WHASA, SABS and PABS abstracts

 Wound Healing Southern Africa 2019;12(2):22-39

WHASA ABSTRACTS

A ONE-PAGE CLINICIAN ENABLER TO DIFFERENTIATE BETWEEN FOUR LEG ULCER AETIOLOGIES

S Thiart
Private Nurse Practitioner

A one-page clinician enabler to differentiate between four leg ulcer aetiologies: venous leg ulcers, arterial leg ulcers, ulcers of inflammatory origin (e.g. pyoderma gangrenosum, vasculitis) and neoplastic aetiology (e.g. basal cell carcinoma, squamous cell carcinoma and melanoma). The majority of clinicians are familiar with venous and arterial leg ulcers and are confronted with them regularly in their practices. Lower leg ulcers of inflammatory and neoplastic aetiology are scarcer, and the differentiating signs and symptoms are less known.

The definition of "enabler" from various dictionaries: "A person or thing that makes something possible" or "One that enables another to achieve an end" or "To supply with power" or "To make able". For this exercise a clinician enabler is a written tool (thing) to assist or strengthen (supply with power) an individual healthcare professional. It is a form of reinforcement and guidance, ultimately improving patient care (make able).

WHEN NURSES DISCUSS PATIENT CASES ON SOCIAL MEDIA

S Thiart
Private Nurse Practitioner

Discussing the ethical pitfalls related to the use of social media for the exchange of information and opinions between professional nurses as well as nurses and the public in a dominant technology and social media era. Social media discussions are often emotionally charged which have a negative impact on decision making. What is professional behaviour on social media and how do we as professional nurses act appropriately on social media?

An 86-year-old patient at life's end developed SCALE after an initial pressure injury. Patient was treated palliatively. There was regular communication between the interdisciplinary team and the patient's family. The family insisted on hospitalisation because of the influence from a distant family member who was a registered nurse but not direct family of the patient. She obtained her expert information/ opinions on Facebook and the family's decisions were based on this information. While hospitalised her wounds were surgically debrided under general anaesthesia. She passed away three weeks later. The treating WP obtained the information about the patients' hospital admission and treatment thereafter from Facebook where photos etc. were posted.

She also learned through Facebook that she, along with other team members, would be sued for negligence and malpractice.

The information on Facebook was incorrect or at the very least incomplete thus the opinions and suggested treatment options were incorrect and/or insufficient. Highly charged emotions further influenced the already incorrect or insufficient treatment options. The emotional aspect had a snowball effect and was detrimental to objective and appropriate decision making.

We cannot escape social media but there is significant room for the education of and guidelines for healthcare practitioners about the ethics and responsibility surrounding communication with fellow practitioners and the public on social media and the possible pitfalls thereof for nursing specifically.

ANTINEOPLASM AND HEALING EFFECTS OF HYPOCHLOROUS ACID. A CASE STUDY OF AN ULCERATING BLEEDING BASAL CELL CARCINOMA

H Roos, SK Coetzee, A Blignaut
North-West University

Basal cell carcinoma (BCC) can be treated using various treatment methods, including surgery, radiation, phototherapy, topical and oral medication. A case of ulcerating bleeding BCC of the ear that was

successfully treated with application of hypochlorous acid (HOCl) three times per day over a period of ten weeks, is presented.

We present a case of an 80-year-old Caucasian male with a three-month history of an ulcerating bleeding BCC of the left ear. The diagnosis was confirmed through incision biopsy of the tumour. The lesion extended from the upper anti-helix of the ear inferiorly towards the trachus and was unsuccessfully treated with Imiquimod (Aldara). There was marked inflammation around the lesion that affected the whole external ear. Excision surgery would have resulted in removal of most of the ear with resulting functional (the patient wears hearing aids in both ears) and aesthetic defects. Treatment was commenced through the spray application of 250 mg/l HOCL three times per day. Healing was evident in the closure of the lesion and resolution of the inflammation. Follow-up biopsy confirmed resolution of the BCC after 10 weeks of treatment.

HOCl is normally manufactured by the neutrophils through the oxidative burst process and has antiseptic, anti-inflammatory and antineoplastic properties. Recent advances in the manufacturing of pure HOCl, without concomitant sodium hypochlorite, has made it possible to treat multiple clinical conditions without side-effects. Various experimental studies confirm the antineoplastic nature of HOCL, but a clinical case in the treatment of skin neoplasm has not been demonstrated.

The successful treatment of BCC highlights the potential for treating skin neoplasms with HOCL. Further studies should be done to confirm the antineoplastic effect of HOCL and to develop treatment protocols for its use in the clinical setting.

MONEY VS TIME – "SHORT TERM SACRIFICE FOR A LONG-TERM INVESTMENT"

A Simpson
Advanced Wound Care Specialist

In this comparative study, I compare cost of conventional treatment (CT) of a plantar neuropathic diabetic ulcer, with the treatment of approximately the same depth and size wound, using the gold standard treatment, total contact casting (TCC). Patient B (CT) and Patient A (TCC).

Two patients were used in this study. Both patients were more or less the same age, Pt B was male and Pt A was female. Both had similar sized and depth wounds in the mid planter region. TCC was applied on Pt A from the second visit and the patient was instructed to limit ambulation to at least one third of the usual activity. CT with advanced wound care products was used on Pt B and patient was advised against bearing weight on involved extremity. Compliance with conventional treatment is always a struggle when it comes to weight bearing. Ulcers were considered healed if they showed complete skin closure with no drainage. Cost was calculated of Pt A (TCC) from the first visit, till closure, which was a total of five weeks, changing the TCC once a week. Cost of Pt B (CT) was calculated from first visit, for five weeks. Because of compliance and ambulation, patient had to have dressing changes twice a week. After five weeks, the wound was not healed.

I am pleased to document, that although the TCC seems more costly initially, the duration of treatment proved to have been more cost effective. TCC proved not only cheaper, but also faster progress from first dressing change to healing time. CT cost double each week in comparison to TCC. On average Patient B cost R3 524.59 per week and Patient A R2 835.89 per week. The wound on Patient A was closed after five weeks and Patient B still has ongoing wound care.

QUICK GUIDE TO WHAT TO DO AND HOW TO DO IT

A Potgieter
Santro Nursing Care

Nurses are frequently approached for advice of what to do and how to do it when faced with an emergency at home or at work. They do not have time to attend lectures or courses and need a quick guide on what to do and how to do it, especially in our kindergarten environment and other places where our loved ones are cared for while we are at work. The aim of these posters is to provide a quick reference of what to do and how to do it while waiting for more advanced help in an emergency or stressful encounter.

We created four posters illustrating in words and pictures how to handle an emergency – how to stop bleeding, what to do when a child stops breathing and how to treat burns.

People understood better what to do and how to do it and were more able to take charge of a situation without suffering anxiety or panic attacks while dealing with the situation. These posters enable them to handle the stressful situation by following the easy steps as illustrated so that they are able to assist the person in need of help.

Education plays a very big role in our daily lives and by sharing our knowledge and skills we can empower our communities to help themselves in situations they do not know how to handle.

EFFECTS OF PHOTOBIOMODULATION ON DIABETIC WOUND HEALING IN VITRO

N Houreld
Laser Research Centre, University of Johannesburg

Diabetic patients have a higher probability of developing chronic ulcers, which are a major cause of non-traumatic limb amputations, resulting in reduced quality of life, increased morbidity and premature death. Photobiomodulation (PBM), a non-invasive and non-thermal treatment modality formally known as low-level laser therapy (LLLT), has been shown to speed up the healing of such ulcers. PBM has been shown to reduce pain and inflammation and stimulate healing and repair. However the molecular mechanism/s involved in these observations are not well comprehended.

This study looks at the underlying molecular and cellular effects of PBM on diabetic wound healing in vitro. A diabetic wounded cell model was simulated in WS1 fibroblast cells. Cells were irradiated at 636, 660 (visible red) and 830 nm (near infrared) at a fluence of 5 J/cm2. Cellular migration, viability, proliferation, extracellular matrix (ECM) proteins, mitochondrial enzymes, the JAK/STAT signalling pathway, fibroblast differentiation, and oxidative stress have been investigated.

PBM stimulated healing mechanisms in diabetic wounded cells in vitro. This work has unequivocally shown that PBM is able to positively stimulate and speed up diabetic wound healing in vitro by intensifying cellular migration, proliferation (via epidermal growth factor, EGF, secretion and activation of the JAK/STAT pathway) and viability, accelerate fibroblast differentiation, increase collagen production and decrease protease levels, and reduce oxidative stress.

For PBM to be accepted by the greater medical fraternity and used as a treatment methodology, there is a need to understand the molecular biology which initiates cellular functions post-irradiation. This study has shown the speed and promptness of PBM in restoring normal cellular functioning and speeding up wound healing in what would be normal senescent, largely unresponsive cells.

CHRONIC WOUNDS: COMBINATIONAL APPOACH WITH PLATELET RICH PLASMA

A Potgieter
Santro Nursing Care

The challenge for non-healing wounds in our communities is growing by the day and this has a great impact at personal, professional and social levels. This is at high cost in terms of medical, human and material resources. Application of platelet rich plasma (PRP) is easy and can be very cost effective in the treatment of non-healing or chronic wounds and it provides the necessary growth factors which enhance tissue healing. The purpose of the study was to evaluate the safety and efficacy of the autologous PRP for the treatment of chronic non-healing wounds.

Autologous PRP was prepared from whole blood utilising a rapid, intraoperative point of care system that works on the principle of density gradient centrifugation at the bed side of the patient. Treatment was a single dose of subcutaneous PRP injections along with a wound gel.

The treated patients were followed up on a regular basis. All wounds showed signs of wound healing with reduction in wound size and healing time duration was also reduced.

The study showed that it is potentially safe and effective to use autologous PRP for treating non-healing or chronic wounds. It can be combined with other therapies, is easy to use and helps to treat difficult non-healing wounds. This also gives the patient back their quality of life and in some cases their dignity.

AN EXPERIMENTAL CASE STUDY TO VISUALISE BACTERIA IN CHRONIC VENOUS ULCER WOUNDS WITH FLUORESCENT IMAGING

M Backeberg, T van der Bijl
Wound Care Practitioners, Centurion

Chronic wounds and their economic, social and personal effect are well-known challenges in most wound clinics. Wound bed preparation is an important aspect in the treatment of chronic wounds, and concentrates on reducing infection, inflammation and bioburden, removing non-viable tissue and promoting tissue regeneration.

