the most prevalent. This practice is quite painful and creates stress and psychological trauma in the child.
Objective: The present study seeks to determine whether it is possible to diminish the pain, improve the patient's state of comfort and the wound healing, when dermabrasion is complemented with topical treatment with silver sulphadiazine, vitamin A and lidocaine or with topical treatment with collagenase.
Methods: Randomized, double-blind, prospective comparison clinical study between two topical dermatological preparations complemented by the surgical technique of dermabrasion. 20 pediatric patients with AB type burns with indication for dermabrasion, divided into two groups of ten subjects each. A group was treated topically with silver sulphadiazine, vitamin A and lidocaine (Platsul A® Soubeiran Chobet Argentina) and the other with collagenase. Pain was evaluated using pain scales, and the wounds, by clinical and iconographic follow-up.
Results: Patients treated with silver sulphadiazine, vitamin A and lidocaine experienced improvement in the evolution of the pain. Both groups showed improvement in would healing and reduction of after-effects.
Conclusion: Dermabrasion combined with topical treatment with silver sulphadiazine, vitamin A and lidocaine in treatment of AB burns in pediatric patients enables pain control, improving comfort during and between treatments with less stress, which could signify less psychological trauma. Both treatments show improvement in wound healing quality.

P047

Early enteral nutrition, issues to get an adequat progression during first hours until get a complete enteral feeding

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Introduction: Early enteral nutrition is one of the important aspects to decrease the catabolism and maintain better conditions to treat critical burn patients. It seems to be most appropriate for patients start as soon as possible with low volumes per hour and increase progressively until get a complete enteral nutrition. However in real life our expe-

rience to carry out the enteral nutrition protocol presents several issues. There are many factors that can alter the correct administration to provide an optimal enteral feeding. For example, the long time with absolute diet and the long time initiating diet with 20ml/h during first hours can increase the catabolic state and the immunosuppressed state. Not follow properly the algorithms of gastric retention can stop de enteral nutrition many hours unnecessarily.
The aim of this poster is to show the issues that we had to get good enteral nutrition progression trying to start on 24 first hours until complete enteral nutrition needs in first 48h.
Methods: We present an observational retrospective study. Criteria of inclusion: Burn critical patients of both genders with ≥18 years old that need enteral nutrition even if they have less of 20% Total Surface Burned Area. The clinical history and the scoring graph reported daily for every patient had been used for this study.
Results: On average, we started enteral nutrition during first 24h but we not got complete enteral nutrition in first 48h since the patient arrived at our burns unit**.** However, we observed the complications and some of them can be improved.
Conclusion: There are issues that can alter the enteral nutrition protocol. Enteral feeding was improved solving some of this complications and having an exhaustive control.

P048

Burn Camp for teenagers in Germany by Paulinchen - Initiative for Young Burn Survivors

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Since 2012 Paulinchen – Initiative for Young Burn Survivors has been providing a yearly Burn Camp for teenagers from ages 15 to 21.
Methods: An experienced team with a psychologist, a music therapist, a nurse, two young adults with burns and a service woman for the kitchen is organizing the program. In the middle of nowhere, surrounded by beautiful nature the Burn Camp takes place in a self-catering house.
For most of the participating teenagers it's the first time after the accident being away from the protecting family setting and being together with others of the same age and with burn scars. Travelling on their own to the Burn Camp is a challenge which strengthens their self-confidence. Being together without the parents, who are mostly more anxious and painfully touched by the accident, is in a way very relaxing for the young people.
Different activities with handicraft work, small excursions and a visit to a public pool are a good platform for the teenagers to share their experiences and challenges about their life with a burn accident and scars. They give advice to each other from their different perspectives after the accident. And for sure they have a lot of fun together. It`s very important for the team members, that each of the teenagers feels noticed and valued during the burn camp.
Conclusion: A lot of the participants join the Burn Camp each year until they turn 21. Some of them then start to work in the team. During the Burn Camp friendships are built and the teenagers stay in contact also after the Burn Camp. All of them go home with the feeling that they are not alone with their destiny. They know that there are other young people of the same age with similar problems and feelings.

P049

18 years experience of burn holiday camps in Portugal

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Objectives: In Portugal, for the last 18 years the AAQ has been promoting annually a camp for burned children. The main objectives have been to create the opportunity for children to talk freely about the problems they face; to work towards the acceptance of the new image; to develop hygiene routines and organizational skills; to improve adherence to treatments; to develop self-esteem and self-concept and to facilitate the social integration in a group.
Methods: Each year, for a whole week, 15 children with severe burns from all over the country, were invited to attend a burn camp. The staff included 1 doctor, 2 physiotherapists, 1 psychologist, 2 nurses and 2 animators. Each year, a theme has been selected and all the activities were developed around it (anesthetizing sadness, being the same is being different, the future is...). The activities were diverse (painting, pottery, dance, swimming, canoeing, slide, watch the dolphins). All these activities took place in a very enjoyable atmosphere in order to facilitate the interaction between children and staff and set the basis for the final party where a broader team attends: AAQ and friends. During the icebreaking the participants write what they expect. By the end they write what they gained from the experience.
Results:18 burn camps have been successfully imple-

mented (around 270 participants).
The children expected that the camp would make they experience happiness, love, affection, strength, hope, new experiences, friendship, different thinking.
By the end of the week they reported bringing home smiles, joy, adventures, courage, good mood, relaxation, will to live the life, being able to wear a shirt or address without fear, self-esteem, self confidence, good memories and friends.
Discussion/Conclusion: The burn camp has proved to be a unique and valuable opportunity to deal with the devastating impact of a burn in the child's life.

P050

Multi-cultural burn camp - Youth participation experience

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Objectives: The aim of the study is to explore the possible contribution of participation in burn camp for teens growing up with scars. The specific burn camp is multi-cultural and includes both Israeli and Palestinian teens, therefore the study also addresses cultural biases.
Method: The study uses the qualitative methodology phenomenology, to explore the contribution and meaning of participating in burn camp among adolescent burn survivors. In-depth semi-structured interviews are conducted before and after the camp with 15 adolescent (9 boys and 5 girls) burn survivors. The teens were aged 13 to 18 years, and all attended camp at least twice before participating in this research. The interview examines the overall experience of the adolescent and includes probing question exploring participants' perception, thoughts and feeling. In addition, a smaller focus group of 8 campers is held during the camp. All interviews and focus group are recorded, transcribed, analyzed and core themes identified.
Results: Preliminary interviews were completed. Camp dates are April 3rd to 6th 2017. Focus group is scheduled for April 5th. Post-camp interviews will be completed by the end of April. From the preliminary interviews, it seems that there is an increasing participation of the teen in his or her family, community and school, however, this positive impact is more significant in the months following the camp.
Discussion: Following the completion of the interviews and full analysis of the results a comprehensive discussion will be conducted. From the preliminary results, the following important questions arose: The efficacy of a burn camp as a coherent part of the rehabilitation process, what is needed to be done beyond the camp to preserve the positive influence accomplished on the daily routine of the young adult. Also, similar results from both cultures associated in this study may suggest stronger transferability of the conclusions.

P051

The Role of the Burns Unit in Managing Complex Non-Burn Wounds

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Objectives: Large area non-burn skin loss can present a unique set of challenges to the burns unit. We aim to describe the breadth of different presentations and discuss our approach to their management.
Methods: We retrospectively identified all cases of adult non-burn skin loss greater than 5% total body surface area admitted to a single, busy burns unit for an 18 months period, from the British Isles Burns Injury Database. We analysed the aetiologies, clinical presentation and management of these cases and chose 3 cases exemplifying 3 different diagnoses.
Results: Between January 2015 and June 2016 18 cases were admitted under care of our burns team (6 to the Intensive Care Unit and the rest to the Burns Unit) with severe skin loss. Diagnoses were necrotizing fasciitis (NF) 8 (44%), Toxic Epidermal Necrolysis (TENS) 8 (44%) and Purpura Fulminans (PF) 2 (12%). Surgical management of NF included reconstruction with skin graft, and both PF cases required limb amputations. All cases of TENS were managed jointly with dermatology. Five patients died during admission, 3 of which had TENS and 2 had NF
Conclusion: Surgical priorities in non-burn skin loss differ significantly from major burns. In NF the focus is on ensuring adequate debridement, clean wounds and resolution of infection before attempted wound cover. In TENS a conservative approach to wound care and dressings with emphasis on prevention of propagation is best. PF requires timely inspection and debridement of muscle due to high incidence of necrosis and close monitoring and correction of hematological abnormalities. The presence of severe underlying medical conditions, such as immunosuppression in these patients, requires stronger collaboration across different specialties. The resultant poor physiological reserve and propensity for deterioration warrant a high degree of vigilance in their management and contribute to a high mortality.

P052

Virtual Beds Model: a follow-up study

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In the last EBA congress, Hannover 2015, we presented the results of our attention-patient centered model, high-

lighting the teamwork and the consensually oriented decisions; because we can use hospital-beds from the state health system for a long-term detention, we named "Virtual Beds Model" (VBM). Since that date, we have been developing and improving the concept. Objectives. The aim of this study is to show the main VMB quality: adaptability to the supply and demand, with practically non-investment. Methods. We reviewed the files of all attended patients at Centro Estatal de Cuidados Críticos (CECC), in Salamanca, Guanajuato, México. Methods. The Burn Unit is located into a building dedicated to critical care; it is a 12-beds intensive care unit, placed out of a conventional hospital; literally it has no long-term beds. The CECC influence area is around 6.5 millions population. The core of the VBM is grounded on medical education, patients to be attended standardization, communication, and the use of state of the art wound covers. As our experience and recommendations about "no touch" the wound aftercare, we chose to use live cultured human keratinocytes (Epifast) as first choice election. In a more than simplistic explanation, CECC receives the referred patients, provides medical-surgical attention, cover the wound, send them back to their original hospitals, and does the one-week reevaluation. Results. From 2012 to 2016 there were attended at CECC a total of 1681 burned patients, 525 (31%) inpatients, and 1156 (69%) in the VBM model (outpatients). 336.2 year-average patients, 105 inpatient, and 231 VBM. There were no deaths related with VBM. Conclusions. As we probed in this study, the VBM has the property of to be so flexible, in such a manner, that we can to increase or decrease the bed numbers as we need it, without major infrastructure investment.

P053

Comparative study of the cost of care for burn inpatients

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Objectives: To identify studies on costs of burn care and describe the mean total cost of inpatients.
Methods: We searched for cost studies in PubMed and Scielo. We collected data from country of study, methodologies used to compose costs total, total cost of hospitalization and total burned surface area (TBSA). We used the US dollar exchange rate corresponding to the study.
Results: We selected 8 studies carried out in reference hospitals in the treatment of burns, in Europe, Latin America and Asia. Most studies were direct costs only, in one study associated the health-related quality of life questionnaire, one study associated survival analysis and in another the cost-of-illness. The direct costs were calculated considering the consumption of medicines (6 works); clinical support (5); specific procedures (3); and fees of health professionals (4). The types of studies were cohort retrospective (4), prospective (1), cross-sectional (1) and two mixed studies (retrospective-prospective). The mean total cost inpatient, adjusted by the exchange rate, and the mean TBSA was: Spain (US$ 57,090; TBSA 20.2%); Brazil (US$ 39,594.90; 27.9%); Australia (US$ 7,956.92; 23%); India (US$ 1,060.52; 42.46%); Finland (US$ 28,270; no information) in 2013 and (US$ 24,639; TSBA stratified) in 2014; United Kingdom, large burned patient only, (US$ 161,978.46 to 1,014,153.42;) in 2009 and (US$ 4,106.61 to 51,777.54) in 2014.
Discussion/Conclusion: We found the total mean cost inpatient very different between the studies, which may be related to the technologies used in the treatment, the severity of the health problem and also the evaluation methodology used. There is diversity between studies and various components are possible to calculate the cost of treatment. There is a need to stratify TBSA. There is an urgent need for harmonization of the methodology to determine the cost of burn inpatients and implications in Health's Systems.

P055

Myoglobinuria and acute renal insufficiency in patients with electrocution

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Objectives: https://es.wikipedia.org/wiki/Mioglobinuria induces acute renal insufficiency (ARF) and might result in death by electric injury. Myoglobin causes reduced blood circulation through the kidneys where the reduced glomerular filtration already exists as a result of hypovolemia, as well as causing the entire obstruction of the renal channels. The objective of our study is to determine which clinical-pathological variables point to the occurrence of ARF.
Methods: The concentration of myoglobin in serum was determined by the CLIA method (sendwich chemiluminescence assay) on ADVIA Centaur in patients with electrocution, 12h upon hospital admission. In urine myoglobin was detected qualitatively. The examination included 28 patients that suffered electric shock who were hospitalized between the year of 2010 and 2015.
Results: Of all patients 18% had https://es.wikipedia.org/wiki/Mioglobinuria, while only 1 patient developed ARF. Logistic regression analysis proved that the following clinical-laboratory parameters correlate with https://es.wikipedia.org/wiki/Mioglobinuria: creatine concentration in serum, activity of creatine-kinase enzyme as well as the prehospital cardiac arrest, existence of deep burns. Utilizing the prediction model: positive when having ≥2 risk factor, can be significantly increased sensitivity of the method for defining patients at risk.

Conclusions: The patients with https://es.wikipedia.org/wiki/Mioglobinuria had little risk of developing ARF. This rule of prediction can be used as screening whereby patients would be put in two groups: those with low risk and those with the high risk of develop ARF, whose treatment requires a more aggressive therapy.

P056

Year 1: The new Helsinki Burn Centre, Igniting the flame

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Objectives: In January 2016, the Helsinki Burn Centre moved into a brand new facility and was unified with a previously existing general ICU. The new unit comprise a ten bed ICU and six bed Burn ward. The new national Burn Centre, part of the University Hospital, consists of four Intensive beds dedicated to burns patients, a burn ward, outpatient clinic, OT and rehabilitation unit, all situated on the same floor. The previous Burn Centre established in 1988, was only able to treat three intensive care and three ward patients at a time, insufficient to cover the entire country. Consequently some burn patients had to be treated elsewhere."
Methods: To firstly analyse the challenges posed by the unification of two different intensive care units. Secondly, to assess the results of interventions made to solve these problems.
Results: Major differences were observed between the general ICU and previous burn unit cultures. One major issue was the loss of very experienced burn nurses due to the new geographical location of the new unit. In spite of an increased workforce from 2 groups of 30 nurses to 85, following the loss of a third of the burn nurses, education became a key issue.In addition, solutions included: a coordinating nurse for the entire department and a specific burn care coordinator, unified protocols, specified orientation programs and task division such as wound care management and dialysis treatment.
Conclusion: After a year of acclimatisation this journey is far from over. The result of relocating the Helsinki Burn Centre to a new hospital has resulted in problems not anticipated. The learning process is gradual and new functional ways of caring for our patients have been found. Overall however, the moving of the Helsinki Burn Centre has been successful but there are numerous challenges still to be faced.

P057

The Impact of Major Trauma Network Triage Systems on Patients with Major Burns

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Introduction: Trauma is a leading cause of death and disability worldwide. Patients present-ing with severe trauma and burns benefit from specifically trained multidisciplinary teams. Regional trauma systems have shown improved outcomes for trauma patients. The aim of this study is to determine whether the development of major trauma systems have improved the management of patients with major burns.
Methods: A retrospective study was performed over a four-year period reviewing all major burns in adults and children received at a regional burns centre in the UK before and after the implementation of the regional trauma systems and major trauma centres (MTC). Comparisons were drawn between three areas: (1) Patients presenting before the introduc-tion of MTC and after the introduction of MTC. (2) Patients referred from MTC and non-MTC within the region, following the introduction of MTC. (3) Patients referred using the urban trauma protocol and the rural trauma protocol.
Results: Following the introduction of regional trauma systems and major trauma centres (MTC), isolated burn patients seen at our regional burns centre did not show any significant improvement in transfer times, admission resuscitation parameters, organ dysfunction or survival when referred from a MTC compared to a non-MTC emergency department. There was also no significant difference in survival when comparing referrals from all hospitals pre and post establishment of the major trauma network.
Conclusion: No significant outcome benefit was demonstrated for burns patients referred via MTCs compared to non-MTCs. We suggest further research is needed to ascertain whether burns patients benefit from prolonged transfer times to a MTC compared to those seen at their local hospitals prior to transfer to a regional burns unit for further specialist care.

P058

The first Full-Scale Care Process Simulation Training Course for the Management of Severe Burns

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Introduction: Training and simulation is key to the continuous medical education of health care professionals. Proper education is required to increase physicians' performance resulting in improved patients' outcomes. To im-

prove the treatment of burns, we aimed to establish an educational tool to simulate the acute care management of the severely injured.
Methods: With a size of 800 m2, The Medical Simulation and Training Center Styria offers, as one of the leading simulation and training facilities for healthcare professionals in South- and Central Europe, to simulate the management of severely burned patients. This environment is capable of mimicking acute and long-term burn care, as well as treatment procedures using a full-scale process simulation with high fidelity trainers.
Results: We developed a four-day burn injury training program, which simulates the entire process of burn patient management. Within The First Grazer Simulation Course for the Management of Severe Burns, all diagnostic, therapeutic, and logistic decisions will be simulated and trained, starting at the initial patient assessment and management at the emergency department, critical care transfer to the intensive care unit, surgical care in the operating room, to the post-operative management on the ward.
Conclusions: The First Grazer Simulation Course for the Management of Severe Burns could provide education, knowledge, and training for burn care providers. By improving technical and soft skills during the training, we aim to enhance physician performance and patient outcome.

P059

Re-Evaluation of the Online Presence of Burn Centers in Austria, Germany and Switzerland.

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Introduction: Websites serve as information and communication platforms and represent an important tool for the self-promotion of hospitals. In 2010 Selig et al. evaluated the online presence of burn centers in Germany, Austria and Switzerland based on 37 quality criteria. They found that most websites offered a good overview of the services provided by the hospitals. A significant need for improvement was noted in terms of specific information on burns, layout and usability. The aim of this study was to reevaluate the websites to assess their development over the past few years.
Materials and Methods: Within a period of 6 weeks (January - March 2017), the websites of the German-speaking burn centers were re-evaluated according to the quality criteria of Selig et al. divided into the following categories: “general information”, “information brokerage”, “research”, “teaching”, “patient care” and “key aspects of clinical treatment”. Particular attention was paid to specific information on burns. In addition, the implementation of social media platforms such as Facebook and Twitter was investigated.
Results: Overall, we noted an increase of quality of the websites compared to the first evaluation. Especially in the categories of “teaching” and “patient care” significant improvement was recorded. However, burn-specific information was still sparse. Social media platforms were often involved.
Discussion: Well-prepared content is an important quality feature of websites. The homepages of burn centers should serve the population as a medium for information and communication and must therefore be further developed. Furthermore, a clear structure and design of the websites can prevent long searches and lead to uncomplicated and fast information yield. The frequent implementation of links to social media platforms suggests that these have become an important medium for representing a hospital and especially for providing information.

P060

Emergency Management of Severe Burns (EMSB), implementation of the concept in Finland

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Objectives: Finland is sparsely populated large country with only one National Burn Centre located in Helsinki region. In Helsinki Burn Centre we noticed a need to develop more standardized care and guidelines for health care professionals treating severely burnt patients outside burn care facility. Emergency Management of Severe Burns (EMSB) course, originally developed by Australian and New Zealand Burn Association (ANZBA), was found to be the most suitable for Nordic countries. The objective of this presentation is to present the implementation of EMSB course concept in Finland.
Methods: First EMSB course was held in 2012 as a precourse of the Nordic Burn Meeting in Helsinki. The course was organized by Dutch Burn Foundation´s EMSB staff. The next step was to organize EMSB instructor course with in the next year by multinational EMSB staff. Subsequently a joint effort, EMSB Nordic was established in Finland and Norway in 2013. After instructor course, Finnish Burn Association got license to run independently Nordic EMSB courses under supervision of ANZBA. EMSB Nordic are directed by burn intensivist and staff consists of surgeons working with burns, anesthesiologists and burn nurses and the course is coordinated by a provider- and instructor certified burn nurse.
Results: Two courses are organized annually in Finland and participants have been from Finland, Norway and Estonia. Since 2013, 216 candidates have attended the course. All the courses are held by International EMSB staff, instructors attending from Norway, United Kingdom, Netherlands and Finland.
Conclusion: EMSB concept has so far been established

only in few European countries. It has proven to be suitable also for Finnish health care system, since EMSB and course can be adapted to each country´s specific circumstances. In Finland we have already seen the positive outcome in burn patient care.

P061

Video interaction guidance in Dutch burn care; the implementation in burn centre Rotterdam.

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Objectives: Burn injuries and their care are punishing experiences for hospitalized children. It is thought that if nurses have more skills to interact with children during recurring medical events, like wound dressing changes, these would be less distressing and painful. To modify interactional behaviour, video interaction guidance (VIG) can be used. With VIG, adult-child interactions are filmed and edited to produce a short film. In subsequent video review sessions, the interaction is discussed and, focussing on the positive, feedback is given. A recent pilot study showed that interactional behaviour during wound dressing changes did change as a result of VIG and was associated with the (dis)comfort of the child. To gain further evidence on the effect of VIG, it was introduced in a different Burn Centre.
Methods: At the burn centre Rotterdam eleven nurses were randomly selected and allocated to receive VIG (4 nurses) or not (7 nurses). Of the nurses receiving VIG, 3 wound dressing chances were videotaped before they received VIG and three after.
Results: A total of 76 dressing changes were videotaped of 11 nurses. All 4 nurses have completed their VIG training. They learned to look for the initiatives of the child, for the reaction of the nurse and what this reaction meant for the child. By recognizing this pattern, the consciousness of the nurse was triggered: what does the child tell you and what does it mean for the child to be heard. Questionnaires showed that trained nurses are unanimously positive about VIG. In addition, two persons working in Rotterdam became certified VIG trainer.
Conclusions: The implementation of VIG in Burn centre Rotterdam was successful. The formal study regarding its effects on the interaction between nurse and child (process) and the distress of a child during wound care procedures (outcome) will be completed this summer.

P062

The Epidemiology and Management of Electrical Burns in Cairo University Hospital between the years 2010-2015

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Objective: This study attempts to show the prevalence of electrical burns in our burn unit and the epidemiological difference between high and low voltage injuries. It comprises retrospective study including the years 2010-2014 and prospective study of the year 2015.
Methods: The retrospective study is more of a statistical analysis of number of electrical burn patients and mortality rate, while in the prospective study we were able to follow the patients, treatment process, response and outcome.
Results: In the retrospective section, 1233 burn patients were admitted ,118 were due to electric injury, 21 females, 25 high voltage burns, 44 cases of contact injuries, 83 flash burns, 5 cases of amputation and 13 mortality cases. In the prospective section in the year 2015, 277 burn patients were admitted, of which 15 were due to electric injury. Out of the 15 cases, 2 females, 13 males, 10 cases of high voltage burns, 14 cases of contact injuries, 1 flash burn patient, 6 cases of amputation and 2 mortality cases. Five patients got sterile repeated dressing with Silver Sulfadiazine cream, 8 patients got surgical interventions for coverage: 5 flaps (1 groin, 2 abdominal and 2 latissimus dorsi) and 4 grafts.
Conclusion: Electric burns are not common yet dangerous especially direct contact burns. Initial management may need ICU or CCU admission for neurological or cardiological life threatining conditions.Wound management includes dressing, debridement and escharotomy when needed. Definitive treatment will be grafts or flaps according to each case. Amputation may be limb salvage in low voltage type or radical in high voltage type. Early physical treatment and rehabilitation measures are core segments in the treatment process to limit the long term morbidity. The definitive care of these patients should be delivered in specialized centers in order to maximize good long-term outcome.

P064

Treatment of Second Degree Burns with Lactic Acid Skin Substitute in Out Patient Setting- Pain and Patient Comfort

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Objective: A burn wound coverage has long been sought that, among other requirements, reduces pain, protects the fragile wound bed and minimizes the risk of infection during the healing phase of second degree burns.
The lactic acid skin substitute currently utilized in our burn center appears to meet the needs of pain control, wound bed protection and infection risk minimization.
Methods: Our burn center experience with lactic acid skin substitute spans 3 years treating over 400 patients with partial thickness thermal burns, ages ranging 8 weeks to 95 years old.
Under moderate sedation, Wounds are initially debrided, lactic acid skin substitute and petroleum based gauze is applied. Outer dressings and burn net are then applied.
The patient is discharged with outer layer dressing changes planned every 2-3 days. Over the next 6-14 days, loose edges of the skin substitute are trimmed as they separate from epithelialized wound margins until all has separated in the outpatient setting.
Dressing changes are easily taught to family members at virtually no pain.
Hospital LOS may be decreased as the need for IV pain control for dressing changes is reduced.
The lactic acid skin substitute is generally well tolerated at home.
The outpatient treatment will be described in detail in this presentation.
Results: Overall positive response from patients and families.
Our patients occasionally report the following disadvantages:
1) Itch beneath dressing toward the end of the healing phase, 2) unable to shower, 3) unusual color changes in bilayer as healing progresses which are inconsequential and rarely 4) uncomfortable warmth of dressing.
Conclusion: The lactic acid skin substitute provides a relevant option in the treatment of partial thickness burns.
Most patients and their families welcome the prospect of a “no touch” wound care system as well as decreased need for opiate pain control and dressing materials.

P065

Epidermal Skin grafting ‘CELLUTOME™ in Burns and Plastics Patients with Chronic Wounds

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Chronic wounds continue to present a significant challenge to healthcare providers. For a majority of patients wound healing is straightforward, however some patient healing can be prolonged and require split skin grafts (SSG). SSG have long been the ‘gold standard’ of care but have not gained favour in the treatment of chronic wounds for a multitude of reasons; including creating a second wound in a patient with poor wound healing. Epidermal grafting is a minimally invasive treatment using nominal amounts of autologous tissue offering a viable option and an alternative to autograft in these challenging wounds. Herein we report our experiences of using the ‘CELLUTOME™ for patients that present with these challenging of wounds.
Epidermis was harvested and the cells transferred to the recipient site using Mepitel©. Patients were reviewed weekly, photographs taken at each appointment to assess healing.
Patients wounds ranged from 4 weeks to 4 years. Prior treatments had included split skin grafts, Pelnac© and Integra™ Wound types ranged from ulcer, surgical wounds, phlebitis and burn wounds. Age ranged from 40-92 years. Comorbidities included hypertension, osteoarthritis, MS, gout, vascular disease and heart failure. Healing time ranged between 7-10 weeks. 2 of the patient’s required further surgical interventions. Donor healing occurred in all patients in the first week without complications. No donor pain reported. Patients reported minimal discomfort from the treatment. The treatment varied between 8-45 minutes, depending on the time taken for the device to raise the epidermis.
The ‘CELLUTOME™ is a minimally invasive procedure requiring no pain relief and carried out in an outpatient setting. The procedure is simple, relatively quick and effective in treating patients with chronic wounds. This novel technique could be used as an alternative treatment for some patients with chronic wounds allowing the clinician a treatment option when only the epidermis is needed.

P066

Nutritional screening in minor burns

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Objectives: Nutrition is important to optimize wound healing and is a cornerstone in burn care. This holds also true for minor burns but is frequently overlooked. Can we identify patients with nutritional difficulties after minor burns (< 20 % TBSA) through nutritional screening of outpatients?
Methods: To identify patients with nutritional difficulties, a dietitian screened patients at follow up visits to our outpatients’ clinic. Screening for malnutrition, unhealthy eating habits, and assessment of nutritional intake were conducted. Patients received a “cost-index score” according to their eating habits: (0-4: considerably unhealthy, 5-8: borderline, 9-12: healthy). Nutritional screening and assessment resulted in a nutritional diagnosis.
Results: As of today 7 patients, age 19-76 years old (median 44 years), TBSA 0,4-13 % (median 1%, mean 4%) were screened for nutritional status.
Of these 7 patients 5 (70%) received a nutritional diagno-

sis (2 with considerable unhealthy eating habits, 2 with borderline unhealthy eating habits, and 1 with healthy eating habits). The patients with a nutritional diagnosis showed that 3 had “Inadequate protein intake” (whereof 1 had eating difficulties post burn injury), 1 “Inadequate protein-energy intake”, and 1 “Limited food acceptance”. The patient with “Inadequate protein-energy intake” was found to be in risk of malnutrition.
The remaining two patients were identified as having “No nutritional diagnosis at this time”. They also scored the highest on healthy eating habits, had no risk of malnutrition, or eating difficulties.
Discussion/Conclusion: The role of nutrition in the management of minor burns is often overlooked. This minor screening of 7 outpatients identified that approximately 70% of them needed nutritional intervention. To us this confirms that nutritional status is often overlooked in minor burns as these patients normally do not receive any nutritional intervention. Screening for malnutrition and unhealthy eating habits tends thus to better identify those requiring further nutritional intervention.

P067

Journal Club - not just for doctors
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Introduction: Journal clubs are where a group of individuals meet to critically evaluate appropriate literature in their field of interest. In relation to healthcare, journal clubs usually occur to bridge the gap between research and practice through discussion of evidence based care.
While journal clubs are common practice in the medical profession, they are less prevalent within other healthcare disciplines. In order to improve the standard of care and cohesiveness within the burns multi-disciplinary team (MDT), a journal club was developed which aimed to improve cohesiveness and facilitate best practice and patient care provided by the team.
Method: Members of nursing and therapy staff attended bi-monthly meetings to discuss articles of interest which covered all areas of burn care. The selected articles were not discipline specific but covered areas of burn care where the nursing, physiotherapy and occupational therapy teams were involved.
Results: Journal club members were able to review current literature and utilise the findings to devise standard operating procedures to enhance patient care and experience. It is found that through adopting best practice based on the latest evidence the overall standard of patient care is improved. One specific example of practice improvement was the implementation of strategies to formally record burn associated pruritus. This resulted in an increased awareness and lead to the development of a formal pathway to manage burn associated pruritus.
Discussion: The development of MDT journal club has helped improve the working relationship between the members of the MDT and allowed an increased awareness of non-medical issues associated to burn care. This has enhanced overall patient care and has increased the team cohesiveness.
There is a lack of journal clubs for non-medical members of the multidisciplinary team. A newly developed MDT specific journal club has an overall positive effect on patient care.

P068

Growing our paediatric burn care service; staffing, standards and peer review
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Objectives: In 2011 the Children’s burn service separated from the adults to become a dedicated 5-bedded unit. Initially there were 2.6 WTE (whole time equivalent) children’s burn nurses and 1.0 WTE play specialist, with an additional 3 WTE general paediatric nurses. At this level of staffing the service was considered unsafe. This poster will review the procedures taken to address these issues and provide a service compliant with the National Burn Care Standards (2013).
Methods: Concerns about staffing levels were highlighted externally and following a meeting with hospital management an increase in staffing levels was approved and two nurses were rostered per shift instead of one.
Standards for Burn Care were introduced in 2013, giving further impetus to our concerns. A self-assessment of the service was completed demonstrating compliance against the standards which was followed by a peer review.
Results: The Peer Review Report was positive, but expressed serious concerns regarding staffing levels which added support for further recruitment.
Additional funding enabled the service to expand by 3 further WTE nurses, a ward clerk and clinical nurse specialist.
Discussion / Conclusion: The original staffing establishment was based on historical data. However, since 2011 the paediatric burn service has experienced a five-fold increase in the number of referrals, partly because of national recommendations.
Initially, formal training and education were neglected, compounded by ever-increasing patient numbers. A programme of training is now in place, allowing staff to complete an accredited burns course and the EMSB.
Financial constraints within the NHS have led to more a stringent requirement to demonstrate the reasons underlying requests for additional resource. Our experience of engaging constructively with internal trust management, our burns network, as well as the peer review process based on national standards, indicates that positive change is achievable even in times of austerity.

P069

Nursing procedure in the treatment with Nexobrid and coordination with multidisciplinary team

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Objective: Nexobrid® contains a mixture of enzymes and is indicated for the removal of eschar in adult with deep and full thickness thermal burns, a process also known as debridement. Our objective is the development of the procedure implantation in the burned unit as a coordinated and effective form.
Methodology: The patients will be selected by plastic surgery depending on the protocol of the use of the product, characteristics of the injury and conditions of the patient.
Results: In the actuation during the emergency will be carried out an indication of possible treatment with Nexobrid® by plastic surgery department, starting the process of decontamination of the injures.
Then, we coordinate with intensivist (intubated patients) and/or anesthesia in the rest of patients to start the analgesia and sedation needed for the application of the product, which can be made from two hours after the decontamination.
Nursing apply the product in the times of execution established of way coordinated with the others professional and will be the responsible through their care of maintenance optimum of them tissue result in of the debridement enzymatic.
Conclusion: Nursing is the key in the execution of the treatment, coordination of the different specialists and care of the tissues in the cure process.

P070

Burn wound Irrigation Tubing: A Technical Tip for preparation

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Introduction: Several burns dressings require intermittent irrigation to keep them active. Often the irrigation tubing is simply made from intravenous infusion tubing by haphazardly cutting holes in the tubing with a pair of scissors. We aimed to determine how effective this technique is and to determine what technique creates the optimum distribution of irrigation fluid across the dressing.
Method: I.V. giving set with 3mm diameter at 80cm length of tubing was prepared using varying techniques. Fenestrations were made using traditional method of cutting holes 2-3mm diameter with scissors, vertical scalpel slits, and puncture holes using G14 – G 24 gauge cannulas at 1, 2 or 3 inch intervals. The tubing was then wrapped around a human model with dressings mimicking those used in clinical practice. Betadine solution was then injected into the tubing with upkeep of betadine on the dressings reviewed.
Results: The study found with fenestrations made using scissors, the betadine solution pooled at the start of the fenestrations along the tubing, preventing adequate distribution. When using 2 G16 calibre holes at 2 inch intervals along the tube we found the most satisfactory distribution of irrigation fluid. When the perforations were made at 1 inch intervals this prevented a sustained pressure flow to provide adequate distribution throughout the length of the tubing.
Conclusion: Bernoulli's Principle states that as the speed of a moving fluid increases, the pressure within the fluid decreases. So, decreasing the size of the holes, lets less water through the holes, thus building up the pressure, with increased pressure the water flows faster. A balance is to be made between the number of fenestrations in the tube, their size and distribution in order to maintain adequate pressure. With this information at hand future use of irrigation fluid application to burns dressings can be made more efficient.

P071

Implementation of a pain protocol including hypnosis in a burn centre: the training program

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Objectives: The aim of this study is to present the educational program we used to implement hypnosis in our burn centre as part of our pain management protocol. The project will be described with respect to aims, conceptual framework, structure, target groups, teaching themes, and experiences.
Methods: In connection with other local professional environments promoting clinical hypnosis, we implemented a multidisciplinary educational program to integrate hypnosis and comfort talk into our pain and anxiety management protocol. The educational program (3 days of theoretical classes and 4 days of practical supervision) was targeted on all the professionals involved in burn care in our burn centre. Additional non-mandatory workshops were planned on a weekly basis.
Results: Between May 2015 and March 2017, more than 50% of professionals of our burn centre (including nurses, physiotherapists, plastic surgeons and anaesthesiologists) participated in the hypnosis educational program. After the course, all participants declared a high level of satisfaction and claimed an understanding of the importance of communication and the use of therapeutic language in the clinical practice. Some reported the integration of hypnosis in their clinical practice as challenging.

Discussion/Conclusion: Burn patients suffer daily from pain and anxiety related to procedures (dressing changes, wound cleansing, physical and occupational therapy).
On the basis of international guidelines, pain treatment should include pharmacological and non-pharmacological strategies. In particular, hypnosis has been proved to be effective in pain management and have a tangible impact on the patients'outcome, reducing costs as well. Development of specific training programs may be an important contribution to its implementation.

