

EPUAP²⁰₂₄

Pressure ulcers:
THE CLOCK IS TICKING!
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ABSTRACT BOOK

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KS1.1

TAKING STEPS TOWARDS MEASURING AND MONITORING PRESSURE ULCER PREVALENCE WITHIN AND ACROSS OECD COUNTRIES

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Over the past few decades, the OECD has been leading the work on measuring, monitoring and promoting patient safety across OECD and other countries. Taking part in the OECD's monitoring efforts, an increasing number of countries measure and report patient safety using administrative data sources in recent years. However, data sources which have been conventionally used for monitoring quality of care, do not usually capture all patient safety incidents occurred due to underreporting. Moreover, beyond counting the number of incidents that happened, incident prevention and management and learning from past incidents are becoming increasingly important to promote safe healthcare, make practice change and avoid future incidents.

In this context, the OECD recommends countries to monitor patient safety in healthcare in a multifaceted manner by using different data sources including surveys for healthcare professionals, users and their carers, and point prevalence surveys. The OECD regularly reports cross-country differences in patient safety measured by various data sources in the database and flagship publications, and advocates economic values in promoting safe healthcare, emphasising the significance of patient safety culture and people-centred safe care based on inputs from healthcare professionals and patients.

Progress has been made to monitor and promote patient safety in healthcare, but in long-term care, while needs to ensure its quality and safety is increasing, efforts has not been as expanded and undertaken systematically within and across countries. Countries and providers are using different indicators and specifications, not allowing international comparisons.

Monitoring efforts to assure patient safety in long-term care needs to be enhanced from priority areas. An OECD survey found that pressure ulcer prevalence which increases the risk of antibiotics use is considered one of the priority areas for promoting safe long-term care in most OECD countries. Based on patient safety work undertaken in healthcare, the OECD is taking steps towards enhancing monitoring and benchmarking of quality and safety of long-term care including the prevalence of pressure ulcer across countries to reduce its prevalence, through collaboration with ECDC and EPUAD.

KS1.2

QUANTIFYING SUCCESS: ASSESSING THE IMPACT OF YOUR PRESSURE ULCER PREVENTION PROGRAMME

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Pressure ulcers present a persistent challenge in healthcare, contributing to significant patient morbidity and escalating costs. The effective implementation and evaluation of Pressure Ulcer Prevention Programmes (PUPPs) are essential to mitigating these outcomes. However, the true measure of these programs' success lies in the ability to quantify their impact.

This keynote presentation will outline a comprehensive approach to assessing the effectiveness of pressure ulcer prevention initiatives. Utilizing data from leading healthcare institutions, a multidimensional framework will be presented that not only tracks clinical outcomes—such as reductions in pressure ulcer incidence and severity—but also evaluates key process metrics, including protocol adherence, staff training effectiveness, and patient satisfaction.

Real-world examples will illustrate how data-driven insights can foster continuous improvement, ensuring that prevention programs are not merely implemented but continually optimized. Attendees will acquire practical strategies for balancing quantitative measures with patient-centered outcomes, providing a holistic evaluation of PUPPs.

The presentation will emphasize the importance of integrating evidence-based practices with robust outcome measurement, thereby empowering healthcare professionals to enhance the quality of care through precise assessment and targeted improvements. Participants will leave equipped with the tools necessary to implement, validate, and refine pressure ulcer prevention efforts, ensuring sustained success in patient outcomes and care standards.

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KS1.3

THE VALUE OF THE EPIDEMIOLOGICAL DATA FOR PRESSURE ULCER/INJURY

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Introduction: Pressure ulcers/injuries (PUs/Is) are a burden on healthcare systems worldwide. Data on the incidence and prevalence of PU's/Is' are used to implement effective, tailored prevention practices. The aim of this paper is to highlight the importance and value of collecting epidemiological data in terms of its practical use in a selected country of Slovakia.

Methods: Since providers' internal data on the incidence and prevalence of PUs/PIs are not publicly available, it was not possible to obtain them even after an official request was sent to the selected hospitals. The data come from providers' annual reports to the MoH and followingly to the insurance companies as part of the obligation to report quality indicators.