The objective of this case study was to assist in effective wound and peri-wound cleaning and provide decision making in choice of wound dressings to enhance healing. We aimed to visualise real time organisms present in wounds with fluorescent imaging, to facilitate decisions regarding treatment at that specific time, and to speed up healing by applying the correct product at the appropriate time.

A 51-year-old male patient with chronic venous ulcers on bilateral lower legs. Funding was limited, patient was depressed and did not have hope of ever healing.

Moleculight I™ was used in standard and fluorescent mode, pre- and post-cleaning for three consecutive weeks. The guideline provided to identify organisms was applied, and treatment could be adjusted during this time according to imaging.

Organisms present in the wound and surrounding area were visible. This assisted in effective wound bed preparation of wounds thought to be highly colonised chronic wounds. Cleaning of wound was done accordingly, and post-cleaning imaging showed the effectiveness in concentrating on the correct area. More effective choices could be made in applying the correct dressing to different wounds.

Fluorescent imaging has assisted to a large extend in wound bed preparation and dressing choice, saving costs of diagnostic testing, and preventing the possible over-use of antibiotics.

This provided emotional comfort to the patient, both in lowering possible self payments, and in giving him hope in a situation that he thought was impossible to overcome.

SABS AND PABS ABSTRACTS

THE VALUE OF PSYCHOSOCIAL SUPPORT GROUPS FOR CARERS IN AN ACUTE TERTIARY PAEDIATRIC BURNS UNIT

C Ablort-Morgan
Occupational Therapist

Burn injuries are a common occurrence in South Africa, impacting especially lower socio-economic communities. At Red Cross War Memorial Children's Hospital (Cape Town, Western Cape), we treat approximately 1 400 in-patient burns cases per year and approximately 4 500 out-patient burns cases per year. The burn injuries most commonly seen in our unit are hot water burns (approximately 76%), however the most devastating burn injuries treated in our unit are flame burns. Burn injuries are often traumatic with significant physical and emotional scars to children and their families.

We have noted the following psychosocial problems present in children and families post burn: poor body image and self-esteem, fear of pain, depression and aggressive behaviour, regression in developmental milestones, withdrawal, eating and sleeping disturbances, separation from family and friends, feeling isolated and alone. Through the use of Psychosocial Support Groups run by an Occupational Therapist and a Psychologist, carers are given an opportunity to share their personal stories, express their feelings and concerns regarding possible operations and returning to the community, as well as concerns regarding their child's appearance and the condition of their skin. Carers are able to receive support from others as well as offer support to others; due to carers being in different phases of recovery, they are able to learn from each other's experiences and also better understand their feelings, of, for example, guilt, anger and blame. Our Psychosocial Support Groups strive to equip carers to help their children deal with the trauma of being burnt.

INTERBURNS ABC NURSING COURSE

SAA Addison
Interburns Faculty Nurse, Korle-Bu Teaching Hospital, Accra, Ghana

In the year 2015, the relentless efforts of nine senior nurses from three different countries (Ghana, Ethiopia and Wales) gave birth to the comprehensive and concise skills development course – Advanced Burn Care (ABC) course for nurses in burn management in low- and middle-income countries across the globe. Interburns ABC has, over the past five years, successfully created a network of international nurses working with physiotherapists and nutritionists to improve burn care in resource-poor countries around the world.

In the last four years, the Interburns ABC nursing course has been successfully conducted in Bangladesh, Ghana, Nepal and Ethiopia respectively by its experienced multidisciplinary faculty comprising volunteer professionals from Europe, Africa, Asia and the Middle East. The result is that over 140 nurses and dressers in over ten countries and four continents have been empowered with relevant knowledge and skills to confidently and effectively deliver essential burn care within their own environments using their locally available resources. These nurses in turn are now serving as trainers and resource persons for their co-workers within their various facilities.

A recent development on the Interburns ABC programme is the Implementation and Improvement Science course for nurses which was started early this year in Malawi, enrolling a select group of nurses from both Malawi and Ethiopia. The aim of this pioneering short course is to prepare and equip nurses working in burn units, with the theoretical and practical skills needed to plan, implement, monitor and communicate small-scale quality and service improvement projects in their clinical area. In the Interburns ABC 'pipe-line' of many more innovative projects is a programme with Interburns ABC volunteers network to reach out to a number of the facilities of participants to spend a period of time, working with them within their own environments and finding innovative ways of achieving optimum care outcomes using their locally available resources.

Interburns ABC recognises the pivotal role nurses play in the management of burns and thus has been working relentlessly since its inception, to consistently ensure that nurses in low- to middle-income countries are amply equipped with the relevant knowledge, skill and competence to deliver optimum burn care.

BUILDING IMAGE-BASED DIAGNOSIS SUPPORT ARTIFICIAL INTELLIGENCE ALGORITHM FOR ACUTE BURNS. METHODOLOGICAL CHALLENGES AND PROMISING RESULTS

C Boissin[1], J Fransen[2], F Huss[2], L Wallis[3,4], N Allorto[5], L Laflamme[1,6], J Lundin[1,7]

[1] Department of Public Health Sciences, Karolinska Institutet, Stockholm, Sweden

[2] *Department of Surgical Sciences, Uppsala Hospital, Uppsala, Sweden*

[3] *Division of Emergency Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University, Bellville, South Africa*

[4] *Division of Emergency Medicine, Faculty of Health Sciences, University of Cape Town, Cape Town, South Africa*

[5] *Edendale Burn Services, Department of General Surgery, University of KwaZulu-Natal, Durban, South Africa*

[6] *University of South Africa, Institute for Social and Health Sciences, Johannesburg, South Africa*

[7] *Institute for Molecular Medicine Finland FIMM, Institute for Life Science HiLIFE, University of Helsinki, Helsinki, Finland*

Acute burns are complex to diagnose and erroneous assessments impact on the victim's mortality and morbidity. Specialists operate from a small number of burns centres and the capacity to provide timely assistance to frontline clinicians is therefore limited. Diagnostic assistance through artificial intelligence could be an option to provide a timely and equitable diagnosis. This project sheds light on the feasibility of the development of an artificial intelligence algorithm for assisted diagnosis of acute burns and clarifies challenges faced along the way.

A bank of images has been built from a number of burn centres in South Africa and is updated continuously (currently about 1200 images). Attempts have been made to train deep learning algorithms to diagnose the burn depth, an element that is challenging both

at bedside and image-based teleconsultation. We came across methodological challenges that need further consideration.

Some challenges are clinical, i.e. inherent to the complexity of burn diagnosis, and imply the need of having an accurate diagnosis for the burn images on which the algorithm is trained. Other challenges pertain to the actual development of an algorithm. Prior to identifying burn depth, a complex task relates to the feasibility of finding the burn itself in images of varying body parts and backgrounds. Further, training an algorithm for diagnosing burn depth also requires large numbers of varying cases, the accurate labelling of the wound area for training, and decisions to be made as regards the best outcome to train upon. Current preliminary results indicate satisfactory identification of the burn area and promising results with regards to burn depth diagnosis.

Development of artificial intelligence algorithms requires strong collaborations and discussions between technical and clinical experts but is showing promising results.

MAJOR BURNS: THE PHYSIO- AND OCCUPATIONAL THERAPY TEAM EFFORT

L Botha
Physiotherapist

M Pursad
Occupational Therapist

Red Cross War Memorial Children's Hospital is the leading peadiatric hospital for burns management in sub-Saharan Africa. With advances in the medical field, large burns mortality decreases. A multi-disciplinary team approach to rehabilitation following the burn is an essential step towards regaining return to function and independence in activities of daily living.

The physio- and occupational therapy team engages in therapy from admission, implementing individualised programmes for these patients to regain optimum functional outcomes. The overlap in roles and support between these two professions is displayed in order to achieve the desirable outcomes needed for these patients. Treatment extends beyond the management of physical impairments and the multi-disciplinary team approach focuses on the physical, emotional and psychological impact on the survivor as well as the community they return to.

By using case studies, this presentation strives to position and confirm the collaboration between the professions, from the acute tertiary institution, through the different stages of recovery, as an essential part of the occupational well-being of the developing child within the current and future context.

PSYCHOSOCIAL BURDENS OF BURN INJURY AND TREATMENT EXPERIENCED BY ADULT IN-PATIENTS IN TERTIARY HOSPITALS IN SOUTH-EAST NIGERIA

JC Anetekhai
University of Nigeria, Enugu Campus, Enugu, Nigeria

A plethora of challenges experienced by burn injured patients exists. These experiences extend to the caregivers with profound effects. Understanding these experiences is vital for improving the quality of life of its survivors.

This study explored the psychosocial burdens of burn injury and treatment experienced by adult in-patients and caregivers in three tertiary hospitals in south-east Nigeria. An explorative, mixed methods research design was used. A total of fifty-seven respondents (all the patients/caregivers within the study period of six months) were used. A 31-item survey developed by researchers and burn nurses and Psychosocial Burdens of Burn Injury and Treatment Interview Guide (PBBIT-IG) were used for data collection. The most represented age group was 21–40 years (patients [71%], caregivers [83.3%]) and most (84%) earn $\leq$ 278 USD monthly. The most common psychological burdens identified by the respondents were: pain experienced disturbs emotionally (4.83 ± 0.39); feelings of sadness since injury (4.16 ± 1.04); and not having freedom as before (4.08 ± 1.00). The social issues reported were: limited ability to hang out with family and friends (4.16 ± 0.95); limited ability to attend social functions (4.08 ± 1.00); as well as interruption of other social activities (4.08 ± 0.90). The narratives emphasised the presence of social isolation as a result of their new look, strained relationships with friends and family, limitation in attending social functions as well as poor personal image.

In this study, the quality of support received from burn staff, particularly the nurses, appears to play a role in alleviating the burden of injury and its treatment. This highlighted the need for a targeted intervention specific to the distressing problems associated with burn injuries to help diagnose and manage them.