P072

Material for Burn Victims in the Battlefield

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Objectives: Demonstrate that minimal material for treating burn victims are equally as effective.
Démontrer que des ressources matérielles simples pour la prise en charge des brulés sur le champ de bataille peuvent être aussi efficace que des moyens honnéreux
Methods: Show that what is generally used in a civilian context is rather cumbersome and that "minimalism" as often practiced by the military, is equally as effective.
Décrire les moyens de réponses conventionnels et déterminer sur base de restriction de poids et de volume quel moyen reste le plus efficace pour les premiers soins des brulés sur le champ de bataille pour les militaires
Results: Military minimalism – due to mobile restrictions – has nonetheless come up with efficient ways of dealing with burn victims. Avec des moyens limités, la prise en charge primaire des patients brulés sur le champ de bataille peut être aussi efficace qu'avec des moyens moins limités dans la vie civile
Discussion/conclusion: An exchange/dialogue related to nonconventional experiences in the medical field.
Échange des différentes expériences liées aux situations non conventionnelles

P073

The Brussels Terrorist Attack (22 March 2016): The Job of Military Anesthesist Nurse

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Objectives: Describe the routine functional adaptation of the military anesthetist nurse during a massive influx of victims.
Methods: Describe the ordinary day of a military anesthetist nurse. Decribe the changes that took place during the attacks
Results: The adaptations indicate that the use of a military anesthetist nurses in an unconventional context decreases the otherwise considerable strain on medical personnel in specific hospital sectors.
Discussion/conclusion: The close colaboration and trust between doctors and military anesthetist nurses (due to their experience and knowledge with burn-victims and injuries commonly associated with combat) allowed for a rapid and effective response as resources began to dwindle.

P074

Analysis of nurse dependency of burn patients using national burn injury database information

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Objective: To analyse the nurse dependency data in the International Burn Injury Database (iBID) to see how it can be used to inform workload measurement, quality of care and establish optimal staffing levels.
Methodology: An exploratory statistical analysis of the iBID database, using a correlational design in order to measure the degree of association and prediction between the variables relating to burn severity and nursing activities. This data has been collected from the burn units and burn centres in England and Wales since 2007.
Results: Five workload measurements have been used to formulate a nurse dependency total for each patient every day that could be used as a burn workload model. This presentation will describe the initial results of correlation between this nurse dependency model totals and burn severity variables such as location of care, TBSA, age and outcome.
Discussion: Concerns over balancing nurse staffing levels with patient acuity is not a new phenomenon yet there continues to be difficulty in quantifying workload and the subsequent number of staff required for good patient outcomes. One of the reasons for this could be that there are few suitable and validated nurse dependency tools available to predict or support staffing levels. Those in use in the UK do not address the specific challenges of patients with a burn. The results to date show that there is a complex relationship between the nursing workload measurements described here and burn variables.

P075

Non Medicinal Pain Treatment for Infant Burn-Victims While Dressing the Wound.

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Objectives : 1) Improve the treatment and atmosphere for

infant burn-victims 2) Integrating distraction methods for painful care 3) Gaining the confidence of children so that their treatment apprehensions are decreased.
Method: I chose a simple quantities and qualitative method. This study is an adapted approach as it deals with a subject insufficiently explored and analyzed. Seemingly, only anesthetics are used to decrease pain, but clearly they are not enough. I look into some American studies on the subject and discovered a distraction matrix associated with anesthetics. This allowed me to see how much time was offered by mental distractions and if these distractions can effectively decrease pain. To realize this study, I used virtual reality goggles in combination with gaming apps. (It goes without saying that the application of the gear avoided injured areas.)
Result: I tested this digital distraction on eight children between the ages of 3 and 12. The distraction test considerably decreased the pain of 5 children in 8.
Conclusion: This distraction test only works if the child has received proper pain treatment and if he allows himself to be " carried away " by the game. If the child is afraid or anxious the digital distraction will not work properly. Additionally, the parents have a very important role to play. If the parents are anxious themselves, the child is affected and will not be in the right state of mind to be distracted.

P076

Recent trends in burn epidemiology worldwide: a systematic review.

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Introduction: Burns are more prevalent in societies with lower economic standards and in less developed regions. Incredible socioeconomic advances of the past decades should therefore have placed the worldwide burn incidence in a downwards trend. The aim of this review was to assess the worldwide development of burn incidences during the past two decades.
Methods: The pubmed database was searched for literatury by using the key words "burn", "thermal", "injury", "epidemiology", "trend", "tbsa", "size", "depth" and "mortality". Articles were drafted and only original communications published from 2001 onwards that reviewed a period of at least 5 years were included into further analysis. Development of burn incidence, injury severity (size and depth) and mortality rates were assessed. Socioeconomic development status of each paper's country of origin was assessed according to the human development index.
Results: A total of 46 studies could be found. The absolute majority of studies were from very high income countries (n=32, 69%), fewer from high income (n=10, 22%) or intermediate income countries (n=4, 9%). There were no studies from low income countries. 26/30 (87%) studies described a downwards trend of burn incidence, 4/30 (13%) saw no trend. A decrease of burn severity was described in 15/17 (88%) studies, 2 (12%) reported no trend. A decrease of mortality was described in 22/27 (81%) studies, remained static in 4/27 (15%) and increased in 1/27 (4%).
Discussion: Overall there has been a decrease of burn incidence, burn severity and burn mortality in the past two decades. It would be overhasty to speak of a worldwide trend, since no studies from low income countries could be found. Hence studies on burn epidemiology should be done especially in low income countries.

P077

Equity in medical interventions between female and male patients in Swedish Burn Care

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Background: Disparity between male and females in medical treatment has been noticed worldwide. It is generally difficult to determine if this disparity in use of health care resources depends on gender-related discrimination or differences in medical condition and illness severity. The burn trauma population provides an excellent trauma model with a common cause of injury and a measurable impact of injury, the total surface area burned % (TBSA%). The aim of this study was to investigate potential differences between males and females in medical interventions.
Methods: All patients admitted for burns during 2000 – 2015 were included. Daily recordings of the therapeutic intervention using the "Burn Scoring system (BSC)" analysed with a multivariable regression model for panel data to adjust for age, TBSA %, and in-hospital mortality.
Results: The 1363 included patients generated a total of 22,301 in-patient daily recordings. Age was (median) 33 years (10 - 90 centiles: 1-72), 70% were male (930 of 1363), and crude mortality was 5.1%. Unadjusted mean difference of daily BSC recordings was higher in the male group as compared to the female group ($p < 0.001$), but sex was not an independent factor for daily BSC points after adjustment for age, TBSA %, and in-hospital mortality (model R^2 0.60, $p<0.001$).

Conclusion: Equity of interventions between male and female patients has been validated, using a burn based trauma model in Sweden.

P078

Mortality among patients with Baux score less than 100: a retrospective descriptive cohort study

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Introduction: Baux score (sum of age and percentage total body surface area burned, TBSA%) is the strongest predictor for mortality after burn injury. Baux score more than 100 is traditionally associated with a high mortality rate. There is however a small group of patients with Baux score less than 100 who die during burn care, and we aim to explore them.
Methods: All patients admitted during 1993-2015 to our centre for burn care were included (n=1946) in this retrospective descriptive study. The main study group consists of those patients who died with Baux score below 100 (n=23), and their medical charts were thoroughly examined for cause of death and co-existing causes.
Results: Crude mortality was 4.8% (93/1946), and 25% of the patients who died (23/93) had Baux score less than 100 with a min-max range of 64-99. In this group, flame burns was the cause for admission in 18 of the 23 cases (78%), median age was 70 years (46-84 years), TBSA was 20.5% (5.0-40.5), full thickness burn 7.0% (0-27.0), duration of hospital stay 11 days (3-41), and 18 of them (78%) required treatment with mechanical ventilation. The main causes of death were cerebral diseases in 9 of the 23 patients (39%), cardiovascular diseases in 6 cases (26%), respiratory failure in 2 cases (less than 1%) and other organs failure in 6 cases (26%).
Conclusion: Patients with burns who died with low Baux score are a small and heterogenic group and therefore it is not possible to predict them.

P079

Enzymatic burn wound debridement with NexoBrid®: Simulations of Total Treatment Costs and Comparison to SOC

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Objectives: NexoBrid® is a non-surgical, enzymatic tool for selective burn wound debridement providing advantages vs. surgical standard of care (SOC). This empiric cost study compared treatment cost of NexoBrid®-based treatments and SOC, and analysed the cost impact of improved burn wound care using NexoBrid®.
Methods: The analysis is based on two different cost simulation models. Based on the results of a randomized phase III trial and costs specified in the G-DRG system, the Average Outcome Model (AOM) compares total costs of NexoBrid® based treatments vs. SOC to determine cost saving potentials. In the Defined Patient Model (DPM) distinct burn wound treatment pathways in clinical practice were assigned to actual treatment costs to allow economic considerations.
Results: Using NexoBrid® cost savings are inversely related to the treated TBSA (1-15%) and directly related to the savings in burn centre stay (up to 6.5 days) (AOM). Based on quantitative and qualitative aspects, ¾ of all cases in the range of 5-15% TBSA are in favour of NexoBrid®. Main cost drivers are LOS and ICU stay (45-80% of total costs). NexoBrid® becomes a more powerful cost driver with increasing TBSA treated. If NexoBrid® completely substitutes for SOC, total cost per patient can be reduced by nearly 30% (5% TBSA treated) or are in the range of SOC costs (15% TBSA treated) (DPM).
Conclusion: Cost advantages using NexoBrid® emerge in cases with low or medium burned TBSA when costs for enzymatic debridement remain below SOC. Even in severe cases (15% TBSA burned) total costs of NexoBrid®-based pathways do not exceed costs of SOC pathways. Additionally, enzymatic debridement using NexoBrid® can be successfully applied as a strategic tool in order to reduce surgical procedure time and OR room capacity. Beside these quantitative aspects, qualitative improvements of burn wound care influencing overall economic efficiency must be considered.

P080

Bloodstream infections in patients with major burns requiring intensive care in the Vienna Burn ICU

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Objectives: Severely burned patients are at a high risk of developing infectious complications. To identify organisms that cause BSI over an 11 years period we conducted a single-center retrospective cohort study at the ICU for burn trauma of the General Hospital of Vienna, Austria.
Methods: A retrospective single-center cohort study was performed on 472 patients admitted to the Burn Intensive Care Unit of the General Hospital of Vienna between 2003 and 2014. Statistical analysis was conducted by competing-risks regression by the method of Fine and Gray.

Results: 177 pathogens (gram-negative bacteria: 78/171, 46%, gram-positive bacteria: 69/171, 40% and fungi: 24/171, 14%) were detected in blood cultures of 119/472 (25%) burn patients. A greater total burn surface area (TBSA) and abbreviated burn severity index (ABSI) were associated with a significant higher incidence of bloodstream infections (BSI) caused by Pseudomonas *spp.* (p<0.001, p<0.001), Enterococcus *spp.* (p<0.005, p<0.001) and Candida *spp.* (p<0.001, p<0.001). The incidence rate of BSI caused by multi-drug resistant bacteria in our burn ICU was in 2006 (1/51, 2%), in 2007 (1/41, 2%), in 2008 (1/33, 3%), in 2009 (3/38, 8%), in 2010 (0/38, 0%), in 2011 (1/52, 2%), in 2012 (1/27, 4%), in 2013 (1/37, 3%) and in 2014 (2/26, 8%). Before 2006 there were none (Table 3). A considerable number of patients diagnosed with multi-drug resistant bacteria were transferred from aboard (5/11, 45%). The mortality rate among patients suffering from BSIs caused by multi-drug resistant bacteria was 5/11 (45%) and in 3/5 (60%) patients the fatal bacteremia was caused by multi-drug resistant Pseudomonas aeruginosa.
Discussion/Conclusion: Despite a relatively high overall in-hospital survival rate, the results of the current study demonstrate that multi-drug resistant bacteria represent a growing threat for burn patients.

P081

Risk factors for blood stream infections caused by Pseudomonas aeruginosa in severely burned patients

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Objectives: Despite great advances in burns medicine, major infections among severely burn-injured patients remain as a limiting factor for successful treatment in burn medicine. Previous investigations revealed especially high morbidity and mortality in severely burned patients caused by Pseudomonas aeruginosa bacteremia. We aimed to identify risk factors for blood stream infections with Pseudomonas aeruginosa in severely burned patients.
Methods: In our retrospective, single center cohort study, we assessed patient data of 490 patients admitted to our Burns Intensive Care Unit of Vienna´s General Hospital from 01/2003 to 12/2014.
Results: In 21 (4,3%) patients Pseudomonas aeruginosa was found in microbiological blood analysis ("study group"). A greater TBSA (50% versus 30,7%) and ABSI (9,9 versus 7,7), a higher rate of kidney failure (p<0,001), gastrointestinal complications (p=0,006), and number of surgical procedures (4 versus 1) characterized those patients. A significantly higher number of Pseudomonas-isolation in wound swabs (p=0,006) and CVC-infections (p<0,001), were present in the study group. The overall mortality was greatly increased among Pseudomonas-positively tested patients (9/21, 43% versus 101/469, 21,5%) as well as the length of ICU stay (71 versus 27 days). International patient transfer correlated significantly with Pseudomonas BSI (4/21, 19% versus 18/469, 3,8%, p<0,001). In 4 patients, episodes of multiresistant Pseudomonas aeruginosa occurred in 2013 and 2014. These cases showed no chronological connection to each other, transmission within the Burn Unit could be excluded.
Discussion / Conclusion: Our data suggest that high TBSA and ABSI, prior isolation of Pseudomonas in other sites and international transfer pose high risk for development of Pseudomonas-Bacteraemia. We could not show correlation of age, sex, or national patient transfer with acquisition of Pseudomonas-BSI. There was no transmission of multiresistant Pseudomonas aeruginosa within our BICU so far. Strict hygiene standards and close surveillance will remain crucial in the future.

P082

Bacterial and Antimicrobial Susceptibility Profile, and Prevalence of Sepsis Among Burn Patients at the Burn Unit of Cipto Mangunkusumo Hospital

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Background: Infection is major cause of mortality and morbidity among burn patients. Effective measure of reducing infection is routine monitoring of the bacterial infection and antimicrobial susceptibility patterns at burn unit. This will help in creating burn center-specific protocol for empirical antibiotic therapy.
Method: A retrospective, descriptive study was conducted in Cipto Mangunkusumo Hospital (RSCM) Burn Unit between September-November 2016. The data collected include bacterial isolate culture, antimicrobial susceptibility spectrum, and the number of burn patients diagnosed with sepsis.
Result: 36 patients were identified with bacterial pattern changed continuously between *Klebsiella pneumonia* (17%), *Pseudomonas Aeruginosa* (12%), and *Acinetobacter baumannii* (11%). High resistance rates are found in 10 antimicrobials spectrum, particularly cephalosporin. Only Carbapenem, Aminoglycosides and Tigecycline are sensitive to these bacteria. Fourteen patients were diagnosed with sepsis (38,9%), 10 were deceased. Two major sepsis-causing bacteria were *P. aeruginosa* (33,3%) and *K. pneumoniae* (28,9%).
Conclusions: Etiologic agents of burn infection in our setting alternated continuously every month. Almost all bacterial isolates are classified as multi-drug resistant, with high resistance rates to our empirical therapy (ceftriaxone) leading to outbreak of sepsis and mortality rates. Combination of Carbapenem (Imipenem, Meropenem and Doripenem) and Aminoglycosides (Amikacin) are selected as empirical therapy.

P083

Mortality and Causes of Death among Burn Patients at the Burn Unit of Cipto Mangunkusumo Hospital

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Background: All around the world, burns are considered one of the important causes of disability and mortality. We present an investigate and analyses the causes of death after burn injury, to evaluate our burn unit and in an attempt to improve standards through a greater depth of understanding the trends in mortality in our service.
Method: A retrospective study method which collected the data of burn-injured patients who died between January and December 2016 in Cipto Mangunkusumo Hospital Burn Unit.
Result: Thirty-four patients were died in RSCM burn unit (23,3%). average age was 40,08 years. Most victims are male (n=22; 64,7%), average length of stay 14,1 days, 4 patients were diagnosed with inhalation injury (11,8%), 32 patients (96%) have extent of burns over than 20% TBSA. The most common cause of burn due to flame (n=29, 85,3%). MOF was the primary cause of death (n=31; 91,2%). *Pseudomonas aeruginosa* was the most common organisms isolated from burn deaths patients (n=14; 45,2%).
Conclusion: The major cause of burn death in our unit was MOF with the primary trigger of sepsis, which concurs with current literature.
Keywords: Cause of death, mortality, burns.

P084

The Influence Of Predictive Factors On Survival Rate Of Burn Patients: Analysis Of 693 patients

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Objectives: Traditional predictive factors, like %TBSA or patients' age, are essential determinants of mortality risk among burn patients. The aim of this study was to evaluate additional predictive factors that influence the outcome of burned patients at the Dr. Stanislaw Sakiels' Centre for Burn Treatment in Siemianowice ÅšlÄ…skie, Poland.
Methods: All burned patients admitted between 01.01-01.06.2015 were included to analysis. Five models of Cox proportional hazard risk were created. A model consisting of all parameters was chosen.
Results: It was shown, that sex does not influence patients' survival, however, one year increase of age results in 3,2% increase risk of death. An even more significant impact on surviving rate of patients is linked with burn area – risk of death increase 1,47 times for each 20% of burn surface. Type of burn isn't a predictive factor. Performing early excisions in the study group did not influence overall survival. Unsuccessful outcome increased 0,5 times with every consecutive surgery. Patients who underwent limb amputation are at risk of death 1,8 times higher than patients with no amputation. Patients, who due their general health condition had to be admitted to the ICU, were at 9,3 times higher risk of death compared to patients hospitalized in surgery wards. Blood transfusion procedures did not influence patients' surviving rate. Rehabilitation and hyperbaric oxygenation as adjuvant therapies did not impact the risk of death.
Discussion: Despite the fact that age and burn surface are unchanged factors for treatment outcome, created models show that estimation of survival rates based on those two parameters is considered insufficient. ICU patients with burns exceeding 80% and patients who underwent limb amputation are at particular risk of death.

P085

Evaluation of the use of non-specific immunoglobins in burned pediatric patients

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Objective: To evaluate the use and follow-up of the administration of non-specific immunoglobulins (Ig) in burned pediatric patients.
Methods: Retrospective observational study, including all pediatric patients with >10% burned surface area (BSA), who were hospitalized between August 2012 and March 2016.
Different variables were registered: biodemografic data (sex, age, weight), burn data (mechanism and burned BSA) and Ig administration data (plasmatic levels, dose, date and number of administrations).
Results: Forty-eight patients were enrolled (28 male and 20 female). The median age was 2 years (8m-15y) and the median weight was 12kg (7,5-67kg). The 87,5% (42) of burns were caused by scald. The median BSA was 14,5% (10-50%).
Determination of IgG levels was made in 37 patients (77%). Twenty-two patients had below-normal levels and a median BSA of 20,5%. Patients with normal levels had a median BSA of 12%.
Non-specific Ig (400mg/kg) was administered in 52% (25) of the patients. Nineteen of these patients had below-normal levels before the first administration. Seven patients achieved normal levels of IgG (2 with BSA >20%) after the

first infusion but there were 4 patients (3 with BSA>20%) who still had below-normal levels. A new dose of Ig was administered in 3 of them. No IgG determination was repeated after the first infusion in 8 (42,1%) children.
Ig was not administrated in 23 patients. The determination of IgG was done in 12 (52,17%) patients and 3 had below-normal levels.
Conclusions: There is a positive correlation between the BSA and the depletion of immunoglobulins.
By analyzing the results, the authors recommend the determination of IgG levels 72 hours after burn in children with BSA>15%. Moreover, when Ig is administrated in patients with a BSA>20%, it should be necessary a new determination after a week.

P086

Telephone Survey of Electronic Cigarette Associated Burn Injury: A SingleRegional Burn Centre Experience.

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Introduction: Electronic cigarettes are devices that deliver a nicotine containing vapour and have been advertised as a healthier alternative to tobacco. Often used as nicotine replacement therapy, e-cigarettes are utilised to help with smoking cessation. Consequently, the use of e-cigarettes has become increasing popular. The health implications of e-cigarettes are not limited to the inhalation of the e-cigarette vapour and media reports have highlighted the risk of burn injuries as a result of their use.
Methodology: Following the discharge of six patients who had attended our regional burn centre with e-cigarette associated burns, a short telephone interview was conducted to see how the incident which led to their burn injury has altered their attitudes and behaviours towards the use of e-cigarettes.
Result: Response rate was 50%. All patients who responded had 4 or more weeks off work and had purchased their e-cigarettes from abroad or eBay sellers. They received no safety information from the seller or with the product packaging.
Although there were no reported long term disabilities or functional deficits, it was found that all patients complained of cold intolerance, pruritus of the burn and joint stiffness. All respondents continue to use e-cigarettes following their burn. All respondents have become more safety conscious and aware of the need to acquire their e-cigarette device from reputable companies. Following their accidents all had purchased new e-cigarette devices from high street vendors feeling that these products would have a higher safety profile.
Discussion/Conclusion: It is essential that safety information be included on e-cigarette packaging and a need to regulate the standard of these products through governmental legislations. Further regulation of e-cigarette standard and awareness of its potential harm through improper usage is essential with a nationwide effort in collecting e-cigarette associated data to improve the overall standard of care in similar injuries.

P087

Burn Index and Survival Probability of Patients with Massive Burns in China: A Multicenter Prospective Study

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This study was designed to investigate the epidemiological characteristics and evaluate burn index associated with prognosis of massively burned patients in China. A total of 2483 massively burned patients with no less than 30% total body surface area (TBSA) were enrolled in this study, 69.59% of them were males, the male to female ratio of 2.29:1. The mean age was 49.23±16.67 years, 67.34% of the patients were adults aged 15-59 yr. Most of the patients (78.82%) were admitted within 6 hours post-burn, The burn injuries caused by scalds and flames accounted for 81.07% and 14.61%, 18.80% and 66.89%, 20.80% and 74.31% in the age group of 0-14yr, 15-59yr and ≥ 60yr respectively. The mean TBSA of the patients was 42.1± 14.5%, and the mean BI was 39.75 ± 21.59. The case fatality rate (CFR) was 9.79%. The area under the receiver operating (ROC) characteristic curve for BI was 0.941 (95%CI, 0.929–0.954), and BI above a threshold of 41 showed the highest association with mortality of the cases. Multivariate logistic regression analyses showed that aged 60 and above, admitted after 6 hours post-burn (adjusted odds ratio, 1.663; 95% CI, 1.094–2.526; adjusted p =0.017), BI exceed 41 (adjusted odds ratio, 10.930; 95% CI, 6.895–17.328; adjusted p < 0.000) and combined with inhalation injury (adjusted odds ratio, 7.969; 95% CI, 5.033–12.617; adjusted p < 0.000) were significant independent risk factors for death of massively burned patients. Males, adults remain high risk population in massively burned patients. Scalds are the main cause of pediatric burns, while flames predominate in adults and seniors. BI of 41can be a crucial threshold for CFR in massively burned patient. Furthermore, more attention should be paid to patients in view of the increased risk of poor prognosis associated with this BI and other risk factors.

P088

Why and how I do use suprathel in burned patients

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Objectives: The use of skin substitutes after the mechanical, surgical or enzymatic debridement of a burn is crucial

to reestablish the skin barrier, for this we show our experience with suprathel.
Methods: Over almost 2 years he has treated with a dozen patients, both small and large burned, with different depths and mechanisms of cause with suprathel. The application is done directly in the bed (mostly Nexobrid) followed by a cure with Jelonet without the need for anesthesia since its application is not painful. We leave the cure for 5 days and then cure every 2 days with Prontosan or Clorhexidine.
Results: Complete epithelialization of most intermediate or deep burns is done within one month, with a minimal infection rate that was resolved in all cases with topical antibiotic cures in a few days.
Conclusion: Suprathel is very easy to apply, it does not produce pain to the patient, its cures are fast and do not need staple removal or stitches. It can be used in consultation, in the operating room or in the room of our unit. And its princeps indication are the hands and large burned according to our experience.

P089

Retrospective analysis of clinical data of last 3 months at Istanbul wound and burn center

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Objectives: We wanted to determine the patient profile of Kartal Dr. Lütfi KÄ±rdar Training and Research Hospital which is one burn center in Istanbul.
Methods: Patient data of last three months between November and March recorded. The data consisted of patient age, gender, duration of hospitalization, burn type, burn grade, burn percentage and burn area. The age groups were divided into 4 divisions: 0-14, 15-24, 25-64 and over 65 years. The subgroups of burn type were flame, scalding, electric, chemical, contact and hot oil burning. Burn grade divided into 4 divisions as grade1, grade2, grade3 and grade 4. Finally, the burn zones were examined in 6 parts; head, anterior body, posterior body, upper extremity, lower extremity, and multi-area.
Results: A total of 108 patients' records, 38 women and 70 men, with a mean age of 24.22±2.29 were reached. The mean duration of hospitalization was 10 days. 48% of burn cases were scalding, followed by flame burns with 35.2%. The least frequent type of burn was hot oil burn, which had a 0.9% rate. 66.7% of the cases had grade 2 and 31.5% were grade 3 burn. Mean burn percentage was 10.48±8.37. While 58.3% of the cases had multi-area burns, 1.9% of the cases had posterior body. While there was no difference in any of the parameters between the groups ($p>0.05$), there was a positive correlation between age and burn grade ($p=0.003$). It was found that the incidence of scalding burn increased when age decreased (0.016). Additionally, it has been determined that the scalding burns' length of hospitalization was greater than that of the flame burns ($p=0.043$).
Discussion: The most common type of burn was the scalding and it can affect the duration of hospitalization. As the age increased, there was an increment in the level of burns.

P090

Chemical injury: 4 years of experience with an advanced approach

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Objectives: Chemical burns are a specific kind of injury requiring customized therapy. A radical change in skin pH results in tissue damage, sometimes with potentially life-threatening effects.
Water is still considered to be the golden standard in emergency rinsing of chemical injuries but there are additional options involving hypertonic solutions based on amphoteric and chelating molecules. In March 2012 we started applying two varieties of the above-mentioned agents in the emergency management of chemical injuries. One agent is specifically intended for decontamination of hydrofluoric acid splashes.
The other solution is indicated for all further kinds of acid or alkaline splashing. Question remained if the modern solutions really made a difference.
Methods: We retrospectively compared emergency treatment of chemical injuries admitted in our hospital between January 1st 2008 and December 31st 2015. In the "control" group only water was used. In the "advanced approach" group, according to indication, the previously described hypertonic solutions were applied, possibly preceded by rinsing with water. Both research groups were statistically (SPSS 23) compared for composition (gender, age, burn cause, triage), need for surgery and days of hospitalization.
Results: 112 patients were included for statistical analysis, 66 in the "control" group and 46 in the "advanced approach" group.
As far as composition is concerned both research were comparable. Statistics revealed significantly less surgery ($p<0.0001$) and a significantly shorter hospital stay ($p=0.031$) in the "advanced approach" group when compared to the "control" group.
Discussion/conclusion: In our hospital, patients with chemical injury clearly benefited from the application of an advanced approach, involving hypertonic solutions based on amphoteric and chelating molecules, in the emergency treatment of this kind of trauma.

P091

Minimising blood loss and transfusion rates in patients undergoing major burn excision: 5-year results from a tertiary burns centre and a review of the literature

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Objectives: Burns surgery may lead to significant blood loss in physiologically compromised patients. Blood transfusions are associated with significant morbidity and costs, are not readily available in regions or countries without established blood banks, and may not be accepted by patients from certain religious or cultural backgrounds. A study was undertaken at our tertiary burns centre to test the hypothesis that early and total burn wound excision can be undertaken with low rates of perioperative blood transfusion.
Methods: Prospectively collected data from 1 January 2011 to 31 December 2015 were used to identify perioperative transfusions administered to intensive therapy unit (ITU) patients undergoing primary burn excision, and stratified by the percentage total body surface area burn (% TBSA). A literature search for "burn* AND transfusion" was undertaken using Pubmed on 1 January 2017, to provide baseline outcome data comparison and identify alternative approaches to minimising transfusion use.
Results: 49 (32.9%) of 149 consecutive ITU patients received a blood transfusion at the time of their first (total) burn excisional procedure. Rates were 19.1% in those with under 40% TBSA burns, compared to 36.4% in those with 40% or more (chi-squared test of difference, p-value=0.068). 419 papers were found using the initial search terms. Of these, 46 were relevant and included in our review.
Discussion / Conclusions: Intraoperative blood loss and transfusion rates can be minimised by using specific techniques (early total excision, infiltration, topical haemostatic agents and dressings, limb elevation and tourniquet use) and optimising both thermoregulation (e.g. operating table and overhead heaters) and coagulation (e.g. tranexamic acid). Additional methods include erythropoietin use, altered blood sampling regimens, non-surgical debridement, and haemostatic wound coverage techniques and dressings. By augmenting and refining these approaches, we hope to move closer to the ideal of major burn surgery without the need for allogenic blood transfusion.

P092

An overview of 16 years of admissions for electrical burns to Burn ICU of Papanikolaou Hospital, Greece

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Objective: This paper presents demographic data, morbidity and outcomes of patients with electrical burns who were admitted to a four bed Burn ICU.
Method: Using a sample of 36 patients who were hospitalized between 2001 and 2016 in the burns intensive care unit, we outline a retrospective study of our own experience. We had recorded and evaluated: the patients' ages, sex, nationality, socioeconomic status, mechanism of injury, coexistence of and extent of damage from thermal injury, surgical procedures/amputations, severity of the patients' conditions on admission and during hospitalization in the burns ICU (SOFA, APACHE II, SAPS II), duration of ICU stay, complications, duration of intubation, and respiratory support, and outcome.
Results: The 36 patients who had sustained electrical injuries made up 8.2% of all our burns ICU admissions. Of these, 92% were male, 3% < 15 years of age, 72% between 15 and 50, while 27% were over 50. Infection of the burn wound was the most common complication, but renal failure and amputation also presented serious problems. The mortality rate was 5.5%. (Two patients died from septic shock).
Discussion / Conclusion: Those with electrical burns make up a small percentage of the patients treated in the burns ICU. A low mortality was observed, the main cause of death being septic shock.

P093

Abdominal Complications after Major Burn Injury

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Introduction: Abdominal complications in patients with major burns without abdominal injury has been described. We identified this complication within our burns centre, both during acute resuscitation and later during the inpatient stay. We sought to define incidence, outcomes, and associated factors contributing to abdominal complications in major burns.
Methods: We examined all patients with abdominal pathology between November 2003 and May 2016. Data included age, gender, total body surface area burn, inhalation injury, disposition, length of stay, resuscitation volume, time from injury to diagnosis, vasopressors, and early tube feedings.
Results: Among 316 patients admitted to the Regional Burn Centre, 18 (5.7%) were diagnosed with abdominal pathology with mean burn %TBSA of 60 (range 40-95 %TBSA), of which 5 (1.58%) had abdominal catastrophe. 7 (2.2%) patients had upper GI bleeding, 6 (1.9%) patients

had paralytic ileus, 5 (1.58%) patients had small bowel infarction / perforation and 1 patient developed pancreatitis. All but two cases were due to flame burns. All patients were formally resuscitated on admission. 10 (3.16%) patients with abdominal complications died. Of the patients with abdominal catastrophe the mortality rate was 60%. 3 patients were taken to theatre for laparotomy with small bowel resection. 2 patients were not fit for surgical intervention. Average length of stay was 1.07/%TBSA. On average abdominal complications developed 50 days post injury, with abdominal catastrophe occurring on an average of day 16.
Conclusions: Abdominal catastrophe without abdominal trauma occurs in 1.58% of our population. Associated mortality was 60% without obvious cause. More aggressive monitoring for abdominal complications, intra-abdominal compartment pressures and earlier operative management may improve outcomes.

P094

A Retrospective Analysis of Complications of Patients Requiring Single and Multiple Site Escharotomies

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Objectives: Escharotomies are a mainstay of emergency burns care. Neck and chest escharotomies are performed to allow adequate ventilation and Limb escharotomies are performed to improve circulation in circumferential full thickness burns. This study aimed to review the outcomes and complications of Escharotomy patients within the burns population.
Method: A retrospective review was conducted of all patients who required escharotomies seen at a regional burns centre in the United Kingdom over a 10 years from 2006 to 2016. Patients were identified as all those listen with escharotomies on the international burns database. Number of complications and mortality outcomes were recorded.
Results: 116 patients were identified who required escharotomies ranging from 0.5-95% TBSA with a mean TBSA of 40.8%, 79.3% (92) of these had burns > 15%TBSA. Average patient's length of stay was 39 days (range 1-231). 77.5% (90) were male and 23.5%(26) were female. A total of 217 complications were collated from 116 patients. Overall there was a 31% (36) mortality rate. 80 patients received limb escharotomies only, with an average TBSA of 35%, patient to complication ratio of 1.62 and 22.2% (18) mortality. 6 had only chest escharotomies with average TBSA of 45.5%, complication ratio of 2.67 and 50% (3) mortality. 10 patients had chest and limb escharotomies with average TBSA of 73%, complication ratio of 4.3 and 70% (7) Mortality. 9 patients had neck, chest and limb escharotomies with an average TBSA of 80.2%, complication ratio of 2.78 and 77.8% (7) mortality.
Conclusion: The results show that patients requiring neck, chest and limb escharotomies have higher complication and mortality rate. Patients requiring chest and limb escharotomies had higher complication and mortality rates than patients requiring chest escharotomies alone. The results show that patients requiring multiple escharotomies have higher TBSA burns and complication rate.

P095

Studying educational and safety conditions of occupational injured victims in bur patients

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Introduction: Burn is one of the major causes of death and disability in the world. Occupational burn injuries are statistically high. Thus, in this study we examined occupational accidents with safety and education approach.
Materials and Method: This was a prospective cross-sectional study conducted in two years on patients of Motahari hospital. Available samples were selected. After accreditation of form they were examined as a pilot on 1000 patients and inserted into Kobocollect software. Data were collected through interviews. Questions about patients' demographic characteristics, epidemiology of burns and data on burn causes on education and socio-economic conditions and home, work, school safety were completed. The data output was analyzed by SPSS v. 21.
Results: Of 847 patients (2.5% female and 97.5% male, 10-66 years), 118 cases (13.9%) were work-related accidents. Thermal burn 79%, electrical 19.4% and chemical 1.6%. 68.6% had upper extremity burns and 48.30% had third and fourth-degree burns. In 52.1% of cases, safety tips had not been taught. Of these patients 39.8% did not have personal protective equipment and only 80% used protective equipment permanently. Nearly a third of workplaces (27.8%) were not equipped with fire extinguishers. In 30.2% of burns, equipment breakdown and in 75% improper use of tools caused injury. Of whom 75% were unaware of the breakdown and 73.4% claimed carelessness during their work.
Conclusion: The results of this study showed that lack of training and safety tools and non-compliance with preventive tips were the main causes of occupational accidents. This requires developing an educational program by specialists in occupational medicine, occupational health, employers and authorities.