Results: The resulting value represents the assumed total of 313 434 treated patients of the chosen insurer with the overall results of PUs/Is incidence of 9 to 15 per 1 000 (0,97%- 1,54%) registered patients in the selected year 2021. Women, elderly patients and patients treated in the community suffer from PUs/Is in greater numbers. The most frequently occurring PUs/Is are stages 2 and 3.

Conclusions: The prevalence of PUs/Is was found to be remarkably low compared to global results. The methodology for data collection by providers is not clear and known. We point out shortcomings in the collection of epidemiological data, but nevertheless summarize the use of those available for amendments to national standards, such as the mandatory reporting of PUs/Is. Several activities related to the prevention and care of PUs/Is have been carried out in Slovakia. It is important to know not only the incidence in terms of area of care, time, and provider, but also more particularly and specifically, the risk characteristics, and/or the presence of PU/I, so that more individualized and tailored care can be initiated.

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KS1.4

PRESSURE INJURY INCIDENCE MEASUREMENT AS QUALITY IMPROVEMENT STRATEGY: NATIONAL TRENDS IN SWITZERLAND

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Introduction: Pressure injuries have been monitored nationally in all hospitals in Switzerland since 2011. On a national level, pressure injury incidence decreased in the first survey years, followed by a levelling off. These findings suggest a stagnation in quality development. However, there are indications that the patients' risk of developing a pressure injury has increased (based on patient characteristics) over the same period. Thus, improvement in the quality of care regarding pressure injuries may be (partly) masked by the potentially changing pressure injury risk among the population. Therefore, the aim was to determine the risk-adjusted (controlled for patient characteristics) trend in pressure injury incidence in Swiss acute care hospitals.

Methods: A secondary data analysis was conducted. The data originated from the national pressure injury quality measurement, which is based on a repeated multicentre cross-sectional design and was carried out once a year in Swiss acute care hospitals. Descriptive statistics, a Cochran-Armitage trend test, and logistic (multilevel) regression modelling were applied.

Results: The analysis sample comprised 123,715 patients from 230 hospitals over 10 survey years (2011–2019 & 2022). The incidence of descriptive pressure injury varied in Switzerland between 3.7% and 5.6% over the survey years. No linear trend (decrease) could be found when patient characteristics were not considered. A non-linear decreasing trend in pressure injury incidence was detected when controlling for patient characteristics (patient-related pressure injury risk factors) and a time effect (representing quality of care improvement/deterioration over time). If the incidence per survey year had been estimated solely on the basis of relevant patient characteristics, an increase in incidence would have been expected.

Conclusions: When controlling for patient characteristics (risk-adjusted), there is a non-linear decreasing trend in pressure injury incidence in Switzerland. Although patients' risk of developing a pressure injury increased between 2011 and 2022, the incidence of pressure injuries in Switzerland did not rise. The results indicate that quality of care regarding pressure injuries in Swiss hospitals has improved. Nevertheless, in view of demographic trends and increasing staff shortages, it seems important to continue monitoring pressure injury incidence. In order to ensure regular monitoring in the face of limited human resources, it is important to take advantage of the advances in digitalization in hospitals. This 'digitalization trend' will be used for the national quality monitoring of pressure injuries in Switzerland by using electronic patient files as a data basis in the future.

COI: No potential conflict of interest to report.

KS2.1**PRESSURE ULCER RISK ASSESSMENT AND PREVENTION IN
CLINICAL PRACTICE****Susanne Coleman¹**¹ *Leeds School of Medicine, LICTR, Leeds, United Kingdom*

Introduction: Despite recognized limitations, pressure ulcer risk assessment remains the corner stone of preventative clinical practice (1). The basic programme theory associated with risk assessment is that once an individual is identified as 'at risk', tailored individual PU prevention can be implemented. Although in theory this appears straightforward, in practice there are several interacting components that need to be in place to achieve this; these include the assessment itself, potential outcomes, clinical decision making about care interventions and their implementation in practice. These components are set within the context of complex healthcare environments responsible for safe care delivery.