PREDISPOSING FACTORS TO BURN INJURY AND FIRST-LINE MANAGEMENT IN ENUGU STATE, NIGERIA

JC Anetekhai
University of Nigeria, Enugu Campus, Enugu, Nigeria

Burns are a public health problem that impose a significant burden on the world's poor. Identification of practices that predispose to burn injuries and their first-line management is important in developing an effective preventive educational programme. This study assessed the predisposing factors and the first-line management among adults in Enugu East Local Government Area of Enugu State.

A survey was carried out among 411 residents of the five sub-urban communities. A structured questionnaire which focused on the demographic information, practices that predispose to burns, and their burn first-line management, was used to collect data from the respondents. The scoring was based on a total of 12. Scores of 4 or below were graded as 'low', scores from 5 to 8 were graded as 'moderate' while scores from 9 and above were graded as 'high risk'. Overall, 78.6% of the respondents engage in moderate to high-risk practices that predispose to burn injuries, such as carrying hot water to the bathroom or around the house (78.6%), leaving hot water unattended (78.3%), storing PMS motor fuel at home when there is a scarcity of fuel (75.4%), amongst others. About 54.5% of respondents had a fair knowledge while none had a good knowledge

of first-line burn management. Burns were mostly managed with remedies that are not scientific, such as toothpaste, egg, herbs, salt, kerosene, gentian violet, engine oil, pap, and starch. Only 18% had a form of first-aid training, and the source of knowledge was mainly from neighbours (68.6%), radio (26.3%) and market (2.7%).

Knowledge of first-line management of burn injuries is limited while many resort to other remedies that have not been proven effective. An educational programme targeted on first-aid management with cool water and prompt referral is necessary to reduce burn extent and mortality.

CONTINUOUS VERSUS BOLUS ENTERAL FEEDING IN THE CATABOLIC PATIENT

S Cohen

Registered Dietitian, Chris Hani Baragwanath Academic Hospital – Paediatric Burns Unit, Johannesburg, South Africa

Nutritional support is a cornerstone aspect of the treatment of burns patients. Severe hypercatabolism and hypermetabolism result in increased proteolysis and consequent loss of skeletal muscle. Failure to counteract this state causes impaired wound healing, organ dysfunction, mechanical ventilator dependency and increased susceptibility to infections. Hypercatabolism may persist for up to a year post-injury and is associated with increased morbidity and mortality. Identification of factors influencing muscle protein synthesis and prevention of muscle protein breakdown is essential.

Many issues related to the nutritional support of burns patients are still debated. Beyond optimal timing of initiation of feeds, quality and quantity of energy and macronutrients and route of feeding, the pattern of feed administration remains controversial and has been identified by the critical nutrition expert panel as a 'top 10' priority study to be done.

Continuous enteral feeding (CEF) is defined as a constant infusion rate of nutrition over 24 hours, whilst bolus enteral feeding (BEF) is defined as administration of an enteral volume at standard intervals (e.g. 3–6 times per day). CEF is thought to be better tolerated with fewer gastrointestinal complications and aspiration, whilst it is argued that BEF is more physiological.

It is further argued that BEF may promote protein anabolism, through protein synthesis stimulation. It is proposed that following consumption of a meal, protein synthesis occurs rapidly, within 30 minutes and lasts for 90–120 minutes. However, after 120 minutes, the 'muscle full' effect kicks in whereby protein synthesis rates return to baseline, despite the availability of a continuous amino acid supply. Muscle protein synthesis rates are also regulated by insulin, a stimulant for protein translational processes and a suppressor of proteolysis. In CEF it is suggested that circulating insulin levels are minimal but constant, indicating a moderate stimulation in muscle protein synthesis. In BEF, insulin levels rise rapidly and robustly, suggesting muscle protein synthesis is maximally stimulated.

MORE THAN JUST A SPREAD

S Cohen

Registered Dietitian, Chris Hani Baragwanath Academic Hospital – Paediatric Burns Unit, Johannesburg, South Africa

Failure to meet energy and protein requirements as well as persistent protein catabolism may account for the delay in growth frequently observed in our paediatric population for up to two years post-burn.

We find that in most of our patients, there is a skewed protein distribution with the majority of daily intake consumed in the evening. Given the anabolic response to bolus to protein ingestion, repeated ingestion of moderate protein-containing meals to optimise the anabolic efficiency of the daily protein intake should be advised.

However, dietary sources of protein are not always easily available and accessible due to increased costs, among other challenges. It is for this reason that the Chris Hani Baragwanath Paediatric Burns Unit has started a peanut butter drive. Apart from animal-based proteins, peanuts contain notable quantities of protein. The nutritional implications and outcomes of this drive for our patients will be discussed.

PALLIATIVE CARE FOR THE BURN PATIENT

D den Hollander

Head of Clinical Unit, Burns Centre, Inkosi Albert Luthuli Central Hospital, Associate Lecturer, University of KwaZulu-Natal, Durban, South Africa

Most African burn centres report a mortality of around 9%. Many other patients with massive burns and a futile prognosis cannot be managed on the few burn beds that are available and terminal care must be provided by the referring hospital.

In the low- and middle-income country setting, inappropriate treatment is defined by the doctor's assessment of the patient's condition, and the wishes of the patient, as well as by the availability of limited resources. In the burns literature few guidelines exist for the management of these patients. This presentation seeks to fill this gap by providing guidelines for the management of terminal burns patients based on a review of the literature dealing with palliative and terminal care in other acute care situations such as trauma and critical care.

Topics reviewed will be respiratory care, terminal ventilation withdrawal, fluid and nutrition, pain management, wound care, spiritual care, and care of the family. Guidelines for bad-news communications, as laid down in the oncology literature, will be discussed.

THE ROLE OF THE TERTIARY BURNS UNIT IN A MIDDLE-INCOME COUNTRY: MASSIVE AND COMPLEX BURN WOUNDS

D den Hollander

Head of Clinical Unit, Burns Centre, Inkosi Albert Luthuli Central Hospital, Associate Lecturer, University of KwaZulu-Natal, Durban, South Africa

The significant burns burden of disease in a middle-income country (MIC) demands a regionalised approach to care. The role of the tertiary burns unit is to manage, amongst other patients, those with massive (i.e. > 40%) and complex burn injuries, such as chemical and electrical injuries, fourth-degree burns and neglected burn injuries, as well as severe traumatic soft-tissue injuries.

The Burns Centre at Inkosi Albert Luthuli Central Hospital (IALCH) has developed several solutions to these problems, including the use

of dermal substitutes, MEEK micro-grafting, and sprayed epithelial cells in platelet-rich fibrin.

In this presentation we will describe the evolution of these techniques in our unit, and our management protocols for various types of patients. We will also evaluate the financial implications of the introduction of these new techniques in our unit.

A ROADMAP TO WOUND CARE IN STEVEN-JOHNSON SYNDROME/TOXIC EPIDERMAL NECROLYSIS

A Muganza, C Ede
Chris Hani Baragwanath Hospital, University of the Witwatersrand, Johannesburg, South Africa

Steven-Johnson syndrome/toxic epidermal necrolysis (SJS/TEN) represents a spectrum of severe muco-cutaneous adverse reactions. Although this disease entity is not uncommon, recent evidence suggests an increase in incidence in South Africa, possibly related to the HIV pandemic. There are various options for wound care but there is lack of consensus on the optimal approach for management of the skin lesions. Herein we report two cases of toxic epidermal necrolysis managed with three types of wound-care products to determine which one is the most effective.

A retrospective case report of two female patients with SJS/TEN. The first patient is a 33-year-old pregnant woman at 13 weeks gestation who was managed by application of three types of wound-care products – Acticoat (nano-crystalline silver-based fabric); Biobrane (porcine dermal collagen bonded unto nylon mesh and silicon membrane); and EZ Derm (glutaraldehyde-treated porcine skin) – at different parts of the body. The second patient is a 28-year-old female, newly diagnosed with HIV who was managed with Acticoat alone. Both patients were followed with serial photographic documentation of wound healing until discharge.

Our result shows that nano-crystalline silver-based wound-care product (Acticoat) produced faster epithelisation and better healing compared to Biobrane or EZ Derm.

As SJS/TEN is rare and results in high mortality, recruiting patients for randomised controlled trials is difficult for ethical concerns. Hence, these two cases provide a rare opportunity to compare the efficacy of three types of approach to skin care in SJS/TEN. The findings support the need for a multi-institutional prospective study to evaluate the efficacy of nano-crystalline silver dressing in treatment of SJS/TEN.

WHAT DOES EARLY EXCISION OF FULL-THICKNESS BURN IN A RESOURCE-POOR SETTING MEAN?

A Muganza, C Ede
Chris Hani Baragwanath Academic Hospital, University of the Witwatersrand, Johannesburg, South Africa

Early excision and appropriate cover are the goals of care for full-thickness burns. However, there is no consensus on timing for early excision. A recent study from the burns unit at Chris Hani Baragwanath Hospital compared outcomes of early to delayed excision for full-thickness burns. Herein we present a six-case series of severe full-thickness burn to demonstrate that an approach to early excision tailored to available resources may improve outcomes.

In all the cases, burn excision was performed as early as possible and type of coverage that deemed appropriate was applied. Various types of coverage were used including xenograft (EZ Derm), MEEK procedure, high graft expansion with addition of RECELL technique and use of dermal substitutes. A serial photographic documentation of progress is presented. There appear to be improved outcomes with modification of practice to include appropriate coverage at the time of excision.

In low-income countries with delayed presentation of patients to burns units, resource constrains, and sepsis, the practice of early excision of full-thickness burns is possible, however, the timing of excision should be tailored to the available resources in order to achieve improved outcome.

SIX SURGICAL PRINCIPLES FOR SUCCESSFUL BURN RECONSTRUCTIVE SURGERY IN LOW- AND MIDDLE-INCOME COUNTRIES – A 10-YEAR EXPERIENCE

E Eriksen[1,3], M Kildal[2]
[1] *MCM General Hospital, Addis Ababa, Ethiopia*
[2] *Uppsala University Hospital, Uppsala, Sweden*
[3] *CBWC Foundation, Norway*

Burn reconstructive surgery due to scar contractures in low- and middle-income countries can be performed with excellent outcomes in a sustainable way despite limited resources. Six important key points to achieve these favourable outcomes have been identified through the accumulated experience of more than 10 years of continuous burn surgical care performed for 100–120 patients yearly in hospitals in Addis Ababa and in rural Ethiopia.