P096

Impact of Air Fluidized Support on the Outcome of Patients with Posterior Thermal Injuries - the Viennese Experience

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Objectives: In extensive thermal injuries with posterior involvement early necrectomy and split thickness skin grafting of the back is notoriously difficult due to exposure of skin grafts to shear stress and pressure. An additional tool in the management of burn wounds is the air fluidized bed. The aim of this retrospective study was to evaluate the impact of air fluidized support on the outcome of patients with posterior thermal injuries.
Methods: All patients with TBSA ≥15% admitted to the Burn Intensive Care Unit of the Division of Plastic and Reconstructive Surgery, Vienna General Hospital, between January 2003 and December 2014 were included in this retrospective study. Demographical data, ICU records and surgical records were collected, and statistically evaluated in respect of different treatment regimens (air-fluidized bed versus conventional pressure reducing mattresses).
Results: A total of 349 patients with TBSA ≥15% were admitted to ICU between 2003 and 2014, 24 (6.9%) died within the first 3 days. Of the remaining 325 patients, 122 (37.5%) showed burn wounds of the back (IIb – III°); in 77 air fluidized therapy was applied.
Long-term survivors managed in the air fluidized bed had significant higher TBSA (median 50% vs. 25%), significant higher ABSI score (median 9.5 vs. 8) and delayed surgical therapy of the back (14 vs. 4 days after admittance) than patients managed with conventional pressure-reducing mattresses.
However, survival rates did not differ between the two groups (29.9% vs. 31.1%). Severe infections due to late necrectomy were not observed.
Conclusion: The use of air-fluidized bed therapy in patients with severe burns and posterior involvement allows to postpone dorsal necrectomy in favour of early ventral or extremity surgical treatment, resulting in the survival of patients with higher ABSI scores as compared to patients managed with conventional pressure-reducing mattresses.

P097

Are we Missing the Consequences of Blast Injuries in Burned Patients?

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Objectives: Recent military experience has allowed mild traumatic brain injury (mTBI) from blast to be investigated extensively with an acceptance that the resultant brain compression and tension may lead to cognitive and neurodegenerative disorders. Early detection and treatment may mitigate chronic sequelae. We reviewed our preparedness to deal with blast-injured casualties and existing treatment protocols to optimise care for this group.
Methods: A 6-year retrospective audit was performed of all patients admitted to a regional burns centre with a mechanism description of 'explosion' or 'blast'. Notes were reviewed to determine mechanism and magnitude of any potential blast injury. Patients were categorised into high, possible, and no risk of blast injury. The subsets were then analysed to determine whether neurocognitive deficits were present and how they responded to our existing treatment protocols.
Results: 384 patients met inclusion criteria. More than 75% sustained trivial injuries with no risk of blast injury. Of the remaining 25%, 15% were possible and 10% high risk. The high-risk category did not show statistically significant differences in mortality or in-patient stay. Neurocognitive deficits were identified in most patients in the early stages of admission but it was difficult to differentiate these findings from the critical care derangements common to burn-injured patients.
Discussion and Conclusions: The identification of patients sustaining a true blast injury is almost impossible from current iBiD datasets. The number of civilian blast-injured patients managed in a regional burn centre is small, however, they represent a population at risk and should be identified if recognised treatment options exist. We propose a scoring system to assist with national data recording, discuss emerging technologies for diagnosis and describe how this can be integrated into modern burn care.

P098

The prevalence of Dysphagia at the burned service

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Objective: To determine the prevalence of dysphagia in patients at the burned service of the HUAP.
Material and methods: A descriptive cross-sectional study that took into consideration patients and survivors at the HUAP Burns service, with hospital stay between June and November 2015 (49 patients). Twenty-four patients met the inclusion criteria: head and neck burn, intubation (OTI)> 48 hrs, inhalation injury, presence of TQT and complaints expressed by the patient, family or team members. Patients with neurological alterations and / or swallowing disorder background (1 patient) were excluded, leaving a final sample of 23 patients.
The variables studied were: dysphagia, dysphagia sever-

ity, head and neck injury, inhalation injury and presence of OTI.
Background and clinical assessment of swallowing by a speech-language pathologist were collected. Data were stored in an Excel spreadsheet and analyzed with the statistical program SPSS 22.0.
Results: 65.2% of the 23 patients had dysphagia (n = 15). The degrees of dysphagia were: 33.3% mild to moderate, 26.7% mild; 20% moderate; 13.3% moderate to severe, and 6.7% % severe.
Conclusion: A wide prevalence of dysphagia was found in the study group, in different degrees. Several variables may contribute to the development of this symptomatology in burn patients, mainly orotracheal intubation.
It is essential to include a speech therapist in the team to treat dysphagia in a timely manner to reduce the associated risks and aid rehabilitation.

P099

Long term result data - 2 years after Colectiv fire disaster

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Objectives: On the evening of October 30th, 2015 Romania and the entire world witnessed the fire disaster that struck the Colectiv Club, which killed 64 people and injured other 186 people. The burn victims were taken to 11 hospitals, including ours – we received 23 burn patients. It was the first time our department, and the entire country, encountered such a mass casualty. Now, after two years since the fire disaster, we present the first outcomes of our patients' care.
Methods: The burned patients we received in our facility, aged between 19-46, had the heads, backs, arms and hands affected by the fire, the depth being mixed, deep partial and full thickness. The TBSA affected by the burns was between 2-90%. The eschar removal was done either surgically (2 patients) or by enzymatic debridement (17 patients). The heads and faces were conducted towards spontaneous epithelisation, whereas the hands and arms were grafted, in 17 patients. The hospitalization duration was between 10-62 days. 5 people out of the 23 died, including the 2 patients treated surgically alone. All patients treated by enzymatic debridement survived.
Results: Despite the fact that we couldn't follow up on all of our patients, who were transfered abroad and remained in the care of other physicians, the ones that stayed in contact with us (11 patients) had a good functional and cosmetic outcome. 5 patients required subsequent reconstructive surgeries at 6 months after the fire or additional procedures (cortisone injections - 4 patients), but overall we are satisfied with the results.
Conclusions: The Colectiv fire was the biggest fire disaster in our country. It required sustained effort on the part of the medical personnel to save the victim's lives, not just on the night of the fire, but also long term.

P100

Isolated foot burns in children in a warm climate

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Background: European studies of paediatric foot burns report scalds as the leading cause. Mechanisms of injury are different in warmer climates. We sought to characterize the mechanisms and outcomes of isolated foot burns in our population.
Methods: Retrospective review of a prospectively collected database of all children aged 0-15 years presenting to a Queensland paediatric burns centre over a 26-month period. Non-parametric analyses such as the Mann-Whitney U and Pearson Chi-square were used.
Results: There were 218 children with foot burns treated over a period of 2 years and 2 months, of which 214 had complete records. There were significantly more boys than girls ($n = 134$, 62.6% cf. $n = 80$, 37.4%, $p < 0.0001$). The leading mechanism of injury was a contact burn accounting for 63.1% ($n = 135$) followed by scalds (23.8%, $n = 51$). Friction, flame and chemical burns were a minority but were significantly deeper ($p = 0.03$) and significantly more likely to require grafting ($p = 0.04$) and scar management ($p < 0.0001$) compared to contact and scald burns.
Conclusion: In our population, contact burns are the most common mechanism of injury causing burns to the feet. The leading aetiology is campfire burns, which account for one-third of all burns to the feet. Prevention campaigns targeted at this population could significantly reduce the burden of morbidity from these burns. Friction, flame and chemical burns constitute a minority of patients but are deeper and more likely to require skin grafting and scar management.

P101

Starchy liquid burns do not have worse outcomes in children relative to hot beverage scalds

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Aim: To characterise children presenting with hot beverage scalds versus scalds caused by starchy water. Initial appearances of starchy burns had led us to be more pessimistic in our prognosis with these injuries, but we did not know if this was an accurate assessment.
Methods: Retrospective survey of prospectively collected

database of all children presenting over a two-year period.
Results: There were 138 starch scalds and 262 hot beverage injuries. Children with hot beverage injuries were significantly younger (18.2 months; IQR 14.1, 27.8) than those suffering starch scald injuries (51.4 months; 18.7, 102.3; $p < 0.001$). Perineal burns were more common in the starch group than the hot beverage scald group (10.9% vs. 2.4%, $p < 0.001$). Chest/breast and abdominal burns were more common in the hot beverage group than the starch group (60.7% vs. 36.9%, $p < 0.001$). Children under three years of age in both groups are significantly less likely to receive adequate first aid at the scene ($p < 0.001$). There are no differences in the need for skin grafting or scar management when comparing hot beverage scalds and scalds caused by starchy liquids.
Conclusions: Scald injuries caused by starchy liquids do not appear to cause a more severe injury than hot beverage scalds. There is a different pattern of injury from starchy liquids in older children. Children under three years old are less likely to receive appropriate first aid at the scene.

P102

Frosties: aerosol cold burns
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Background and Aims: Frosties are intentional frostbite injuries using cold aerosol sprays, predominantly in adolescent females, often as a mutual dare or test of courage. Clusters are common. First aid is infrequent and presentation is often delayed, perhaps due to an underestimation of the severity of the injury or to embarrassment. They are commonly deep injuries, and many require split-thickness skin grafting. Frosties are well documented on social media sites, but not their consequences.
Methods: A single centre prospective database of all new burns was interrogated for frostie burns. Ethics approval was obtained prior to the study. Data from our cohort were then compared against all other reported cases in the literature to confirm patterns.
Results: Nine patients were found over the three years of the database, the largest consecutive series reported to date. Patients were aged between 12.7 and 16.3 years, with seven females. Four presented as two pairs, having injured each other. The limbs were always the affected areas (6 lower, 3 upper). Multiple injuries occurred in three patients. Presentation was always delayed, up to 27 days post injury (1-27 days, median 10 days). In only one case was any first aid applied, and this was inadequate. Three patients required split-thickness skin grafting. Four of the nine patients were already known to school counselors, or other child advocacy services.
The literature yielded a further 19 cases. As with our cohort, the limbs of adolescent females were most commonly affected; with delays to presentation, lack of adequate first aid and a high risk of skin grafting. Early loss to follow-up was common.
Conclusions: Frosties are one example of risky activity amongst adolescent females. The consequences are under-recognised and under-reported, resulting in delays to treatment and a high chance of requiring split-thickness skin grafting. Frosties may be an external manifestation of underlying psychosocial pathology.

P103

Modifiable Risk Factors of Scald Burn in Children under 5 yrs in Bangladesh
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Objetive: Scald burn is very common in our country and most vulnerable population is children. Around the year children come to our hospital from different parts of our country with burn and 72% of them caused by scald. Unawareness ,late presentation from rural areas ,lack of proper initial management scald burn wound become infected and deep and increase morbity. Due to huge load of scald burn occur in children in our country from daily lifestyle make us obliged to find out the risk factors behind the accident which can be modifiable. Scald burn in children is preventable and this study address the modifiable risk factors which can reduce the incidence in our perspective.
Methods: This is a retrospective observational study conducted in Burn and plastic surgery unit, Dhaka Medical college Hospital , Dhaka between 1/1/2016-31/12/2016. Total scald burn patient were 893 in a year among them 562 patients are children and 282 patients are under 5 yrs. 178 patients were male and 104 were female.Cause of scald burn were mostly due to accidentally submersed into hot liquid, unattended child near hot liquids, hot liquid carry without caution, unjustified practice of keeping hot water pot near or under bed of child in rural areas and slums and cooking or drinking hot liquids with the child in lap.Prevalence of incidence according to cause of scald evaluated.
Results: Accidental pouring or submersion into hot liquid in 41% cases, transport of hot liquid carry without caution 24% , unattented child near hot liquids 15% ,practice of keeping hot water vessel near or under childs bed 12% and cooking or drinking hot liquids with child in lap 8%.All the risk factors are modifiable for prevention .
Conclusion: Evaluation of modifiable risk factors is very important in reducing scald burn injury in children.

P104

Danish burn victims compaired to burn victims in other northern European countries. A 5-year retrospective study.
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Objectives: Burn injuries are associated with significant morbidity and mortality. Detailed and updated data regarding incidence, mechanism of injury and mortality of burn injuries is key to improve future care, in terms of both treatment and preventive measures. We have examined the epidemiology of burn injuries in the Danish population from year 2010 through 2014.
Methods: We examined the characteristics of patients admitted at the burns department of The Copenhagen University Hospital, Rigshospitalet, between January 1st 2010 and December 31st 2014. Data on incidence, mechanism of injury and mortality were collected retrospectively.
Results: We found 1158 patients, consisting of 765 men (66%) and 393 women (34%) giving a male:female ratio of approximately 2:1. Children from 0-4 years accounted for 21% of patients, and scalding was the mechanism of injury in 86% of cases. For all remaining age groups the most frequent mechanism of injury was fire. For age 0-14 total body surface area (TBSA) ≥10% accounted for 63/377 (17%) patients, for age 15->90 TBSA ≥10% accounted for 243/781 (31%) of patients. Total mortality-rate was 7,2% (83/1158). No patients under 20 died. Mortality was respectively 2,3% (5/216) aged 20-39, 7,4% (18/244) aged 40-59, 20% (43/208) aged 60-79, 36% (17/47) aged 80 and above.
Discussion/conclusion: In the present study, we report incidence and mortality data from a single, tertiary burns center. Our patient population is comparable to our neighbouring countries in regards to mechanism of injury within age groups and gender distribution but in Denmark we appear to have a higher mortality rate.

P105

Epidemiological Features of Minor-Burns in an Urban-Region: Experience of a Burn Center

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Introduction: We sought to investigate features of urban minor-burns, treated at our center, located in the capital city.
Methods: Subjects were 3023 minor-burn victims during 2003-2016 who lived in urban-region. Study-group was divided into two subgroups according to ages; ***GroupI: ≤****18 years (n=1354), GroupII: >19-years (n=1669).* Data collected were age; sex; occupation; social-security status; home-heating methods; burn-causes; extents of burns; body-sites affected; time of day and seasons in which the injury occurred; account of event, time intervals between injuries and admissions **(TIIA)**; number of other medical-center admissions before our center.
Results: Mean age: 25.7±0.42(range,0-91), Male/female ratio: 0,62/1. Mean TBSA burned: 2.5±0.6%(range,0.5-30). Preschool children comprised 37.8%(n=1142), adults in workforce comprised 26.1%(n=789). Other occupation-groups were students(16.6%,n=502), housewives (11.8%,n=357) and retired adults(7.7%,n=233). Most were insured by social security (95.1%,n=2875). Most had centrally-heated homes(94%,n=2842). The most common burn-cause was scalds(75.1%,n=2180). All burn-causes were more frequent in ***groupII*** except contact-burns (p<.05). Hands were the most common body-sites affected (31.1%,n=941). Higher rates of hand-burns were observed in ***groupII***(59.8%), higher rates of head-burns(52.3%) and neck-burns(60.5%) were observed in ***groupI***(p<.05). Only 2% of injuries occurred between 00:00-06:00 hours, 76.3% of which were in ***groupII.*** 55% of injuries occurred in spring/summer(n=1684). The most common environment in which injury occurred was the home(81.5%,n=2463); outdoor-burns were more frequent in ***groupII***(p<.05). Injuries occurred due to hot food/drinks, heating-devices, electrical-devices, automobile-devices, unsafe self-care, unsafe entertainment-activities, and addictions. Mean **TIIA** was 2.03±0.1days(range,0-30). Median number of other medical-center admissions before the burn-center was 1±0.014(range,0-5). Rates of direct admissions to our burn-center were higher in ***groupII***(p<.05). However, higher numbers of ***groupI*** patients were admitted on the day of injury(p<.05).
Conclusions: Our data revealed that epidemiological features of minor-burns in urban-regions differ in adults and children. They are useful for establishment of preventive strategies for injuries which cause significant loss of urban-workforce and quality of life.

P106

Electronic Cigarettes and House Fires - a need for a national campaign?

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Introduction: In recent years, the use of electronic cigarettes, 'vaping', has become increasingly popular. Since 2015, there have been media reports of significant burn injuries secondary to the lithium ion batteries used in e-cigarettes exploding and causing harm. This has resulted in a number of patients requiring hospital admission, with some requiring surgery. While the major media focus lies in the burns injuries sustained by e-cigarette users, the potential for harm can be far more significant should one consider potential risk for house fires.
This project hopes to highlight the fire hazards from e-cigarettes and ascertain if a national campaign to highlight their danger is required.
Methodology: A survey was sent to the regional fire service to enquire incidences of all fire service attendances/reports involving e-cigarettes and their battery device.

Results: Between September 2014 and October 2016 the regional fire service attended 34 e-cigarette incidents. 60% (n=21) of these incidences were false alarms caused by the e-cigarette vapours activating the smoke alarms. The remaining 13 incidents of fire were secondary to either the e-cigarette or the battery from the device.
Discussion/Conclusion: House fires associated with e-cigarettes do not only have economic implications to the user in relation to loss of property but also to the fire service, as they would have to attend to manage the fire. Even in cases of false alarm the fact that the fire service are called out adds to the burden of the service. Lithium ion batteries are very sensitive, they contain compressed gas and flammable contents and battery failure can result in a violent reaction similar to a firework explosion.
There appears to be less understanding of the dangers of e-cigarettes and/or their batteries in causing house fires. Therefore, a campaign to highlight the dangers of e- cigarettes and their batteries is needed.

P107

Burns First Aid; Are we getting the message across?
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Introduction: The importance of first aid following a burn injury is paramount in reducing the severity of injury. As the majority of burn injuries occur within the home it is beneficial that all individuals have the appropriate knowledge to provide immediate treatment.
Method: A questionnaire was used to establish the knowledge of the general public with regards to first aid following a burn. An identical questionnaire was used to compare the results with individuals who had attended the burn service after sustaining a burn. It was repeated at different stages of treatment to demonstrate how effective the burn service is at giving first aid advice.
Results: General Public – There were 169 respondents of which 12.4 % admitted they did not know what to do following a burn injury. 10.6% were aware of the exact recommendations of cooling the burn wound for 20 minutes with cool running water. 76.9% of the general public asked, suggested that they know what to do but then gave incorrect information.
Burn Service – Out of 138 respondents, 6.5 % suggested they did not know what to do following a burn injury, 34. 7 % were aware of the recommendations and 58.6% indicated that they were aware of the procedure but were incorrect.
Discussion/ Conclusion: This audit has highlighted that the general public do not have the appropriate knowledge in relation to first aid that is required to improve the outcome of burn injuries. It has also raised concerns that the burn service is not as effective at delivering the message of the importance of first aid. Following a burn injury individuals are more likely to be receptive to such advice and every opportunity should be utilised. Given that burn care is expensive and can be complex burn prevention must be integral to future practice.

P108

Qualitative analysis of clinician experience when using the BuRN-Tool in clinical practice
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Objectives: The BuRN-Tool (**Bu**rns **R**ecognition of **N**eglect and Maltreatment) is a clinical prediction tool (CPT) to aid the identification of child maltreatment. As part of a larger evaluation of the BuRN-Tool applied to 100 children who have presented to the emergency department with a burn. Focus groups were conducted with the objective of exploring the views of clinicians on its feasibility, acceptability and impact in clinical practice.
Methods: Three focus groups were conducted (total n = 25) in a paediatric Emergency Department (ED). Focus groups were tiered by clinician seniority to facilitate open and honest discussion between peers. Thematic analysis was conducted. 100% of data were double-coded.
Results: Feasibility and acceptability of the use of the BuRN-Tool was high across all participants and tiers. Participants consistently reported that the BuRN-Tool was easy to use and the results were easy to interpret together with the recommended actions to take. All participants commented that the BuRN-Tool was clinically beneficial, especially for those of a more junior tier or those who do not consistently work in paediatrics. Those with a paediatric specialism placed importance on the 'gut feeling' of the clinician, and expressed how this interacts with clinical examinations and incident history in making a decision for the appropriate next step. They were reassured that the BurN-Tool was giving confidence to junior and less experienced colleagues.
Discussion: Findings suggest that BuRN-Tool was clinically beneficial and supports a positive clinical impact in the ED setting. The results varied with the level of clinical experience and paediatric training. Both play a significant factor in confidence of clinicians when confronted with possible maltreatment. Data suggest that the BuRN-Tool helps to increase the confidence of those lacking experience. Clinicians appreciated the benefit of a CPT in aiding the assessment of child maltreatment in burns.

P109

Effectiveness of Basic Educational Intervention in Paediatric Burns First Aid

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Introduction: Burn injuries are prevalent worldwide. In Singapore, burn injuries are the third most common cause of injury amongst children. Caregiver first aid can mitigate the devastating effects of paediatric burn injuries, however, knowledge has been lacking due to poor public health education. Our aim was to raise the level of knowledge regarding paediatric burn first aid by determining current deficiencies and assessing the efficacy of a short, structured educational intervention.
Method: Over a 12-week period, 263 caregivers were surveyed at the paediatric emergency department and burn clinic of KK Women's and Children's Hospital. The questionnaire recorded caregiver demographics and knowledge of burn first aid pre-intervention. A pictorial educational poster was then given to each caregiver, together with standardised burn first aid advice. The survey resumed thereafter and the post-intervention questions were completed.
Results: Of the 263 surveys conducted, 248 complete responses were obtained. We found a statistically significant increase in knowledge of caregivers immediately following the intervention. A statistically significant predictor of improved post-interventional scores was the caregivers' highest educational level. >60% of caregivers felt a topical agent was essential in burn first aid, which reflected a particular predilection in Asian communities such as in Singapore.
Conclusion: Our study shows it is possible to correct knowledge gaps in the immediate period through a simple pictorial guide, regardless of educational background. Our study also identified a short, structured method for a focused national educational campaign to decrease paediatric burn incidence.

P110

A Ten Year Experience of Firework Injuries Treated at a UK Regional Burns Centre

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Introduction: In the modern era people use fireworks worldwide to celebrate national, religious, cultural festivals and holidays. However the misuse of fireworks is associated with serious preventable injuries. We aim to review cases of burns caused by fireworks presenting to a regional burns unit in UK, in order to ascertain at risk individuals, patterns of injury, and treatment outcomes in this specific burns population.
Methods: A retrospective review was performed of all patients presenting to our tertiary burns unit with burns sustained from fireworks over a ten year period from October 2004 to October 2014. Patient demographics, aetiology of injury, management and patient outcomes were recorded.
Results: A cohort of 93 patients with injuries caused by fireworks were identified from our database. The mean age was 21.2 (range 6 months to 57 years). The identified cases included 82 males (88.2%) and 11 females (11.8%). Flash burns contributed the highest proportion of burn injuries in the cohort 59%, followed by flame burns 20%, with contact burns causing 11% and blast injury 10%. Most burns were to the hands 55%, followed by Head and neck 43%, with the remaining quarter of burns in this cohort were to the arms, trunk, lower limb and perineum. 39% of patient's required surgical intervention, with 11% requiring skin graft and 6% fracture fixation.
Conclusion: Fireworks can result in significant burn injuries, eye injuries and fractures requiring surgery and post-operative rehabilitation. Prevention is key to aim to reduce the incidence of these preventable injuries. Increased public awareness by campaigning has been shown to reduce the incidence of firework injuries. The number and severity of accidents can be minimised by raising awareness regarding safety precautions, motivating manufacturers to adhere to strict quality control and encouraging the use of fireworks as part of professionally organised displays.

P111

Electrical burns: a retrospective analysis over a 10-year period

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Objectives: Electrical burns are still a major problem in our society. Although its incidence is rather low, it is considered one of the most devastating injuries. In this retrospective study, we reviewed the medical records of patients admitted to our Burn Unit during a 10-year period. The aim of this study is to analyze specific aspects of electrical injuries and to delineate a prevention strategy.
Methods: A retrospective analysis of medical records of all the patients admitted to our Unit with electrical burns, during a 10 year period (2006/01/01 – 2015/12/31), was undertaken. Demographic data, mechanism of injury and electric current voltage, total burn surface area (TBSA), location and depth of burns, acute complications, surgical interventions and length of hospital stay (LOS) were analyzed.

Results: During the study period, out of 1695 burn patients admitted to our Unit, 99 subjects (5.84%) suffered electrical burns. 97% of these patients were male. The mean age was 38.3±13.7 years and the mean TBSA was 11.9%±13.2%. The mechanism of injury was occupational in 75 cases. Injuries were classified as low-voltage burns (24.2%), high-voltage burns (30.3%) and flash burns (45.5%). TBSA (p=0.014), mean LOS (p=0.002) and serum creatinine kinase levels (p<0.001) were significantly higher in patients with high-voltage injury in comparison to low-voltage injury, as well as the incidence of escharotomy/ fasciotomy (p=0.049) and flap surgeries (p=0.004). Although there was a higher incidence of amputations in this group (16.7% vs 12.5%), the difference was not statistically significant (p=0.487).
Discussion/ Conclusion: The high prevalence of electrical burn in males and workers emphasizes the need to review occupational safety regulations. Educational efforts regarding potential hazards of electricity and reinforcing compliance with safety measures are essential for avoiding these injuries.

P112

Epidemiology of burns in pediatric patients.
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Introduction: Pediatric burns may cause life-long disability and affect the quality of life as well of patients and their families. The aim of our study was to determine the epidemiological characteristics of burns in children treated in our burn center.
Methods: This was a retrospective study of pediatric outpatients treated in our burn ICU in Tunis between January 2015 and december 2015. Burn patients aged under 16 years wer enrolled. Multivariate analyses were carried out to determine the factors (burn etiology, time and place of injury, living conditions, first-aid treatment methods.
Results: 3584 patients were burned from which 724 were aged less than 16 years (20.2%). Infant's 0-2 years old (40.1%), with male predominance, were the most commonly affected.
The mean TBSA was 4.01%. The most common cause of burns was thermal at 97% and occurred mainly at home (94%) followed by electrical ones at 1.4%, and chemical ones at 0.6%. Burn injuries occurred essentially during summer (34.3%), with a peak during July and August, being the months with the most public holidays and other festivities, and account for 24.6% of total emergencies of the year. In our series, burns affected upper limbs (44.6%), lower limbs (35.4%) and the head/neck (28.6%). Immediate cooling was performed in 39% of patients. Three-quarters of children were brought by their families in the first 24 hours following the accident, almost half of them in the first hour.. Healing was identified in 265 patients with an average healing time of 27.71 days.
Conclusion: Burns in children are frequent (20.2%) . It mainly concern male gender with age under 4 years . Pediatric burns often occurred indoors, especially in the kitchen, and a low proportion receives adequate first aid . Education to parents may reduce burn incidence and improve pediatric patient care following burns.

P113

Powder Laundry Detergent: An Unsuspected Cause of Paediatric Genital Chemical Burns
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Objective: Genital chemical burns are uncommon, more so in children of young ages. The authors report a case of a 16-month-old child who sustained penile and scrotal chemical burns secondary to dermal exposure to powder laundry detergent. Whilst there have been several reports of liquid laundry detergent causing such burns, to the best of the authors' knowledge, no cases secondary to contact with powder laundry detergent have been previously reported.
Methods: A literary search based upon the above case was performed using Pubmed, Medline, Ovid, EMBASE and Google Scholar databases. The words "Paediatric", "Child", "Genital", "Penis", "Scrotum", "Vagina", "Vulva", "Detergent", "Powder", "Chemical" and "Burn" were used to perform the search. Two authors reviewed results from the literary search independently. An experiment was also performed to compare the pH of powder detergent (10mL) from the above case in water (100mL) versus urine (100mL). The pH of each of these solutions was measured using Neutralit® pH indicator paper (pH 5.5-9.0) and values were assigned for each solution's pH by each of the authors independently.
Results: The above literary search yielded 11 relevant results. Whilst several results reported cases of paediatric genital chemical burn secondary to liquid laundry detergent capsules, none of the results identified reported cases of chemical burn secondary to laundry detergent in powder form. The results of an experiment comparing the pH of powder laundry detergent in water versus urine demonstrated no difference in the agreed levels of alkalinity assigned independently to each solution (both approximately 7.0).
Discussion/Conclusions: The above case provides further insight into a previously unreported cause of genital chemical burns in children. Laundry detergent in both liquid and powder forms pose significant risk to children. Parents must be made aware in order to allow institution of appropriate prevention strategies and, when necessary, initiation of adequate decontamination techniques.

P114

Prevention of thermal injuries

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Thermal injuries belong among serious injuries that represent health, economic and social problem all over the world. They are significantly involved in morbidity and invalidity of children (especially the youngest age group 0 – 4 years) and underage. An average of 1% of the population are treated for burns each year. Of which 97% are treated as an outpatient and 3% are hospitalized. Children injured by a thermal injury are around fourty percent out of the total number of patients. This count is also featured in numerous abroad studies and single burn centers in Czech Republic. These data suggest an alarming fact that up to 70% of children that suffered from thermal injury were younger than three years. That's why it's needed to focus maximum preventive activities on education of parents of this age group in particular. Thermal injuries are the third frequent cause of child death caused by external source in the age group to fourteen years. Knowledge of all circumstances of origin of injury is important for the prevention of its creation. According to available researches the vast majority (97 %) of thermal injuries of children happened in the home.
Project goals: Design and create an educational leaflet thematically focused on prevention of thermal injuries for the age group 0 – 4 years.
Design and create an educational video thematically focused on chemical burn by sodium hydroxide.
Design and create distinctive reflective stickers warning about the danger of thermal injuries.
Become acquainted with statistical data of thermal injuries of children in the age of 0-4 years.
Teach the target group of the project identify and eliminate possible health risks of injury arising from the normal daily activities of the age group 0-4 years.
The target group of our project are parents, grandparents, people caring for children and older siblings of children.

P115

Virtual Reality as distraction technique during wound care; fine-tuning its application to a better effect

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Objectives: Virtual Reality (VR) as distraction technique to relief pain during wound dressing changes is promising, but more high quality studies are needed to further its effectiveness. This study investigates the effect of VR on procedural pain and patient's satisfaction. In particular, this study identifies patient-related, wound-related and psychology-related variables associated with the effectiveness of VR. Furthermore, need for pain medication, VR side-effects, nurse's satisfaction and user friendliness with the VR equipment are assessed.
Methods: Patients of eight years and older, without physical limitations to use VR and without need for intensive care are randomly assigned to the treatment or control group. Both groups undergo 4 consecutive dressing changes as usual and the treatment group also use VR. The equipment consists of Oculus Rift and Samsung Gear VR. The hard- and software are carefully adapted to the requirements of this specific medical setting.
Results: So far, 4 patients have participated, of which 1 was eliminated because of an unreliable pattern of answers. The VR group (2 patients) experienced moderate pain during 4 consecutive dressing changes (*mdn* 3.5; 0-8.5). They were satisfied with the procedure (*mdn* 7.7; 3.5-10), but less so with the VR system (*mdn* 2.9; 2.1-7.5). The Samsung Gear overheated during the procedure and there was a drifting problem. The nurses of the VR group were satisfied with the procedure (*mdn* 8; 2.1-9.7) and also with the use of VR (*mdn* 7; 4.6-9.0). No adverse effects of VR were found. The use of both systems was feasible and did not interrupt wound care.
Discussion/Conclusion: VR, which is carefully adapted to this specific medical setting, received an enthusiastic welcome. The hard- and software evolve rapidly, which will further benefit this serious application of VR. Completion of this study (*N*=128) will help specify for whom VR is the best option.

P116

Not all dressing changes have to be traumatic

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Objective: Burn injuries are said to be one of the most painful and traumatic injuries to be sustained. Dressing changes alone can be extremely painful; with this in mind we questioned our current distraction techniques and how we could improve this. The majority of dressing changes initially were through the assistance of the play specialist utilising a number of different tools. The Paediatric burns unit was then given the opportunity to trial the use of a mobile VPOD 3D unit
Method: Over a period of 11 months the mobile VPOD 3D unit was trialled on 214 patients aged between 2-16 years using a combination of sedation medications. The dressing was then undertaken with the use of the programme.
Results: From the 214 patients the VPOD 3D unit was trialled on, there was a good verbal response from both patients and parents. Parents felt their children coped better

with the use of certain programmes; however we were unable to compare this against not using the mobile VPOD 3D unit as this could be seen as unethical. It was found the unit was most successful on children aged 3 – 10. Staff also felt the distraction during the dressing changes were made simpler.
Discussion/Conclusion: Achieving the best outcomes from the unit; two members of staff were needed, One to interact with the child and the other staff member to undertake the dressing change. During the process of using the VPOD 3D unit it was found to have advantages and disadvantages for use; it allowed staff to move the unit around the room to allow for optimum viewing and distraction. Having a variety of programmes allowed the children to be able to choose suitable programmes. Trialling the sensory unit, staff on Burns are able to see the benefits relating to the sensory unit.

P118

A multicenter study of self-inflicted burns: Preliminary results

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Introduction: Patients admitted for self-inflicted burns, mostly after suicide attempts, represent a minority percentage of Specialized Burn Units (SBU). However, the complexity of their integral care makes them a differentiated group with very specific clinical characteristics and psychosocial needs.
European studies report that they represent 4% of the inpatients in the SBU. In Spain seems the percentage is lower, like in Catalonia with 1.45% and in Valencia 1,8%. Given the lack of knowledge of whether this value is specific for Catalan SBUs or it can be generalized to other Spanish communities and SBUs, this multicentric study has been design to add to the knowledge in this field.
Objectives: To describe the socio-demographic and clinical characteristics of patients with self-inflicted burns, and to compare data from two sample populations of two different SBU from the Spanish state, during the 2010-2016 period.
Results: A sample of 54 patients was recruited (72% men, 28% women); 41 patients from Vall d'Hebron University Hospital (Barcelona), and 13 patients from Hospital de la Fe (Valencia). Descriptives from the whole sample revealed similarities with other European populations: predominance of males, single, elementary studies and previous psychiatric history, especially of severe mental disorders. When comparing between groups, no statistically significant differences were found in socio-demographic characteristics, except for number of children (Mann-Whitney U=143,500, p=,041, z=-2,049) and severity of the injuries (Chi-squared=8,859, p=,003, Eta=,409) and intoxications (Chi-squared=10,422, p=,001, Eta=,43).
Conclusions: This preliminary study allows us to appreciate similarities between both samples and in relation to other European studies. Due to the limitations in the number of cases and the differences found in the two subgroups, these results serve as a starting point for the continuity of the project.

P119

Burned out soul - A cross-sectional study impact of PTSD and depression towards quality of life of post major burn patients.

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Objectives: The objectives of this study are to determine the effect of Posttraumatic stress disorders (PTSD) and depression towards quality of life (QOL) in major burn cases.
Methods: Majors burn patients that was treated in Hospital Universiti Sains Malaysia were selected based on the inclusion criteria. A total number of 55 patients with 2 years post burn were invited voluntarily and consented to participate in answering the psychometric battery which is the Malay translated and validated questionnaires.
Results: There is a significant relationship between PTSD and QOL (DF1,53=31.52, p<0.05). The direction of relationship was negative. It reflects the higher PTSD score obtained, it will lead to poor quality of life. Overall, the model explained 37.3% variance changes in quality of life. It was reported that in every 1 score changes in PTSD, we expect the changes of QOL was -1.10. There is also a significant relationship between depression and QOL (DF1,53=72.66,p<0.05). The direction of relationship was negative. It reflects the higher depression score obtained, it will lead to poor quality of life. Overall, the model explained 57.8% variance changes in quality of life. It was reported that in every 1 score changes in depression, we expect the changes of QOL was -2.237.
Conclusion: PTSD and depression is a strong predictor towards post major burn quality of life. Therefore, treating burn patients holistically and beyond the visible scars will lead to a better quality of life.

