

# Accepted Abstracts

## *ICWDO 2022*



6<sup>th</sup> International Conference on  
**WOUND CARE, DERMATOLOGY AND ORTHOPEDICS**  
December 05-06, 2022 | Dubai, UAE

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# WOUND CARE, DERMATOLOGY AND ORTHOPEDICS

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## Developing a systemic monoclonal antibody therapy for the treatment of large burn injuries

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Studies have shown that Flightless (Flii) is elevated in human wounds including burns and reducing the level of Flii is a promising approach for improving wound repair and reducing scar formation. The most effective approach has been to neutralise Flii activity using localized, intradermal application of function blocking monoclonal antibodies. However, large surface area burns are difficult to treat by intradermal injection of therapeutics so the aim of this study was to investigate if systemic injection of a monoclonal antibody against Flii could improve healing in mice following burn injury.

Flii neutralizing antibodies (FnAbs) were labelled with Alexa-Fluor-680 for biodistribution studies and healing effects of systemically administered FnAbs to mice with burn injuries. A partial thickness, 7% (70mm<sup>2</sup>) total body surface area scald burn injury was created on the dorsal surface of mice (n=10/group) and 100µL of Alexa-Fluor-680-labeled FnAbs were injected into the intraperitoneal cavity (IP) at time of injury. The burns were imaged on days

0, 1, 2, 3, 4 and 7 using IVIS Lumina S5 Imaging System and healing assessed macroscopically, histologically and using immunohistochemistry.

Fluorescent radiance efficiency measurements showed that IP injected Alexa-Fluor-680-FnAbs localized at the site of burn injury from day 1 remaining there for whole 7-day study. The burns treated with FnAbs showed a reduction in macroscopic wound area and increased rate of epithelialization compared to controls. Immunohistochemistry for NIMP-R14 showed a reduction in inflammatory infiltrate while CD31/VEGF staining showed improved angiogenesis post- systemic FnAb treatment. These results suggest that systemically administered FnAbs are active within the burn site and can improve healing outcomes. The clinical application of systemically injected Flii monoclonal antibodies could therefore be a potential approach for promoting healing of large surface area burns immediately after injury.

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## Biofilms and surgical site infections

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Surgical site infections are common in human and veterinary medicine and can result in increased morbidity and mortality as well as adding to overall healthcare costs. Surgical site infections are nosocomial infections and can be classified as superficial incisional, deep incisional, or organ-space. Biofilm-producing bacteria in surgical site infections have survival advantages compared to sessile bacteria, making diagnosis and treatment more challenging. Treatment of surgical site infections varies and depends on the type of infection, drug susceptibility,

patient factors and wound factors. Preoperative, intraoperative and postoperative measures can be taken to prevent the development of surgical site infections. Surgical materials to reduce the likelihood of biofilm formation have been developed, but strong evidence to support their use is lacking. Further prospective studies and the development of active surveillance programmes are warranted.

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## AI-based body segmentation and risk analysis of pressure ulcer by evaluating the real-time pressure heat-map information

**Ahmad Reza Heravi, Mohammad Mohammad Amini and Sajjad Aemmi**

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The risk of getting pressure ulcer increases as the amount of pressure on a specific part of the body rises. Moreover, studies show that the duration of steady pressure on body organ plays an important role in inducing the pressure ulcer. In this paper, a real-time pressure heat map of sleeping volunteers is generated based on the collected data from a commercial sensor sheet and the trend of localized pressure variation is analyzed to find out the risky situation for pressure ulcer. The novelty of this study is to use body segmentation to find the risk of pressure ulcer. Based on a trained AI network, 13 segments of human body are detected from pressure heat map (for 10 standard back sleeping conditions and for non-standard ones) and the

maximum pressure and duration of this applied pressure in each segment is investigated. Based on clinical evidence, the limitation for duration is applied and proper signals are generated to show the risk of getting pressure ulcer in people using body pressure mapping system. The body segmentation is performed based on training by datasets containing pressure heat map and RGB images taken by a ceiling mounted camera. The results validation is performed based on datasets containing just the pressure heatmap to remove the need for images for evaluation of the process. This is the most compatible method to collect less information based on GDPR.

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## Debridement of severe wounds in children's practice

**Ruben Nalbandyan, Pavel Medinskiy and Anastasia Gromova**

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**Background:** In connection with a growing number of road accidents, new extreme sports, the problem of open wounds has remained actual up to the present. A surgical infection, aggravating the course of wound process, increases the size of struck tissues and it's the ultimate obstacle to provide different types of reconstructive operations. The success in cure and prevention of wound contamination is in direct relationship to quality of debridement and the correct choice of treatment tactics.