The key issues identified are: 1. The availability of specific surgical equipment for excision and skin grafting; 2. The timing of procedures to ensure that adequate cleaning of wounds and optimal nutritional status are achieved prior to surgery; 3. The importance of a structured plan for skin harvesting including techniques of harvesting larger areas of deep dermal or full-thickness skin grafts and techniques of closing the donor sites; 4. The crucial point of removal of all scar tissue including the thick white fibrous tissue in chronic burn wounds to achieve good graft take as well as optimal functional and cosmetic results; 5. Optimal skin grafting techniques including principles of expanding wound areas to include complete aesthetic units for better outcome, direct application of skin grafts after excision and use of staplers to reduce bleeding and operating time; 6. The importance of postoperative wound care and mobilisation including frequent dressing changes, avoidance of routine antibiotic treatment and the use of splinting in sensitive areas.

With a structured and team-based way of working with burns and wounds focusing on alignment to specific key-issues, good to excellent results of reconstructive burn surgery can be achieved even under low-resource conditions. These important key points should be shared with general surgeons and healthcare workers handling the large number of burn patients in low- and middle-income countries.

LOW-DOSE "COCKTAIL ANALGESIA" FOR PROCEDURE PAIN DURING DRESSING CHANGE OF BURN PATIENTS AT CHRC BURN UNIT: A CASE SERIES STUDY

FF Tegete
Mission Restore and Interburns, Bugando Medical Centre, Tanzania

Burn injuries cause intense and prolonged pain which is made worse by frequent dressing change and additional procedures during dressing change. Burn patients require relief of pain and anxiety when undergoing painful procedures in order to avoid loss of trust in healthcare providers, an increase of pain perception and to achieve effective wound healing. Tolerance and dependence on ketamine and midazolam during dressing change may be a risk to burn patients as the drugs are associated with severe adverse effects; an increase in dosage may also be associated with higher cost to the patient. The purpose of this case series study was to assess the effectiveness and safety of painful dressing procedures of burn patients using low-dose combination of intravenous ketamine and midazolam for sedation and analgesia.

A case series study on eight patients who underwent dressing change on different days at CHRC burn unit. Data was recorded to determine the level of pain (before, during and after the procedure), dosing, adverse effects, time of drug administration, time procedure started and total time taken for procedure. Pain assessment was done using the Numeric Rating Scale and the Wong Backer Rating Scale tools.

This study found that the majority of the adult patients had an increased intensity of pain during dressing change following additional procedures such as staple pin removal and removal of necrotic tissues, compared to the pain score of those who had only wound dressing change without additional procedures. In children, the mean pain score outcome during dressing change in this study was 2.3, less than half that of adults which was 6.2. The study found that intravenous low-dose ketamine and midazolam was more effective and safer in children than adults.

ANAESTHESIA NURSE-LED SEDATIONS IN THE WOUND-CARE AND PROCEDURE ROOM – SAFE AND RESOURCE-SAVING

A Frestadius[1], E Eriksen[2], F Huss[1], M Kildal[1], F Freden[1]
[1] *National Burn Center, Uppsala University Hospital, Uppsala, Sweden*
[2] *Burn Unit, MCM General Hospital, Addis Ababa, Ethiopia*

A total of 350 patients are treated with burn dressing changes as out-patients at Uppsala University Hospital annually. The procedures were previously performed with an anaesthesiologist present and frequently took place in the operating room. A safe and efficient anaesthesia nurse-led protocol, releasing the anaesthesiologist, has been developed and evaluated in this study. The protocol is now under evaluation for use in burn-care settings in Ethiopia.

All patients fasted according to Swedish Society of Anaesthesia guidelines. Premedication and analgo-sedation methods were decided on by an anaesthesiologist. All procedures started with the modified WHO Surgical Safety Checklist. The protocol for children was based on nasal and rectal sedation. In children < 8 months or with ABC-conditions/disease, sedations were performed in the operating room. An anaesthesiologist was always present in the ward. The protocol for adults was intermittent/continuous propofol and additional opioids and ketamine iv during procedures.

During 2016 and 2017 a total of 726 analgo-sedations were performed for burn wound care. The majority (n = 549, 76%) were iv-sedations. Nasal/rectal sedations were performed in a total of 177 cases (34%), all of which were children. Airway complications that needed anaesthesiologist intervention occurred in three children in the iv-sedation group (0.5%). The complications were handled without sequelae. No complications were reported in the group that received nasal/rectal sedation only.

Globally, wound care is still performed with limited pain management. Anaesthesia nurse-led sedations according to the protocol offer pain management in a safe and reliable way using scarce anaesthesia resources wisely. It is a convenient work-method in most burn-care settings. We are currently introducing the nasal/rectal sedation protocol in a wound-care room setting in three hospitals in Ethiopia. An improved method for pain management in paediatric burn care is an important goal for burn care.

THE ROLE AND IMPACT OF QUALIFIED HEALTH PROFESSIONALS (IESO) TO IMPROVE BURN CARE IN RURAL ETHIOPIA

A Habtamu[1], M Kildal[2], A Frestadius[2], E Eriksen[3,4]
[1] *Bule Hora General Hospital, Ethiopia*
[2] *Uppsala University Hospital, Sweden*
[3] *MCM General Hospital, Ethiopia*
[4] *CBWC Foundation, Norway*

Ethiopia has a serious shortage of plastic surgeons. Most of the specialists live in Addis Ababa. Patients with burns in our region of seven million inhabitants are referred to Bule Hora from five local hospitals and health centres.

A health professional with a national master's degree programme for mid-level health professionals in emergency general surgery (IESO) was recruited in 2013. Six months of training at the burn unit at MCM General Hospital was added for the IESO to be able to perform skin grafting and contracture release. Bule Hora Burn Unit was then inaugurated in 2015 in collaboration with the Children's Burn and Wound Care Foundation (CBWCF). The burn unit has 12 beds and an operating room.

During the first year of service between 1 May 2015 to 29 April 2016 a total of 45 skin grafts, 15 contracture releases and 25 wound-care cases for superficial burns were performed by the IESO. There were no mortalities among these surgical cases. Since 2015 the IESO has operated more than 347 patients with burns and wounds including reconstructive surgery due to scar contracture. Since April 2019, as part of a collaborative project between Ethiopia and Uppsala, all patients are now registered in the Global Burn Registry. Further quality measures will be added to better describe the burn population and outcomes of treatment. Plastic surgery specialists

join the IESO on a regular basis to support continuous education and quality control.

Results so far indicate that task sharing with IESOs can improve access and outcomes for patients in need of burn and wound care. Training IESOs in burn care is one important step to facilitate sustainability in burn care in rural health settings where there is no surgical specialist. A similar programme for training and continuous education could be a model for other developing countries.

COPPER SUPPLEMENTATION AND MAJOR BURNS

M Husselmann

Dietitian, Red Cross War Memorial Children's Hospital, Cape Town, South Africa

Nutritional support is essential for the management of severe burn injury due to the catabolism that accompanies the hypermetabolic state. The importance of providing sufficient macro- and micronutrients to support immunity, promote wound healing and anabolism are well known. Trace-element deficiencies have been documented in major burns due to insufficient intake, the re-distribution for intracellular inflammatory processes as well as exudative wound losses. Exudative copper loss of 10–40% of total body copper has been reported.

Copper is a trace-element essential for wound healing as it is a component of several enzymes involved with collagen synthesis. It is also involved in immunological processes therefore placing those with major burns at risk of infection in the presence of copper deficiency. Currently there are variations with respect to recommended dose and duration of copper supplementation. A recent observational study recommended higher dose supplementation than what was previously mentioned in guidelines, because of the high exudative losses. Due to mucosal competition (via the metallothionein transporter) between copper and zinc, as well as increased urinary excretion found with enteral copper supplementation, high-dose enteral copper supplementation is not recommended. Intravenous copper replacement is being used for those with proven copper deficiency and major burn surface area (> 30%).

Clinical benefits of early copper supplementation have been shown to improve the uptake of skin grafts, to decrease infection rates and to reduce hospital stay. Therefore, copper supplementation should be considered for those with proven copper deficiency.

INFANT BURNS: A SINGLE INSTITUTION RETROSPECTIVE REVIEW

C Brink, Q Isaacs, MF Scriba, MEH Nathire, H Rode, R Martinez

Department of Paediatric Surgery, Red Cross War Memorial Children's Hospital and Faculty of Health Sciences, University of Cape Town, South Africa

Thermal injuries amongst infants are common and a cause of significant mortality and morbidity in South Africa. This has been attributed to the lack of an enabling environment (poverty-related lack of safe living conditions) and the cognitive and physical developmental immaturity of infants, who depend on their surroundings and adults to keep them safe.

This is a retrospective observational study of 548 infant admissions over 48 months. 'Infant' was defined as a child below 13 months of age. The 548 infants constituted 23% of all paediatric burn admissions of ages 0–12 years. Three-hundred and fourteen were males (57%) and 234 (42.7%) females. The infants were divided in a pre-ambulatory group of 143 (26%) infants of 0–6 months and an ambulatory group of 7 months to 12 months consisting of 457 (83.3%). The total body surface area (TBSA) ranged from 2–65%. Seventy-six percent (417 infants) occurred in the home environment. Scalds accounted for 86% (471 infants) and 6% (33 infants) were as a result of flame burns. Non-accidental injuries accounted for 1.2%. The anatomical distributions varied between the pre-ambulatory and ambulatory groups. Conservative management was done in 397 (72.4%) and 101 (18.4%) infants underwent surgery. Infection was suspected in 76 (13.5%) infants with positive blood cultures in 15 (20%) of the 76. ICU care was received in 46 (8.3%) infants and 15 (32.6%) of these had inhalation injuries. Of the inhalation injuries 11 (23.9%) infants underwent mechanical ventilation of an average of 4.4 days. Ventilator-associated pneumonia was diagnosed in 8 (17%) of the ventilated children. The mortality rate was 0.36%.

The surgically treated patients acquired more complications than the conservatively treated group. Special treatment considerations should be considered in this paediatric sub-group.