P120

Reliability of Patient Information Resources for Scar Revision Surgery Post-Burn Injury

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Objectives: Patients considering treatment of scarring post-burn injury will browse the internet in search of infor-

mation. Not all information is reliable and only a small proportion based on good evidence. Many of the publications available provide inaccurate or confusing advice, making it hard to know which information to rely upon in order to make a decision regarding scar revision surgery. This study aimed to evaluate the quality of information available using the top 6 websites from a web search relating to surgical treatment of scarring post-burn injury and compare these to validated patient information resources.
Methods: Information leaflets from the British Burns Association were used as the gold standard for patient information. Searches for 'Scar Revision Surgery' were performed using search engines 'Google', 'Bing', 'Yahoo' and 'Ask'. The top 6 'hits' were selected and assessed using the DISCERN instrument (http://www.discern.org.uk/discern_instrument.php) to assess the quality of written information.
Results: Each website was scored using 16 criteria that assessed all aspects of information provided and accessibility. Websites were then ranked in terms of reliability.
Discussion/Conclusion: The internet is an unlimited information resource that patients access. As reconstructive surgeons, it is useful to be aware of the most commonly accessed sources in order to help our patients by guiding them to those most appropriate.

P121

Epidemiology and screening of non-accidental burns in children in a Dutch burn centre

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Objectives: International estimates of the incidence of non-accidental burns (NAB) in children admitted to burn centres vary from 1% to 25%. Hardly any data about Dutch figures exist. The aim of this study was to evaluate the incidence, treatment and outcome of burns due to suspected child maltreatment in paediatric burns. We described the process of care and outcome, including the accuracy of the SPUTOVAMO screening tool and examined child, burn and treatment characteristics related to suspicions of child abuse or neglect.
Methods: A retrospective study was conducted in children aged 0-17 years with a primary admission after burn injuries to the burn centre Rotterdam in the period 2009-2013. Data on patient, injury and treatment characteristics were collected, using the Dutch Burn Repository R3. In addition, medical records were reviewed.
Results: In 498 paediatric admissions, suspected child abuse or neglect was present in 43 children (9%). 442 screening questionnaires (89%) were completed. In 52 out of 442 questionnaires (12%) the completed SPUTOVAMO had one or more positive signs.
Significant independent predictors for suspected child maltreatment were burns in the genital area or buttocks (OR=3.29;CI:143-7.55) and a low socio-economic status (OR=2.52;95%CI:1.30-4.90).
Conclusions: The incidence of suspected child maltreatment requiring the set-up of additional support in our population is comparable to studies with a similar design in other countries.

P122

Can we see the person behind the scars? Psychosocial aspects of coping with scars

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The human visible appearance and in particular our face and hands are central to identity and serves as a primary vehicle for expression, emotion, and character; they also play an essential social role in nonverbal as well as verbal communication.
Living with visible differences may impose on the person many challenges.
Living with scars may have a significant psychosocial effect on patients' quality of life. Face scars often limit the movements of the face, thus distorting the expressions of the individual and making it difficult for others to ''read'' the person's feelings from facial expressions.
Children affected by scars may be ignored, teased, bullied and ostracized. Scars may also significantly disturb self-image and psychosocial processes and may increase the emergence of psychiatric disorders such as anxiety and depression.
In this oral presentation I would like to highlight and review some of the obstacles faced by people with scars through the perspective of recent scientific research in this field. I would also like to discuss some of the evidence based psychological treatment programs for example cognitive behavioral therapy (CBT) and rehabilitation options currently offered to people with scars. The structure and effect of camps for children with burns will also be reviewed in this lecture.

P123

Use of co-experiencing psychotherapy in work with burn-injured children

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Co-experiencing psychotherapy is based on a general methodological approach, which L.S. Vygotsky called the "philosophy of practice" or "psychotechnics". Experiencing is a productive meaning-generative activity that helps to

cope with critical situation – situation of impossibility where a person has to change himself, because it is impossible to change the obstacles. Specific activity that the co-experiencing psychotherapist performs may be called co-experiencing and the general method of this activity—the method of understanding.
We believe that this psychotherapy is effective for the treatment of burn-injured children, because burn trauma usually interrupts Experiencing or impedes it.
According to this approach, Experiencing has four levels: Immediate Experience, Apprehension, Reflection and The unconscious. Trauma may cause barriers for these processes. Co-experiencing psychotherapy has instruments for working with each level of Experiencing. There are empathy for Immediate Experience, clarification for Apprehension, maieutic for Reflection and interpretation for The unconscious.
Second basic assumption of this theory is about the topology of life-worlds of the traumatized child. It is supposed that child's path from trauma to recovery lies trough 4 types of the life-worlds. There are infantile, realistic, value based, and creative life-worlds. Each of them has its' own type of critical situation – stress, frustration, value conflict, and crisis. Each of them has its' own language, characters and scenery. For every lifeworld, the adressee of the experiencing is different. For example, psychotherapist responds to the infantile life-world to a child with mothering, to the creative life-world with taking part in creative process etc.
This approach helps a child in her journey to the recovery trough by providing support for the Experiencing and resolution of the life's critical situations.

P124

Biopsychosocial problems of children with burn injuries from parents perspective

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In the Czech Republic children form about 36% of all injuries in proportion to adults. There is a higher count of boys than girls among hospitalized children. More than 2/3 of hospitalized children are in the age group 0-3 years. Burns formed by combustion have the largest average range, most of the areas have deep character and surgical treatment is needed in most cases. There is always burn of one limb in most cases. The most common range of burns is up to 5% body surface. Approximately every 7th hospitalized child is operated. The objective of the study is to describe the influence of burn injury on quality of life and its associated problems. Determine the needs and experiences of children and family members taking cares of children after burn injury.
The research is conceived as a qualitative survey, using interpretative phenomenological analysis which allows to understand the life experience of the individual.

P125

Pressure garment (PG) therapy for the hemangiomas of extremities

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Aim: analyzing the available data about PGT for the hemangiomas of extremities
Methods: The analysis of the treatment of five patients with advanced mixed (simple and cavernous) hemangiomas that took several circular segments limbs. The patients' age was 6,5 ± 1,5 months on the period beginning pression therapy. At birth, all children in these areas were recorded circularly limbs localized hemangiomas bright pink color with a smooth surface. At the age of 1-2 months hemangioma began to acquire crimson, noted a significant increase in local temperature of the skin over the tumor, there was strong growth of hemangiomas. Pressure Clothing was used as recommended by Mayo Clinic.
Results: elastic PG made individually. Initial pressure on the hemangiomas ranging from 28-32 to 40-45 mm. Hg. on cm^2 at the final stages of treatment, corresponding to 2-3 class compression in the treatment of burn scars and chronic lymph-venous insufficiency. PG used 23 hours a day. Compression period was 12-18 months.
State hemangiomas evaluated once a month. along with regression of hemangiomas gradually restored properties of the skin (texture, elasticity, color and strength of the skin), significantly reduced itching. He was removed lymph venous congestion. Children are well perceived compression therapy. Good aesthetic effect was noted.
Conclusions: Methods of compression therapy of frequently complicated hemangiomas children at an early age contributed hemangiomas regress. Hemangiomas have a complex nature and inability etiopathogenetical treatment for patients in early childhood advisable to carry out constant compression PG provided follow-up of children's surgeon once a month.

P126

The relationship between self-rated health and physical function and activity capacity in adult burn patients 6 and 12 months after injury.

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Objectives: Physical function and daily activities are often affected after a burn injury. Many patients experience com-

plications like pain, muscle weakness, scar contractures and scar hypertrophy. As a consequence this might also affect the experience of health related quality of life.
The aim of this study is to examine the relationship between self-rated health, physical function and activity capacity, in adults with burns.
Methods: All patients who come for follow-up at the Burn Center at the University Hospital in Uppsala, Sweden, 6 and 12 months post-burn, and fulfills the inclusion criteria, are asked to participate. The participants are adults over 18 who have been treated at the Burn Center and comprehend Swedish verbally and in writing. Individuals with underlying diseases, that prevent the assessment of the burn effect on the function, are excluded. During the follow-up visits a number of assessments and tests are carried out by the treating PT and OT. The results of these assessments will be used in the study. Data will be analyzed using non-parametrical tests, correlation analysis, and descriptive statistics.
Records of the participants' age, gender, TBSA % and depth of the burn will be collected from medical records.
Results: Fifty consecutive patients were included from November 2015 to February 2017. The final analysis has, at the time of abstract submission, not been carried through, but so far we can see a significant correlation (p=0,001) between perceived health (EQ-5D) and DASH (activity capacity upper extremity) at the 6 months follow-up. There is also a significant correlation (p=0,002) between EQ-5D and IMF (function lower extremity) at 6 months.
Conclusion: The preliminary result of this study indicates that function and ability to carry out personal daily activities affects burn patients´ perceived health. However, the small sample size has to be taken into consideration when interpreting the results.

P127

Occupational reintegration in patients after severe burn injuries

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Objectives: Based on improved surgical possibilities and bettered intensive care, the morbidity and mortality of severely burned patients could be reduced significantly during the last decades. Thus, subsequent occupational reintegration of these patients evolved as a parameter for optimal functional outcome after burn injury and quality of life. In the literature, degree of burn, number of weeks of treatment, and TBSA, among many others, are described as factors possibly impairing occupational reintegration. Moreover, it is thought that during rehabilitation psychological problems are increasing in relevance compared to physical impairment. Satisfaction of social needs such as acquisition of a social task, social status and the individual identity, which are the basis for any occupation, play an important role to wellbeing and health in this patient collective. We aimed to identify factors possibly impairing or favoring successful occupational reintegration of patients after severe burn injury.
Methods: In the present study, we contacted 112 patients, who fulfilled all criteria for study inclusion. 11 patients decided to participate in the study; All patients included in the current study were treated between 2004 and 2013 at our burn ICU.
Results: 7/11(64%) patients were successfully reintegrated in their profession and 4/11(36%) patients reported no occupation after their burn injury. The most frequent reason for failure of reintegration was advanced age. Other factors contributing to non-reintegration were length of hospital stay and ICU-stay, type of burn, occupational accident as cause of burn, and length of rehabilitation. Furthermore, occupational reintegration seems to correlate with education, the severity of pain, impairment of mobility, and problems with aesthetic appearance.
Discussion/Conclusion: Our findings suggest that these above described factors have to be considered and potential risks should be minimized already during hospital stay of severely burns patients in order to achieve successful occupational and social reintegration.

P128

Patient and Observer Scar Assessment Scale, translation into Norwegian, cultural adaptation, and clinimetric properties

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Objectives: The purpose of this study is to achieve a Norwegian version of POSAS with good clinimetric properties for use both in clinical practice and research. The aims are to translate POSAS into Norwegian, examine its intra- and intertester reliability, validity and responsiveness.
Methods: Four experienced burn physiotherapists, fluent in the English language, translated POSAS individually into Norwegian, and agreed on one Norwegian version in 2015. A translation bureau had also translated the scale, and the official Norwegian version (POSAS-NV) is a mix of the two versions. A cognitive debriefing was carried out among patients, nurses and plastic surgeons. POSAS-NV was back-translated according to international guidelines. A cross-sectional design will be used to examine intertester reliability and validity of the POSAS-NV, and a longitudinal design to examine test-retest reliabiltiy and responsiveness. At least 50 patients will be asked to take part in the study and will be included on the basis of written informed consent. In the case of children, informed consent will be asked for from a parent or next of kin. Exclusion criteria are patients with severe cognitive dysfunction

or too poor skill in the Norwegian language to understand information and instruction given and to score the patient scale, as well as mature scars.
Results: The cognitive debriefing resulted in a few suggestions mainly with regard to lay-out of the scale, which has not been incorporated into POSAS-NV as it would differ from the English version. The back-translated version was accepted by the developers in 2016. Examination of clinimetric properties is ongoing. Twenty patients have been included in the study from August 2016 to February 2017.
Discussion: Challenges experienced with patient inclusion and practical issues with carrying out the study will be discussed.

P129

Correlation of pliability with (Visco-) elastic properties of burn scars

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Background and objectives: Patient and Observer Scar Assessment Scale (POSAS) and Cutometer® are the most frequently used assessment tools to investigate pliability of burn scars, subjectively and objectively. We aim to investigate the correlations between POSAS pliability items and the (visco-) elastic properties of scarred skin measured with the Cutometer®. These results could provide information necessary to determine minimal clinically important differences (MCID) for POSAS pliability items and Cutometer®.
Methods: Fifty-eight measurements on 20 patients with burn or surgical scars are performed. Patients completed the POSAS-P, whilst observers assessed pliability using POSAS-O and Cutometer®.
Results: The Cutometer® R0 parameter was most strongly negatively correlated with both POSAS-O-pliability (r=-0.597; p<.0005) and POSAS-P-pliability (r=-0.358; p=.006). When correlating the POSAS pliability scores with the R0 values, a downwards trend is demonstrated. There appear to be 'levels' of change, only showing significant differences between the 'levels' and not between the consecutive individual scores. We observed a significant positive correlation between the observer- and patient-reported pliability scores (r=0.443; p=.001), however imperfect.
Discussion: The strong correlations of the R0 parameter with POSAS pliability scores imply that the Cutometer® could also serve as an anchor to determine the MCID for the POSAS pliability parameter since a cut-off score ≥ 0.3 is present. The presence of 'levels' of change suggests that observers can distinguish between 'levels' of severity, but the differences between certain scores appears arbitrary. The significant but imperfect correlation between the observer- and patient-reported pliability scores suggest that observers and patients are not attributing the pliability in the same way. A difference in the assessment protocol for the observer and the patient could explain this.
Conclusion: The Cutometer® is a valid instrument for measuring the characteristic of pliability when using the R0 parameter, and can serve as an anchor to determine the MCID for POSAS pliability.

P130

Intensive rehabilitation of patients suffering from burns: traditional methods, modern methods and Crenotherapy (Thermal Spa Water Treatment)

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Objectives: The healing of areas affected by burns, especially those involving severe deep burns, even after having undergone appropriate reconstructive surgery. The affected areas are almost always scarred with aspects of dystrophy, hyperaemia, hypertrophy, keloid transformation, ulcerations and in certain parts of the body receding scars which obstruct or limit the functioning of limbs and other affected organs.
We have been dealing with rehabilitation as a result of scarring for over 25 years. Once recovered from the healing of ulcers, patients are then monitored and treated for all aspects concerning a scarring pathology, with the aim of ensuring prevention and functional recuperation, especially in children during their development and growth.
Methods: Individual intensive rehabilitation programme for 3 hours each day.
Patients undergo the following treatment: moisturising deep massage articular / limb mobilisation and movement postural correction recuperation of orthostatism and ability to be ambulentoccupational therapyEndermology (LPG)Roboderm Technology (Icoone) (Thermal) Crenotherapeutic Treatment Prevention and treatment of hypertrophy, through local infiltrative pharmacological therapy, compression therapy through use of silicone sheets and /or appropriate compressive elastic sheathing.
Prevention of deformity, through use of specific braces or splints, both of a static and dynamic nature.
Riconstructive plastic surgery through scar release and elongation plastics, cutaneous skin graft, cutaneous expansion, lipofilling, etc. The fundamental aspect is that every surgical operation is part of a relevant programme of early and associated rehabilitation.
Conclusion: When admitted and discharged patients undergo a general evaluation of results. Their level of autonomy is assessed through the use of internationally

recognised disability indicators, they are photographed and in so doing the pathological areas which require semiotic instrumental evaluation are pointed out through;
- tonometry;
- elastometry;
- colorimetry;
In particular the results of these tests will be useful for monitoring areas that show up pathological scarring the follow up.

P131

Bioavailability of scarred skin during application of a vaso-active substance

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Objectives: The skin acts as a mechanical or insulation barrier in physiotherapy interventions. The evidence of topical applications in physiotherapy is poor or lacking in skin and (burn) scar research. In this study, non-invasive skin measurements will be used to evaluate bioavailability of scarred skin during application of a vaso-active substance.
Methods: Two groups consisting of 14 scar sites and 8 healthy skin sites are selected based upon predefined in- and exclusion criteria. Baseline measurements on a 6cm^2 scar/skin site include skin color, trans epidermal water loss, skin hydration and epidermal and dermal thickness. A filter disk saturated with a Methylnicotinate (MN) solution (0.005M) is applied for 30 seconds on the marked scar/skin site. Bioavailability is assessed by quantification of an MN-induced skin redness observed with the Chromameter® over 65 minutes after the MN application by a standardised protocol. Change in skin color is compared using a repeated measures ANOVA. Spearman correlations between skin color and all independent variables are calculated. Between group differences are tested by the Mann-WhitneyU. Spearman correlation coefficients between skin hydration outcome measures are calculated.
Results: A significant groupxtime effect for chroma a* values is demonstrated (p=0,044). A significant difference between both groups is found for the sum of total color change (p=0,02) and for dermal thickness (p<0,0001). A correlation between the latter parameters is significant (r=,587, p=0,004). Hydration values of the Corneometer correlate significantly with the Grey Index T of the Moisture Map® (r=0,427, p=0,047).
Conclusion: The dermal thickness is a determining factor for bioavailability of MN in scars. Epidermal thickness and TEWL were no significant factors of influence on skin color within the current study. The Moisture Map® can be used as an assessment tool for skin hydration, especially the Grey Index T seems a valuable parameter based upon the current primary study results.

P132

Proof of concept for tension reducing taping as a mechanotherapy for hypertrophic post trauma and burn scars

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Objective: There is strong acknowledgement that mechanical forces can regulate inflammation and fibrosis and therefore may be used therapeutically to stimulate tissue repair and remodeling. This mechanism is referred to as “mechanotherapy”. Although the pathophysiological background of mechanotherapy is well described, evidence based practical applications are lacking within scar treatment.
The goal of this study is to obtain a proof of concept for a newly developed taping technique that can reduce tension on pathological post trauma and burn scars. In a previous study we developed a technique consisting of one piece of elastic therapeutic tape with a longitudinal incision made in the middle of the tape. The latter technique is most suitable for scars in between joints. The current technique is innovative for scars located over joints.
Methods: Scar patients are selected based upon predefined in- and exclusion criteria. Two pieces of tape are applied in a standardised way, thus reducing tension at the scar site. The tape makes no direct contact with the scar site, thereby avoiding maceration of the scar.
Distensibility, which has an inverse relationship with tension, is measured before application of the elastic therapeutic tape with a Cutometer, which measures the vertical deformation of the skin in millimetres when the skin is pulled by means of a controlled vacuum into the circular aperture of a probe.
This measurement is repeated after the application of the tape, one, two and three days later. The more the skin can be deformed, the more tension is reduced on that skin site. Standard descriptive statistics including means and standard deviations are used to summarise patient demographic and presentation data. Paired sample T-tests are used to calculate the difference in the scores for distensibility.
Results: Currently data collection is being finalized and results can be presented at the conference.

P133

The Effect Of Early Rehabilitation Program On Physical Functions In Patients With Lower Extremity Burn Injuries-A Pilot Study

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Objectives: Impairments in joint range of motion, gait ability and balance cause physical disability in patients with lower limb burns. So that, early rehabilitation program (RP) has becoming increasingly important in acute burn care. The purpose of this study was to examine the effect of early RP on physical functions in patients with lower limb burns.
Methods: Seven adults with lower extremity burns (4F,3M; mean age=33±11 years, mean burn surface area= 4.8±3.5%) were included in this study. GAITRite system for gait parameters, timed up and go test (TUG) for dynamic balance and six minute walk test (6MWT) for exercise capacity were used. These evaluations were made twice; initial (admission) and final (discharge). RP was applied by physiotherapist during the acute hospitalization. RP included active range of motion exercises, functional mobility, balance activities and gait training.
Results: The mean sessions of rehabilitation program were 12 days. In the initial and final evaluations were found as step length 42.70±9.01cm vs. 58.29±4.13cm (burned side), 39.64±10.63cm vs. 59.19±3.97cm (non-burned side), cadence 79.11±21.52 vs. 105.11±10.07 steps/min, velocity 56.94±24.67 vs. 102.91±11.74 cm/sec, and distance 6MWT 154.84±47.43 vs. 480.14 ±60.56 m respectively. When the initial and final evaluations were compared there were significant differences for all these parameters(pË,0.05). Although base support was shorter in final measurements, there was no significant differences between the initial and final values (18.34±8.35 vs. 12.56±3.07 cm, pËƒ0.05). Initial TUG values were higher than the final values and the differences were significant (18.30±4.73 vs. 9.51±0.89 sec. p=0.01).
Discussion/Conclusion: This prospective pilot study showed significant improvements in physical functions during early RP. Gait parameters, exercise capacity and balance are very important indicators of effectiveness of early RP after burn injuries. The limitation of this study was its small sample size. Future studies may compare the effectiveness of different rehabilitation programs in larger burned population.

P134

The effects of micro-needling on dermal thickness and density of burn scars: Preliminary results of a pilot study

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Background and Objectives: Scar hypertrophy is characterized by an increased dermal thickness and low echogenic density. Micro-needling is a minimally-invasive technique that needs little after-care and is widely used for skin resurfacing. The aim of this study is to investigate whether micro-needling can improve the dermal thickness and density of hypertrophic burn scars.
Methods: Adult Caucasian patients with hypertrophic scars older than 1 year and located on arms, legs or trunk (excluding hands or feet) were eligible for this study. They received a micro-needling treatment with a Dermaroller® device (needle length 2,5mm) twice with 3 months in between. High Frequency Ultrasound Scans were taken before the first treatment (baseline measurement), before the second treatment and 3 months after the second treatment. A-scans and densitometry were used to measure dermal thickness and density. A one-way repeated measures ANOVA with post-hoc comparisons was used to analyse the results.
Results: Preliminary results of 12 patients with a mean age of 36,6 years (±13,3y) and scars that were on average 22,7 months (±14,5m) old are presented. Dermal thickness decreased statistically significant over time (p=.002) from 3070µm (±760µm) to 2642µm (±698µm). Dermal density improved statistically significant over time (p<.0005) from 15,41 (±8,02) to 26,97 (±10,84). Pairwise comparisons revealed that this significance was reached after the second treatment compared to baseline for both dermal thickness (p=.017, d=0,61) and dermal density (p=.003, d=-1,27).
Conclusion: These preliminary results indicate that two micro-needling treatments with 3 months in between can have a positive effect on dermal thickness and density of hypertrophic scars.

P135

The Facial Scarring Challenge - New Technologies to Assist

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Objectives: There are a variety of treatment modalities available to manage facial scarring and improve function following burn injuries. The use of Lycra pressure garments, facial splints and silicone gel are the mainstay of current clinical intervention in achieving a positive outcome result. This study demonstrates a team approach in providing the best solution to achieve this by exploring ways

of combining effective pressure management with silicone to address the developing scar as it matures.
Methods: This is a single case study demonstrating our experience with technology to manufacture a new product previously not available in our service. The patient had agreed to assist us with our plans to improve our treatments for the benefit of other patients in the future.
Results: The photographs over 4eight months show a visual improvement in the hypertrophic scarring. This is confirmed by his POSAS scoring system- reducing from 8 to 6 in the overall compared to normal skin. The study highlights the benefits of treatment with a light weight silicone lined thermoplastic facial orthotic splint as an alternative to separate modalities to manage challenging facial scarring. It also demonstrates an alternative technique using 3D imaging technology as a non-invasive mechanism to facilitate accurate fabrication of splints that is more acceptable to the patient.
Discussion/Conclusions: Scanners have been shown to improve speed of application, delivery and implementation of facial orthotics. Further research is warranted to access these new technologies and materials to provide long term effective burn rehabilitation solutions. This patient had a significantly improved cosmetic outcome utilising pressure and silicone in conjunction with a supervised rehabilitation program and compliant wearing schedule. The Silon-STS® material proved to be an effective choice in the management of facial scaring and is a treatment modality option for future consideration in burn rehabilitation to effectively manage scar hypertrophy.

P136

Providing Choices to Empower the Patient and Aid Compliance

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Objectives: Custom made pressure garments have been used since the early 1970's and remain one of the most widely used treatment options for hypertrophic scarring post burns injury. Recent advancements in manufacturing and design innovation has modernised the aesthetics of garments and provided choices in fabric colour and trims, offering personalisation of garments to aid client choice with this treatment regime.
It is assumed that beige pressure garments have negative connotations and that coloured pressure garments have positive connotations; this study explores factors like the addition of colour and garment trimmings and what impact this has on patient satisfaction and compliance.
Methods: Questionnaires were collected from twenty patients in a single burns centre pilot study. Compliance and opinion was evaluated from the perspective of the following variables: garment personalisation, style, comfort, colour, self-image garment information.
Results: On the basis of our findings, strategies patients believed to enhance garment use were identified; primarily that colour choice and personalisation in custom made pressure garments does have a positive influence, which can improve compliance and increase self-confidence.
Discussion/Conclusion: Much of what is traditionally understood as 'patient non-compliance' centres around difficulties in everyday activities and comfort factors but little is documented around other factors that influence compliance to treatment. Further detailed studies will allow clinicians to facilitate involvement in patient rehabilitation and explore the positive impact of patient satisfaction in garment choice and personalisation.
It is evident from the data produced that 'colour and personalisation' offers a control mechanism to the patient that has a positive outcome in social acceptance, increased self-esteem and compliance. Identification of these factors is important to assist clinicians to explore choices to empower the patient and aid compliance. A follow up national burns centre study is planned to explore patient perceptions of personalisation of pressure garments and colour-culture relation.

P137

Evaluations Of Gait Parameters Of Patients With Lower Extremity Burn Injuries

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Objectives: Pain, range of motion limitations and impaired sensation are all possible complications of lower extremity with burn injury which cause impaired walking. The purpose of this study was to compare of gait parameters of the burned and nonburned limb in patients with lower extremity burn injuries.
Methods: Twelve adults with lower extremity burns (9F, 3M; mean age=34±10 years, mean burn surface area= 4.3±2.8 %, unilateral limb burns: 7 bilateral limb burns:5 patients) were included in this study. In cases with bilateral lower limb burns, the limb with higher burn surface area was noted as the burned side. Gait parameters were evaluated by GAITRite system which consist of an electronic walkway, within 3 days after burn accident. This equipment collected data on the following components: Step length, cadence, velocity, stance (%Gait cycle) and base support. These values were evaluated using Wilcoxon test.
Results: The results indicated that in the patients with burns step lenght was significantly higher on the burned extremity compared to nonburned extremity (41.36±10.58 cm vs. 37.43±13.59 cm, p=0.008). There was significant difference for stance (%Gait cycle) between burned and nonburned limb (64.32±4.76 % vs. 69.86±8.05 %, p=0.013). Cadence and velocity (81.16±21.65 steps/min vs. 56.63±26.27 cm/sec) were lower than predictive values. Base support (15.31±7.47 cm) was higher than normal values.

Discussion/Conclusion: This study showed that gait parameters of burned lower extremity differ from nonburned lower extremity. The larger base of support, increased step lenght, decreased velocity and cadence have been occured in order to maintain balance and stability. In addition to, pain, fear of movement may have contributed to the decreased stance phase, cadence and velocity. So that reasons gait training interventions should be included in the acute period of rehabilitation programs for adults with lower extremity burn injuries.

P138

Burns Rehabilitation after burn injury upper and lower extremities

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The rehabilitation for patients with burn injuries of extremities starts from the day of injury, lasting for several years and requires multidisciplinary efforts. A comprehensive rehabilitation programme is essential to decrease patient's post-traumatic effects and improve functional independence. Post burn keloid and hypertrophic scars are very common in burn injuries especially in the region of body. After completion of burn treatment at the in patient department most patients need prolonged follow-ups at the out – patient department, dispensarization. Dispensarization system of Samarkand Burn Center is carried out through structural subdivisions (examination room for dispensarization and ambulatory reception of reconvalescents). Every year about 350-400 patients undergo dispensarization from burns. Sanatorium Complex with Rehabilitation Center is located in Samarkand Regional hydropathic establishment "Nagornaya" in Nurabad area of Samarkand Region. In this center every patients is prescribed individual treatment taking into consideration his rehabilitation needs and physical condition. Sanatorium and health resort treatment includes: injections and applications of ferments, magneto therapy, electrophoresis (lidaza, hydrocortisone, irixol) hydrotherapy, pelotherapy, serohydrogen irrigation and bath (radon baths), massage, exercises therapy. Results Thus, to improve the effectiveness of rehabilitation of patients with foot burns, a united rehabilitation system including patient's dispensarization and creation of rehabilitation centers is necessary.

P139

Orthotic Scar Management for Hands

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Objective: To understand the construction of resting hand orthosis with slicone

Introduction: Foremost consideration with a burn injury is wound closure; an achievement that comes with the threat of function and joint mobility in the hand. Scar tissue has the potential to interrupt the intricacy of soft tissue structures along the pathways of usual function. An immediate conservative measure of treatment is introducing scar tissue to silicone. This is a non-invasive proven method to improve texture, pigmentation, and height of scar tissue as well as providing hydration. Silon-lined thermoplastic material allows rigid positioning to provide a sustained stretch as an opposing force to the influence of hypertrophic scar tissue while providing the benefits of silicone. The LTS Silon material allows direct visible contact and conformity to scar features on the hand during fabrication.
Materials Used/Needed: Thermoplastic material dense blue adhesive foam, LTS Silon material, strapping, Scissors, adhesive Velcro, Heat gun **Fabrication:** Determine areas of the affected hand that would benefit from silicone and cut LTS Silon material accordingly. More globally consider the optimal resting position of the hand/digits and fabricate resting orthosis needed Carefully mold the silon side of material onto scar areas; translucency of warmed material will ensure correct placement. Reheat area of resting hand splint to adhere pre-molded Silon LTS. Be sure to adhere securely with appropriate warming of both materials **OR**Place dense blue foam on fabricated orthosis with warmed LTS Silon overlapped and secured around the edges encapsulating the foam. Imbed affected hand into Silon LTS over foam to impress palmar/digital features targeting scar areas. Keep pressure until Silon LTS translucency is opaque/white. Place straps and Velcro to secure hand in desired resting posture.
Results: Maximizing orthotic efforts in the burn injured hand by adding silicone is an effective immediate means of initiating scar management to optimize hand function.

P140

Multidisciplinary management of the burn survivor with %92 Total Burn Surface Area: Case report

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Introduction: Burns that are usually more than 20% of the body surface are considered serious burns. A burn that covers 50% of the body can be a direct cause of death. As survival rates from severe burn are improving, early physiotherapy programs may highly important to obtain functional recovery.
Case report: A 29-year old man was admitted to Istanbul Wound and Burn Center on the 01/03/2016 due to burn injuries. It was a scalding burn due to a work accident. The patient with no medical history had 92% TBSA (II and III

degrees) in the literature.
Debridement and skin graft were performed several times under general anesthesia and the patient is being treated in intensive care unit (ICU).
The multidisciplinary team planned and performed interventions:
- Plastic surgeons prescribed wound treatment.
- Anesthetists and intensivists operated ventilation and medical regimes in ICU.
- Physiotherapist promoted respiratory physiotherapy, splinting, positioning, structered mobilization program at supine,sitting and standing positions gradually in ICU.
- Nurses cared the patient according to the treatment plan.

The patient transferred to the in-patient service on 04/08/2016 and discharged on 30/09/2016. Patient follow-up and individualised physiotherapy program continued in both in-patient and out-patient clinics.
Conclusions:
- A patient with 92% TBSA has a chance to survive under multistage physiotherapy protocol.
- The treatment plan for burn patients should be co-ordinated and implemented by the multidisciplinary team.
- Patient's age and medical status affected the recovery period in burn clinic.
- Physiotherapy applications should be done in ICU, in-patient and out-patient services progressively. It is major determinant of tissue healing and functional recovery in serious burns.

P141

Spinal cord injury after high-voltage electrical burns

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Objective: To describe spinal cord injury characteristics and diagnose following high-voltage electrocution.
Methods: We report two cases of patients which received inpatient care in Vall d' Hebron University Hospital's Burn Unit after electrocution, both diagnosed with spinal cord injury. Case 1: 17 years old male with 3rd degree burns affecting 18% of total surface body area (TBSA) after high-voltage electrocution, presenting an exit wound on his right forearm, bilateral claw hand deformity, and muscular necrosis of both upper extremities that required bilateral transhumeral amputation. The 10th day after injury, the patient experimented an acute urinary retention plus bilateral lower extremities weakness, with physical examination compatible with incomplete epiconus syndrome grade C in ASIA scale. A spinal magnetic resonance imaging (MRI) was performed showing no alterations on dorsolumbar structures. Case 2: 28 years old male with 2nd and 3rd degree burns affecting 7% of TBSA after high-voltage electrocution, complicated with left forearm compartment syndrome that required amputation. The 8 th day after injury, the patient suffered bilateral lower extremities weakness with physical examination compatible with incomplete spinal cord injury dorsal level D7 grade C in ASIA scale. No alterations were found on spinal MRI.
Results: Case 1: after rehabilitation treatment, the patient was discharged with final diagnose of epiconus syndrome grade D of ASIA scale, achieving independent gait capacity, but with total dependence for daily living activities (ADL's) performance, due to intolerance of upper limb myoelectric prosthesis. Case 2: after rehabilitation treatment, the patient was discharged with final diagnose of spinal cord injury dorsal level D7 grade D of ASIA scale, achieving independent crutch-assisted gait capacity and partial dependence for ADL's performance.
Conclusion: Spinal cord injury following high-voltage electrocution is infrequent but needs an early diagnosis and multidisciplinary approach given the severity of the sequels and the immense impact on functionality.

P142

Optimizing functional results in the burn patient: Intensive rehabilitation protocol

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Objective: In this communication, we review existent scientific literature focused on rehabilitation of the burn patient, summarizing recommendations provided by international consensus documents and the most recent evidence. Moreover, we present the method in which this recommendations have been applied to the Great Burns Unit of the Hospital La Fe, in the form of a interdisciplinary intensive rehabilitation protocol.
Methods: A bibliographic search was performed among existent literature and international consensus documents focused on the field of burn patient rehabilitation; presenting and summarizing the obtained information . The way we applied those international recommendations to our Burns Unit is also described.
Results: Existent bibliography supports the development and application of intensive rehabilitation protocols in burn units for the improvement of the functional results of their patients. The experience in our unit in which this sort of protocol is applied, matches the good results described in literature.
Conclusions: Early intensive rehabilitation therapy is a key stone when it comes to prevention and treatment of functional complications. This interdisciplinary approach must focus in prevention of long term complications, such as contractures, abnormal scarring, deformities, muscular atrophy, mobility limitations and other issues which can de-

crease physical function. Its utilization in a Burn Unit, will help optimize functional results of their patients.

P143

The influence of age on quality of life after upper body burns

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Objective: Our objective was to determine the influence of age on the quality of life of patients burned on the upper side of the body, more than three years after burn.
Methods: We analyzed the Spanish version of The Burn Specific Health Scale in a 58 patients with burns only on upper side of the body, divided in two groups: 29 patients 65 years old or younger, and 29 older than 65, all of them attended at the Vall d'Hebron Burn Center, Barcelona, between 2011-2014.Statistical analysis included parametric and non-parametric tests as appropriate with SPSS v20.
RESULTS: Patients age ranged 24-97 years, and averaged 43,71 and 76,53 respectively in both groups; 62,07% were women. The were no differences between groups in the mechanism of burn, nor in the duration of hospitalization or the total burn surface area (9,76% and 11,23% respectively), but diabetes and other comorbidities were significantly more frequent in the older group. Eleven patients died in the older group and two in the younger (p=0.011). At the time of receiving the quality of life test, younger and older patients did not show differences in the domain of physical (48,46 vs 46,84), mental (97,85 vs 91,63), social (40,62 vs 38,05), sexual activity (6,35 vs 5,53) and general health (42,08 vs 39,21).
Conclusion: Mortality after a burn in the upper side of the body burn was significantly higher in older people but, as opposed to what could be expected, in this study there were no significant differences between patients older and younger than 65 years in perceived quality of life when examined three years or more after a the burn.