Methods: Drawing on international guidelines (1) and work involved in the development, evaluation and implementation PURPOSE-T (including a systematic review, consensus study, conceptual framework development, design and pre-testing, field testing and realist evaluation), I will explore the pathway from risk identification to appropriate prevention/management (2,3).

Results: The presentation will highlight key pressure ulcer risk factors most important for consideration in PU risk assessment and how these can be translated into practice. It will go on to highlight contextual features that impact PU prevention in practice and suggest ways in which we can bring these findings together to develop a more integrated system of care.

Conclusions: We have substantial knowledge about PU risk factors to support clinical decision making and PU prevention in practice. The challenge remains how we can appropriately integrate this existing knowledge into different healthcare contexts to facilitate PU prevention in practice.

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- 1) *International guideline 2019, EPUAP/NPUAP/PPPIA*
- 2) *PURPOSE NIHR Monograph, Nixon 2015*
- 3) *Realist Evaluation*

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KS2.2

INDIVIDUALIZED NUTRITIONAL ASSESSMENT AND INTERVENTION PLAN FOR PATIENT AT RISK OF PRESSURE ULCER DEVELOPEMENT

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Nutritional deprivation and insufficient dietary intake are the key risk factors for the development of pressure ulcers¹.

Malnutrition can be defined as a state resulting from lack of intake or uptake of energy, protein and other nutrients that causes adverse effects on the body (shape, size and composition), the way it functions and clinical outcomes².

Malnutrition (undernutrition) affects: 35% of people recently admitted to care homes, 29% of adults on admission to hospital, 30% attending hospital outpatients, 11% of people at GP practices. It leads to reduced muscle strength and frailty, increased risk of falls, slower recovery from illness and surgery, poorer clinical outcomes e.g. higher mortality, impaired psycho-social function (e.g. anxiety, depression, altered cognitive function), impaired immune response, impaired wound healing.

Ideally, all persons in nursing homes, in home care settings, at admission in hospital, suffering from chronic illnesses should be regularly screened for malnutrition. There are different tools available for the screening, but NRS-2002 is used for hospitalized patients and MUST-toolkit for outpatient settings³. For those who are found malnourished or at risk of malnourishment, nutritional assessment and individualized nutritional care plan should be made. Nutritional assessment is the systematic process of collecting and interpreting information in order to make decisions about the nature and cause of nutrition related health issues that affect an individual (British Dietetic Association (BDA), 2012). The Subjective Global Assessment (SGA) is a gold standard for nutrition assessment⁴.

Individualized nutritional care (INC) is nutritional care that is tailored to a patient's specific needs, preferences, values and goals. Four key pillars underpin INC: what matters to patients, shared decision making, evidence informed multi-modal nutritional care and effective monitoring of outcomes⁵.

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KS2.3

A MOVE IN THE RIGHT DIRECTION - INTEGRATING TECHNOLOGIES TO ENHANCE RISK ASSESSMENT FOR THE EARLY DETECTION AND PREVENTION OF PRESSURE ULCERS.

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Introduction: Despite the extensive use of over 70 risk assessment tools, pressure ulcers (PU) remain a significant issue¹. Advances in understanding PU pathophysiology highlights the need for an evolving and targeted risk assessment approach². With technological advancements, it is essential to evaluate if PU prevention strategies can be enhanced with technology.

Methods: A literature review was conducted to explore emerging technologies for enhancing risk assessment. Technologies selected for review included artificial intelligence (AI), sub-epidermal moisture (SEM) assessment, cytokine assessment, thermography, and ultrasound. The selection was guided by systematic reviews and evidence of each technology's efficacy in early detection and prevention.

Results: AI, particularly machine learning, has shown promise in enhancing risk prediction and personalised care by analysing large datasets with greater accuracy³. SEM assessments have demonstrated feasibility for early detection of tissue damage, however extending assessments to other at-risk areas is needed⁴. Cytokine assessment holds potential but requires point-of-care testing, complicating clinical application⁵. Thermography provides real-time temperature data but lacks a clear threshold for interpretation⁶. Ultrasound visualises injury but is subjective and requires significant training for accurate use⁷.

