RAPID TISSUE VIABILITY EVALUATION USING METHEMOGLOBIN AS A BIOMARKER IN BURNS

While many burn injuries will heal spontaneously, nearly 1 in 10 are severe enough to require hospitalization or transfer to a specialized burn centre. The early surgical management of a severe burn is critical to patient outcome, but few tools exist for triaging viable and non-viable tissue at early timepoints post-injury. Without a validated outcome measure, even experienced burn surgeons diagnose tissue viability with an accuracy of only 50-70%, with significant consequences for patient morbidity, mortality and cost to the healthcare system. The authors of this article have developed a non-invasive device that uses near-infrared spectroscopy to rapidly assess traumatic burns at the bedside. They report that near-infrared spectroscopy can detect methemoglobin non-invasively, and that this molecule increases in burned tissue immediately following injury in both a porcine model and in humans. Methemoglobin levels are highest in non-viable tissue, and correlate with tissue viability as early as 24 hours post-burn. Methemoglobin is the first reported objective outcome measure for use in the management of traumatic burn injury.

Leung G et al. Int J Burn Trauma, 8(5): 126-134, 2018

EFFICACY OF NON-PHARMACOLOGICAL INTERVENTIONS FOR PROCEDURAL PAIN RELIEF IN ADULTS UNDERGOING BURN WOUND CARE: SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

The aim of this meta-analysis was to investigate the efficacy of non-pharmacological interventions for procedural pain relief in adults undergoing burn wound care. The authors conducted a comprehensive literature search. Twenty-one eligible randomized controlled trials, comprising a total of 660 patients, were included. Distraction interventions, particularly those using virtual reality, and hypnosis were found to have the greatest effects on pain relief. Non-pharmacological interventions further resulted in a significant small, homogeneous effect on anxiety reduction. The authors conclude that the benefits of non-pharmacological interventions on procedural pain relief and reduction of mental distress are demonstrated. However, further trials are needed to strengthen this evidence.

Scheffler M et al. Burns, 44(7): 1709-1720, 2018

THE LIVED EXPERIENCE AND QUALITY OF LIFE WITH BURN SCARRING: THE RESULTS FROM A LARGE-SCALE ONLINE SURVEY

The authors conducted a large-scale online survey to inform and direct the development of an online community healthcare hub for people living with scarring. Questions gathered information on psychological symptoms, scar support and knowledge of wounds and healing. 1034 people living with scars completed the survey. 119 of them had burn scarring. The results highlight that patients with burn scars have higher levels of pre-existing psychological difficulties, carry a greater number of scars, and experience more symptoms. There is a lack of support for patients with scars once they have been discharged by their healthcare provider. The most popular forms of support chosen were face-to-face interaction or online support. The authors identified six key themes in the psychological impact of burn scarring: appearance-related concerns, social anxiety, acceptance and coping, experience of symptoms, skin viability and survivorship.

Brewin MP & Homer SJ Burns, 44(7): 1801-1810, 2018
EPIDEMIOLOGICAL EVALUATION OF PAEDIATRIC BURN INJURIES VIA AN OUTPATIENT DATABASE IN EASTERN ONTARIO

The aim of this study conducted in Eastern Ontario, Canada, was to establish a paediatric burn database in order to assess current standards of practice and burn epidemiology, and develop a framework for focused burn prevention programs in the catchment area. A paediatric burn database was built in REDCap at the Children’s Hospital of Eastern Ontario (CHEO) retrospectively for the period 2010-2015. Information collected included demographic data, details about the injury and description of the burn wounds. A total of 695 patients were seen as outpatients. Burns included 51.6% scald, 30.6% contact, and 9.6% flame injuries. Mean age was 4.25 years, and mean burn extent was 4.4% total body surface area (TBSA). Patients from rural areas had sustained burns wounds due to flame and contact with hot surfaces (p<0.05), whereas in children from urban areas hot liquids were the main etiology (p<0.05). The newly created outpatient burn database will be used to tailor burn prevention programs.

Garland K et al.
Burns Open, 2(4): 204-207, 2018

FROSTBITE VS. BURNS: INCREASED COST OF CARE AND USE OF HOSPITAL RESOURCES

The aim of this study was to examine differences in the hospital course of frostbite patients compared to those with burns limited to the hands and feet. Patients with frostbite injury and those with isolated hand and/or foot burns were identified in the National Burn Repository. Patients with frostbite injury were significantly older and more likely to be male. Frostbite patients were less frequently covered by commercial insurance. Mean total BSA (TBSA) did not differ between the two groups. The mean intensive care unit (ICU) days and requirement for mechanical ventilation were not significantly different between the two groups, however frostbite patients were significantly more likely to require ICU care. Hospital length of stay (LOS) was significantly longer in frostbite patients, and their hospital costs were significantly higher. The authors conclude that frostbite injury appears to be a significant predictor of increased LOS and hospital costs compared to burn-injured patients.

Nygaard RM & Endorf FW
J Burn Care Res, 39(5): 676-679, 2018

IN SITU DELIVERY OF FIBRIN-BASED HYDROGELS PREVENTS CONTRACTION AND REDUCES INFLAMMATION

In this article the authors examine the effects of debridement on deep-partial thickness burns and the results of three different hydrogels on healing. Burns were created on the dorsum of pigs and 4 days later the eschar was either left intact or debrided for treatment with collagen, PEGylated fibrinogen (PEG-fibrin) or PEGylated autologous platelet-free plasma (PEG-PFP) hydrogels. Wounds were photographed, scored and biopsied for histology on postburn days 7, 10, 14 and 28. The authors found that, compared with nondebrided wounds, debridement improved wound colour and suppleness but accelerated contraction. Debridement also significantly reduced the number of neutrophils in the wound bed at days 10 and 14 postburn. Treatment with all hydrogels transiently mitigated contraction, with the PEG-fibrin group displaying less contraction on day 28. All hydrogels were visible histologically for up to 10 days, with significant cellular and blood vessel infiltration observed in PEG-fibrin hydrogels. Collagen and PEG-fibrin hydrogels reduced neutrophils and macrophages in surrounding granulation tissue on day 7, while PEG-fibrin hydrogels contained less immune cells. Data suggest that a single hydrogel application at the time of debridement has immunomodulatory properties that aid wound healing. The authors conclude that these hydrogels may be combined with other biomaterials, cells or biologics for replacing/augmenting skin substitutes.

Burmeister DM et al.
J Burn Care Res, 39(1): 40-53, 2018