CHEMICAL INJURY: EXPERIENCE WITH AN ADVANCED APPROACH

J Verbelen, H Hoeksema, K Claes, S Monstrey

Department of Plastic and Reconstructive Surgery, Burn Centre, University Hospital Gent, Belgium

Chemical burns are a specific kind of injury requiring customised therapy. 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 (Diphoterine®, Hexafluorine®). In March 2012 we started applying these specific hypertonic agents in the emergency management of chemical injuries.

We retrospectively compared the emergency treatment of chemical injuries admitted in our hospital between 1 January 2008 and 31 December 2017. In the "control" group only water was used. In the "advanced approach" group, the previously described hypertonic solutions were applied, according to indication and possibly preceded by rinsing with water. Both research groups were statistically compared for composition (gender, age, chemical burn cause, triage), need for surgery and days of hospitalisation.

One-hundred and fifty-three patients were included for statistical analysis, 78 in the "control" group and 75 in the "advanced approach" group. As far as composition is concerned, both research groups were comparable (gender $p = 0{,}198$; age $p = 0{,}281$; chemical burn cause $p = 0{,}960$; triage $p = 0{,}581$). Statistics revealed significantly less surgery ($p < 0{,}0001$) and a significantly shorter hospital stay ($p = 0{,}001$) in the "advanced approach" group when compared to the "control" group.

In our hospital, patients with chemical injury clearly benefited from an emergency management involving hypertonic solutions based

on amphoteric and chelating molecules. In general, this adapted approach of chemical injuries could result in a reduction of costs.

A MODEL FOR STRUCTURED KNOWLEDGE-SHARING, TRAINING AND DECISION SUPPORT TO IMPROVE BURN CARE AT DIFFERENT HEALTHCARE LEVELS IN ETHIOPIA AND SWEDEN

M Kildal[1], A Frestadius[1], D Gerbu[2], A Habtamu[3], E Eriksen[4,5]

[1] Uppsala University Hospital, Sweden

[2] Arba Minch General Hospital, Ethiopia

[3] Bule Hora General Hospital, Ethiopia

[4] MCM General Hospital, Ethiopia

[5] CBWC Foundation, Norway

Burns and wounds according to the WHO are a "neglected global burden of disease". The current high rates of burn death and disability could be brought down by sustainable improvements in prevention and care. To address these challenges a collaborative project was introduced in four hospitals with burn care facilities in Ethiopia and Sweden.

The overall goal of the project is to develop a sustainable model to improve standard of care after burns and wounds and to create a network for continuous education and exchange of experiences. Specific improvement areas were identified: primary wound-care treatment, treatment of pain and anxiety, early basic wound surgery and rehabilitation after surgery. The project is based on long-term experiences of an NGO working with burns and wounds in collaboration with three hospitals in Ethiopia. A letter of understanding stating goals and commitments between partners was established.

Exchange programmes for experience-sharing and training team members of all four hospitals is now running regularly. Procedure rooms as a method to implement international standards on hygiene, pain management and wound care are now being set up in all hospitals. Educational programmes for surgeons, nurses and physiotherapists are encouraged and supported. Standardised surgical equipment for burn surgery has been made available to all hospitals. Excision and grafting of burns and wounds are performed regularly and quality measures are registered continuously in the Global Burn Registry.

Some important lessons so far are to base the project on pre-existing burn care programmes, and to aim for a win-win collaboration for all stakeholders. Implementation of new routines is more easily done when caretakers can participate in practical exchanges of experiences and then adapting knowledge acquired to local conditions. It is of essence to have the support of local and regional leadership for sustainability over time.

PAEDIATRIC BURN RISK MUTATIONS IN THE CONTEXT OF HOUSEHOLD ELECTRIFICATION

D Kimemia

SA Medical Research Council, VIPRU-UNISA Institute for Social and Health Sciences, Johannesburg, South Africa

Burn injuries remain a cause of premature death and disability in energy-impoverished SA communities. Although the post-apartheid government expended considerable efforts in the national electrification programme, this was all about electricity and not energisation per se. As such, there was no policy framework or plans for transitioning poor households to safe, clean, environmentally benign and affordable energy. The policy gap resulted in a different set of injury risks in the newly electrified households.

Using a national dataset on hospitalised burn injuries, this study differentiated between the risks for paediatric scalding versus flame burn injury across energy source types in newly electrified South African households. The dataset comprised 2 933 cases of male and female children aged between 0 and 12 years. Descriptive statistics and logistic regression analysis were employed to detail the sample characteristics and assess the risk for scald versus flame burn injuries across three energy sources (i.e. firewood, paraffin, and electricity).

The results indicate that 52% of all admissions for burn injuries in this sample were caused by electricity. Most of these injuries were scalds (85.3%), with infants and toddlers at greatest risk. Furthermore, the fuel transition from firewood to paraffin indicated a threefold increase in scalds relative to flame burns, from paraffin to electricity a sevenfold increase and nineteen times increase from wood to electricity. The results imply that the risk of burn injuries in electrified households has not decreased but has instead mutated incrementally from flames to scalds.

We recommend the enactment and enforcement of safety regulations for electrical appliances used by low-income households, targeted household energy safety education, and implementation of an energisation policy for universal access to safe domestic energy.

JUST VULA IT: EXPERIENCES AMONG SOUTH AFRICAN EMERGENCY DOCTORS USING A SMARTPHONE APP FOR BURN INJURY CONSULTATIONS AND REFERRALS

A Klingberg[1], LA Wallis[2,3], SC Fritzell[1], M Hasselberg[1]

[1]Department of Public Health Sciences, Karolinska Institutet, Stockholm, Sweden

[2]Division of Emergency Medicine, Faculty of Medicine and Health Sciences, Stellenbosch University, Bellville, South Africa

[3]Division of Emergency Medicine, University of Cape Town, Cape Town, South Africa

Vula is a smartphone application (app) for consultations and referrals between front-line clinicians and speciality care. Burns have been active on the app since 2016, with a steady increase of referrals made through the app. However, for a new practice to become normal routine, individuals and groups need to organise themselves, invest and engage in activities such as new ways of thinking and acting. This study aimed to explore what promotes and hinders the embedding and integration of a smartphone app for burn injury consultations in the emergency centre.

We conducted fifteen semi-structured interviews with South African emergency doctors within the Cape Town area in order to investigate their experiences using the Vula app for burn injury consultations and referrals. The interview-guide and analysis were informed by the Normalization Process Theory (NPT).

We identified three themes across the interviews: (1) It makes life so much easier; (2) It is all word of mouth; (3) You do what you can with what you have.

The doctors said that the app streamlined the consultation and referral process and provided good management and decision support. However, in a two-fold manner, the doctors were left to their own devices; knowing about the app and how to use it was often word of mouth, as well as the fact that they had to use their own smartphone and data plan. Ensuring that adequate resources, support and evaluation mechanisms are in place could facilitate the integration and embedding of the app and make it a sustainable part of daily practice.

BENCHMARK ANALYSIS OF BURN MORTALITY PATTERNS AT A TERTIARY HOSPITAL BURN UNIT, INDORE, INDIA

W Lubega
CoRSU Hospital, Kampala, Uganda

Burn injuries cause a significant amount of morbidity and mortality in low- and middle-income countries (LMICs). In India, burns account for over 300 000 deaths per year. In 2003, the 50% burn mortality (LD50%) corresponded to total body surface area (TBSA) of < 40%. Choithram Hospital and Research Centre (CHRC) Burn Unit has aligned its burn protocols with international guidelines and advances in burn care. This benchmark study was done to find out whether the burn-care protocols have translated into improved burn survival and LD50.

A retrospective chart review of burn patients admitted between June and November 2018 was done. Data was collected from hospital admission files and included age, sex, total burn surface area, burn mechanism, presence of inhalation injury, length of stay and outcome. Data were entered in Microsoft Excel software and analysed. LD50 computed using Probit Analysis.

Eighty-two patients (63 adults and 19 children) were enrolled. Mean age was 30 years, overall male to female ratio was 1.7:1 and average percentage TBSA was 32.49. Twenty-three (28.05%) died. Flame burns contributed to 95.7% of adult deaths. Adult females had a higher mortality rate compared to males (65.4% vs 16.2%). The elderly (> 58 years) had a higher mortality rate than the middle-aged (15–58 years): (44.4 vs. 35.1). No child mortality occurred, however the majority (79%) had scald burns. Average paediatric percentage TBSA was 13.66. Average percentage TBSA associated with mortality was 61.2 with an LD50 of 52. Inhalation injury was present in 65.2% of deaths and an average percentage TBSA 66.87.

This benchmark study demonstrates a LD50 above India's national average despite the high caseload of severe critical burn patients. It reflects the unit's multidisciplinary approach and integration of general advances in burn care despite challenges in LMICs.

UNTOLD STORY OF HONEY DRESSING FOR BURNS IN SOUTH AFRICA

A Muganza, C Ede
Chris Hani Baragwanath Academic Hospital, University of Witwatersrand, South Africa

For thousands of years honey was described by Egyptians as an effective means of burn wound treatment. In recent years many centres have used honey dressing in different forms as an alternative to dressing. Honey provides the following properties for wound healing:

- Its acid pH of between 3.2 and 4.5 reduces the presence of proteases that impair wound healing.
- The sugar has an osmotic effect. This reduced swelling encourages the flow of lymph to heal the wound.
- It also draws bacteria from the wound.

At the Johnson & Johnson Burn Treament Centre honey dressing has been the most frequently used dressing in the last ten years for different indications. The most common indications are:

- Partial-thickness burns
- Full-thickness burns
- Chemical
- As debriding agents

We present in this paper a number of cases and pitfalls regarding the use of honey and we make some recommendations.

TRIALS AND TRIBULATIONS IN MANAGING SEVERE BURNS AT THE JOHNSON & JOHNSON BURN TREATMENT CENTRE

A Muganza
Chris Hani Baragwanath Academic Hospital, University of Witwatersrand, South Africa

In low- and middle-income countries more than 20% burns have high mortality and morbidity. Disproportion between the number of victims and resources available for care are major causes. Other limiting factors include:

- Prevention measures
- Preparedness and planning
- Triage/guidelines for admission
- Scarcity of specialised burn beds

At the Johnson & Johnson Burn Treatment Centre, which is the only modern burn facility in the public sector in Johannesburg, with 28 years' experience, more than twenty thousand severe burns have been treated.