P144

Use of neuromuscular taping in the treatment of post- burn scars

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Objectives: This study covers burn scar rehabilitation treatment integrated with Neuro-Muscular Taping (NMT).NMT is applied without tension, giving decompression and dilation stimuli, helping to maintain elongation of the skin and underlying tissues regaining functional skin elasticity.
Methods: The NMT application technique used is without tension creating a decompression and dilation stimuli to the skin. The tape was applied over the skin in maximum possible elongation creating the formation of skin folds or wrinkles. This particular method of taping creates a decompression stimulus to help reduce adhesion and improve oxygenation of subcutaneous tissues.
Treatment cycle pre-discharge: N°1 weekly treatment using manual therapy techniques for scars including stretching and manipulation.
Starting at 3 months post-discharge: N°2 treatments weekly
- 1 treatment weekly for NMT application
1 treatment weekly for manual therapy
During this treatment phase there was a gradual increase in tape width to help the decompression stimuli to go towards deeper tissues
- Also applied to the skin donor sites
Results: Improved skin quality of the grafted areas homogeneous skin coloration Improved joint mobility and function. Reduce scarring adhesions. Improved tactile sensitivity, thermal recognition
Conclusion: The use of NeuroMuscular Taping as an integrated therapy to standard burn scar rehabilitation treatment has led to a general improvement of the skin grafted areas. Improvements were noted through homogenous skin coloring as well in terms of skin elasticity and functionality, reduced adhesions and the skin became less rigid gaining a softer quality. All of which allowed the patient to return to the same sport activities prior to the burning trauma. In addition, the level of foot hyposensitivity has improved from a condition of complete anesthesia to an overall normal situation of location recognition and normal response to tactile, heat and pain stimulus.

P145

Use of play-therapy in establishing a program of non-medical support in the Speransky Children's hospital# 9 in Moscow

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Russian hospitals do not provide burn rehabilitation: neither medical nor psycho-social support. The hospitals also provide no non-medical assistance either. The only organization in Russia that provides burn rehabilitation on regular basis is Speransky Children Hospital Fund at Speransky Children's Hospital#9: a Russian non-profit organization that offers support for burn victims.
The presentation focuses on the stages of psycho-social rehabilitation of children at Speransky Hospital: from the patient's admission to the follow-up programs after discharge. We use different methods of play therapy, music therapy, and Child Life support. We work children from different age groups in the hospital playroom. Not offi-

cially being part of the hospital, we face many difficulties trying to convince medical professionals that the psychological condition of the child actually impacts the process of healing.
We would like to talk about our experience of running a psycho-social program in a Russian hospital. We will share the problems we faced and our results in 2015-2016.

P146

What is different about scar management? Physiotherapy and Occupational Therapy perspective

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Objectives: Scars have a significant impact on the quality of life of patients who suffered a burn. Limited functional movements and low self-esteem can affect the ability to cope with daily life activities and engage in meaningful social interactions. As physiotherapist and occupational therapist working in at Hospital de S. José in Lisbon, we face the challenge of selecting at an early stage the most effective and evidence-based treatment strategies that will result in better long term outcomes for patients. In recent years a growing body of evidence is available, fostering PTs to examine and change the traditional approaches. Thus, the main objective is to discuss and analyse the current options and facilitate the point of care decision-making process in order to maximize function.
Methods: a literature review covering the last 5 years has been undertaken and available treatment strategies to minimize the impact of scars were identified and compared on effectiveness, affordability and patient acceptance.
Results: massage, silicone, and splints have been confirmed as having a positive impact on scar management. Evidence suggests the optimal timing when they should be used to maximize the benefits.
Discussion/Conclusion: Scars are an important aspect for patients who suffered a burn.
It is important for physiotherapists and occupational therapist to be up to date with the current options available and the evidence that supports them in order to make the best decisions.

P147

The participation in daily activities of pediatric burn survivors in Arab population

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Introduction: Pediatric burn survivors are known to have major difficulties adjusting and coping with their post injury condition in daily life. This study aimed to explore the level of participation of arab origin children in daily activities of burn survivors, from both perspectives of the child and his/her parents.
Methods: Participants were 20 burn survivors aged 7 to 18 years (11 boys, 9 girls) and their parents. The children completed the Children's Assessment of Participation and Enjoyment (CAPE), a self-reporting questionnaire. The parents completed the Children's Participation Questionnaire (CPQ), a parent reported questionnaire and a bio-socio-demographic questionnaire.
Results: Significant correlations were found between the number of aids and the child independence in participation. No correlations were found between the children and their parents' reports on a child's participation. The parents reported on lower level of participation dimensions (diversity, frequency, independence and enjoyment). At the same time, the children reported on lower score for participation's diversity and higher score for participation frequency and enjoyment, relative to the participation level of typically developing peers.
Conclusions: The participation's diversity and independence level of burn injured children is limited, even years after the injury. However, parents and child hold different perspectives regarding enjoyment in participation. Enhancing participation is a central goal for rehabilitation; therefore, it is important to consider both perspectives.
Discussion: This study is part of a larger research, which aims to evaluate and measure the effectiveness of a pediatric burn camp on the level of participation in daily life activities. Assessing lack of participation in certain domains may lead the rehabilitation, educational team as well as camp leaders and other caregivers towards certain activities to optimize improvement, adjustment and participation in all domains of daily activities. Parents' expectations need to be addresses in order to maximize their support and active involvement.

P148

Rehabilitating approach in a upper lymphedema related to burns sequelae. A case report

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The incidence of lymphedema secondary to burns is uncertain; there are no epidemiological studies in the scientific literature.
We present the case of a burned patient with an affectation of the 80% of the body surface with second and third-degree burns of years of evolution.
The patient has required multiple corrective surgical procedures, presenting important retractions and amputation of upper extremities phalanges.
In spite of everything, the patient partially maintains her autonomy thanks to the functional clamp of both hands. In the postoperative course of an excision of a periarticular

calcification of the elbow, presents clinical edema of the hand dorsum and first right phalanx with the loss of manual ability.
On examination, a pitting edema without stemmer sign is detected due to the absence of skin folds.
The predisposing factors for lymphedema were the circumferential involvement and depth of the burn, scar retraction and the trauma derived from the intervention.
In our case, the challenge was to find a customized decongestant system with which maintain her autonomy, thus we opted for a self-adjusting low elasticity device with lymphatic padding.
Self-adjusting systems allow us to regulate working pressure during the day (dynamic stiffness index) while molding to different surfaces.
They have the additional advantage that they allow self-management with respect to the pathology reducing health costs derived from therapy

P149

Conservative rehabilitation of children with post-burn scars skin

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The goal: is to study the results of conservative rehabilitation in children with post-burn scars.
Material and methods: On the basis of Hrodna regional children's clinical hospital was under the supervision of 60 children with thermal injury. Patients were examined 1 month after healing, then depending on the appointments of conservative therapy. Used silicone coating, customized compression therapy, enzymatic therapy.
Conservative treatment efficacy was evaluated by subjective criteria (pruritus, sleep disturbance) using a visual analog scale from 0 to 10 points, objectively using the Vancouver scale (Vancouver Scar Scale), developed by T. Sallivan and co-authors in 1990 to evaluate the rumen parameters: pigmentation, vascularity, elasticity, height of the scar above the level of healthy skin.
At the beginning of treatment, patients in both groups, the intensity of the itching was 7-9 points, had sleep disorders, the appearance of scars according to the Vancouver scale was estimated to be 8-10 points. Patients of the 2nd group after 3 months of treatment subjective and objective measures of scar process was significantly better than the control. The intensity of itching in patients of the first group decreased to 2-4 points, the normalization of sleep was noted in 12 patients, while the indicators in the second group was 5-6 points 3-4 points, respectively. Objectively the appearance of the scarred tissue in patients in the second group who used combined therapy, was 3-4 according to the Vancouver scale, while in the first group there were 5-6 points, respectively. Particularly quickly in the second group was a reduction in the height and mobility of scar tissue.
Thus, our data show the effectiveness of the use of the complex of enzyme, silicone preparations, individuation of compression underwear that allows to reduce the increase in the scarring process in the skin.

P150

Integration of camouflage techniques into burn scar rehabilitation: the practical experience of our burn centre.

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Objectives: In this paper we describe how we integrated camouflage techniques into burn scar rehabilitation in our burn centre.
Methods: Camouflage techniques are part of the multidisciplinary burn scar rehabilitation in our burn centre. Plastic surgeons and physiotherapists evaluated and selected patients to be involved into the camouflage sessions during the follow up. Patients are considered suitable for camouflage at least 6 months after the wound closure. After having been selected and informed, the patients followed a specific camouflage training consisting of 2 different sessions. In the first session patients have the make up done by camouflage cosmeticians, while in the second session the patients do their own make up under the supervision of the professionals.
Results: From April 2012 to June 2016, 37 patients were involved in the camouflage project. All patients reported at the end of the make-up sessions a positive impression which translates into a social impact of feeling "normal" again. Women with face and neck scars, even not alterating physiognomics, were the most compliant. While, men seemed to be interested in learning camouflage only if having scars massively altering their appearance.
Discussion/Conclusion: Aesthetic damage limits the patients social reintegration due to considerable psychological problems with self-esteem and self-confidence. Moreover, an altered appearance may lead to social stigmatisation. Camouflage techniques may have a positive impact on quality of life, particularly socialisation of burn patients.

P151

Enhanced knowledge on outcome and effectiveness of treatment of hand burns (oid..)

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Introduction: To understand the impact and recovery of burns of the hand and direct, tailor treatment, outcome assessment is essential. There is however, a large variety of measures and outcome assessment is often incomplete. The aim of this project was therefore to develop a core set.
Method: The first concept of the core set was based on the framework of the International Classification of Functioning, distinguished two phases of rehabilitation, three patient states and included patient reported and clinical outcome. Subsequently, potential assessments were allocated to the various outcomes. This concept was presented and discussed during the European Burns Association congress in 2013 and subsequently revised. The revision was sent to 65 international colleagues along with a survey.
Results: Eleven surveys were returned from 16 persons representing 9 institutions from 6 countries. Main bottleneck was the fact that some assessments were not translated or validated in all countries. Based on the feedback, final revisions were made to the core set.
Conclusion: With multidisciplinary and international input, a core set of outcome assessments for burns of the hand was developed. The core set has a dimensional approach which emphasizes the multidimensionality of burns to the hand and their recovery, and will contribute to enhanced knowledge on outcome and effectiveness of treatment of hand burns.

P152

Effect of Aerobic Exercises on Liver Enzymes Post Burn

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Objectives: The current study was conducted to examine the effect of aerobic exercise on liver enzymes post burn.
Methods: Thirty burned patients with burned surface area about 30% to 40% participated in this study. Their ages ranged from 25-40 years. They were selected from Orabi hospital and were divided randomly into two equal groups.
Group (A) composed of 15 patients who received aerobic exercise in form of treadmill exercise for 45 minutes at 60-75% of maximum heart rate, 3times/week for 8 weeks beginning after their release from intensive care unit in addition to their physical therapy program (splinting, stretching ex., strengthening ex. and ROM ex.) and medical treatment (cataflam, alphintern, zinetac and hemacaps, wound dressings).
Group (B) composed of 15 patients who received only their physical therapy program (splinting, stretching ex., strengthening ex. and ROM ex.) and medical treatment (cataflam, alphintern, zinetac and hemacaps, wound dressings). Method of evaluation was measurements of ALT and AST liver enzymes by spectrophotometer device.
Results: There was a significant decrease in ALT and AST plasma liver enzymes levels in aerobic exercise group when compared with the control group.
Conclusion: Aerobic exercise can be considered as an effective method in decreasing ALT and AST plasma liver enzymes levels post burn.
Key words: (Aerobic exercise, Burn & Liver enzymes).

P153

Variability in split-thickness skin graft depth when using an air-powered dermatome: a paediatric cohort study.

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Aim: Earl Calvin Padgett introduced calibrated powered dermatomes in 1938. A year later he presented his experience in a publication emphasising "…particularly the advantages of a type of skin graft which it has not been possible, for the writer at least, to cut previously, namely a skin graft **cut at a predetermined level** in the last quarter of the thickness of the skin…" (emphasis added). This statement introduced the concept powered dermatomes provide uniformity in the depth of STSG, a concept largely unchallenged since. Split-thickness skin grafts (STSG) taken using calibrated powered dermatomes are assumed to yield a graft of uniform thickness, though this assumption has never been analysed statistically. This study aims to test that assumption in a paediatric population.
Method: STSGs from a consecutive cohort of paediatric patients were analysed for mean thickness, measured from a central biopsy. All STSGs were taken from the thigh at a dialled thickness of 0.007 inches. Data were analysed using non-parametric methods.
Results: There were 140 STSGs taken from 91 children. The median thickness was 6.94 thousandths of an inch, with a spread of thicknesses about this median (IQR 5.05-9.28). There were no significant differences when results were analysed by surgeon, patient age or sex, swipe number within the case, or the number of previous passes with the same blade.
Conclusion: STSG thickness is inconsistent, with a broad spread about a median value. This study provides no data to suggest there are pre-operative predictors of STSG thickness being significantly more or less than that dialled on a powered dermatome.

P154

Does 3D Wound Mapping Software Compare to Expert Opinion in Determining Burn Wound Area?

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Introduction: New technologies in the field of burn wound and scar assessment are continually being evaluated. Accurate estimation of total body surface area (TBSA) burn wound is of paramount importance in fluid resuscitation to prevent complications which are associated with morbidity and mortality. Estimating the TBSA is performed by a multitude of different methods, however a gold standard would be ideal. The aim of this study was to compare the estimation of burned TBSA% between 3D photography by Panasonic FZ-M1 Toughpad in conjunction with WoundCare Lite software and expert opinion volunteered by burns doctors.
Methods: Two life sized mannequins were used to simulate burns; an adult and a child. The burn was drawn to mimic real life burn patterns. Burns were measured prior to specialist assessment on the 3D camera. Burns doctors were asked to estimate the TBSA% of the burn. 10 burn sizes were assessed on the adult mannequin, and 8 on the child.
Results: Wound size as estimated from the camera varied from 0.42% to 18.23%, with a mean of 5.246%. Each burn was assessed by a median of 3 assessors (ranging from 2-8). Burn TBSA assessments from the 3D camera and specialist assessment (compared using ICC) showed excellent agreement, 0.985 (95% CI 0.905, 0.996).
Conclusions: This study has demonstrated that the wound mapping software WoundCare Lite in conjunction with the Panasonic FZ-M1 Toughpad 3D camera compares well with expert opinion in determining burn surface area on a mannequin. Further research is needed to establish whether this is the case in burns on patients in an acute setting.

P155

Eschar removal by Bromelain based Enzymatic Debridement (Nexobrid®) in burns: European Consensus Guidelines

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Early eschar removal and debridement in burn wounds is regarded as a significant step in deep and partial thickness burns. It aims to reduce the rate of infection and provides early wound closure by primary healing or secondary transplantation. Early wound closure accompanied by preservation of dermis, is regarded as a necessary step to reduce scar related complication, e.g. functional limitations. Next to the standard of care to remove burn eschar by classical surgical excision, hydrosurgery, maggots and lavae, laser, and enzymatic debridement have been described as adjunctive techniques to the burn surgeon. There is no doubt that early eschar removal in between 72 hours improves the outcome of burn wound treatment by reducing bacterial wound colonization, infection and length of hospital stay. Contrarily, the right technique for eschar removal is still a matter of debate. There is increasing evidence that enzymatic debridement (ED) is a powerful surgical tool to remove eschar in burn wounds, reducing the blood loss, the need for autologous transplantation and the number of wounds requiring surgical excision. In order to assess the role and clinical power of ED and eschar removal by Bromelain based preparation (Nexobrid®) beyond the literature and in view of the users, a European Consensus Meeting was scheduled to provide statements for application, based on the mutual experience of applying ED in more than 500 adult and pediatric patients by the Consensus panel. Issues to be addressed were indications, pain management and anesthesia, timing of application, technique of application, post-interventional care, transplantation after ED, blood loss, training strategies and learning curve and areas of future research needs. 65 consensus statements were provided for the use of ED. The consensus document may serve as preliminary guideline for the use of ED with user-orientated recommendations until further evidence and systematic guidelines are available.

P156

Evaluation of hydrosurgery in burn care Which patients benefit most?

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Objectives: During the last decade hydrosurgery has become popular as a new option for tangential excision in

burn surgery. The Versajet™ hydrosurgery system is thought to be a more precise and controlled manner of burn debridement. To investigate the optimal surgical treatment of patients with deep dermal wounds, we recently started a multicentre RCT to assess scar quality after debridement with hydrosurgical versus conventional tangential excision. A limited number of studies compared the outcomes of hydrosurgery with conventional tangential excision techniques in burns, and only a few did recommendations on the application of both techniques. However, no algorithm for the decision process prior to surgical excision is available, and burn specialists decide individually whether hydrosurgery could be applied or not. The objective of this study was to evaluate the use of hydrosurgical and conventional tangential excision in the Netherlands.
Methods: A retrospective study was conducted in all patients admitted to a Dutch Burn Centre with burns who needed tangential excision between 2009 and 2014. Data were collected using the national Dutch Burn Repository R3.
Results: 1407 patients were treated with hydrosurgical excision (22%), conventional excision (47.1%) or with a combination of both techniques (30.9%). In 2009 hydrosurgery was used in 30% of the cases, compared to 52% in 2014. The proportion of people treated with hydrosurgical surgery differed between the three Dutch burn centres. Hydrosurgery was frequently used in children and scalds. It was often combined with conventional techniques in patients with a TBSA of >20%. Body parts treated most frequently treated with hydrosurgery alone were the face, hands and genitals.
Discussion: The use of hydrosurgery in Dutch burn care is increasing and substantial. To evaluate if this substantial application in the treatment of burns is legitimate, more research into the long-term effects of hydrosurgical excision is necessary.

P157

Importance of initial management and surgical treatment after hydrofluoric acid burn of the finger

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Occupational injuries to digits due to hydrofluoric acid (HFA) are frequently encountered. They have distinctive features, including intense pain, progressive tissue necrosis, and possible bone erosion. To minimize tissue damage, it is of great importance to execute prudent preoperative assessment and determine the correct surgicalmodality to reconstruct and maintain the function of the hand. However, proper protocols for fingers have not been presented in previous studies. Eight cases with HFA burn to digits were presented to the emergency room. Wounds were immediately irrigated with saline, calcium gluconate was applied topically to block destructive effects of fluoride ions. Blisters that could lead to progressive tissue destruction were debrided. A fish-mouth fasciotomy was performed and prostaglandin was administered intravenously tomaintain maximal distal circulation.Wounds were evaluated daily for apparent demarcation for 6 or 7 days. Digits were reconstructed with free sensate second toe pulp-free flap to provide sufficient padding for the fingertip. All patients showed excellent recovery with stable flaps with acceptable external contour, durable softtissue padding, and full range of motion of affected joints. In conclusion, when a patient is admitted due to HFA exposure to the finger, early treatment including irrigation,topicalneutralizers, andfasciotomy are of greatimportance tominimize tissue damage. In addition, a physician should wait atleast 7days untilthe degree of damage to the tissue can be classified so that the physician can decide whether aggressive debridement should be proceeded. In case of deep layer injuries of weight bearing portions such as finger pulp, reconstruction techniques utilizing durable tissues such as partial second toe pulp free flap should be employed.

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Thermal burn in a 30 minutes old newborn: Report and two years follow up of the youngest patient with iatrogenic burn injury

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Burns in infants are rare. The majority of neonatal burns occur in the hospital setting. The immaturity of their immune system, their fragile and thin skin, the difficulties in resuscitation, the engraftment paucity limited by donor sites and long- term complications, make taking care of burned newborns extremely difficult. We present the case and a two years follow up of a newborn burned 30 minutes after his birth with a total body surface of 35%, when the hot water bottle used in the hospital accidentally burst. This is a case reported of theearliest iatrogenic burn in a newborn. The newborn wasdischarged home after 30 days in hospital for resuscitation ,dressings and skin grafting. He was under regular observation for the last two years.

P159

Rapid enzymatic burn debridement: Review of seven clinical studies

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Objectives: The ideal debriding agent should be effective, fast, selective and non traumatic with minimal blood loss and maximal preservation of non-injured dermis that may heal spontaneously. Current surgical debridement is effective but traumatic and non-selective, and non-surgical methods are inefficiently slow. The use of NexoBrid (NXB), a concentrate of proteolytic enzymes enriched in Bromelain, is growing steadily in the EU and other areas. The objective of this work is to provide a comprehensive review of all clinical studies done with NXB.
Methods: Seven different clinical studies assessing the short and long term effects of NXB on deep burns were compiled. Of those, four were controlled (compared to the Standard of Care–SOC) and 2 were observer-blinded. The endpoints of debridement efficacy, time to complete debridement, surgical burden, and safety of a 4 hour application were studied in adults and children.
Results: Data from over 550 treated burn patients comparing NXB to SOC demonstrate that debridement in both arms was effective (> 90%). NXB removed the eschar earlier and faster, and the treated wound bed could be visually diagnosed and healed spontaneously (epithelialization) or by autografting. Overall surgical burden (expressed by need for excisional debridement, autografting and escharotomy) was significantly reduced, as was blood loss. The NXB effect on comprehensive burn care and time to wound closure changed according to the general post debridement strategy (surgical or non-surgical) applied. Long term results were at least as good as in SOC. Adverse events were consistent with those commonly seen in patients with deep burns.
Conclusions: NXB has been proven to be effective, fast acting and undamaging to uninjured tissues with the potential for increased chances for spontaneous epithelialization. An overall reduced surgical burden with favorable long term outcomes can be the basis for a minimally invasive approach to burn care.

P160

Delayed and fractional use of enzymatic debridement with Nexobrid for extensive burn injury: A Case report

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A 61-year old male was presented at our Burn Centre with a severe burn injury affecting 95% TBSA second to third degree. On admission, a mechanical debridement, an escharotomy and a tracheotomy were performed. Due to acute respiratory and cardiac failure, no surgical intervention could be performed in the next few days. Thus, a fractional use of enzymatic debridement with Nexobrid was performed to a TBSA of 54% starting on Day 5: Day 5: upper limbs (20% TBSA); Day 7: lower legs and feet (17% TBSA); Day 8: upper legs (17% TBSA). Despite successful enzymatic debridement, the patient died on Day 8 due to acute lung and heart failure.
This Case report reveals that a delayed and fractional application of Nexobrid to a TBSA of more than 15% is possible.

P161

Artificial dermis (AD), an alternative of flaps

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Introduction : Flaps are the gold standard to cover exposed tendons, bones or neuro-vascular pedicles . In difficult situations, as deep and large wound defects, flaps are difficult to realize. Artificial dermis (AD) could be used as an alternative solution.
Material and method: After excision of death and infected tissue, large and deep defects with exposed vessels, nerves, tendons or bones, have been covered by a tridimentional collagen elastin matrix and an epidermal graft . NWPT have been used for deep and infected wound defects. Follow up was clinical and functional assessment.
Results: 39 patients (23to 72 YO) 25 males ,14 females, were treated. 20 for burn,19 for necrotizing fasciitis. 12 hands, 25 lower legs and feet and 5 others locations were grafted. Surfaces grafted were 74 cm^2 to 1280 cm^2 .NWPT was used for 18 patients, and changed every 4 days before grafting AD. Mean time before grafting AD after NWPT was 3 weeks.Mean healing time of the AD was 2 weeks . All exposed zones were covered. By restoring the shearing planes, collagen-elastin matrix thus avoid deep-rotted adhesion and improves the tegumentary suppleness and the final functional by the free tendinous play obtained under the composite grafts. With a final healing time and number of surgical procedures reduced. The good results were obtained with a simple surgical reproducible technic, without disadvantages of difficulties, potential complications, and donor site scaring of flaps. The graft incopore more naturally than a flap and ie allowed to wear normal shoes.
Conclusion: Even in difficult situation,AD could be considered as a surgical alternative to flaps,and could be used without any loose of chance, as the solution of first intention with keeping the possibility to use flaps in second recourse.

P162 Enzymatic debridement by means of Bromelain in burns

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The standard of care for full thickness burns is surgical debridment followed by autografting. Recently the use of enzymatic debriding agent rich in bromelein has been proposed as a non surgical alternative for the removal of burn necrotic tissue. Local application of bromelain has been shown to be rapid, effective, non-invasive, safe, easily performed at the bedside with minimal blood loss. The activity on necrotic tissue seems to be mediated by a non-proteolytic component present in bromelain extract, named escharase.
In this paper it is described a clinical experience in the treatment of patients affected by extensive burns admitted to Turin Burn Center by means of an enzymatic debriding agent rich in bromelein. From January 2016 we treated 15 patients with acute burns, 10 male and 5 female, age ranging from 16 to 84 years. The percentage of the total body surface area ranged from 10% to 80%. Treated surfaces ranged from 5 to 15% TBSA. All the treated burns were deep second and third degree. Anatomical involved regions were mainly located on the limbs. Concomitant trauma and previous diseases were registred. The treatment was applied in an early phase (1-8 days) following the producer recommendation. Debrided areas were immediately grafted with glycerol-preserved allografts or, in case of incomplete debridement, with topical preparations. In 8 cases patients were successively operated with autografts in the same areas; in the other cases a spontaneous healing was achieved.
The effectiveness of enzymatic debridement, prevalence of local infection and healing time, as well as pathological scar occurrence and cosmetic results are discussed.

P163

NexoBrid in large burns - results of a pharmacokinetic study

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Objectives: The growing use of NexoBrid, a concentrate of proteolytic enzymes enriched in Bromelain indicated for enzymatic debridement of deep thermal burns, has lead to interest in the treatment of large burns. The objectives of this study were to assess the safety, efficacy and pharmacokinetics (PK) of NexoBrid in patients with deep burns up to 30% TBSA.
Methods: A multi-center, open label, single-arm study in patients aged 4-70 years old suffering from 4-30% TBSA deep partial (DPT) and full thickness (FT) burns.
Results:Thirty-six patients were enrolled and treated with NexoBrid, 22 with a single application up to 15% TBSA and 14 patients (with a total treated area between 15-30% TBSA) were treated with two separate NexoBrid applications, each up to 15% TBSA (maximal dose of 60 gr). Complete eschar removal was achieved in 89% of cases, in an average of 0.83 days from enrollment (2.16 days from injury). The PK profile in patients treated with 1 or 2 applications is similar; NexoBrid concentration reached Cmax by 2-4 hours and then declined with a mean T1/2 of 12±4.4 hours. Quantifiable serum concentrations were measured through 48 hours after dose administration. NexoBrid systemic exposure increases with dose and %TBSA, and a small increase in the average PK parameters was observed after the second application. The safety profile in patients treated up to 15% TBSA was comparable to that of patients treated between 15-30% TBSA, with no safety findings associated with increased TBSA or number of applications.
Conclusions: NexoBrid use was shown to be safe and the efficacy results are consistent with previous studies. The pharmacokinetic profile following first and second topical applications was comparable, suggesting no concern with accumulation following a second topical application of NexoBrid.

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Enzymatic burn debridement in children – first experiences in 10 patients

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Objectives: Enzymatic debridement of deep burns achieves a more selective result by preserving viable dermis, leading to reduced need for surgical debridement and autografting. NexoBrid is currently labeled for adult patients, however surgical treatment of children is challenging even for experienced burn surgeons. We present the results of children treated with NexoBrid in our center in an off-label setting.
Methods: Informed consent with signature of both parents was obtained prior to treatment. NexoBrid was applied in a dose of 2g per 180 cm^2 on deep partial (DPT) or full thickness (FT) burns for 4 hours. Following a 2 hour post NexoBrid wet-to-dry soaking a selectively debrided wound bed allows for a correct burn depth evaluation and conservative or operative treatment can be performed accordingly. All treatments were done under sufficient anesthesia or analgosedation.
Results: Since 2013 we treated 10 children with NexoBrid (which constitue 9% out of the 115 patients treated in our center) according to the above protocol. Cause of burn was flame (n=5), scald (n=3) and contact burn (n=2).Mean age was 9,4 years (1-17), 7 males / 3 females. Mean TBSA was 12 % (3-30). Enzymatic debridement was performed on an average of 7 % TBSA (2-15) at day 4 (1-7) after trauma. Hospital discharge was at day 20 (9-34) after admission. Autologous skin grafts were needed in 6 patients. Time to complete wound closure was 27 days (15-37) after debridement. Compression garments were prescribed in all

cases. In two cases surgical scar revision was needed. No NexoBrid related adverse events were seen.
Conclusion : Off-label use of NexoBrid in children is feasible and safe. The thinner skin in younger patients benefits from selective debridement and preservation of viable dermis to support spontaneous reepithelisation especially in DPT burns.

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Clinical advantages of a selective enzymatic debriding agent (NexoBridTM)

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I**ntroduction:** Patients with severe burns represent a challenge for the need of an early debridement before developing a progressive multiple organ dysfunction syndrome. The current standard of care (SOC) is surgical or non-surgical debridement, depending on the burn depth at the initial diagnosis. Surgical excision often sacrifices viable skin together with necrotic tissue and, in addition, results in significant blood and heat loss. Rapid and selective bromelain-based enzymatic debridement (Nexobrid™) has the potential to offer an alternative method of eschar removal with fewer complications.
Materials and methods: In this study 60 patients affected by intermediate-deep burns, with a mean age of 70,43±3,6 and a mean TBSA of 28,33±13,66% were assessed. Half were treated with Nexobrid™, the other half with the SOC. A series of parameters were evaluated: hospital stay, number of surgical procedures, variations in biochemical parameters (Hb, WBCs, PCR, fibrinogen), blood transfusion and rate of survival.
Results: A decrease in hospital stay, surgical interventions and reduction of blood transfusions were recorded. PCR value drop in few days were observed while WBCs and fibrinogen values did not show significant differences in the two groups. Survival rate were increased in the group of patients treated with Nexobrid™.
Conclusions: Nexobrid™ is a rapid and selective eschar-removal product, which significantly reduces the number of surgical procedures and post-surgical complications, as well as the severity and the onset of septic complications; it also enhances the short and medium term survival rate in severe burn patients.

P166

Rapid enzymatic debridement of deep facial burns in a patient with severe inhalation injury: Case report

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Objectives: To assess the off-label use of rapid enzymatic debridement of deep facial burns associated with severe inhalation injury.
Methods: Fifty-three-year-old female patient sustained 16% TBSAB (Total Body Surface Area Burns) caused by fire to face, neck, trunk, both hands and right thigh associated with severe inhalation trauma. The burn depth was diagnosed clinically as mixed deep dermal/third degree of 12% TBSAB and superficial of 4% TBSAB. Enzymatic debridement of all the deep burn areas (8%TBSA), except the right thigh, was performed by bromelain derived proteolytic enzymes mixture gel (NexoBrid, MediWound). The procedure was accomplished according to manufacturer´s instructions. All the debrided wounds had been covered temporarily by fresh-frozen porcine xenografts. Full thickness skin injury areas were closed by split thickness autografts, deep dermal areas were treated conservatively.
Results: Single debridement efficacy was 95% on the face, neck and trunk and 90% on both hands. Healing by epithelization under xenografts of most of the wounds including face area was achieved within 5 weeks. Only 2,5% TBSA of the debrided areas on both hands and neck required autografts.
Conclusion: Deep facial burns are often combined with severe inhalation injury. The current method of choice for burn eschar removal is tangential excision. However, during tangential excision also viable tissues with good healing capacity are removed, which is important particularly in functional areas as are the face and hands. In our patient enzymatic debridement proved to be safe and effective on the face in a very high-risk patient with severe inhalation injury and unstable circulation as an alternative to tangential excision.

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Use of a single layer skin substitute for burn hand cover

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Burns on the hands affect the quality of life, daily living activities and work reincorporation of patients. Skin substitutes may be an option for the reconstruction of these patients, but the use of this type of products in a high-demand service such as ours may lead to prolonged hospitalizations, which are prohibitive for us. The release of a single layer skin substitute, in which the immediate graft is possible, opens up new possibilities of use.
Our goal is to present a case of a burn patient with compromise of both hands, in one of which was used an acellular dermal matrix (Integra Single Layer®).

Clinical Case: A 35-year-old patient with a background of alcoholism, drug addiction and suicide attempts entered the Burned Service of the Hospital of Emergency Public Assistance with self-inflicted burns on face, neck, trunk and upper limbs of 30% of surface area. It emphasizes deep commitment of the left hand and deep partial thickness of the right. A suprafascial escarechotomy was performed on the left hand, and a tangential escarechotomy with a razor to dermal plane on the left. Later, both hands were grafted with lamellar grafts, but in the left hand an acellular single layer skin matrix was used.
Results: The patient progresses favorably, with catching on 90% and progressive recovery of the mobility of both hands. We present the photographic record of the technique, result and follow-up.
Conclusion: Evidence on the use of single layer skin substitutes in a functional area such as the hand is scarce. After this experience, we propose their use in this type of patients, on who classic skin substitute cannot be used due to limitations regarding hospitalization times, and for whom recovery of the functionality is a priority.

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Enzymatic Debridement and Prevention of Compartment Syndrome in Electrical Burn Injuries: a case report

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Electrical Burn are affected by a high frequency of complications. One of these is compartment syndrome, requiring emergency surgical management.
We report the case of a patient who reported High Voltage electrical burn injury, 12% TBSA,circumferential skin lesions involving the right hand and elbow.
He was transferred to our hospital 24hrs after the trauma, he presented an high risk of developing compartment syndrome. He underwent enzymatic debridement of the burned areas 48 hours after the trauma, following the application protocol of bromeline (NexoBrid), performed under deep sedation.
At this moment the interstitial pressure at the elbow was 76mmHg. After 4 hours we removed the drug and interstitial pressure was 46mmHg at the elbow and 8mmHg at the hand. Clinically there was a
reduction of oedhema and pain.After 24h the area was covered with allograft.Functional recovery was total after 38days. There was no need to perform escharotomies or fasciotomies. The patient was able to restart his working activity after 40 days. Treatment of electrical burn injury with enzymatic debridement can be considered a use out of label. Its use in prevention of compartment syndrome was successful.Cryopreserved allograft as medication has proven its efficacy, offering the best outcome.In electrical burn injuries we should prevent compartment syndrome. Use of Enzimatic debridment helps in the management of skin lesions.The treatment can be made at the bed of the patient, requiring a proper sedation; Nexobrid is relatively simple to use and requires a short learning curve; patient's recovery is faster compared to classic surgical treatment (escharotomy or escharectomy); The use of Nexobrid for escharolysis in circumferential lesions after electrical burn injuries can be useful in the prevention of compartment syndrome, in absence of motor or sensitive compromission. In presence of a compartment syndrome, even at early stages, emergency surgical escharotomy or fasciotomy has to be preferred.

P169

Demographic Characteristics of Burn Mortality and Its Relation to Tangential Excision at Burn Unit of Cipto Mangunkusumo National General Hospital

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Background: Burn injury is considered as one of major problem because of high mortality and morbidity. One of the several managements to decrease the rate of mortality is wound excision. The aim of this study is to describe the characteristics of burn mortality in our burn unit and the association with timing of tangential excision.
Methods: We collect data of burn patients who died in 2016 at Burn Unit of Cipto Mangunkusumo National General Hospital. We investigate the characteristics and the association of mortality and timing of tangential excision from collected data through literature review. An online database search of PubMed, Cochrane, and Burns Journal was performed to get the literature.
Results: Thirty-four patients out of 146 burn patients died at RSCM Burn Unit from January - December 2016. Most of died patients are male (n=22; 64,7%) in productive age (20 - 29 years old). The most common cause of burn were due to flame (n=29, 85,3%) with the extent of burns over than 40% TBSA (n=29; 85,3%). The major cause of death was multiple organ failure with sepsis (n=31; 91,2%). Only 13 patients (38%) underwent early tangential excision, while the rest were delayed or no tangential excision because of unstable condition of the patiens or delay of referring to our burn unit. From database search, only 5 literatures relevant to our study. From all the literature, early tangential excision decrease rate of infection and mortality.
Conclusion: The major cause of death in our burn unit was multiple organ failure due to sepsis. From the literature, delay in excision were associated with delayed wound closure as well as increased rate of infection and sepsis.
Keywords: Burns, mortality, demographics characteristics, tangential excision.