**Materials and methods:** The present study is based on experience in treatment of 140 children with wounds (27,2%), open fractures of long bones (12,6%), traumatic amputations of extremities (6,4%), infected wounds (46,4%), pressure ulcers (7,4%), who underwent treatment in the Children's clinical and research institute of emergency surgery and trauma from 2015 to 2021 years. The age of patients ranged from one month to eighteen years old. The area of wound surface varied between 5 and 30 cm<sup>2</sup>.

The patient treatment was provided according to the principles of active surgical wound healing method, included:

1) radical debridement; 2) additional treatment of wound with different physical methods; 3) local wound treatment; 4) primary or early immobilization; 5) early plastic and reconstructive surgery.

**Results:** Debridement was carried out with the anatomical features of affected segment. Hydrosurgical system "Versajet" (54 patients), ultrasound cavitation of wound (70 patients), wound treatment with defocused ray of plasmic scalpel (35 patients), VAC- therapy (68 patients) were used during the surgery in order to facilitate the surgical treatment and improve results. Hydrosurgical wound treatment was carried out simultaneously with plasty in 24,3 %.

**Conclusion:** Combined use of traditional and up-to-date methods of wound treatment has allowed to bring the course of complicated wound process to not complicated one, reduced the number of repeated debridements and allowed to prepare wound surface for further plastic closure.

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## Autologous adipose-derived stem cells (ADSCs) transplantation in the management of chronic wounds

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Our aim is to characterize the chronic wound response to autologous Adipose-Derived Stem Cells (ADSCs) sheet transplantation. A pilot descriptive longitudinal study at the Wound Healing Center of the Vietnam National Burn Hospital, from July 1, 2019 to August 30, 2020. Thirty patients with 38 chronic wounds enrolled in the study and were grafted with autologous ADSCs sheets on the wound bed. Wound edges, wound bed, wound size and structure using H&E staining, ultrastructure changes by Transmission Electron Microscope at the time of transplantation and at the first, second and third week of follow-up were followed. Results indicated that after ADSCs sheet transplantation, the structure and ultrastructure of chronic wounds had improved. The Extracellular Matrix (ECM), neo-vascular, fibroblast and collagen fibers proliferated and arranged side by side at the dermis layer. Fibroblast proliferated and increased secretion of collagen. Keratinocytes proliferated and immigrated in epidermis layer. After three weeks of

autologous ADSCs sheet transplantation, the epithelial cells covered 90% of the wound surface. Neo-vascular, fibroblast and collagen proliferation increased weekly. The image of lymphocytes infiltration in connective tissues decreased. Wound size reduced significantly compared to before experiment, wound beds were cleaner and filled with granulation tissue. Re-epithelialization appeared at the wound edge and throughout the wound. Wound measurements were statistically significant at the second and third weeks after starting treatment (week 2:  $12.8 \pm 11.56 \text{ cm}^2$  (range: 1-47.42  $\text{cm}^2$ ),  $p < 0.05$ ; week 3:  $7.44 \pm 5.68 \text{ cm}^2$  (range: 0.45-20.10  $\text{cm}^2$ ),  $p < 0.001$ ), indicating the autologous ADSCs treatment enhanced the healing of chronic wounds. In conclusion, ADSCs has a beneficial effect on cutaneous regeneration and chronic wound healing.

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## Non-surgical restoration of facial soft tissues after dog bites

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At present, technologies in medicine have reached unprecedented heights: surgeries with the robots are widely introduced into routine practice, parts of the human body are replaced with bionic prostheses, but such banal life situations that often happen all over the world, like animal bites, often bring a lot of problems, causing the formation of functional disorders, aesthetic defects, especially in the area of face and neck and sometimes even can cause death. The most prevalent group of bites is inflicted by domestic dogs, however, the victim most often initiates the attack of the animal and many people do not seek medical help for various reasons, those who

apply most often undergo primary surgical treatment of the wound with rough suturing of its edges without the use of microsurgical technique, the wound process itself is carried out by a rough non-physiological method, the purpose of which, in fact, is to burn the wound to prevent bacterial complications. The result of such healing are rough scars, which become a traumatic factor for a person. The purpose of this report is to demonstrate protocols of the treatment of facial bite wounds on specific clinical examples (my patients) who received complex conservative therapy based on the principles of regenerative medicine.

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