In this paper we present a number of severe burns treated in the past five years with different options available and propose ways forward to improve management and outcome in low- and middle-income countries.

A COMPARISON STUDY BETWEEN EPICITE-HYDRO DRESSING AND ACTI-COAT DRESSING IN THE TREATMENT OF SUPERFICIAL AND PARTIAL-THICKNESS WOUNDS, AT CHOITHRAM RESEARCH HOSPITAL AND CENTER, INDORE, MADHYA PRADESH, INDIA

BD Nakuya, S Chamania[1]
[1] *Burn Surgeon, Choithram Research Hospital and Center.*

The search to find an ideal dressing for burns, that provides the much needed moist environment and protection against antimicrobial organisms, that is comfortable and pain free and is satisfactory for both the patient and the surgical team, has been a challenge for decades. In this study, we assess the efficacy of a new German dressing for burns called Epicite-Hydro, compared to the well-known Acti-Coat dressing. Ease of application, pain assessment and rate of healing were compared between the two dressings.

The study was carried out as a prospective randomised study. Patients with superficial and partial-thickness burns, TBSA < 20%, fresh or less than two weeks old, were identified and enrolled into the study. Photographs were taken of the wound before the application of the dressing, on Day 5, and Day 10 with subsequent follow-up. Pain scores were also assessed on these days. Percentage of epithelisation was recorded on Day 10 and compared between the two dressings.

Both dressings were found to be user friendly and easy to apply. Excellent results were noted for superficial and partial-thickness burns using Epicite-Hydro, in patients of all age groups, with different co-morbidities. However, Acti-Coat seemed to have more superior results for partial-thickness burns in terms of re-epithelis ation. In partial-thickness burns, Epicite-Hydro, was noted to keep wounds clean and encourage growth of granulation tissue over the wound that required grafting later. In the matter of pain relief and comfort, Epicite-Hydro dressing was found to provide better pain relief and comfort to most patients upon application and on dressing changes.

EFFICACY AND SAFETY OF DECONTAMINATION WITH A HYPERTONIC AND AMPHOTERIC SOLUTION AFTER CHEMICAL EXPOSURE

A Navarro[1], L Mathieu[1], J Blomet[1], AH Hall[2]

[1] Laboratoire Prevor, Valmondois, France

[2] Toxicology Consulting and Medical Translating Services, Springtown and Azle, Texas and Colorado School of Public Health, University of Colorado, Denver, United States of America

To review the safety and efficacy of Diphoterine® solution, which is a hypertonic and amphoteric solution, for chemical burn treatment of skin and eyes.

Information sources were PubMed, ScienceDirect and Google Scholar. Terms included were Diphoterine, chemical burn irrigation, chemical injury, management, chemical burn emergency, Previn solution, skin decontamination and eye decontamination. Any study published through a peer-reviewed journal was considered eligible. Published data must have included Diphoterine® solution or chemical lesions and decontamination management used. Various testimonials received from industries and organisations were added to this bibliographic research.

The retrieved data could be classified as studies of safety or studies of efficacy.

The main safety results showed that Diphoterine® solution is non-irritant for skin and eyes, non cytotoxic and non toxic with acute oral and dermal LD50 > 200 mg/kg.

As to the efficacy of the solution, results could be divided in three categories: First – is industry testimonies, more than 70, concerning immediate use after a chemical splash. Second – chemical accident in industries, pre-hospital and hospital, more than 400 cases of irritant and corrosive. Third – a dozen comparative studies with more than 2 700 cases washed with various solutions (water, saline or Diphoterine®). These documents helped to extract main conclusions about time of intervention, which we split into immediate intervention (industry) and delayed intervention (pre-hospital and hospital).

When hypertonic and amphoteric solution of Diphoterine® is used immediately after the accident, it often enables tissues to be preserved without any lesion. When used after a delayed wash, the need of medical treatment or surgery decreases and allows medical care in best conditions. In all cases, Diphoterine® solution helps to limit the chemical burning process.

DRESSINGS IN BURNS CARE WHEN RESOURCES ARE LIMITED

D Navet

Interburns Nursing Lead, Course Director ABC Nursing, Staff Nurse Welsh Centre for Burns and Plastic Surgery, Wales, United Kingdom

The Interburns Nursing Team has nurses from many countries, some with limited resources and others with access to the full range of modern dressing technology. This Nursing Team has built up a strong relationship over a considerable period of time, working in a number of different countries and has created a bank of transferable knowledge for managing burns patients within the locally available resources. The Advanced Burn Care (ABC) course for nurses has been running since 2016 and, as well as teaching, has enabled exchange of ideas and informed discussion on the availability and practicality of different dressings. The majority of burn injuries are treated conservatively and that means effective wound management is an essential part of ensuring the optimal outcome. Patients don't need to have large burns to end up with infections or contractures.

The joint knowledge of all of us working in Asia, Africa, the Middle East and Europe can highlight ways to improve the management of dressings for burn patients.

This is an attempt to show what is available and how we can overcome the difficulties that most of us share when it comes to the common practice of 'change of dressing'.

CHALLENGES IN MANAGEMENT OF AN EXTENSIVELY BURNT FEMALE PAEDIATRIC PATIENT AT UNIVERSITY TEACHING HOSPITAL – KIGALI (CHUK)

Y Nezerwa

Plastic Surgery Department, Rwanda Military Hospital, Kigali, Rwanda

Burn injuries are a major global epidemiological problem resulting in significant morbidity and death, especially in neonates, infants and children whose dermal layer of skin is generally thinner than in adults. The management becomes very challenging when dealing with an extensive burn surface, with limited intact skin graft, in settings where alternatives to the practice of donor-site harvest and autografting for the treatment of severe burns, is almost non-existent.

On 16 August 2018, a six-year-old female child was admitted to the CHUK Burn Unit following a third-degree flame burn on the chest, abdomen, back, both buttocks and thighs with approximate TBSA of 40%. Upon reception of the patient, she was managed following ATLS protocol and appropriate fluid resuscitation. When she stabilised, a long process of debridement of devitalised tissue began, complicated by several episodes of sepsis which led to long courses of susceptible IV antibiotics, not forgetting a malnutrition state prevailing up to date. Her weight on admission was 23 kg, now 10 months later she is still hospitalised and weighs 15 kg, on dressings once in two days. Initially, TPN Kabiven was provided, then Fresubin, but as she comes from a low-income family and as a result of the long hospitalisation, the financial supporting organisation stopped its aid. A synthetic temporary skin was donated, but the malnutrition status makes her not optimal to major staged operations.

Major limitations to this case are malnutrition which renders the patient unfit for surgery, and the lack of availability of alternative methods to autograft (e.g. cadaver, plant, fish, synthetic skins [temporary or bioengineered]…) What would you recommend?

ASSESSMENT OF ADEQUACY OF FACILITIES AND EQUIPMENT IN HEALTHCARE SETTINGS OFFERING BURN CARE ACROSS NIGERIA

OA Olufemi[1], SA Ademola[1], OM Oluwatosin[1], RE Nnabuko[2]
[1] University College Hospital, Ibadan, Nigeria
[2] Mercy Clinics, Enugu, Nigeria

Globally, advances in technology and systems have improved burn prevention and care outcomes. However, in low- and middle-income countries (LMICs), the majority of victims are treated in over-capacitated and under-resourced facilities hence increasing morbidity and mortality rates. Effective burn care is premised on development of burn systems but in LMICs the inherent challenges of burn care settings is a major clog in the wheel of efficient burn care.

We aim to assess the adequacy of facilities and equipment in healthcare settings offering burn care across Nigeria.

This is a descriptive study utilising quantitative data gathering through questionnaires completed by respondents from each representative facility.

A total of fourteen (14) healthcare settings rendering burn care were involved in the study. Seven (50%) of these offered Burn Services, 29% are Burn Units while 21% are Burn Centres. Overall, 71% do not have sufficient beds to meet current needs, 78.6% have intensive care facilities. Ten (71.4%) do not have adequate patient surveillance equipment, or hydrotherapy facilities, although 9 (64.3%) have specialised and equipped spaces for occupational therapy. Twelve (85.7%) do not have access to skin banks or storage for skin products while 85.7% and 92.9% of these do not have support groups for burn patients or burn camp respectively.

The outcome of burn care is related, among other things, to the available standard and quality of care. There is a need to overhaul and strengthen burn care systems to enhance desirable burn care outcomes, in addition to setting standards, which is an important strategy to in improving quality care.

OUTCOME OF BURN MANAGEMENT INVOLVING HIGH-DOSE MULTIVITAMINS ON MAJOR BURNS IN ENUGU

Il Onah, CON Ezinwa, CE Chijioke
Burns and Plastic Surgery Department, National Orthopaedic Hospital Enugu, Enugu State, Nigeria

Major burns pose a major health challenge to the patient and managing team. It may consume the patient's store of nutrients especially in a country where more than 60% of the population live below the poverty line. We know burn injuries most frequently affect those of low socioeconomic class. The purpose of the study is to evaluate the outcome of major burn management involving the use of high-dose multivitamins.

A five-year retrospective study of patients with major burns who were managed by a plastic surgery unit that routinely uses high-dose Vitamins A, C and E was done. Data was obtained from the Acute Burn ward register and patients' folders were retrieved from the medical records for the analysis. Compliance with protein and caloric instructions were unavailable.

From January 2013 to January 2018 one hundred and twenty-nine patients were admitted in the unit in the period under review. Data was available in 74 folders. Percentage compliance to the high-dose vitamins was compared to the rate of healing and readiness for skin grafting of the burn wound. Patients that had higher percentage compliance with the high-dose vitamins had faster rates of healing or wound readiness for skin grafting. Clinical signs of hypervitaminosis were not seen. Perhaps, it was not sought since it was a retrospective study.

Management of major burns using high-dose vitamins may have a role in the promotion of burn wound healing. Larger prospective and multicentred studies are needed to determine its place in burn care.