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Extracorporeal Membrane Oxygenation (ECMO) in Severe Burns Debridement; Lessons Learnt

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Objectives: We present our experience of debridement and grafting of severe burns in a patient on ECMO support. Preservation of physiological homeostasis on the operating table enabled extensive debridement and extended operative time far beyond the normal limits of surgery.
Methods: We retrospectively gathered notes corresponding to the patient's management in five hospitals, including two regional burns centres.
Results: We present the case of a 33 year old male involved in a domestic house fire. The patient sustained 50% TBSA full thickness burns to his back, bilateral upper limbs, and lower limbs combined with a significant inhalational injury. Following initial debridement of 16% TBSA the patient developed acute renal failure and respiratory failure requiring ECMO at a national centre, delaying further operative intervention.
Seventeen days post burn he returned to theatre on ECMO for removal of allograft, debridement, MEEK and meshed autograft of 38% total body surface area. This six hour operation involved five operating surgeons and two scrub nurses. A total of 20 units RBC, 10 units FFP and 4 units platelets were transfused on table.
Discussion / Conclusion: Major burns often require multiple theatre sessions for debridement and coverage. Time on table is limited by extreme demands on homeostatic mechanisms and physiological reserve of the patient.
We describe a single session burns debridement supported by the use of ECMO, allowing for the maintenance of normothermia without the use of external warming devices. This enabled more extensive debridement and extended operative time far beyond the normal limits of burns surgery, thereby reducing the number of trips to theatre and time to complete wound coverage. However, anticoagulation associated with ECMO resulted in transfusion of blood products equivalent to the patient's entire blood volume and may be the new limiting factor in future cases.

P171

Early surgical treatment of burns using wound coverings Burn center Krasnodar Russian Federation

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Aim: To develop methods of early surgical treatment of deep dermal burns with wound dressings.
Methods. Annually in the center 1,300 treated patients with burns (including 700 children). Running up to 2000 operations. In 500 patients with deep dermal burns are performed annually in the early necrectomy 2-5 days after injury to the closure of wound dressing wounds. Since 2015 applies "Suprathel". In order to create optimal conditions for the epithelialization of deep dermal burns after necrectomy the wound impose "Suprathel".
Results. After necrectomy to the lower layers of the dermis perform napkins with epinephrine hemostasis for 5-7 minutes. Then superimposed sterile wound covering "Suprathel", which is fixed with a bandage. Subsequently, only cosmetic dressings performed starting from the third day after surgery. Wound coatings are not removed until complete epithelialization of wounds. Epithelialization occurs depending on the depth of burns 8-12 days after surgery. When staged surgical treatment of painful dressings with ointments, without "Suprathel", made every other day for 15-21 days.
Conclusion: In combustiology clinical picture of wound healing is diverse and depends on the stage of wound healing and burn depth. In the traditional, staged surgical treatment of deep dermal burns tend to deepen with the formation of granulation tissue and the need to follow autoplasty. A more preferred method of treatment of deep burns is a method of early surgical treatment, in which the crust is removed in the early stages after the burn, and the wound is closed wound coverings. Research result has been an advantage once the surgical treatment of wounds using "Suprathel" to the local conservative treatment with long-lasting dressings.

P172

Efficiency evaluation of use of synthetic skin substitute in treatment of children with deep burns

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Aim: The known problem of deep burn wounds is formation of rough scars in the place of damage even after surgical treatment. However, application of a biodegradable dressing[1] over a autologous split-thickness skin grafts allows to improve quality of scars. In this study we assess effect to use of a synthetic analog of skin[1] by means of an objective method of a research.
Method: A comparative analysis of long-term results of treatment of 20 children with deep burns of the skin on the area from 2 to 25% of the body surface. Each patient was compared zone of interest: Zone A - third-degree burns in the treatment of which used synthetic substitute[1]. Zone B – full-thickness wound, which was used traditional surgical treatment: split-thickness skin graft. Zone C – normal skin. Instrumental assessment of treatment results was carried out using the device[2].
Results / Discussion: The bloodstream in Zone A, where

at a stage of treatment of wounds dressing[1] was used, by the end of the 12 months after burn was authentically more approximate to normal skin. Hemoglobin and melanin distribution (absolute and relative) in the areas of use of synthetic skin substitute was more uniform by 1 year after surgery, than in the zone of comparison.
Conclusion: Use of a synthetic skin substitute[1] at children with deep burns, along with early surgical treatment, allows to achieve good esthetic results after surgeries that is especially important at localization of zones of damage to cosmetic significant areas.
[1] "Suprathel®"
[2] "Antera 3D®"

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Limb salvage using acellular dermal matrix (AlloDerm?)
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Objectives: In extensive deep injuries of the limbs, such as electrical, contact burns, and crushing injuries, bones and tendons are easily exposed and injured because of soft tissue defects. The exposed deep structures become dry easily and necrotic changes are accelerated. Amputations are widely performed to those devitalized limbs at many clinics. Among various methods including skin graft, local flap, and free flap, etc., free flap can be a best choice when available donor tissue is present. However it takes long operation time and is affected by patient's underlying disease and vascular condition. Many surgeons think that skin graft can only be applied to the well vascularized tissue. But using acellular dermal matrix properly, bone and tendon exposed extensive wounds can be covered by skin grafts easly without amputation.
Methods: There were 8 burned patients. We debrided necrotic tissue of the wound and removed necrotic tendons and bony cortex with burring until identifying pinpoint bleeding of the bone. The hydrated AlloDerm‡ (25/1000 inchs, meshed type) was applied on the wound, and then thin split thickness (7-10/1000 inchs) skin graft was performed immediately.
Results: All wounds were well covered by skin grafts and there were no amputations. Mean healing period was 3.2 months and 2.5 times of operations were proceeded on average during that period. **Discussion / Conclusion**: Alloderm® and STSG give us an advantage of short operation time and less limitations in donor site than flap surgery. Alloderm® is resistant to infection and protects bare bone or exposed tendon from dry-up for long period. So, it can make up for the weak points of skin graft only. We propose that Alloderm® and thin split thickness skin graft could be an option to cover soft tissue defects in extensive deep burned wounds of limbs.

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The Use of Groin Flap for Upper Extremity Coverage in Electric Burn Injury
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Background: Electrical burn injuries commonly occur in the extremities, especially wrist, forearms, and hand. In high-voltage burns, the injury associated with deep extension and underlying tissue damage, resulting ischemic tissue and eventually, higher
possibility extensive necrotic tissue The importance of nonvital tissue debridement and adequate defect closure in electrical burn injuries determine the outcome of limb salvage.
Method:A case series of electric burn injury extremity with two stage of reconstructive surgery using groin flap. Author questioned clinically whether two-stages surgical method affect morbidity of electric burned patients and relation ship between type of harvesting flap (delayed and non-delayed groin flap) interferes flap vitality.
Result from PubMed, Burns Journal and Google™ search generated 53 articles. Screening articles based on inclusion criteria, exclusion criteria, and full text reading. Three remaining articles appraised in regard of validity, importance, and applicability.
Result: Time of reconstruction did not appear to affect flap survival and outcome. Fasciocutaneous flaps also relatively thin and, therefore ideal for coverage in regions with exposed tendon and bony structure. No evidence found from world literature whether type of flap harvesting will affect flap vitality.
Conclusion: The use of groin flap as distant pedicle flaps, provide alternative where in case of free flap reconstruction was not be able to do. The possibility of compromised does not related with timing of reconstruction surgery, since pathophysiology of vascular occlusion and progressive necrosis tissue in electric burn injury. Pliable characteristic for covering small cross sectional diameter anatomic region such as wrist is advantageous, however, due to bulkyness appearance, secondary reconstruction will be needed for thinning flap.

P175

Single- Stage Reconstruction of Burn Contracture by STSG c artificial dermis
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Objectives: Burn scar contracture cause esthetic, functional, psychological, and social problems. Until now, we consider the best treatment of contracture to be the full-thickness skin graft. However, the donor site of full-thickness skin insufficient to cover the large joint like axillae,

neck, or popliteal area. Clinicians often meet the patient that have burn injury at the inguinal area, the primary donor site of full-thickness skin. In these cases, we use the split-thickness skin graft combined with dermal substitutes. The purpose of this study was to evaluate clinical outcomes of contracture treatment in severe burn scar contracture performing split-thickness skin graft with dermal substitutes as adjuvant method.
Methods: We analyzed the retrospective clinical and photographic records of 30 patients with severe burn scar contracture. We performed split-thickness skin graft with dermal substitutes to minimize recontracture. Surgical procedures were performed in the following manner. Contracture release by centrifugal direction with scar excision. Several marginal darts inserted to prevent the centripedal recontracture. Meticulous hemostasis and irrigation was undertaken. Thereafter, surgical glove changed, and the artificial dermal substitutes were placed on the fresh wound bed, and covered with nonmeshed split skin .
Results: The overall take rate was about 95%, and no grafts failed to affect recontracture. Mean follow-up was 1 year. Excellent/good outcomes were shown in 28/30 patients.
Discussion: Split-thickness skin graft remains the standard treatment of deep dermal and full-thickness burns; however, the delivered dermis is insufficient in most cases to prevent functional and cosmetic disability. Many studies have reported that artificial dermal substitutes improve the quality of skin grafts, that the amount of the dermal component contributes to the prevention of contractures. In extensive burn scar contracture, skin grafting in combination with dermal substitutes can be an alternative to split-thickness skin graft alone for the contracture release.

P176

Improved vascularity in a scarred, post burn transposition flap

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Background: Massive burn injury often has scar complications persisting long after the patient has survived the acute phase. These include neck and limb contractures, eyelid ectropion, microstomia, hypertrophic and keloid scarring, itch and dysesthesia. We present a case of 46% total body surface area burns with recurrent left neck contracture in which a large perforator based transposition flap was performed.
Aims: To compare the vascularity of scarred, post burn skin flaps versus traditional local flaps.
Methods: A 20x5cm transposition flap was planned over the right chest. Preoperatively, a Doppler probe was used to identify thoracoacromial perforators at the flap axis and internal mammary perforators supplying the distal flap. The fasciocutaneous flap was raised, preserving two distal perforators. Full thickness excision of the left neck contracture was performed and the flap was transposed superiolaterally to fit the defect.
Results: Flap vascularity at its distal edges was excellent despite the length of flap. Microvascular augmentation of distal arterial flow was not required. Moderate tension was applied to the underside of the flap using quilting stitches, to allow for improved neck contour. The flap remained well perfused with no skin necrosis and the patient was discharged after 1 week.
Conclusions: Large transposition flaps with narrow bases tend to suffer from distal flap necrosis. This can usually be addressed at the outset by preserving distal flap perforators for vascular augmentation at the recipient site. In our case, we noticed improved vascularity over scarred post burn tissue hence there was no need for vascular augmentation. Unusual lengths of flap can be taken due to the delay phenomenon of burn injury. Post operatively, the flap survived with no complications.

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Caveats and Technique for the Reconstruction of Burns Contractures using an Artificial Dermis in a Tropical Burns Centre

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Objectives: Excision of scar tissue and locoregional flap coverage is the gold-standard in treating hypertrophic scarring and contractures from burns injuries. An artificial dermis with a split-thickness skin grafting is a viable alternative when donor sites are lacking in patients with extensive burns.
There is a paucity of data on the use of artificial dermis in a tropical burns centre, a practise marred by a high infection rate in the Southeast-Asian region. Moreover, the high cost of the artificial dermis demands a successful outcome. We describe our successful experience with the use of bi-layered artificial dermis with split-thickness skin grafting in treating post-burns scar contractures.
Methods: A two-staged procedure of artificial dermis followed by 9:1000th inch split-thickness skin graft was used to reconstruct full thickness wounds after the excision of burns contractures in 7 patients. These were located over 4 wrists, 1 foot, 2 elbows, 2 necks, 1 chin, and 1 pre-auricular region. Cause of burns were flame burns in 3, chemical burns in 2 and scalding in 1.
Results: There was a 100% rate of skin graft take over the wound beds which were covered with a neo-dermis 14-18 days after the artificial dermis was applied. 1 developed hypertrophic scarring but the rest healed with a soft, pliable consistency and satisfactory cosmetic outcome. Patients achieved close to a full range of motion when

treated scars were located over joints. No cases of infection were encountered. At 6 months, hypertrophic scarring developed around the peripheries of 2 wounds while the rest remained soft and pliable. Through this experience, we developed a reproducible, effective technique for the procedure.
Conclusion: We demonstrate that a bi-layered artificial dermis followed by split-thickness skin grafting may be used reliably in a tropical burns centre, whereby a consistent technique contributes greatly to a successful outcome.

P178

Dual perforator flap for the Reconstruction of Large Sacral Defect due to Electrical blanket
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Objectives: Electrical blanket was commonly used in Korea especially in winter season. Contact burn due to electrical blanket was increased in Korea and management of large soft tissue defects in the sacrum has been progressive developed. In this study, we report using the superior gluteal artery perforator flap with additional parasacral perforator supported by different angiosomes to cover large sacral defects due to 4th degree contact burn.
Methods: A 79-year-old female with medical history of hypertension was referred for the treatment of 4th degree burns on the sacral area, caused by an electric blanket. After debridement, the sacral wound size was 11 x 10ãŽ . We subsequently planned the superior gluteal artery perforator super-flap with additional parasacral perforator because of the large defect size. The perforators were identified and mapped with a hand-held doppler. The flap was designed to include the superior gluteal perforator artery with the parasacral perforator artery. The flap size was 19x 16ãŽ and the pedicle lengths of superior gluteal artery perforator and parasacral artery perforator were 4.5cm and 2cm respectively.
Results: Dual perforator flap - Superior gluteal artery and parasacral perforator artery - was well coverd the large sacral defect. Postoperative seroma was developed but resolved by conservative treatment without additional surgery.
Conclusions: The superior gluteal artery perforator super-flap with parasacral perforator with consideration of angiosome territories can be a good option in covering large sacral defect supposed to be unable to be covered by unilateral superior gluteal artery perforator artery flap. This procedure reduces the operation time and prevents unpredictable flap failure. Even though the parasacral perforator is included, versatility of the large superior gluteal artery perforator flap is preserved due to sufficient perforator length gained after adequate dissection.

P179

Burns injures caused by electricity treated with dermal regeneration template
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Burns injuries caused by electric current are injuries resulting from an effect of pathogenic amount of electricity to the surface of body. Electrical current destroys all the tissues that get in the way of the passing current. Very often places of entrance and exit do not correlate with huge and massive destruction in the initial phase.
This paper presents a 27 year old man with extensive burns of body regions (several places of entrance and exit) from electricity. The most severe defects covered the anterior and lateral side of the left thigh and exposed part of femur bone, right gluteus, perianal and sacral regions, left low leg and left foot.
He was initially treated conservatively with HBO and all other substitution therapy. When general condition of the patient had been stabilized the surgical treatment in several phases started.
In absence of donor regions and because of large and massive defects and exposed part of bone femur, dermal regeneration template was applied for the first time in Clinic for Burns, Plastic and Reconstructive Surgery,Clinical Centre Serbia, Belgrade.
Dermal regeneration template use in this case enabled me to save patient's leg instead of amputating it. At the same time we attained better functional and aesthetic outcome for the patient. The patient was threaded for 76 days and 11 operations were done.
After two years of completing the treatment the patient has no functional failure and he has very good aesthetic result.
We can conclude that adequate and early reconstruction of extensive defects after electrocution with application of dermal regeneration template with autografts and as well as eary rehabilitation should be the primary goal of treatment.
M.D. Biljana Ä†ertiÄ‡, Head of Burn Department in Clinic for Burns, Plastic and Reconstructive Surgery Clinical Centre Serbia.

P180

Beneficial effect of platelet-rich plasma (PRP) for healing of infected burn wound in animal models
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Background: The beneficial effect of platelet-rich plasma (PRP) on preventing wound infection through effects of its

hemostatic antimicrobial abilities has been recently pointed. However, the exact therapeutic role of PRP in preventing and treating burn wound infection remains unclear and requires further studies. The present study aimed to assess the effects of PRP on 3rd degree infected burn wound in experimental animal models.
Methods: After induction of burn injury with a contact burn, eighty Wistar rats were assigned randomly to eight groups (four pairs of experiment groups receiving PRP and control groups). The study endpoint was to determine and compare the mean wound area and also mean pathology score across the different study groups at the different time points.
Results: Without any evidences of localized infection on wound area, PRP could improve wound area and also could reduce pathology score without even any surgical intervention. However, by appearing wound infection, the beneficial effect of PRP was effectively trimmed. With respect to pathology score, the lowest mean pathology score was shown in animal group with appearance of local infection after 24 hours of burn induction with early excisional surgery and PRP receiving after 48 hours, while the highest score was found in the group without evidences of local infection or early excisional surgery that received PRP after 24 hours of burn induction.
Conclusion: Although PRP can be introduced as an effective method for treating burn wound, its beneficial effect for infection eradicating is potentially conflicting.

P181

Investigation of complications of free flaps in patients at Hazrat-e-Fatemeh Hospital in 5-year period (2009 to 2014)

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Objective: Free flaps are one of the procedures used to treat patients that need to plastic surgery. This study was performed to determine the complications of free flaps in patients in Hazrat-e-Fatemeh Hospital in five-year period since 2009 to 2014.
Methods and materials: In this observational study that was performed as a cross-sectional descriptive survey, 64 consecutive patients under free flap surgery in Hazrat-e-Fatemeh Hospital in five-year period since 2009 to 2014 were enrolled and the complications of free flaps and contributing factors were determined among them.
Results: The findings revealed that in 79.7% no reoperation was required but in 10.9% the repair and
in 9.4% the flap removal was needed. The outcome was good in 82.8%, 10.9% need to repair for partial necrosis, 3.1% need to removal of flap for partial necrosis and 3.1% need to removal for complete necrosis.
Conclusions: According to the obtained results, it may be concluded that nearly one-fifth of patients under free flap surgery may experience some complications which it would have no known contributing factors to be developed.

P182

Non cultured keratinocytes and melanocytes cells to treat post burn Achromia

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Introduction: Pigmentation of burn scars is hazardous . Hyperchromia are common but also achromia could be observed secondary to burn trauma.The treatment is difficult and quasi non existent.We have tested the efficacy of a non cultured keratino-melanocytes cells graft on those sequels.
Material and method: Patients with a post burn achromia were grafted , after dermabrasion of the lesion,with non cultived keratinocytes and melanocytes obtained after a skin biopsie of the patient.The biopsie was treated with the single use kit Viticell. Successive steps permit to obtain separated cells of the skin. A solution of hyaluronic acid with keratinocytes, melanocytes and langhrerans cells was sprayed over the dermabrased surface.A protect wound dressing (Biobrane) is maintained over the wound until the healing time.The follow up , clinic and photo, was monthsly for 3 months then every 3 months.No PUVA therapy was done.
Results: 11 patients from 23 to 77 YO were treated. The mean healing time was 12 days. 1 local infection was observed and treated with local antiseptic. The follow up is now 7 months to 2 years. No secondary hypertrophy was note.The mean repigmentation evaluated is 70%.
Conclusion: A new way to treat post burn achromia is offer by the possibility to obtain non cultured melanocytes and keratinocytes.This simple technic could also be used to treat the color matching done by graft or flaps.

P183

Treating complications after neck surgery of burn trauma: Case report

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Neck contracture is unpredictable in deep burn and quite often unavoidable. Therefore, the surgical team can face the challenge of additional reconstructive surgeries with

the purpose of managing the complications after the primary procedure.
Objectives: The purpose of this case report is to present our experience in the treatment of functional deformities of the neck after a deep flame burn.
Material and Methods: A 59 year old female patient was admitted to our Clinic with 3rd degree flame burn in the neck area (21% TBSA). The surgical treatment
included debridement and the application of a skin graft which survived completely. Unfortunately, within a month post operation the patient developed a neck contracture. The two-stage reconstruction was made by two pedicle flaps (occipito-cervico-dorsal flaps) without any complications. Primary closure was performed on the donor site. Multiple, small Z-plasty were applied for tissue release. Full functional reconstruction was achieved with satisfactory aesthetic result.
Conclusion: Reconstruction of the post-burn scar is a complex task in plastic surgery. Sometimes several surgeries are needed to restore the functional capacity of the body area and obtaining an acceptable post-trauma appearance.

P184

Distally based sural artery flap for acute and delayed postburn defects

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Objective: To share our experience on managing distal lower limb tissue defects secondary to burn injury using the distally based sural artery flap.
Method: Management of certain defects to the ankle and foot can be challenging to the plastic surgeon often requiring free flap reconstruction. The sural artery flap is a distally based fasciocutaneous flap that has many advantages to offer for coverage of this area. This flap is raised on the posterior aspect of the calf and is supplied by the superficial sural artery that accompanies the sural nerve.
We report our experience with 3 cases: a patient with bilateral foot defects following an electrical burn injury in the acute phase and two patients with chronic heel defects as a result of long burns unit hospitalisation.
Results: All 4 flaps survived without any major complications and minimal donor area morbidity. In the follow up examination all patients were ambulatory without exhibiting any ulcerations or functional deficits.
Discussion / Conclusion: The distally based superficial sural artery island flap is a versatile, reliable procedure useful in reconstruction of the calcaneal area, malleoli and lower part of the limb.This flap not only provides an alternative to microsurgical reconstruction but can also be the first procedure of choice in selected cases.

P185

An analysis of clinical usability of procine skin burn dressings (the Medpig project)

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Objectives: The goal is to assess the clinical usability of two types of porcine skin dressings (treated with 15% glicerin and an acellular tripsinized matrix) in patients with burn wounds, residual and donor fields.
Methods: Porcine skin preserved in 15% glicerol was used for supplying residual and donor fields. An acellular porcine skin matrix was used as a basis for a transplant of autologous cultured keratinocytes and fibroblasts. The clinical usability of both products was compared with that of the standard method of supplying donor and residual fields and burn wounds. Both the research and the control groups were examined using a pain resistance method (VAS - *Visual Analogue Scale*), a clinical wound assesment method (*Bates-Jensen Wound Assessment tool)*, planimetric imaging, photographic documenatation, seeding wound swabs, blood and urine and histopatological examination of the wounds.
Results: Until late 2016, 25 patients were treated with a porcine skin transplant soaked in 15% glicerol. Their average age was 52 years (25-68 years of age). Their average total wound areas was 12% (0-37%), with III/IV degree wound comprising 5% (0-15%). Before the transplant, sterile wounds amounted to 32% while after the transplant - to 36%. The average length of hospitalization was 30 days. 23 patients made the control group. Co-cultures of keratynoctes and fibroblasts were transplanted onto an acellular porcine skin matrix in 5 burn wound patients.
Discussion: The preliminary results of the comparative experiment show that porcine skin treated with 15% glicerol and acellular tripsinized porcine skin are useful for supplying residual and donor fields with a skin cell matrix for transplants.
Presented work was financially supported by The National Centre for Research and Development (grant number INNOMED/I/17/NCBR/2014 as part of "INNOMED" entitled: "Development of Innovative Technologies for the use of Transgenic Pig Tissues for Biomedical Purposes". Acronym "MEDPIG"

P186

A comparison of features of transgeneic porcine skin wound dressings and biostatic allogeneic human skin transplants

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Objectives: The aim of the study was to clinically evaluate a biostatic skin allografts, transgeneic porcine xenografts and revitalized porcine acellular dermal matrix (PADM) in a treatment of burn wounds.
Materials and methods: Transgeneic porcine skin grafts and human skin allografts were used in the
study. Human keratynocites and fibroblasts were used for PADM revitalization. The decellurization methods included: 3% Triton-X, 0,1% SDS, 0.5% tripsin, 2,4 U/ml of dispase II, 85% glicerol and 15% glicerol. Mechanic and biological features of grafts were evaluated.
Results: A porcine skin preserved by use of 15% glicerol is much more clinically effective than 85% glicerol (low elasticity, high hardness and displeasing visual features). Porcine skin incubated in 85% glicerol has a negative effect on live skin cell cultivation and ability to split, which is not the case with 15% glicerol soaked porcine skin.
As the best decellurization method the trypsinization was chosen.
Additionally, trypsinized PADM showed to be the best scaffold for human keratinocytes and fibroblasts *in vitro* culture. Fibroblasts and keratinocytes cultured on porcine skin decelluralized by trypsination have proven to be the most vital ones, hinting at positive results of future transplants using these cells.
Discussion: The decellurization of porcine and human skin by trypsin has proven that both matrix are interchangeable in cases of insufficient supply of autologous human skin. 15% glicerization has proven to be the best method for conserving procine skin.
Presented work was financially supported by The National Centre for Research and Development (grant number INNOMED/I/17/NCBR/2014 as part of "INNOMED" entitled: "Development of Innovative Technologies for the use of Transgenic Pig Tissues for Biomedical Purposes". Acronym "MEDPIG"

P187

What we have learned from using Integra in 6 years of use

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We know that Integra was discovered thanks to the works of Burke and Yannas in the 70's at MIT. It was described as a collagen of bovine origin with a silicone sheet that served as epidermis while integrating the dermal matrix. The initial indication for Integra was for reconstruction of scars by burns as well as diabetic ulcers. The objective of this paper is to describe the indications given by the manufacturer as well as new indications for its use. It also describes our learning curve from the beginning with Integra bilayer to cases of single layer and injected collagen, also called Called Flowable as well as details of how we are doing it now and how to avoid pitfalls.
Material and methods: From July 2010 to July 2016, a retrospective study was carried out on a total of 250 patients, with an age group from 3 months to 70 years. The cases were grouped from acute reconstruction by burn, traumatic sequelae and chronic ulcers.
Results: It is evident that dermal matrix as well as collagen injected is an excellent option to improve sequelae as well as indications in chronic ulcers, reconstruction of scars as well as for fillings as is shown in our results.
Conclusions: Integra in its three presentations offers us to completely change the reconstructive ladder as a viable option for the indications described. New indications are described as post traumatic depressions as well as male intimate surgery also
with permanent results.

P188

Matriderm® Use in Burns Reconstruction: A Series of 55 Cases

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Objectives: Dermal substitutes provide a solution to full-thickness soft-tissue defects that can often have significant functional and aesthetic implications for burns patients. The use of Matriderm®, a scaffold of native bovine type I, III and V collagen fibre template incorporating elastin hydrolysate that is converted into native host collagen within weeks following application, has been previously reported in burns patients. The purpose of this study is to present our results of 55 patients treated with Matriderm® at a Regional Burns Unit based within a medium-sized district general hospital in the United Kingdom.
Methods: Fifty-five patients were treated using Matriderm® at our Burns Unit between June 2009 and August

2016. Indications were soft-tissue loss requiring dermal replacement to enable skin grafting, in most cases to functional and aesthetically sensitive anatomical areas, including the upper limbs and face.
Results: Eleven cases were primarily reconstructed using Matriderm® while fourty-four were treated secondarily following previous procedures. Aesthetic and functional results to date have been encouraging.
Discussion / Conclusion: There is a role for Matriderm® in acute and late burn wound resurfacing particularly when reconstructing full-thickness defects in functional and aesthetically sensitive anatomical areas such as the hand and face. Our series suggests it may improve overall scar quality, reduce lengths of admission and be used successfully in the setting of secondary resurfacing bearing in mind its cost.

P189

Post-burn cervical keloid treatment with surgical excision and reconstruction with a dermal substitute and split thickness skin graft

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Objectives: Facial burns can lead to horrible sequelae. In this regard, keloids represent a difficult challenge for any physician. No single therapeutic modality alone has proven effective although surgical excision is frequently the mainstay of therapeutic protocols. Keloids are very resistant to treatment and have very high recurrence rates. We present a case report of a patient undergoing marginal excision of a massive cervical keloid (post-burn) and a reconstructive strategy using a dermal substitute and subsequent skin graft.
Methods: A two-stage approach was followed. Keloid was completely excised down to normal subcutaneous tissue. Dexamethasone was instilled at the wound bed. A bilayer dermal regeneration matrix was applied to the entire wound with the silicone layer oriented superficially. This was covered with a "tie-over" dressing with paraffin gauze and octenidine.
The second stage occurred 21 days later. The silicone sheet was removed and a split thickness skin graft was harvested from the anterior thigh using an electric dermatome and applied to the neo-dermis. A thight dressing was made with paraffin gauze and octenidine and the first dressing change was 5 days later.
Results: Very good graft intake. Healing was uneventful and donor site morbidity was minimal without keloid formation. There were no signs of infection. The result was aesthetically acceptable and the patient was happy.
No evidence of recurrence 20 weeks post-operative.
Conclusion: The combination of slip thickness skin graft with a dermal regenerative template seems to be very effective. It maintains the pliability of the skin with good cosmetic appearance, limiting skin creep. The removal of the dermis and a substantial amount of extracellular matrix components limits contracture, contributing to a tension-free healing. No recurrence was noted despite the short follow-up.

P190

The new tissue and cell factory Turin Skin Bank

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Turin Skin Bank, has been the Regional Referal Centre for the preservation of skin for the last 18 years; it has been authorised by the Italian National Transplant Centre since 2005, to harvest, manipulate and distribute human alloplastic skin from multi-tissue and multi-organ donors.
Before distribution, the alloplastic tissues undergo strict quality controls, which include a microbiological and viability screening to certify their suitability in clinical use.
After thorough renovation, the Skin Bank is now a Tissue and Cell Factory composed by 4 sterile rooms and 2 research laboratories, opened in 2016.
The Skin Bank operates on the basis of GMP regulation: an articulated documentation quality system which codifies and regulates all the operative procedure concerned in the handling and preparation of the tissue products, in the laboratories and in the training and updating of the specialised personnel. Two new products are now distribute by our facility: Human Acellular Dermal Matrix (HADM) that is used in various reconstructive procedures (burns, breast, pelvic and abdominal wall reconstruction) as a scaffold for autologous tissue regeneration and autologous adipose tissue for reconstructive plastic and orthopedic purpose. The Turin Skin Bank is also active in the field of research and scientific innovations. Its laboratories carry out studies on projects involving new bio-substitutes and research on mesenchimal stem cells from stromal vascular fraction of adipose tissue.
Work supported by Fondazione Piemontese Studi e Ricerche sulle Ustioni and by Compagnia di San Paolo.

P191

Negative pressure wound therapy to the dura

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Negative-pressure wound therapy (NPWT) is historically contraindicated in patients with osteomyelitis or exposed dura. Although its beneficial effects on the scalp have been published, there is a lack of literature describing the application of NPWT on delicate vasculature and internal organ such as the dura mater. We present a case of a complex reconstruction of an infected full thickness scalp burn, where NPWT was successfully used over the dura.

P192

Use of MediHoney ™ Wound Gel following Major Thermal Injury

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Active *leptospermum* honey (ALH) has been reported to have salutary effects in the management of both acute[xx] and chronic[xx] wounds. However, the use of ALH for the management of larger thermal injuries has been sparsely reported. MediHoney™ Wound Gel is a topical preparation of manuka honey which has antimicrobial properties, provides a barrier to wound pathogens and maintains a moist and slightly acidic wound environment, conducive to wound healing.

Case study: A 41 year old male sustained a 85% TBSA thermal burn: 40% deep dermal and 45% full thickness. With multiple theatre trips using auto and allograph in a sandwich grafting technique resulting in only 10% wound healing with a static wound bed. On day 60 post burn injury, 13 days post "sandwich" grafts to abdomen and bilateral extremities, wound swabs from fragile, bleeding, malodorous graft sites demonstrated growth of *VRE*, *e. faecium* and *candida*, while the patient exhibited signs of significant multi-organ dysfunction and sepsis requiring systemic antibiotics, steroids, TPN, and CVVHDF. Family was being prepared for his poor prognosis.

In an effort to decrease the wound bacterial burden and potential systemic seeding, the patient was bathed with antimicrobial soap and wounds dressed with paraffin tulle gauze impregnated with MediHoney Wound Gel secured with gauze and gamgee.

This process was repeated every other day with reapplication of MediHoney Wound Gel.

Over the course of the next 10 days, the wounds improved, with decreased bleeding and developed healthy granulating tissue. In addition, the dressing regimen helped maintain normothermia. The patient improved sufficiently leading to further skin grafting, wound closure and recovery.

Conclusion – Although successful in the management of this patient, the use of ALH for the management of large burns requires further study. This centre has embarked on a 12 month observational study to gather additional clinical evidence.

P193

Negative Pressure Wound Therapy with Instillation Use in Burn Wounds - First Experiences

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Objective: Negative pressure wound therapy (NPWT) has been integrated in acute and reconstructive burn care and is now available with the option to instill topical solutions, which can potentially decrease patient discomfort and nursing time when using "irrigation-soak" dressings. We present our experience using NPWT with instillation and dwell time (NPWTi-d*) in managing burn wounds.

Methods: Patients were managed in inpatient burn center with NPWTi-d using hypochlorite- or sulfur-based topical solutions (dwell time of 10 or 30 minutes, followed by NPWT every 6 hours. Wounds were initially debrided in operating room. Patient 1 was a 42-year-old male with bilateral electrical hand burns, patient 2 was a 22-year-old male with severe elbow friction burn, and patient 3 was a 31-year-old female with large subcutaneous degloving-friction injury. Prior to debridement and NPWTi-d, cream dressings were used.

Results: After 1-2 weeks of NPWTi-d, wounds were stabilized for closure: patient 1 closed with local flaps and split-thickness skin grafts (STSG), patient 2 closed with STSG, and patient 3 closed with local advancement and STSG. Patients 1 and 3 were followed in outpatient burn center for 12 months; wounds remained closed. Patient 2 moved out of the area after grafting.

Discussion/Conclusions: In these patients, adjunctive NPWTi-d allowed for optimal wound management in the burn center. We noted reduced dressing changes and improved patient/nurse perception of wound management burden. Prospective evaluation with standardized patient and nurse feedback should be pursued in larger populations of burn wounds.

*V.A.C. VERAFLO™ Therapy; KCI, an ACELITY company, San Antonio, TX)

P194

Application of adipofascial flap in repairing heat-press injury

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Objective: To repair the deep wound with tendon or bone exposed due to heat-press injury .

Methods: After surgical debridement, the adipofascial flap was harvested under healthy skin around the wound. Then, the adipofascial flap was turned over and covered the wound. Skin graft was performed upon the adipofascial flap.

Results: Seven patients of heat press injury were conducted to this study. Six of them were male, and the other

one was female. The injured area included trunk in one case, upper limbs in four cases, and lower limbs in two cases. Four patients exposed tendon, the other three exposed bone. The adipofascial flap was turned 180 degrees to cover the exposed tendon and bone, the skin graft was performed upon the adipofascial flap. The minimum area of flap was 5 cm * 5 cm, the maximal area of flap was 25 cm * 15 cm, the shortest basilar part was 2.5 cm.
Discussion/Conclusion: Comparing with fascial flap, the adipofascial flap had the same blood supply and vascular distribution but with fewer nutrition needed, thus, it' survived area became bigger; Meanwhile, the adipofascial flap could turn 180 °to cover the wound, which had bigger radian of rotation than fascial flap, so the application of adipofascial flap was more extensive. The pedicle of adipofascial flap did not have "cat-ear" malformation, thus, it did not need the secondary modification; On the other hand, the donor site could be sutured without tension and did not need skin-grafting, so the appearance would be better. The adipofascial flap could be used to repair deep wound with exposure of tendon and bone caused by heat-press injury.