FACIAL BURNS: CHRIS HANI BARAGWANATH ACADEMIC HOSPITAL, PAEDIATRIC BURNS UNIT'S EXPERIENCE WITH NANOTRIX

R Parkhurst
Clinical Head, Chris Hani Baragwanath Academic Hospital, Paediatric Burns Unit, Johannesburg, South Africa

Children represent a large proportion of the total burn population and the prevalence of facial burns in our unit is 30 to 50%. Facial burns pose difficulty and complexity of wound care including pain, dressings and the need for close monitoring to ensure a safe airway and adequate nutritional intake. Due to the high vascularity of the face it heals quickly as long as the wounds stay free of infection. We have had great results using Nanotrix as a primary dressing in superficial partial-thickness facial burns.

The intended purpose of the Nanotrix dressing is to cover the wound and to create a moist wound healing environment. Nanotrix is a synthetic, self-adhesive membrane comprising an Apo-Lactoferrin Hyaluronic Acid Polymer intended as a temporary skin substitute for

superficial to partial-thickness wounds. Nanotrix is highly permeable to oxygen and water vapour and creates an acidic environment, providing a particularly favourable environment for wound healing and mitigates the risk of further infections.

The face is a psychologically significant area of the body and its disfigurement has been found to have numerous potential psychosocial consequences for patients.

I will present a picture series of paediatric patients and highlight some key concepts with the use of nanotrix and highlight some potential complications.

CHALLENGES OF MANAGING MAJOR BURNS IN A DEPRESSED ECONOMY: THE EXPERIENCE OF NATIONAL ORTHOPAEDIC HOSPITAL, ENUGU, SOUTH-EAST NIGERIA

LO Peter-Emekwuru, EA Ugwumgbor, RA Ozifo, II Onah, M Ezeigweneme
National Orthopaedic Hospital, Enugu, Nigeria

Burns are a global health problem and their challenges are overwhelming especially in developing countries. A survey by the World Health Organization shows that 95% of the total annual deaths in burns occur in low- to medium-income countries with the highest rate in the category with major burns. Severe burn care requires substantial expertise and is extremely resource intensive. In developing countries where resources are limited, it becomes quite difficult to nurture patients back to sound health of mind and body.

While several studies have focused on minor and major burns concomitantly, this paper aims to share an overview of the challenges in in-patient management of major burns in National Orthopaedic Hospital, Enugu between 2018 and 2019. A total of 100 target population was used; 50 patients comprising both adults and children and 50 health workers. Finance was a major problem for 98% of health workers while 95.5% of patients stated pain as their major problem. Flame was a major cause of burn with 90%. In addition, most major burns were as a result of accidents, ignorance, spiritual beliefs, and carelessness as described by the patients. Results also revealed that 40% of patients were given first aid using local substances like raw egg, cassava, engine oil, Aloe vera, before arrival at the hospital, which affected healing of wounds. About 75% of patients with major burn had contractures. Generally, males were more affected than females. Discussions were based on economic and social implications, facilities, personnel availability and interferences from patient's belief system.

The studies reviewed indicated limitations which may be complicated by social, religious and cultural beliefs. It would be of utmost importance for Nigeria to establish a nationwide burn database and repository for policy making to reduce the incidence and severity of burns. Other suggestions for improvement were outlined.

WHEY PROTEIN SUPPLEMENTATION IN MAJOR BURNS – BEST SUPPORT TO OPTIMISE NUTRITION

P Sharma, S Chamania, T Potokar, R Singh, S Jain
Department of Burn Surgery and Dietetic, Choithram Hospital and Research Center Indore, Interburns Training Center, India

Optimum nutrition in major burns plays a very important role. Insufficient nutrition causes certain complications and delays the recovery period. Catabolic response leads to sepsis and fatality.

We aim to evaluate the efficacy of whey protein as the best support to achieve optimum nutrition in major burns.

All major burns between 18–60 years, male and female, were enrolled in this study. Nutrition requirement was calculated based on weight and percentage of total burn surface area. Curreri formula were used to calculate total energy requirement; protein calculation was done by 1.5 gm/kilogram body weight with addition of wound protein loss (1.2xBSAm2x%TBSA), and nutritional provision was done according to the nutrient requirement. The oral route was the preferred mode of feeding. Whey isolates and concentrates were given to all subjects depending on their daily protein requirement.

Whey is easily acceptable and tolerable to all patients without any intolerance and complications. No need to insert Ryles Tube to achieve optimum calorie and protein demand. Reduces length of hospital stay and achieves overall cost cutting. Helps to reduce the resource person's efforts.

IMPLEMENTATION AND IMPROVEMENT SCIENCE FOR NURSES

ZC Sichinga
Interburns Faculty Nurse, Nursing Officer, QEH Burns Unit, Blantyre, Malawi

Implementation and Improvement Science is the course for nurses that involves the scientific study of methods to promote systematic research findings and other evidence-based practices that feed into routine practice to improve the quality and effectiveness of health services.

The course also uses various approaches, models, research skills and quality improvement tools such as cause and effect diagram and 5 Cycles. These models and approaches play a vital role in identifying factors and aspects of a problem resulting in taking the right cause of action.

Overall, implementation science is designed to change the systems that eventually will produce results that are sustainable and desirable.

The course is aimed at equipping nurses with knowledge and skills on conducting a quality improvement project to improve the health working environment despite having limited resources.

It is evident that with the knowledge and skills gained from implementation science, patient care has significantly improved. It is worth noting therefore that implementation science has assisted in reducing wastage of vital resources such as time and supplies. Patients have been helped timeously with minimum complications and reduced hospital stay.

The implementation and improvement science course for nurses equips nurses with knowledge and skills on how to improve the quality and effectiveness of health services thereby improving patient care outcome.

NECK CONTRACTURE CLASSIFICATION

F Sima

Neck contracture is one of the challenges in burn management. Different classifications are used for management purposes. One classification is based on range of motion: Grade 1 – no limitations in range of motion (ROM), no facial distortion; Grade 2 – mild limitation of ROM, distortion of lower one-third of face; Grade 3 – cannot extend head past neutral position, distortion of lower one-third of face; Grade 4 – loss of cirvicomental angle, severe facial distortion; possible fusion of chin to anterior chest wall.

MANAGEMENT RECOMMENDATION:

Grade 1 – Z plasties;

Grade 2 – cervical flaps, FTSG;

Grades 3 and 4 – FTSG or flaps;

Skin graft: advantage – covers large area and restores aesthetics; disadvantage – recurrent contracture.

Postoperative splinting of 3–6 months is recommended to prevent recurrent contractures particularly in skin grafted patients.

Flaps: advantage – durable, less recurrent contracture; disadvantage – bulkiness and loss of cervicomental angle.

BURN INJURY TRAINING AND EDUCATION: A SURVEY OF HEALTHCARE WORKERS' EXPERIENCE AT A HOSPITAL IN RURAL KENYA

K Sylvester[1], MA Palilonis[2,3], R White[1,2], DT Harrington[2], PM Vivier[3], RK Parker[1]

[1]Department of Surgery, Tenwek Hospital, Kenya

[2]Department of Surgery, Brown University/Rhode Island Hospital, United States of America

[3]Hassenfeld Child Health Innovation Institute/Brown University, United States of America

Burn injury represents a substantial burden of disease in sub-Saharan Africa. The healthcare providers who treat burn injury patients in this area have varying levels of training and education in this field.

Researchers administered a paper-and-pencil survey in October 2018 to healthcare workers at a 300-bed, faith-based, teaching and referral hospital in southwest Kenya. Bivariate analysis compared workers who provided direct care to burn injury patients to those who did not. A sub-group analysis of workers who provided direct care to burn injury patients used bivariate analysis to compare workers, based on overall confidence in burn care knowledge.

Researchers distributed 200 surveys and received 187 completed surveys for a 93.5% response rate. After excluding workers who had been at the hospital for less than 12 months, 135 surveys were included for analysis. In our sample, 80% (n = 108) of healthcare workers surveyed provided direct care to burn injury patients. There was no significant difference in age or mean years working between the two groups. Workers who provided direct care were more likely to report instruction on burn care during training (98.1% vs 81.5%, p = 0.004). In the sub-group analysis of workers who provided direct care to burn injury patients (n = 108), 47.7% reported feeling often or always confident in overall burn knowledge (n = 51). There was no significant difference in age or reported instruction on burn care during training. Those with high confidence in burn knowledge had lower mean years working (4.9 ± 0.6 vs 7.7 ± 1.0, p = 0.024), were more likely to report seeing more than 10 patients in the past 12 months (19.6% vs 5.4%, p = 0.036) and were more likely to report receiving burn training at the hospital (45.1% vs 23.6%, p = 0.02)

Despite general instruction on burn care during training, healthcare workers report a significant gap in burn care knowledge.

BURN WOUND MANAGEMENT PROTOCOL: THE NATIONAL ORTHOPAEDIC HOSPITAL ENUGU EXPERIENCE – A LITERATURE REVIEW

EA Ugwumgbor, MN Ezeigweneme, L Peter-Emekwuru

South East Regional Burn Center, National Orthopaedic Hospital Enugu, Department of Nursing Services (Burns and Plastic Unit), Enugu State, Nigeria

A burn is an injury to the skin or other organic tissue caused by heat, radiation, electricity, friction or chemicals. Burn wounds are a global public health issue which affects all countries, despite the developmental stage, and cuts across all age groups. An estimated 265 000 deaths occur each year from fires, with more from other forms of burns, of which there is no accurate statistical global data (WHO, 2019). About 1.5 million occur in Nigeria yearly (Fraser, 2015).

Burn care has become a well-focused multi-disciplinary specialty in its own right. The burns and plastic care specialists involved in the care of burn patients play a central role in the co-ordination of the multi-system disease state that burns present. Burn care is complex, with multi-dimensional approaches, involving not only applying different topical agents and dressings, but also the right decisions in selection of suitable burn dressing materials that suit the wound in question.

Qualitative research journal publications were reviewed online using Google search engine. National Orthopaedic Hospital Enugu is the only burn centre in southeastern Nigeria where both acute and chronic burns are managed. The unit has many specialist burn and plastic surgeons and nurses. The hospital is located in Enugu East Local Government Area of the state. The aim of this work is to discuss the overview into the management protocol of a burn patient from the perspective of the National Orthopaedic Hospital Enugu. It is recommended that well-equipped functional burn centres be established in each state of the federation.

RECOVERY THROUGH ANIMATION: A BURN SURVIVOR'S STORY OF HOPE AND STRENGTH

A van Niekerk[1], N Hornsby[1], R Singh-Adriaanse[1], M Sengoelge[2], L Laflamme[2]

[1]Violence, Injury and Peace Research Unit, SAMRC-UNISA, South Africa

[2]Department of Public Health Sciences, Karolinska Institutet, Sweden

Paediatric burn injuries are a major cause of injury and disability, occurring mainly in resource-poor environments. Recovery from burns is often beset with physical, psychological, relationship and reintegration challenges. However, a child's psychological resilience

and social support greatly influences recovery which may be strengthened by early interventions that promote modes of coping and target key sources of stress, preferably already during the acute phase at hospitalisation. A short video was developed to support the early recovery of child burn victims.

The video is a three-minute animation that portrays a story of resilience and positive recovery after a burn injury. The story is from the perspective of an adolescent boy's experiences a few years ago. The boy describes personal strategies and the different sources and forms of support he had received during different phases of this psychosocial journey, from hospitalisation to his return home and to school, and how various people in his life facilitated his recovery. The video narrative was constructed from discussions with child burn survivors, their parents or caregivers, and burn support specialists. Data from these discussions were thematically analysed and synthesised into a script that highlighted the following key recovery needs: (1) the presence, comfort and assistance from family; (2) care and reassurance from hospital staff; (3) reconnecting with friends; (4) being treated as before; (5) acceptance of oneself and by others; (6) positive cognitive strategies; (7) preparing peers and teachers; and (8) acting against bullying.

It is intended that the video be shared with school-aged burn patients and their families prior to discharge or while attending outpatient services. The video is intended to highlight the individual and support needs of the child and bolster the recovery of children and their families, thus complementing the limited formal support efforts, especially in resource-constrained contexts.

GLABROUS SKIN GRAFT FOR BILATERAL FULL-THICKNESS PLANTAR BURNS

A Vorster, A Malan
Tembisa Provincial Tertiary Hospital Burns Unit, South Africa

Palmar and plantar burns are challenging to manage especially when it comes to long-term outcome. This is mainly due to glabrous skin's unique properties with regard to aesthetics and function.

A 36-year-old male presented to the burns unit in August 2018 with full-thickness bilateral plantar burns. His wounds were debrided surgically and dressed as an in-patient. He subsequently developed wound sepsis which was treated locally and systemically. Due to sepsis, definitive treatment was significantly delayed. A staged approach was preferable due to the nature of the injuries, and adequate wound bed preparation. We opted to trial a glabrous skin graft for the patient in order to improve functional, sensory and aesthetic outcomes based on the plastics principle of replacing like with like tissue. We did a split thickness, one to three meshed graft on the left foot as this had the greater weight bearing area and donor skin was limited. The right foot wound was covered by a non-glabrous autograft due to limited availability of glabrous skin and non-weight bearing area. Postoperative care was uneventful and the graft site was exposed on Day 5. We were unsure of initial graft take due to the unfamiliarity of the tissue. We decided to leave the clips in place and observe over the following days. On Day 10 complete graft take was established and the clips removed. Hyperkeratotic skin separated from the wound bed leaving behind a fully healed new dermis. The donor site healed remarkably well by Day 5 and full functionality was restored with minimal scarring by Day 24. The patient was discharged, fully ambulatory, with little to no functional impairment and good aesthetic outcome.

This case illustrates the advantageous use of glabrous skin yielding superior aesthetic and functional results with low donor site morbidity.

TEMBISA PROVINCIAL TERTIARY HOSPITAL BURNS UNIT AND THE VULA APPLICATION

A Vorster
Tembisa Provincial Tertiary Hospital, South Africa

Tembisa Hospital has, for a long time, been running a burns unit. It is run by the head of department along with rotating medical officers. It is not a regional burns centre but accepts many burns patients from outside their catchment areas. It consists of a 40-bed adult and 20-bed paediatric ward and a three-bed adult and three-bed paediatric high care unit. It has an average of 70 admissions per month. Previously there was no definitive protocol or teaching programme in the burns ward and admissions were done by the general surgery team on call.

We first heard about the Vula application (app) from a friend who uses Vula in the Western Cape and we were interested as it was easy to use and kept patient information confidential. Vula was implemented in the Tembisa burns unit in November 2018. Since the start of its use it has been quite amazing to see what a difference it has made in our practice. All our ward admissions were sent through the app by junior doctors in casualty. The detailed form was completed by the intern along with photos and sent to the burns doctor on call. This quick access to all the information allows the burns specialist to make a decision on the management of the patient. The quick reply and immediate guidance have made a big impact on our morbidity and mortality allowing the severe burns and ill patients to be attended to in a timely and proper manner and the less severe burn patients to be sent home. This has had an impact on the overall number of admissions thus decreasing hospital costs. It also allowed real-time teaching, even after hours, for the junior doctors.

THE PLANNING AND IMPLEMENTATION OF THE WOUND-CARE ROOM – A STRUCTURED WAY OF INTRODUCING INTERNATIONAL STANDARDS AND GUIDELINES FOR BURN AND WOUND CARE

Y Wendemagegnehu[1], A Frestadius[2], E Eriksen[1,3], M Kildal[2]
[1] MCM General Hospital, Addis Ababa, Ethiopia
[2] Uppsala University Hospital, Uppsala, Sweden
[3] CBWC Foundation, Norway

International guidelines for burn care are difficult to implement in hospitals in low- and middle-income countries due to lack of resources or lack of staff with relevant education. The goal of this project was to introduce and implement updated guidelines in the Burn Unit, MCM General Hospital, Ethiopia.

A wound-care room was set-up at MCM General Hospital with specific routines and guidelines as at the National Burn Center in Uppsala. Staff from the two hospitals worked together following these routines. The routines were adapted to local conditions and implemented. Staff compliance and staff and patient satisfaction were registered. Staff experience was measured by semi-structured interviews. Basic data was documented in the Global Burn Registry.

In April 2019, 90 wound-care procedures were performed on 12 patients. Compliance to the nine specific routines observed was high with seven of the routines followed in more than 96%. Routines regarding administration of pain medication were followed in only 29/90 procedures (31%). Staff satisfaction was a mean of 4.9 and patient satisfaction a mean of 3.9 on a scale from 1–5, with 5 being top score. Results of staff semi-structured interviews were overall very positive. Improvement areas were identified regarding pain management and lack of parent participation in wound care for children. A new follow-up of results was performed after one month of improvements resulting in compliance to routines of pain medication increasing to 71%.

It seems that structured implementation of routines and guidelines in a wound-care room setting is a useful way to update local burn care routines to international guidelines regarding hygiene, pain management, sedation and analgesia, wound care and early mobilisation. Dedicated leadership, knowledge sharing between centres, systematic measurements and follow-up of compliance to guidelines supported both the implementation and sustainability of the new routines.

VARIABLES IN BURN MASSAGE WITH REGARDS TO HYDRATION, TIMING, DURATION, FREQUENCY AND TECHNIQUES IN HYPERTROPHIC SCARRING AND SCAR OUTCOME

M Wilson
Milpark Hospital, Johannesburg, South Africa

Cutaneous scarring in humans is the normal physiological response to injury and trauma and is unavoidable post-natally. The prevalence of hypertrophic scarring in burns patients is extremely high due to the profound dermal injury, activation of many inflammatory pathways and subsequent widespread, diffuse tissue damage. Studies have shown that this prevalence can be as high as 65% especially after deep dermal burns and in burns requiring skin graft surgery.

Hypertrophic scarring and keloid scarring can be classed as fibro-proliferative disorders of dermal tissue due to the excessive amounts of collagen being laid down, resulting in increased fibrosis causing an overgrowth of granulation tissue and subsequent hypertrophic scarring. Superficial dermal injuries which do not extend to the level of the reticular dermis never result in keloid or hypertrophic scarring. As many as 81% of burn rehabilitation professionals recommend burn scar massage as part of their treatment plan. Burn massage, although widely utilised in burn rehabilitation, is not standardised with regards to time of commencement, pressure, duration, time of massage technique, use of moisturisers, frequency, stage of scar maturity and type of technique used.

There are emerging theories of mechanotransduction which suggest that mechanical force e.g. massage or stretch, can increase the fibroblast proliferation of collagen and therefore increase the hypertrophic scarring. Mechanical forces influence all stages of wound healing. Considering the wide range of variables used in burn massage: could this intervention of massage be precipitating or exacerbating hypertrophic scarring?

NOVEL METHODS TO MONITOR AND SUPPORT THE CUTANEOUS MICROCIRCULATION IN BURN WOUNDS: A REVIEW

Y Zhou
Department of Plastic and Reconstructive Surgery, John Radcliffe Hospital, Oxford University Hospitals NHS Foundation Trust, United Kingdom

Cutaneous microcirculation pertains to the dermal ultrastructure and the microvascular physiology of the skin in both healthy and injured circumstances. In the specialty of burn surgery, this concept is particularly relevant due to its strong association with wound healing. In the clinical context, our ability to assess the cutaneous microcirculation is an area of increasing research. Furthermore, our ability to support and optimise the cutaneous microcirculation in burn wounds is an area that is lacking experience, both clinically and academically.

We conducted a systematic review to find novel techniques used around the world to 1) assess the cutaneous microcirculation, and 2) optimise the cutaneous microcirculation in burn wounds to improve patient outcomes. We used online and paper-based scientific databases for our search. The goal of the review was to find techniques that showed to the highest potential in its clinical applicability to burn surgery.

A range of new techniques is being widely used to assess cutaneous microcirculation. Most prominently, the use of Laser Doppler Flowmetry (LDF) and in-vivo Reflectance Confocal Microscopy (RCM) have the most promising results and the largest pool of data for their use. Both these methods are non-invasive and provide real-time in-vivo information. However, the clinical applicability of these methods remains limited and requires further research.

A number of pilot studies have also been conducted using novel methods to optimise the cutaneous microcirculation in animals. These include the use of agents such as prostaglandins, doxycycline and extra-corporeal shockwaves to stimulate or inhibit pathways involved in the cutaneous microcirculation.

Although there is a growing body of research into the assessment and optimisation of the cutaneous microcirculation in burn wounds, the clinical applicability still requires further investigation. The future is promising if further in-vivo studies on animals and humans are conducted.