P195

Managing the Small, Non-Healing Problem Burn Wound with Epidermal Grafting

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Objective: Small (<1% of total body surface area) non-healing burn wounds can be a significant nuisance to patients and providers and sometimes do not respond to conventional treatments. Epidermal grafting, which can be performed in an office setting, may provide an option for patients with small, non-healing burn wounds, who cannot tolerate anesthesia. This case series presents patients who were not surgical candidates and whose small, non-healing burn wounds received epidermal skin grafts (ESGs).
Methods: After wound bed preparation based on institutional protocol was performed, an epidermal harvesting system* was used to harvest ESGs. Donor sites (thigh) were prepared by removing hair and washing with an antiseptic† and saline rinse. The harvester applied heat and suction to raise epidermal skin into microdomes. After harvesting, a fenestrated adhesive dressing was used to transfer microdomes to recipient site. Gauze and self-adherent wrap were used as outer dressing.
Results: Three patients with small, non-healing burn wounds on left leg, right shin, and left foot, respectively, received ESGs. Patients reported minimal pain during harvesting and fewer dressing changes than with conventional wound care. There was no disruption to their daily lives (eg, no hospital stay). Wounds were fully healed by 4 weeks post-grafting. No complications were reported; donor sites healed without complications and little-to-no scarring by week 4.
Discussion/Conclusions: In these patients, epidermal grafting provided a viable option for wound management with minimal donor site morbidity.
*CELLUTOME™ Epidermal Harvesting System, KCI, an ACELITY Company, San Antonio, TX †HIBIBLENS® (Mölnlycke Health Care, Norcross, GA)

P196

Use of SuprathelR as a complete epidermal substitute in a boy with extensive toxic epidermal necrolysis

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Objectives: Toxic epidermal necrolysis (TEN) is a rare, potentially life-threatening condition characterized by extensive loss of skin and mucosa of more than 30% total body surface area (TBSA). It is linked to certain drugs as well as viral or bacterial infections, resulting in a dysregulated immune reaction against epithelial cells. Treatment, as in thermal injuries, should include an early referral to a burn unit. This case report demonstrates a life-saving management of TEN with an epidermal substitute (Suprathel^{R}) in a pediatric patient with epidermal damage of 100% TBSA.
Methods: A ten-year-old boy was admitted to our pediatric burn center complaining of foreign body sensation and photosensitivity of the eyes, headaches, pyrexia and presenting with extensive epidermolysis involving 100% TBSA. A skin biopsy confirmed the diagnosis of TEN with a complete loss of the epidermal layer as well as extensive mucosal involvement. The patient required fluid resuscitation and admission to the pediatric intensive care unit. Wound care consisted of gentle debridement of the blistered areas followed by extensive Suprathel^{R} application.
Results: Repeated Suprathel^{R} application maintained the skin barrier function over time and resulted in almost complete reepithelialization. The mucosa of the urogenital tract and eyes showed an almost complete restitution, as well. After a six-week inpatient stay the patient could be discharged to our outpatient care.
Two years after treatment the patient is satisfied with the results and the skin is virtually free of scars with a normal appearance and elasticity.
Conclusion: In children, TEN with extensive epidermal loss is a rare, life-threatening condition that requires admission to a specialized pediatric burn unit. Suprathel^{R} proves beneficial in the management of these cases by providing a skin barrier until natural reepithelialization occurs.

P197

Primary Burns Dressings and cost implications: A UK National Survey results

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Introduction: Despite abundant literature demonstrating a wide range of dressings' efficacies and costs, there are no national consensus or guidelines available for primary burns dressings applied following the initial burn debridement. The choice of primary dressings must factor in different aspects including appropriate patient care, need for wound inspection and cost to achieve efficient utilisation of resources.
Methods: We conducted a telephone survey with 28 major burns centres across the UK enquiring about the primary dressing applied to superficial partial thickness; mixed depth, deep partial or deep dermal, and full thickness burns injuries. The product literature was used to classify the type of dressings accordingly and analyse the cost of the most frequently used ones.
Results: 19 UK burns units participated in the survey demonstrating a significant variation in the types of dressings used**.** The use of anti-bacterial dressings to prevent wound infections correlated with increased burn depth. Superficial partial thickness and mixed depth burns were frequently dressed with hydrocolloid dressings. Deep partial-to-full thickness burns were frequently dressed with topical ointments. Cost analysis demonstrated hydrocolloid dressings as the most expensive dressing with topical ointments the cheapest.
Discussion: In the absence of robust evidence in the literature, the choice of primary dressings applied to burn injuries is rarely evidence based. In addition, there is lack of national consensus or guidelines directing the choice of primary dressings recommended for burn wounds of varying depths.
Our findings demonstrated a significant variation in the application of primary dressings to partial thickness, deep dermal, mixed depth and full thickness burns with significant cost implications. Level I evidence is required to provide evidence based recommendations for the efficacy of different primary dressings in variable burns wound depth.

P198

Results from 238 applications of an absorbable synthetic membrane to superficial and deep second degree wounds

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Introduction: The care of 2nd degree burns remains challenging because of pain during daily dressing changes and unpredictability of healing time and scarring. Many temporary coverage solutions have been studied in the past under those aspects. Infection and integration into the healing wounds have been the major drawbacks and there are minimal final outcome reports. The ideal treatment of 2nd degree burns would 1-decrease pain, 2-limit dressing changes,3-allow assessment of healing progress, 4-prevent infection, 5-accelerate healing, 6-improve long term outcome, 7-save treatment cost. This study was IRB approved.
Methods: 85 patients (34 female, 51 male, 39 pediatric) were reviewed that received the skin substitute, a porous synthetic copolymer membrane, in 238 applications to their 2nd ºburns (superficial and deep). Debridement was performed in the operating room or under anesthesia in the treatment room. Wound bed preparation was achieved by dermabrasion or hydrodissection or thin Weck® blade excision. The skin substitute was applied and an outer dressing was applied. The outer dressing was removed regularly. The wound bed was followed through the translucent membrane. The dressing separated spontaneously after epithelialization was complete.
Results: All wounds in this series healed without grafting. Our infection rate was 3.5%. Time to epithelialization was accelerated compared to similar wounds treated with other methods (12.05 days vs 14 vs 22). 8.2% wounds progressed partially to full thickness. No integration into wound beds was noted. The only complication was severe itching. Pain was rated at 1.9/10 throughout the treatment period. Hypertrophic scarring developed in 6 patients =10% (vs. 23% with other treatments)
Conclusions: The application of this skin substitute to 2nd degree wounds offers a simple option of treatment with better outcomes and less pain. Overall cost was comparable to cream dressing changes, considering less frequent dressing changes, less pain medication and lower infection rate.

P199

Influence of early admission to the Burn Care Department on the final results of the frostbite treatment.

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Objectives: The seasonal and incidental occurrence of frostbites, as well as specific population involved provokes a negligent approach in assessment and management of this group of patients by the medical personnel from the point of view of timing and type of successive therapeutic activities. Basic procedures, such as thawing and adequate pharmacological therapy, implemented as soon as possible, significantly decrease the number of amputa-

tions. The goal of this trial is to determine the influence of the timing of admission to the Burn Care Department on the amputation rate.
Methods: 43 frostbite patients included to the trial were divided in 3 groups depends on the day of frostbite/day of admission ratio: 0-1 day, 2-5 and >5 days. The estimation of amputation incidence was done in each group, considering only the fact of executed amputation. The assessment of frostbites was only clinical. No tPA (tissue plasminogen activator) substances were applied. On admission all patients have II-III-IV grade frostbites with haemorrhagic or transparent-filled blisters, flaked nails or necrotized tissues in different stage of inflammation.
Results: Patients admitted to a Burn Care Department within first 24 hours have the lower rate of incidence of amputation-26,7%, comparing with a group of those who admitted in 2-5 days - 40% and after 5th day – up to 87 %.
Discussion / Conclusion: The amputation rates mentioned above are comparable with those from literature. According to the recent data published applying of tPA in first 24 hours noticeably increase the survival of affected tissues up to 90 %. Despite of significant technological progress in medicine the outcomes of treatment of frostbites depends not only on appliance of modern diagnostic methods or novel thrombolytic or inhibitor substances. The neglect of procedures of adequate thawing, basic pharmacological therapy and wound management leads to disappointing results.

P200

First experiences with a nanocellulose-based material (Epicite) for donor sites and dermal burns
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Objective: Report on the first experiences with a nanocellulose-based material as part of a single center prospective trial
Methods: Single center prospective clinical trial (ongoing recruitment)
We included the following parameters in our assessments: Hollander Wound Scale, Vancouver Scar Scale, Visual Analogue Scale, duration and frequency of dressing changes, time-to-healing, etc.
Results: All patients in the donor site group (ongoing recruitment, n=6 in 2/2017) or taking part in the superficial dermal burns assessment tolerated the material well, no adverse reactions were observed. Further results of differences in pain assessment, frequency of dressing changes, and time-to-healing will be presented.
Conclusion: The nano-cellulose based material (Epicite) exhibits excellent dressing properties and is a promising candiadate for future applications in burns, including the capability of being a drug-delivery/carrier system for local antiseptics, and the likes.

P201

The effectiveness of the MolecuLight i:X Imaging Device in the management of bacterial load in burns patients.
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The moleculight camera is a new technology which allows to real-time imaging of bacteria in wounds utilising autofluorescence. When wounds are illuminated by violet light, endogenous collagen in the connective tissue matrix emit a characteristic green fluorescent signal (#_ENREF_7), while some bacteria emit a unique red fluorescence signal due to the production of endogenous porphyrins and other bacteria emit a unique cyan fluorescence signal due to the production of endogenous pyoverdine. 30 burns patients were imaged at various points during their treatment (during dressing changes) using the moleculight camera.12 did not have bacterial contamination based on their images and swab results. 18 had growth of *Staphylococcus aureus*, *Pseudomonas aeruginosa* or other bacteria. These findings were supported by typical signs and symptoms of infection, moleculight images and microbiology results. This research has significant implication for improving overall healing because by detecting bacteria. We may be able to prevent critical colonisation, infection and sepsis. Early intervention could reduce the likelihood of graft failure, and determining the accurate bacteria will target antibiotic therapy and prevent antibiotic resistance. The moleculight camera provides guidance for clinicians in regards to the following: highlighting bacteria, identifying the type of bacteria to be treated and pinpointing the location of the colonisation for more accurate swabbing. The camera also has the potential to greatly reduce the number of antimicrobial dressings utilised by targetting the use of thse dressings more intelligently.

P202

Efficacy, safety and costs of 0.1% Timolol gel in healing split-thickness skin grafts donorsite. A Prospective case-control study
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Introduction: Split-thickness skin graft is one of the most commonly performed procedures in plastic and burn surgery, and effectively creates a secondary wound at risk for infection or delayed wound healing. The aim of this study was to assess the efficacy and safety of topical 0.1% tim-

ololol gel in promoting wound healing in split-thickness skin graft donor sites.
Methods: We designed a prospective case-control study to evaluate the effects of 0.1% timolol gel in healing skin graft donor sites when compared to paraffin gauze. A total of 42 burn patients were treated with either daily dressings with 0.1% timolol gel (1 fingertip unit every 2 cm^2) and paraffin gauzes (case group), or to dressings every 4 days with paraffin gauzes (control group). Healing time, infection rate and patient's pain perception were assessed by a blinded physician. Costs were evaluated in both groups. Vancouver Scar Scale (VSS) and patient satisfaction VAS were recorded at the 6 months follow up.
Results: A statistically significant improvement in terms of healing time was found in the timolol group (mean 6.4 days vs 12.7 days in the control group). The infection rate was the same. Significantly decreased pain perception was recorded in the case group. Total cost of the treatment was significantly higher in the case group. At the 6 months follow up VSS and patient VAS were significantly lower in the case group.
Discussion: The role of topical beta-blockers in promoting wound healing is currently emerging in the literature. Various approaches to optimize the healing of split-thickness skin graft donor sites have been described, including back-grafting; however no clearly superior and easily applicable method has gained wide acceptance in daily practice. 0.1% timolol gel may represent a commercially available, safe and simple, painless and moderately expensive treatment for improving skin graft donor site healing.

P203

Using of stem cells technology for accelerate regeneration of deep burns.

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Aim: to study dynamics of wound healing after excision of necrotic tissue and perform grafting using coatings with the inclusion of allogeneic mesenchyme stem cells.
Methods: 26 patients were under our supervision during 2015-2016 with Ð†Ð† b-III degree burns from 10% to 30% TBSA.
The main group consisted of 14 patients, deep burns were excised on 2-7 days after injury, the wounds covered with xenograft primarily, mesh autografting performed on 10 day and coated with mesenchyme stem cells. Cell preparation consists of mesenchyme stromal cells cultured human adipose tissue, it is designed for application in the form of the surface of the dermal equivalent. Deep burn necrotic tissues were excised in 12 patients comparing group for 2-7 days after injury. The wounds were covered xenograft. Mesh autograft performed on 6-10 days.
Results: Regenerative processes were activated in the wound by using bioplastic matrix - cellular complex: epithelialization of perforations holes in the mesh graft accelerated by 1.5 times, area did not take root grafts decreased by 1.3 times,
number of local infection was reduced by 10%. Capillary blood burn wound area showed that there is an earlier decline (by 3.2±0.3 days) of inflammation in the affected area and attracting neutrophils to the wound with a higher functional activity in patients of the main group.
Conclusions: Using bioplastic matrix-cellular material is reasonable and effective in stimulating the functional processes historegeneration. This reduces the risk of infection and allows a 1.4 times improved results autograft.

P204

The miracle of manuka honey

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Objectives: Honey as a wound treatment has been used for thousands of years. Recently its use in burned patients is generating much expectation for its miraculous results.
Methods: We present our experience in the use of medihoney (in the form of gel and hydrocolloid) for both post-nexobrid treatment and superficial burns directly.
Since July 2015 we have treated 48 patients in our unit, in 16 we have used its gel form for facial burns and in 36 its hydrocolloid form for body burns.
Results: The results obtained with its use both in skin quality and in time of complete epithelization, as well as in comfort for the patient in performing cures, make it a star product in our therapeutic arsenal, having made our unit a protocol of use for facial burns that is currently applied throughout Spain
Conclusion: Medihoney is cheap, simple to use, pleasant for the patient and with very promising results both alone and in combination with nexobrid.

P205

Alloplastic skin substitute* dressings in treatment of donor sites in children with burns

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Objectives: Treatment of patients with severe burns remains a serious problem. The aim of this study was to investigate the efficiency of alloplastic skin substitute dressings on pain syndrome and epithelization of donor sites in burned children.
Methods: Twenty-four patients with 2-3 degree burns up 3% to 15% of body surface were studied. Patients were treated in Burn Center from 1 January to 31 December

2016. Split grafts were isolated with disc dermatome. Thickness of grafts was 0.3-0.4 mm. SUPRATEL[R] was placed on donor wounds in 11 patients. In control group (13 patients) one-level gauze ointment dressings were used. Patients age in SUPRATEL[R] and control group did not differ (11.9±3.36 vs 14.2±4.94 months, Z=-1.2, P=0.23).

Results: In SUPRATEL[R] group the dressings were not removed until complete epithelization of donor wounds and changing of SUPRATEL[R] dressings was not necessary. In control group changing of dressings was needed in 4 patients. The Study has proved that in case of use of alloplastic skin substitute SUPRATEL[R], median epithelization time was 5.7±1.01 days, in control group - time was 8.7±1.49 days (Z=-3.8, P<0.001). According to Verbal Descriptor Scale expression of pain syndrome was less in SUPRATEL[R] group than in control group (1.5±1.04 vs 5.2±0.9 respectively, Z=-4.1, P<0.001).

Conclusions: Our study has shown that use of alloplastic skin substitute SUPRATEL[R] is effective in treatment of donor wounds in pediatric burns. Time of epithelization is shortened and pain syndrome is reduced.

[*-] Alloplastic skin substitute - SUPRATEL[R]

P206

Use of the new atraumatic mesh dressing with Beeswax* in the treatment of III degree burn wounds

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Aim: to evaluate the efficiency of Ð°traumatic dressing with beeswax and povidone-iodine ointment for the local treatment of burn wounds of III degree after surgical necrotomy.

Materials and methods: the study included 40 patients with burns of III degree, with a burn area 10-20% TBSA. 20 patients were included in group I. For these patients after necrotomy and thorough hemostasis postoperative wounds were closed with atraumatic mesh dressings containing povidone-iodine. The dressings is effective against gram-positive and gram-negative bacteria, fungi, viruses and some protozoa. Iodine-povidone complex provides gradual release of iodine. The mesh structure provides a draining effect for the wound exudate with good air permeability. Beeswax, which impregnates the dressing, contains a large amount of aminoacids, minerals and vitamins. So, the dressing ensures the creation of unique internal environment, which provides a stimulating effect on the reparative processes in the wound. 20 patients were included in group II. The wounds after surgical necrotomy were treated in the traditional way using dressings with ointments.

Results: In the group I wounds were prepared for autodermoplasty within 5-6 days after surgical necrotomy. Within these 5-6 days we only once changed the dressing with povidone iodine, the change was Ð°traumatic, painless, required no additional anesthesia. In the group II it took 7-10 days to prepare wounds for autodermoplasty. Dressing changes in the group II were painful, we had to perform them daily. In the group II in 83% of cases we revealed growth of mixed microflora, while in group I - only in 23% of cases.

Conclusions: the dressing with beeswax and povidone-iodine ointment showed its high efficiency in the treatment of burn of III degree after surgical necrotomy, reducing the time of preparation for skin grafting and decreased the risk of development of local infectious complications.

* VoscoPran with povidone-iodine ointment

P207

The use of Silver-Containing Hydrogel wound dressings* in the treatment of burn wounds after necrectomy

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Objective: To evaluate the efficacy of silver-containing hydrogel dressings in the postoperative management of burns.

Materials and Methods: The study included 20 patients aged between 20 and 60 years with burns of II-III degree with the affected area from 7% to 10% of total body surface area (TBSA). Group I included 10 patients. Postoperative wounds after necrectomy were treated with hydrogel dressings. In the other group of 10 patients (group II) the wounds after the necrectomy were treated in the traditional manner by dressings with fat-soluble ointments.

Results: Dressings used in the group I provide an optimal moist wound environment and moderately absorb wound exudate, The upper layers of the wound surface did not dry up. There were no signs of bleeding from postoperative wounds including diapedesis bleeding. Transparency of the dressings allowed to monitor the wound without removing them. Wounds turned prepared for the autodermoplasty within 6-7 days after necrotomy.

Due to their structure the hydrogel dressings didn't stick to the wound bed, and the dressing changes were painless: pain assessed 2.5±1.1 points by visual analogue scale (VAS). Hydrogel dressings showed good bactericidal properties for the content of colloidal silver. In no case generalization of the inflammatory process was observed.

In the group II the wounds were prepared for autodermoplasty only in 9-10 days. Dressing changes for the patients

of the group II were painful, took place with the use of analgesics, level of pain was 6.1±0.5 points. In 50% of cases in the group II the presence of copious purulent discharge was noted.
Conclusions: Hydrogel silver-containing dressings were shown to be highly effective in the treatment of burn wounds after necrectomy, they reduce the time of preparation the wounds for autodermoplasty and minimize the risk of local infection.
*GelePran

P208

Use of alloplastic temporary skin substitute* in the treatment burn wounds of II degree
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Objective: to evaluate the efficiency of alloplastic temporary skin substitute * in the treatment of patients with burn wounds of II degree after debridement.
Material and method: the study included 7 patients with II degree burns on the area from 3 to 5% TBSA (an average of 4.2%), aged from 28 to 55 years. All patients on 3-4 day from receipt of debridement was performed under anesthesia within the living dermis. During the operation, performed a careful hemostasis. Further postoperative wounds were closed alloplastic temporary skin substitute* and a single layer sheet of fatty gauze dressing, which fixed with a bandage. All patients received antibacterial therapy. The effectiveness of alloplastic temporary skin substitute* in the topical treatment of postoperative burn wounds evaluated on terms of its healing, the incidence of purulent complications, number of dressings, according to the degree of severity of pain.
Results: the 6 patients had favorable course of early postoperative period (the absence of suppuration, discharge from the wound, the temperature of the reaction, pain). Therefore, the first ligation was made by 7 days after debridement. Were removed only the surface layers of secondary casts over the alloplastic temporary skin substitute *. The second ligation was performed on 13-15 day, when it was against the backdrop of biodegradable coatings complete healing has taken place. All wore bandaging painless nature and did not require anesthesia.
In the one patient was noted accession secondary infection, necessitating daily dressings with antiseptics, antibacterial therapy has been strengthened. Complete wound healing came only on the 23 day. Pain in this patient during dressing changes were more pronounced pain in group II was more pronounced.
Conclusion: application of innovative alloplastic temporary skin substitute* in the treatment of patients with burns of II degree efficiently and economically feasible.
Suprathel®*

P209

Optimization of storage conditions when banking autologous split-thickness skin grafts
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Objectives: Storage of autologous split-thickness skin grafts (STSG) is a standard method with acceptable results. Numerous different nutritional media are used. The arbitrarily maximum storage time is considered to be approximately 4 weeks. It is well known that there is a successive deterioration of viability and thus graft take with storage time paralleled by a transition from viable grafts to more of a biological dressing. The aim of this study is to explore an optimal storage medium yielding the highest number of viable cells at the time of re-transplantation. In the first step in this project we examined different nutritional fluids used for banking of autologous STSGs.
Methods: Ten nutritional fluids used *in vitro*, clinically, or based on theoretical reasons. Cultured human keratinocytes from healthy donors were diluted to $1*10^6$ cells/mL in various nutritional fluids and stored at 4-7° C for up to 30 days. Sampling was done at day 1, 4, 8, 14, 21, and 30 in storage. Evaluation included cell count, viability, visual check for cell aggregate and ability to resolve.
Results: The procedure was repeated four times. The summarized data at day 30 showed 2 nutritional fluids with 10% or more viable cells (McCoy´s 5A, RPMI 1640), 3 nutritional fluids with 5-9% viable cells, and 5 nutritional fluids with less than 5% viable cells.
Discussion: Over all there were, as anticipated, quite few viable cells after 30 days of storage in all nutritional fluids. For all medias a rapid decline in cell number was seen during day 1-8 and subsequently the reduction was reduced, wherefore days of storage is a central parameter. The aim of this project is to prolong the time viable STSG can be stored and maintain take rate. The project will continue with further studies on different storage media using keratinocytes and human STSG.

P210

Enzymatic debridement of chronic wounds: Preliminary results
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Objectives: Chronic and hard-to-heal wounds represent a major health burden, contributing to substantial disability, morbidity and cost (2-4% of the health care budget). Cur-

rently, non surgical means for wound bed preparation (WBP) used are slow and/or inefficient. There is an unmet need for a fast and effective WBP agent. We present the first proof of concept study assessing the efficacy and safety of NexoBrid® (NXB) in chronic/hard-to-heal wounds.
Methods: A prospective, single arm, multicenter, preliminary study assessing the safety and efficacy of NXB in chronic, hard-to-heal wounds of different etiologies. Patients were treated with consecutive 4 hour applications of NXB until sufficient WBP for wound closure by surgical or not surgical means as judged by the investigators.
Results: Twenty-four patients were included, suffering from wounds due to venous insufficiency (n=6), post traumatic necrosis (n=6), PVD (peripheral vascular disease) (n=4), diabetic foot ulcer (n=1), pressure sore (n=1), and necrosis post: surgery (n=3), lymphedema (n=2) and chronic steroid treatment (n=1). The gross NXB efficacy in all patients was 68% WBP in an average of 14 hours exposure (HE). WBP was found to be more effective in venous insufficiency (82% WBP, 17 HE), post traumatic necrosis (90% WBP, 7 HE), lymphedema (78%WBP, 22 HE), diabetic foot ulcer (95% WBP, 8 HE), pressure sore (95% WBP, 8 HE), and chronic steroid treatment patients (70% WBP, 12 HE). NXB was less effective in PVD with dry adherent eschar (< 30% WBP, 12 HE per patient) and post surgical dry adherent eschar (< 40% WBP, 21 HE).
Conclusions: NXB enzymatic debridement was found to be effective in most etiologies of chronic wounds. Additional studies with larger numbers of patients in each etiology are needed in order to more accurately establish the clinical potential in chronic wounds.
Funding: by MediWound Ltd.

P211

A clinical implementation of in house produced acellular dermal matrix (ADM) inhabited by in vitro cultured cells - case series.
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Objectives: An acellular dermal matrix (ADM) can be repopulated *de novo* by autologous or allogeneic skin cells. The goal was to evaluate a new burn treatment methods based on usage of self produced human biovital skin substitute.
Material and methods: 6 patients were selected for the study (5 females, 1 male; average age 50.8 years). All patients were thermally burned and treated with allogeneic, biostatic skin grafts and in-house produced ADMs revitalized with autologous or allogeneic fibroblasts and keratinocites or allogeneic amnion derived mesenchymal stem cells. Allogeneic, biostatic skin grafts were used as a control. Cells were suspended in autologous platelet leukocyte rich gel PLRG or in buffered saline PBS. Photographic documentation was executed as well as histological and microbial examination.
Results: Photographic and histological images depicted a burn wounds in the appropriate healing progress.
Discussion / Conclusions: The presented method for burn treatment may be the optimal method for burn wound therapy. However, it requires increased number of samples to perform statistical analysis of the results.

P212

Extensive use of Negative Pressure Wound Therapy (NPWT) in severe burned patients
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Negative pressure wound therapy (NPWT) has transformed the management of acute, sub-acute and chronic wounds within the last 25 years.
In the last 10 years the conceptual and wide use of NPWT in large burns was strictly pursued at the Burn Center Murnau. We will provide an overview on this treatment and why NPWT has become standard in our management of large burn injuries.
The retrospective analysis included 520 patients with burn injuries (TBSA up to 90%) treated with NPWT. NPWT was used during all steps of burn treatment from the initial debridement up to the final defect coverage with skin grafts. Intensive care parameters and surgical parameters of tissue repair were recorded during the complete intensive care phase of all burned patients. These parameters were compared to data of burned patients who got conservative wound treatment.
Significant reduction of redressing was shown in all patients with severe burn injuries treated with negative pressure wound therapy. The need of catechoamines and pain medications could be reduced extraordinarily. Furthermore outstanding wound conditioning, as well as excellent take rate after split thickness skin grafting was observed.
Intensive care parameters and surgical parameters of wound healing showed large burned patients treated with negative pressure wound therapy to be more stable than patients treated conservatively.
In conclusion negative pressure wound therapy has shown to be an excellent option especially in treatment of severe burn patients from the initial debridement up to the final step of split thickness skin grafting.
Key-words: burn injury, negative pressure wound therapy, intensive care

P213

Delayed Use of Polylactide-Based Copolymer (Suprathel®) for Pediatric Partial-Thickness Burns: An Option For 'Difficult-To-Decide' Cases

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Objectives: Many partial-thickness burns in children lead to confusion whether they are superficial or deep. In these cases, optimal decisions are achieved during the first 1-3 weeks postburn. Polylactide-based copolymer (Suprathel®) is successfully used for superficial dermal-burns and following surgical-debridement for deeper ones. This study aimed to document the outcomes of delayed outpatient use of Suprathel® in 'difficult-to-decide' cases.
Methods: From 2013-2016, 47 pediatric burn victims were treated with Suprathel® following outpatient burn wound-care including non-surgical debridement methods. Data collected for each case were age, sex, burn cause, burns extent, burn depth, body sites affected. Time between occurrence and admission; time between admission and Suprathel® application; time between injury and completion of epithelialization were evaluated. Numbers of Suprathel® applications, surgical debridements, split-thickness and full-thickness skin-graftings (STSG/FTSG) and reconstructive surgeries; requirements of physiotherapy/ splints were documented (mean±SEM).
Results: Mean age was 5.14±0.81 (range,0-17). Male:female ratio was 0.68:1. Mean TBSA burned was 3.18±0.4% (range, 0.5-13); partial thickness burns were 2.9±0.4% (range, 0.5-13). The most common cause was scalds (72%, n=34). Suprathel® was applied to hands in 18 (38.3%), feet in 15 (31.9%), and genitalia in 2 (4.3%) cases. Although head and neck were involved in 14 cases (29.8%), Suprathel® was applied to 2 (4.3%). Mean time between occurrence and admission was 1.6±0.36days (range,0-10). Mean time between admission and Suprathel® application was 6.5±0.64days (range,0-19), mean time between occurrence and completion of epithelialization was 17.4±1.08days (range,5-34). Only Suprathel® was applied in 31 patients (66%). Eight (17%) underwent surgical debridements, 3 underwent STSG(1)/ FTSG(2). Fifteen (31.9%) required physiotherapy, 5 of them used splints. Two underwent reconstructive surgery in the long-term.
Conclusions: Outpatient wound-care with non-surgical debridements followed by suprathel® application is a functional option for 'difficult-to-decide' partial-thickness burns in children. This method seems to prevent exaggerated surgical approaches which may lead to painful and uncomfortable overtreatment courses.

P214

Use of Dermapace® and Medihoney® gel as a combination therapy in the treatment of complicated diabetic foot burns

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Objectives: Present our experience in the management of diabetic foot burns with the combination of Medihoney® wound gel and Dermapace® in three adult patients.
Methods: We present three cases of diabetic patients with complicated deep foot burns that were admitted in our burn unit between February and December 2016. The three patients had been treated in other centers for more than one week, and one of them had cellulitis signs. We used Dermapace® twice a week (a medium of 9 sessions / patient) and dressings with Medihoney® wound gel changed every 3 days.
Results: The three patients healed uneventfully within one and two months and all of them present a stable skin coverage and have returned to their daily activities.
Discussion: The peripheral neuropathy of diabetes mellitus leads to a loss of heat pain, warmth and cold sensation, so adult diabetic patients have an increased frequency of foot burns. Due to the neurovascular changes associated, burns in these patients are usually deeper and difficult to heal; furthermore, they associate a high risk of infection and may lead to amputation of the extremity.
The clinical evidence in support of the effectiveness of honey in wound care has been reported by many authors. It promotes debridement of necrotic tissue" and stimulates granulation tissue formation by two mechanisms: high osmolarity and low pH. Medihoney® wound gel is a patented formulation with Active Leptospermum Honey and natural gelling agents.
Pulsed acoustic cellular expression (PACE) technology has been developed based on scientific and clinical evidence of the beneficial wound healing effects of extracorporeal shock wave technology. PACE treatment stimulates angiogenesis and growth factor upregulation leading to the regeneration of tissue.
In our experience, this combination therapy is useful in the conservative management of complicated foot burns in diabetic patients, avoiding more aggressive treatments.

P215

Forearm contact burn caused by air bag deployment

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Automobile air bags have gained acceptance as an effective measure to reduce the morbidity and mortality associated with motor vehicle accidents. As more cars have become equipped with them, new problems have been encountered that are directly attributable to the deployment of the bag itself. An increasing variety of associated in-

juries has been reported, including minor burns. Various traumas resulting from air bag inï¬,ation have been reported, and among them, burns comprised 7.8% of all air bag injuries.
We present a automobile driver who was involved in front-impact crashes with air bag inï¬,ation. Superï¬□cial dermal burn was found on her upper arm, hair where the bag had contacted. The wound margin was well circumscribed and blisters were scattered across the region. Conservative dressing treatment was performed and the wound healed completely.
Most burns associated with air bag deployment are believed to be chemical due to contamination with alkaline corrosives, especially the small amount of sodium hydroxide produced in the ignition of the bag. High-temperature gases released upon air bag expulsion can cause direct thermal burns if part of the body comes in contact with the stream of the gas. Also friction burns resulting from physical contact with the surface of the air bag are possible. Tsuneyuki et al. presented a new type burn that the cause of burn was not exposure to hot gas, but direct contact with the high-temperature air bag. Usually, they are found on the face or neck of the occupant. But in our case, the wounds were located at forearm.
Fortunately, these air bag-induced burns are not severe and usually requires only conservative ointment treatment. However, proper diagnosis for the patient and correspondence for the further improvement of air bag system is desirable.

P216

Bromelain based debridement agent: introduction to our daily practise, modifications to the standard protocol and post-debridement wound dressing

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Introduction: In modern burn therapy an optimal debridement must be effective, fast and safe. At present, surgical excision followed by autografting is the standard of care (SOC) for deep burns. However, invasive surgery often results in loss of viable tissue, blood and heat. We present an early single center experience with a new Bromelain Based Debridement agent (BBD).
Methods: From May 2015 to September 2016, we treated 20 patients suffering from deep partial and full thickness thermal burns with TBSA no more than 20%.The BBD application was performed at the patient's bedside under IV analgesia, while removal was performed in the operating theatre under analgo-sedation. We modified the standard protocol of BBD application and immediate post-debridement wound dressing. After eschar removal, full thickness burns were autografted, while viable dermis and mixed wounds were treated with fatty gauze, Suprathel® or UrgoClean®. A retrospective analysis of patients treated with conservative dressings was conducted to evaluate time to wound healing and number of dressing changes.
Results: We treated 20 patients with deep partial and full thickness thermal burns, 12 male and 8 female, aged 19-76 . The mean TBSA treated was 8.7% (range 6-20%). 5 patients were autografted, 15 patients were treated with fatty gauze, Suprathel® or UrgoClean®. With regard to time to wound healing all the 3 dressings were equivalent, while patients treated with Suprathel® and UrgoClean® had a lower number of wound dressing changes.
Conclusions: In our experience, BBD proved to be an effective, fast and selective therapeutic tool for burn wound management. Our modifications to the standard protocol made BBD application easier and more practical and allowed a more effective eschar removal. Suprathel® and UrgoClean® performed better compared to fatty gauze in terms of pain relief and exudate control as a result of the lower number of dressing changes.

P217

The accuracy of burn depth diagnosis: a comparison between clinical evaluation and diagnosis by direct visualisation after enzymatic debridement

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Introduction: The evaluation of burn depth is essential in the therapeutic management of burn patient. The most common technique used to determine burn depth is clinical assessment by an experienced burn surgeon, although this has been shown to be accurate in only 60-75% of cases. We present a retrospective analysis on burn depth based on clinical evaluation compared to diagnosis by direct visualisation after enzymatic debridement.
Methods: Between may 2015 and December 2016, we collected the data regarding burn depth of patients suffering from partial and full thickness thermal burns who were treated with a new Bromelain Based Debridement agent (BBD). Burn depth was assessed by senior burn specialists at patients'admission, before BBD treatment and after BBD treatment. The decision to operate was based on post-BBD assessment of wounds. The clinical evaluation was then compared with the post-BBD diagnosis and final treatment.
Results: Between may 2015 and December 2016, 25 patients were studied (14 men, 11 women), aged 19-76. The mean TBSA treated was 9,7% (range 6-20%).Etiologies were flame (86,7%), scald (11,3%) and contact (2%). In 36% of the cases (9/25 patients) the clinical diagnosis was different from the post-BBD assessment. 5 of the 25 wounds were operated on, while 20 wounds were treated conservatively with protective dressings. Of the 20 wounds treated conservatly, 18 healed within 3 weeks with no surgical intervention, while 2 were treated with delayed excision and grafting.

Conclusions: In our study, the clinical assessment results had a similar degree of accuracy to the data in the literature. The use of BBD as a diagnostic tool of burn depth based on direct visualisation of dermal vital tissue demonstrated to be more accurate. At the same time BBD proved to be an effective, fast, safe and selective therapeutic tool for burn treatment.

P218

Comparative evaluation of effectiveness of Alloplastic skin substitute 'Suprathel' and histoequivalent-bioplastic material for treatment of burn wounds

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Objectives: To investigate effectiveness of alloplastic skin substitute "Suprathel" for treating a burn wounds.
Methods: "Suprathel" represents itself a microporous membrane, consisting of copolymer of polylactide and other polymers. In conditions of wound healing, this synthetic material performs substitute function of damaged skin and stimulates regeneration.
Aforesaid material was used in 20 patients (16 men, 4 women) for treating border and mosaic burns of II-III degrees in Burn Center of F.I.Inozemtsev City Clinical Hospital, Moscow. The average patients age was 35.7 years; the average area of burn wounds, 33.3% of body surface. Group of comparison included 20 patients whose wounds, after dermabrasion, were treated by histoequivalent-bioplastic material (membrane based on hyaluronic acid and collagen).
In the both groups, surface of wounds with simultaneous application of materials ranged from 2% to 5% of body surface.
Treatment of patients started, on the average, on 4th day after injury. Before using materials, burn wounds underwent dermabrasion by synthetic brush, electric dermatome, or hydrosurgical system "Versajet".
Results: When using "Suprathel", the time of epithelialization for border and mosaic burns of II-III degrees took, on the average, 14.8 days after injury; while, in comparison group, it took 15.6 days.
In group with "Suprathel", complete epithelialization of wounds was achieved in 18 (90%) patients; in 2 (10%) patients, partially granulating wounds were formed: which were covered by autoskin grafts. In comparison group, the same results were in 16 (80%) and 4 (20%) patients, respectively.
In group with "Suprathel", pain during dressing changes was less than in group of comparison. Study of long-term results (3 months after injury) showed good quality of newly formed epidermis and absence of pathological post-burn scarring in patients treated by "Suprathel".
Discussion/Conclusion: Application of alloplastic skin substitute "Suprathel" provides effective treatment for border and mosaic burn wounds of II-III degree.

P219

Skin ultrasound after enzymatic debridement in burn care: an objective tool for decision-making process

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Objectives: Enzymatic debridement with Nexobrid is an important tool in early treatment of deep burns nowadays. Debridement is achieved in 4 hours leaving a whitish wound bed after its use. Different protocols in management of the wound bed is done in burn care units with some cases having spontaneous epithelialization while others end up necessitating skin grafts.
There is still no objective tool to assure the success of the debridement, as the wound bed may resembel an eschar to the untrained eye, leading to misjudgment on the efficacy of the product and management of the patient. The development of an objective tool to measure the thickness of the remaining dermis may help in decision-making protocols and thus better outcomes.
Methods: Real time ultrasonography (US) of the skin using high frequency probes (18MHz) was done in 15 burn patients, 12 hours after enzymatic debridement with Nexobrid, providing accurate images of the skin. We measured thickness of the dermis in non-burned skin areas and compared it to the thickness of similar debrided areas.
Results: All skin US showed less dermal thickness in Nexobrid treated areas versus identical non-burned areas in the same patient. Though in all cases the visual diagnosis resembled an eschar, in one case there was practically no dermis and in another one, US diagnosis showed a real eschar. Both patients ended up with skin grafts after some days. When sufficient skin dermis was present, all patients healed spontaneously.
Conclusion: Ultrasound evaluation may provide an objective method for follow up studies and for the assessment of the response to enzymatic debridement with Nexobrid. Skin thickness measurement could be instrumental in providing objective parameters to help predict chances for spontaneous epithelialization or need for early skin grafting.

P220

1% Acetic Acid solution for burn wound care

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Objectives: The aim of our research was to evaluate antimicrobial efficacy and cytotoxicity of 1% Acetic acid solution (AA1%), which is often used for burn wound care in our burn centre.
Methods: The antimicrobial efficacy testing was performed on in vitro burn wound models inoculated with of one of 7 multidrug-resistant bacterial strains (*P. aeruginosa – 2 strains, S. aureus, S. haemolyticu, E. coli, E. faecalis and A. baumannii*). All the bacteria were originated form burn wounds of our burn patients. Four different wound models were prepared using modified method by Hammond et al.: A. wound 30 min following bacteria inoculation B. 4 hrs following inoculation C. 6 hrs following inoculation D. 24 hrs following inoculation
AA1% solution was applied into the models and its efficacy was observed after 24 hrs.
The cytotoxicity tests were realized in cell and tissue bank laboratory using method by Vittekova et al.[2]. The effect of AA1% solution on two live cell systems – murine 3T3 cells and dermal fibroblasts was observed. Results obtained were compared with the control samples (sterile gauze and 20% Sodium dodecyl sulphate).
Results: AA1% solution showed excellent antimicrobial efficacy in models A,B,C inoculated with bacterial strains including *P. aeruginosa* , *S. haemolyticus* and *A. baumannii*. However, it was absolutely ineffective against bacteria in model D. This finding was observed in all the tested bacteria.
As for the cytotoxicity testing, the results obtained were very positive. The effect of AA1% solution on both cell systems was similar than of sterile gauze - no cytotoxicity was observed.
Conclusion: Topical antimicrobial agents are essential in burn wound care. There is an enormous variety of products; however their properties may be different. 1% Acetic acid solution could be a cheap and effective alternative thanks to its antimicrobial activity and no cytotoxicity.
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P221

A prospective study comparing flir one with laser doppler imaging in the assessment of burn depth by a tertiary burns unit in the United Kingdom

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Introduction: Laser Doppler Imager (LDI) is the "gold standard" tool for burn depth assessment. It is costly, requires a skilled operator and incurs maintenance costs. The FLIR ONE is a novel infra-red thermal imaging camera attachable to mobile, used to assess burn wound temperature. Our study evaluates its clinical effectiveness and compares the FLIR ONE with LDI in the assessment of burn depth and its accuracy in predicting healing times within 3 weeks.
Methods: Images of the burn wounds between 1 and 5 days were taken using both the FLIR ONE and Moor LDI. Patients aged 16 years and above were included in study. Infected, chemical and electrical burns were excluded. Healing potential was categorised into wound healing in less than 3 weeks and wound healing in over 3 weeks. Healing potential was determined by changes in wound temperature and blood flow when assessment was performed by the FLIR ONE or the MOOR LDI respectively. Pearson's test was used to determine correlation between burn wound temperature and healing potential.
Results: 25 patients were included in the study. %TBSA ranged from 0.25 to 45. With regards to predicting healing potential of <3 weeks, FLIR ONE had comparable sensitivity to LDI (94.12% vs 94.12%) but lower specificity compared to LDI (37.5% vs 50%). Pearson's test showed no correlation between minimum wound temperature with healing times (r=0.1746) and between temperature difference between minimum wound temperature and normal skin with healing potential of 3 weeks or more (r=0.1487). These were not statistically significant.
Conclusion: At £189 per FLIR device, no maintenance costs, instantaneous images and easy portability, there are clear advantages over the LDI device. However, our experience with the FLIR ONE shows poor correlation between temperature changes and healing potential in assessing burn depth and predicting wound healing within 3 weeks.

P222

The use of Suprathel® Skin Substitute for Partial Thickness Burns in a UK Regional Burns Centre

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Introduction: We aim to present our experience with the use and effectiveness of Suprathel®, a synthetic skin substitute, in a range of uses in burn practice for partial thickness burns in children and adults.
Methods: Retrospective analysis of medical case notes from Jan 2014 to Feb 2017. The study evaluated re-epithelialization time, grafting, wound colonization, infection, length of hospital stay (LOS), wound over-granulation and hypertrophic scar formation. Suprathel® was applied after debridement, followed by Vaseline gauze or Silicone dressings, betadine gauze and bandages. Outer dressings were changed every 2 days unless Infection dictated otherwise.
Results: Eighteen patients (mean age 12.15 years, range

1–54) with a mean total body surface area (TBSA) of 9.7% (range 2.5 - 21) were included. 7 cases were superficial partial thickness, 11 cases were mixed depth with mid-deep dermal components. Median LOS was 9 days (range 2 - 26). Median re-epithelialization time was 15 days (range 9–48). 7 patients took over 21 days to heal. One patient developed hypertrophic scarring. 4 patients developed wound over-granulation. Suprathel® was applied to donor site in one case and directly to burn wound in 17 cases. 8 cases underwent Versajet debridement prior to application. Suprathel® failed to adhere in one case. Three patients needed further split skin grafting to areas initially managed with Suprathel®. 16 wounds were colonized during treatment, with 4 developing wound infection clinically.
Conclusions: Suprathel® is a versatile dressing solution for adult and paediatric patients suffering from burns. The different potential uses have learning curves for the multidisciplinary team. Suprathel® has the advantage that it may also be used to treat mid to deep dermal burns. In patients with extensive burns, Suprathel® can be used to cover the deep dermal burn wounds to prioritise skin grafts and their donor sites for full thickness burned areas.

P223

A Review of Face Care Treatment Products for Partial Thickness Injuries at a UK Regional Burns Centre

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Introduction: Wound closure not only reduces potential pain and infection risk but the face is a highly aesthetic feature and is managed less aggressively than burn wounds elsewhere in the body because of the rich vascularity. There is insufficient high quality evidence to enable conclusions to be drawn about the topical effects of wound healing in facial burns. This study aimed to differentiate the time to wound closure between various treatments and to record microbiology colonisation.
Methods: Medical case notes were reviewed for 109 patients with partial thickness facial burn wounds in adults at a regional burns unit in the United Kingdom from 2/04/2015 to 30/03/16. Burn causes included scalds, flame, flash, chemical and contact. The following topical treatments were compared; Polyfax®, GlucanPro® and soft yellow paraffin. Time to re-epithelisation and microbiological colonisation were recorded. Statistical analysis was performed using GraphPad software.
Results: 29 patients were treated with GlucanPro®: 18 (62.1%) healed <14 days, 5 healed >14 days. 6 had no reported healing time. 12 (41%) had positive microbiology. 24 patients were treated with soft yellow paraffin: 15 (62.5%) healed <14 days, 2 healed >14 days. 7 no reported healing time. 7 (29.2%) had positive microbiology. 17 patients treated with Polyfax®: 10 (58.2%) healed <14 days, none healed >14 days, 7 had no recorded data. 2 (11.8%) cases had positive microbiology.There was no statistical significance identified between groups.
Conclusion: There is currently a plethora of face care options available with a lack of high quality evidence to determine which products are superior. Therefore choice of dressing is usually determined by the clinician or nurse caring for the patient. This study found similar healing rates under two weeks between treatment groups. We found Polyfax® had the lowest percentage of positive microbiological colonisation rates however this was not found statistically significant.

P224

Outpatient Minced split-thickness skin grafts for burn wounds

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Objective: we wanted to explore the option of minced split-thickness skin grafting under local anesthesia in outpatients. The costs of grafting under general anesthesia, keeping the patients at the hospitals, are very high. We also want to see if the technique is easy to performer, is painful and consider the benefits of a smaller donor site.
Methods: nine burned areas were grafted. We used a non-powered, hand-held, dermatome and a non-powered, hand-held mincer was used for each procedure. The skin was expanded 10 times after mincing. The split-thickness skin graft was 12/ 1000 inch (.3mm) thick and was minced into .8 mm x .8 mm pieces. The minced skin was applied evenly to the wound surface with a spatula without regard to the orientation of the individual pieces (dermal side up or down). The grafted areas were covered first with an interface of multiperfurated silicone dressing and then with a 3mm thick layer of hydrogel over the burn wounds. A foam controlled hydration dressing was placed on top of this. Every two days post operatively, the foam and the hydrogel were changed without disturbing the interface dressing.
Results: The nine burn wounds were completely reepithelialized at 2 weeks. There were no adverse effects from the any of the treatment components. The patients referred no pain and were very pleased with the small donor sites and the fact that this could be done on an outpatient basis.
Discussion /conclusion: Compared with the others methods we used before, always keeping the patients at the hospital we found this new method easy to perform and concluded in this limited study of micrografting that it seems to be a useful and simple technique for outpatient skin grafting with a high success rate at a lower cost. We are already doing on bigger prospective study.

P225

Epicite-hydro, new dressing helper in the wound bed preparation in full thickness burns

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Introduction: The patients with full thickness burns require a deep excision, and need a special coverage like a dermal regenerators or cadaveric skin at the initial stage and for wound bed preparation that will finally be grafted. However, this kind of dressing represents difficulties from cost, availability and delay in treatment definitive. For these reasons, it is important to explore new technologies that promotes coverage, moisture to the wound, among others.
Objective: To present the small experience with Epicite^{hydro}, to their income to the burn unit we did not have cadaver skin or Integra to offer to that patients, in order to previously experience a wound dressing that consists of a nonwoven 3D network of pure cellulose fibers and a high moisture load. The specific network pattern, which is superior to comparable dressings, is derived by a unique biotechnological process of production and prevents cell adhesion
with the wound and less pain during usage.
Materials and Methods: 3 patients with areas between partial thickness and full thickness.
Results: The age of patients varied between 7 and 17 years. There were 3 boys. TBSA involvement varied between 22 to 35%, and the full thickness area were almost 20% of TBSA. We made a fascio-cutaneous scarectomy with electrocautery or cutaneous resection with versajet, hemostasis and applied the Epicite^{hydro}; after 5 to 7 days removed it dressing, and applied autograft because the wound bed was in optimal conditions.
Conclusions: We have a big problem with the immediate availability of cadaver skin or dermal regenerator for patients with full thickness burns. That's why the use of this new dressing that promotes the wound bed preparation has been an(d) excellent dressing. We need a prospect and comparative study, with more patients to conclude and give us demonstration of the real benefit of this product.

P226

Initial experience with the first application of allogenic skin grafts for acute burns in Croatia

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Objectives: Authors' very first experience with application of glycerol preserved allografts (GPAs) in acute burn treatment applied in a 7-year-old boy with 93% TBSA 3rd degree flame burn.
Methods: After excision of the necrotic tissue during the initial 4 days, INTEGRA DRT was applied on the extremities. Given the fact that the take rate of INTEGRA DRT was around 30%, allogenic skin grafts were imported from the Banc de Sang i Teixits - Barcelona and grafted onto the wound bed, 14 days after the patient's admission. Donor sites on the scalp and the foot were covered with amniotic membranes (AM) from the local Tissue Bank. During 4 months of hospitalization, GPAs were applied 6 times (7,000cm^2),
Results: AM promoted faster healing in small areas of IInd degree burns. Cadaveric skin grafts enabled the preservation of the wound bed for subsequent autologous skin grafting combined with cultured epithelial autografts (CEA). CEA were applied in preconfluent phase with two-component fibrin glue (Tisseel, Baxter).The take rate after wound bed conditioning with allogenic skin was around 90%. An episode of mold infection occurred on the area covered with allogenic skin what prompted immediate removal of the grafts and initiation of antifungal therapy.
Discussion: Allogenic skin grafts provided a beneficial temporary wound dressing and enabled a very satisfying take rate of autologous skin grafts. Treatment of the patient is continuing with uncertain outcome.

P227

Controlling infection in a complex burned patient with Betaine-Polyhexanide in gel: An alternative wound bed preparation method for grafts

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Objective: Infection is responsible of a high rate of mortality among burned patients. Our aim is to assess the effectiveness of betaine-polyhexanide in gel to reduce signs of infection in a complex burned patient, prepare the wound bed for grafts, and diminishing the use of antibiotics.
Material and Method: Case report to describe the effect of betaine-polyhexanide in gel. Female patient (29). Pregnant (8 weeks). Assaulted in her home resulting burned (AB-B) on face, neck, thorax and arms. 17.5% BSA. Initial management performed in a rural hospital where patient revealed inhalational injury. Transferred 9 days later in critical condition to a national reference center for burned. Deep infection managed with one only surgical cleaning. Continued with advanced wound care during three weeks, changed dressings three times per week: Soaked gauzes with betaine-polihexanide solution left over the wounds for 10 minutes. Primary dressing: gel of betaine-polyhexanide. Secondary dressing: polyurethane non-adhesive, semi-permeable and transparent film.
Resulst: Despite of the critical condition, infection control is achieved. Negative tissue cultures and suspension of

antibiotics. 80% of epidermal tissue covered the burned areas and the rest were grafted successfully. 95% of the grafted areas showed excellent adherence. Very good esthetical and functional outcomes. Early discharged. Patient is happy with these results.
Conclusions: This case report sets a baseline to develop more evidence in the use of betaine-polyhexanide in complex burns. Early infection control and excellent wound bed preparation for grafts are valuables outcomes. More studies could be develop to demonstrate its cost-effectiveness by decreasing antibiotics consumption and length of stay reduction in ICU.

P228

Proteomics analysis of split thickness skin graft's response at 1-year follow-up after grafting on excised wound bed, on Integra or on granulation tissue

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Objective: The objective of this study was to investigate how wound bed priming before skin grafting affects outcome in long term. Proteomics approach of three differently treated excised burn wounds were assessed and compared with each other one year after the injury.
Methods: After fascial excision of large deep burns on four adult patients from Helsinki Burn Unit the study areas were divided into three 5x10 cm sections: 1) split thickness skin graft (STSG), 2) an artificial dermal template (Integra®) and 3) a temporary cover viscose cellulose sponge (Cellonex™). The two latter sections then received STSGs two weeks after the primary surgery. Both epidermis and dermis from histological sections of punch biopsy samples from each site were collected using laser-capture microdissection, and the samples' proteomics profiles were analyzed.
Results: 34 proteins in epidermis and 27 proteins in dermis were significantly differently expressed ($p < 0.05$) between treatments. Especially, in the dermis the expression of collagens COL6A2 (alpha-2 subunit of type VI collagen) and COL12A1 (alpha chain of type XII collagen, a member of the FACIT (fibril-associated collagens with interrupted triple helices) collagen family) was highest in the control STSG-group and lowest in the cellulose sponge treatment group.
Conclusion: Even though clinically the differences between the different treatment sections were minimal one year after excision, at the protein level specific differences were found both in the epidermis and the dermis. Our results suggest that the early treatment and wound priming selections can have an effect even after long term on the grafted skin.

P229

Experience with Medihoney® treating deep-dermal burns

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Objectives: There are multiple options for topical treatment of burns. The antibacterial properties of honey have been long known. In addition to avoiding and treating infection, honey has also proven debriding action, anti-inflammatory properties and inmune stimulation. We describe our preliminary experience with Medihoney Wound Gel treating deep-dermal burns evaluating not only the duration of the healing period but the quality of the reepithelization.
Methods: From August 2016 we have treated 32 patients with deep-dermal burns from different etiologies, including chemical and electrical flash burns with up to a 10%TBSA on any anatomical location. Follow up was done every 3 to 5 days until complete reepithelization was achieved, collecting data as time to complete reepithelization, infection and the posterior surgery when needed.
Results: We observed complete reepithelization on 28 patients. Only 4 patients had to be secondarily debrided and covered with split thickness skin grafts in areas not healing after a certain period. We found no other associated complications and did not have any case of infection.
Hyperthopic scarring did not appear on any patient, however, most of our patients with deep dermal burns are treated with pressure therapy garments.
Conclusion: Medihoney is a highly recommended topical treatment for deep-dermal burns, proving to be a well tolerated and easy to apply ointment, with antibacterial and debriding properties that allow for a directed reepithelization of burns with successful wound coverage.

P230

Use of Suprathel® in surgical, non-surgical and enzimatically debrided burns

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Objective: We evaluated the use of Suprathel®, a synthetic copolymer membrane from polylactids that provides

a temporary wound coverage in burn patients.
Methods: Since 2013, 29 patients with mid-dermal or deep-dermal burns were treated with suprathel® and evaluated retrospectively.
Suprathel ® was applied:
- After enzymatically debridement with Nexobrid®
- After hydro-debridement with Versajet®
- On donor sites
- On mid-dermal non surgical burns

The outer dressings were changed every 2-3 days and the evolution closely evaluated.
Results: A total of 4 patients had to be secondarily debrided and covered with split thickness skin grafts in areas not healing after a certain period.
3 patients had Suprathel® removed because of secondary infection.
Optimal scarring results were obtained on the other 22 patients. Supathel® was easily adapted to wound surfaces. It was a well tolerated temporary coverage which reduced pain and lead to complete stable reepithelization of burns without higher incidence of hypertrophic cicatrization.
Dressing changes considerably reduced the average time, as well as the need of additional anesthetic medication.
Conclusions: Supathel® allows a quick and stable reepithelization with a successful coverage result. It has proven to be a safe and effective option, reducing pain and use of opioids, protecting from bacterial and virical infection and allowing, due to its transparency, a good visualization of the wound through the entire healing process.

P231

Eficiency complex AG Alginate

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Complex silver alginate a valid option to treat burns Even if with colonized or infected wound can control to epithelization. We analysed a case series of 22 patients with other than 3rd degree burns .
Complex silver alginate matrix has shown to be a good choice in the treatment of burns.

P232

Evidence of Upregulation of Aquaporin-3 Expression with Alhydran (Aloe vera based Formulation) Following Full Thickness Skin Burn in Geriatric Patients: A Pilot Study

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Objectives: Problems with dehydration of skin and delayed healing after burns in burnt patients are common in clinical care. Geriatric patients present an additional challenge since their skin is naturally less hydrated. Aquaporin 3 (AQP3), one of transmembrane proteins that transport water and small solutes such as glycerol across cell membranes, is abundantly expressed in keratinocytes of mammalian skin epidermis. AQP3 is shown to play a role in the hydration of mammalian skin epidermis, and to regulate the metabolism of lipids in skin and the proliferation and differentiation of keratinocytes. While *A. vera* has a long history of use in the topical care of burns and other wounds, its efficacy and mechanisms of action, particularly in skin hydration of healing burns in geriatric patients have not been reported.
Methods: This study present a case study of a geriatric patient with a deep burn on upper extremities. After tangential necrectomy of burned tissue, split thickness skin grafting was performed. Following the achievement of skin in-growth and healing of donor areas, an *A. vera* based cream (Alhydran) was applied on the transplanted skin for 90 days. Punch skin biopsies were taken from transplanted skin in both upper extremities and donor areas at days 0, 7, 21 and 60 and 90 post-healing. Expression of AQP3 in the skin samples was studied by immunohistochemistry, immunocytochemistry, reverse transcription-polymerase chain reaction (RT-PCR) and western blotting.
Results: Significant upregulated expression of AQP3 was detected in treated skin and in donor areas compared to controls ($p < 0.05$). There was evidence of increased upregulation of AQP3 with time of application.
Dicussion/Conclusion: Topical treatment of split thickness skin transplants and donor areas in elderly patients after deep skin burn with the *A. vera* based cream can better the hydration the upregulated expression of AQP3. Further clinical study will follow.

P233

The influence of Alhydran® of scars after large surface thermal burns and Quality of Life of burn victims

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Question: How influenced scarring the Quality of Life and Alhydran® the itching, skin tension, dryness and redness of the skin in the early stage of scar maturation during the rehabilitation?
Method: We include 75 burns (54 m, 21 f, average age 51 years, average TBSA 25,4% (most scar areas in the thorax and the extremities) during an inpatient rehabilitation program. Scar treatment was performed daily with Unguentum cordes®. Parallel to scar massage, all burns received a complex, activity oriented rehab program. The treatment protocol was modified towards the use of Alhy-

dran®, when patients suffered from itching and skin tension after 14 days furthermore.
Results: The SF-36 showed the biggest underscoring in the scales of Physical Functioning, Role-Physical and General Health. The Pationnaire® showed especially in the fields of redness (20,4%) and skin tension (16,9%) a substantial improvement compared to the initial values. Also the reduction of itching (13,5%) and dryness of the skin (13,8%), were clearly noted in the scoring of the patients. By comparison of scare care products the products Alhydran® and Ungunt. Cordes® are getting rated equally on the VAS from 0 to 100 concerning tolerance (92 to 87) and handling of application (88 to 82). Remarkable, but without statistically significance is the difference in the rating regarding itching and skin tension witch a gap of 12 resp. 9 points. In the same way positive is the impact on the lost of redness with 11 points.
Conclusions: Alhydran® was successfully used during the early maturation of the scars, to reduce the subjective and unpleasant side effects of burn scars such as redness and skin tension. Alhydran® could trouble free be combined with textile garments. Further clinical studies with a larger randomized group and a longer observation period are needed to be able to draw statistically relevant conclusions.

P234

The treatment of epidermal and deep dermal wounds with polylactid based membrane. 10 years perspective and outlook.

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In the last 40 years the management of Burns has devolved dramatically, being perhaps early excision of burned tissue the standard of care, which contributed to the reduction in mortality by Burns.
Autologous split skin grafts are the most reliable method for closing third degree burns. The search for other treatment options for the coverage of the breakaway areas has resulted in a synthetic copolymer mainly based on DL-lactic acid substitute. (Suprathel) This polylactide-based membrane, alloplastic, absorbable skin substitute that is highly permeable to oxygen and water vapor, providing a particularly favorable environment for wound healing.
Objetive: Assess the effectiveness of the resorbable skin substitute (Suprathel) in 2nd and 3rd degree burns.
Material and methods: Prospectively were included paediatric patients with burns, who attend to the Hospital Civil de Guadalajara in the period from November 2007 to January 2017.
All the lesions were surgical debridement and then applied the resorbable skin substitute (Suprathel) according to the Protocol of management.
Results: The results show that in the patients treated 80% of the injuries including those of 3rd grade epithelized properly, requiring 2 refills of the substitute on average to achieve the epithelialization.
Other results include that can be applied easily and safely, even to large areas. Immediate pain relief after application, excellent coverage of wounds, no change of the dressing needed, significantly less eff ort for nursing staff, cost reduction due to high efficiency.

P235

Who needs a medical photographer anyway?

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Objective: Since the introduction of making digital photographs in 1996 in the Rotterdam Burn Centre, the Netherlands, it has made the recording and archiving of digital material much faster and more efficient. However, security and confidentiality requirements for patient privacy are even more paramount than ever before. A Medical Photographer (MP) can help achieve these aims by regulating the use of the images. Thus our objective is making clinical practitioners aware of the advantages of requesting a medical photographer to maintain standardisation of digital photographs in a Burn Centre.
Methods: A standardised calibration measure with cm, cm2 and colours is used and patient details are added photographing the burns to be able to follow-up wound healing. A Medical Photographer makes the photographs or a video instead of the burns doctor. The MP uploads and archives the images into the Electronic Patient Dossier (EPD) and can regulate the use of the images as well as create a safe back-up.
Results: There will be a continuous, standardised archive of images of each patient receiving treatment in the Burn Centre. This will allow the Burn Care providers to follow the wound healing in time. This information can be easily but also securely accessed via the EPD. The photographs could also be used in research because they were standardised.
Discussion/Conclusion: A Medical Photographer is a registered member of the institute of Medical Illustration, therefore the photographic material is guaranteed to be handled securely and confidentially enabling patient privacy.
Because the MP is processing the photographs instead of the burn doctors, it alleviates the work load for the Burn Care providers who can use their time more efficiently for patientcare.
By standardising photography with calibration, wound healing and scarring can be followed-up more accurately and research becomes more reliable.

P236

Manuka honey a valuable addition to the wound dressing armamentarium

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Objectives: To outline our experience with Manuka honey at our regional burn center, as an advance wound therapy for complex or stagnant wounds
Methods: We describe the current recommendations made by the manufacturer and outline in the relevant literature.We also summarise our experience with complex and stagnant wounds in the burn patient population.The treatment protocol used at our center consists in applying Manuka honey commercially available paste and then a commercially available impermeable wound contact layer and finally covered up with a dry sterile gauze, this dressing was change once every three days with alternate treatments either at home or a local healthcare facility
Results: Manuka honey is a valuable complement to the available therapies and strategies used to manage recalcitrant wounds in burn patients12 patients were successfully treated during the last year.Our center's Manuka honey protocol allows for outpatient treatment and follow-up with the possibility of scheduling alternate visits at the local health center unburdening our facility.
Discussion / Conclusion: The presence of conditions that impose an insufficient wound bed microvascular-wise represents a difficult challenge where both aggressive and conservative approaches proved inadequate or at least untimely. In this subset of patient population Manuka honey proved an effective strategy to restart the wound healing process albeit some cases still remain challenging.

P237

Spontaneous healing and scar control following enzymatic debridement of deep second degree burns

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Introduction: A major problem in patients surviving thermal injury and being treated conservatively, a long process, is the development of granulation tissue followed by hypertrophic scars. Deeper burns that needed longer healing time were more prone to granulate and scar. Early surgery that removed the offending eschar prevented the eschar related complications (mainly local and systemic infections) and allowed early wound closure by autografts.
Care report: Woman, 25-year-old, who was referred to our Burn Institute after a flame burned, 29% TBSA (forearms, hands, knees, legs and feet). On admission the upper extremities were evaluated to be a rather superficial second-degree burns, while the lower extremities: deep second-degree burns. The upper extremities burns were cleansed and covered with Hg Hydro fiber.
The deep partial thickness burns of the lower extremities deemed to be deep in need debridement. The lower extremities burns were treated with bromelain-based enzymatic debriding agent and deep dermal bed treated with Vaseline gauze and various topical preparations, the dressing changed every 2 days. Autografting was not needed.
The Patient and Observer Scar Assessment Scale POSAS) was used to evaluate the scars and their development on hospital discharge and after 15, 30, 60 and 120 days at out-patient Clinique-.
At discarge the upper extremities score was 68 (26/42) lower extremities score was 87 (38/49 posas scale obs/pat).
At fourth month follow up the upper extremities score was 84 (35/49) lower extremities score was 69 (30/39 posas scale obs/pat).
Discussion: Conservative treatment of the superficial dermal burns ended in a quite early wound closure (20 days) but it followed an inflammatory process that led to the sloughing of the thin eschar followed by epithelialization. The deeper, lower extremities burns were debrided and the deep dermis had the opportunity to epithelialize without an inflammatory process ending in scar-free healing.

P238

Chemical burns treated at the Burns Unit in Debrecen during the last decade

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Among burns, chemical burns are usually of lesser extent but tend to be more serious due to the depth of these wounds. Last year we had to treat an increased number of chemical injuries, the most severe among these was a young man with 45% basic burn injury. In a retrospective study we collected data on patients with chemical burns admitted to our Burn Unit during the last 10 years.
During the period of 2007 January 1st and 2016 December 31st we hospitalized 2499 patients with burns, among these 36 patients suffered chemical injuries. This represented 1,44% of our admissions with a mean age of 39,41 (2-75 years). Extent of the injuries were in the range of 1-45% TBSA with an average extent of 4,6%. The hands were the most common involved body site. The injuries required surgical treatment in 26 patients (72%). Account is given about the causes of injuries and their distribution over the observed years. Based on the presented data, the incidence of corrosive injuries seems to increase over

time at least in the region served by our center. This is in opposition to trends in incidence of burn injuries in general, with its cause unknown to us. We figure that more and more households use cold degreasers which is a strong basic substance. Interesting that these increased numbers still represent the lower threshold of incidence among burn admissions when compared to data from the literature (1,4-8.5 %).

P239

Survival analysis of patients with transplantation of keratinocytes in years 2008-2015.

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Goal: Most advanced treatment of extensive burns is keratinocyte transplantation. It should however highlighted that results of clinical transplant keratinocytes are ambiguous. Limitations of this method include long waiting times for cell culture and its susceptibility to infection. The aim of this work was to verify the impact of the application of keratinocytes on the survival of patients. This study specify a group of patients with the greatest chance of successful of treatment and excluded patients in whom there is no reason to apply this costly treatment.
Methodology: All patients diagnosed with burns treated with cultured skin cells between 01.01.2008 and 01.01.2016 were included in the study. Assessment included: patient age and sex,% TBSA,% burns with a depth of III / IV, the number of days from admission to surgery and the need for rehabilitation. Cox proportional hazards model was used.
Results: The analysis included 81 patients with a diagnosis of thermal burns, who were treated with the use of autologous dermal cells. The obtained result of survival in this study is 88%. The analysis shows that there is only one significant predictor of decease - the surface area of burn of third degree (p = 0.029). With the increase of burns area of 10% the risk of death icreased 75.2% (CI HR 1,06-2,9). The probability of three months survival in the case of burns III/IV comprising more than 40% of body surface area is only 60%.
Discussion: The purposefulness of conducting this expensive and time-consuming procedure isn't clinically justified in groups of patients who may heal spontaneously (burn IIa). Qualification of patients under 50 years old for cell culture is associated with defining age as a negative prognostic factor and the impact of process of aging on the proliferative capacity of cells with normal morphology.

P240

Monitoring the progression of a burn wound using infrared technology - A case series

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The decision making process for managing burn wounds can be complex. Every burn surgeon knows how challenging it is to determine early after an injury which deep second degree burns will heal without surgery and which ones will not. In addition, patients taken for a surgical intervention may have areas of third degree burns mixed with second degree burns. Decisions regarding the debridement technique and amount of tissue to remove are complex and depend on a surgeon's experience.
Algorithms based upon the analysis of burn images have been proposed in the past. Thermography may have potential applications in this area. Studies have suggested that thermal images integrated with digital photo data can be used to estimate burn depth. They also describe the need to add thermal reference points in the camera field to effectively link the thermal and digital images, and note that thermal images are only of value in the first 72 hours after a burn due to the ensuing inflammatory response.
In our study, we imaged burn injuries that presented at the West Penn Hospital Burn Center. Any patient with a burn wound having partial thickness severity or greater were eligible for inclusion in the study.
Thermal and digital images were acquired during wound examination. The camera was positioned in a way that the entirety of the burn could be observed in the frame of the image. The FLIR cameras were manually adjusted to keep the burn injury in optimal thermal focus. The amount of time between injury and imaging was recorded.
On patients admitted to the burn center, pictures were taken daily. Patients receiving follow up care in an outpatient setting were also photographed. The images were captured about 5 minutes after the dressings had been removed and wounds cleaned in an effort to minimize the changes of temperature related to this intervention. We imaged patients for as many days as possible or until the wounds healed.
This pilot study provided preliminary data that helps understand the correlation of temperature changes and depth of burns. We are designing a study aimed at further understanding temperature changes after a burn.

P241

Pilot study: feasibility and effectiveness of Mindfulness for people with burns and parents of children with burns

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Objectives: After a burn event, burn survivors and parents of children with burns experience psychological distress and diverse difficulties that impairs their quality of life. Aim of this pilot study was to examine the feasibility and effectiveness of two Mindfulness group interventions provided to burn survivors and parents of children with burns respectively.
Methods: Twenty-eight participants were recruited, but eight people withdrew because of practical or physical problems, and three participants had traumatic stress symptoms in the clinical range. Finally two Mindfulness groups were formed; 1) including 7 people with burns and 1 spouse, and 2) including 9 parents of children with burns. At baseline, immediately after, and 3 months post-intervention they filled out the Beck Depression Inventory-II-NL, PTSS Checklist DSM-5, Five Facet Mindfulness Questionnaire-Short Form, Self-Compassion Scale-Short form, personal goals, and evaluation questions.
Results: All participants were able to complete the intervention and scored it as very useful (score 8,8 on a scale from 1 to 10) and participants were very satisfied (score 8,8). Mindfulness skills improved significantly (p <.05) on short and long term and self-kindness increased significantly (p <.05) on short term in the parents group. In both groups personal goal scores increased significantly (p <.05) on short term and for the parents also on long term. Decreased scores for depressive and PTSD symptoms were shown on the short and long term in both groups, but not reaching statistical significance. Qualitative data showed that participants experienced more inner peace, more awareness of thoughts and emotions, and more self-compassion.
Discussion: Our pilot study suggests that a Mindfulness intervention can be feasible and effective in improving well-being in people with burns and parents of children with burns, but the first results are most convincing for parents of children with burns.