Conclusions: Integrating these technologies into clinical practice could enhance PU risk assessment and advance precision healthcare. Despite their potential, these technologies face challenges in their clinical application. Future research should address these challenges and involve patients and the public to ensure technology enhances autonomy and self-care in PU prevention.

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COI: The RCSI School of Nursing and Midwifery have a research collaboration with Bruin Biometrics.

KS3.1**INTRODUCTION TO ARTIFICIAL INTELLIGENCE IN WOUND CARE
WITH FOCUS ON PRESSURE ULCERS*****Daphne Weibs***^{1,2}¹ *Technion - Israel Institute of Technology, Faculty of Biomedical Engineering, Haifa, Israel*² *Hasselt University, Department of Mathematics and Statistics, Hasselt, Belgium*

Integrating artificial intelligence (AI) and emerging technologies into the clinical care pathway presents a transformative opportunity to improve pressure ulcer prevention and treatment strategies. In this talk, we will explore contemporary AI technologies, including natural language processing, machine learning, and deep learning, and will demonstrate current research and applications in the field of pressure ulcers. We will provide examples of how AI-based technologies can be combined with robotics, imaging techniques, and advanced analytical approaches. Additionally, we will demonstrate the potential of AI-driven decision support systems and machine learning models in pressure ulcer prevention and treatment through recent cutting-edge research and applications. For instance, predictive analytics can help identify at-risk patients and enable timely interventions, reducing incidence rates and the associated healthcare costs. Finally, we will demonstrate how AI, and particularly machine learning, can be integrated into the clinical care pathway to support and advance pressure ulcer prevention and treatment.

KS3.3

Combining New Technology and Artificial Intelligence to Monitor Tissue Viability

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Introduction: Pressure ulcers (PUs) are a persistent challenge in healthcare, contributing to prolonged hospitalizations, reduced quality of life, and increased healthcare costs. Current prevention strategies often fail to provide personalized, bedside risk assessments that integrate clinical, physiological, and biomechanical factors. This preliminary study aims to address this gap by leveraging advanced technologies and artificial intelligence (AI) to develop predictive models for PU risk. By utilizing machine learning to integrate multimodal data from bedside medical devices, our approach seeks to enhance the understanding of tissue viability and advance PU prevention.

Methods: A prospective clinical trial was conducted with 24 participants divided into three groups: younger asymptomatic adults (20-40 years), older asymptomatic adults (above 60 years), and older adults in geriatric care (at risk of PUs but without recent development). Participants were evaluated using shear wave elastography to characterize early mechanical changes in tissue integrity, photoplethysmography to monitor physiological processes, and Line-field Confocal Optical Coherence Tomography (LC-OCT) to assess changes in tissue composition and organization. Hyperelastic properties of thigh soft tissues were determined using Freehand Ultrasound-Based Indentation combined with Inverse Finite Element Modeling. The collected data were used to train a Decision Tree model designed to predict PU risk based on individual biomechanical and physiological profiles.

Results: The analysis identified distinct mechanical responses among the participant groups, with older hospitalized adults showing accelerated tissue stiffening and decreased baseline stiffness compared to younger individuals. Photoplethysmography provided valuable insights into physiological variations, linking dynamic tissue changes with increased PU susceptibility in at-risk individuals. LC-OCT revealed microstructural alterations suggestive of early tissue degradation in high-risk older adults. Although preliminary, these findings suggest potential in combining these bedside measurements to inform PU risk assessment, though further data is required to validate the clinical relevance and predictive power of these combined modalities.

Conclusion: The integration of advanced bedside technologies with AI-driven models shows promise for personalized PU risk assessment and prevention (Yu et al. 2018). By detecting early changes in tissue mechanics and physiological responses, this approach facilitates the identification of high-risk patients before overt PU development. However, additional studies with larger sample sizes and refined modeling techniques are essential to confirm these preliminary results and establish clinically robust protocols. The use of AI in this context has the potential to significantly improve predictive accuracy and support clinical decision-making in PU prevention, marking a pivotal advancement in patient care.

Conflict of Interest: The study received funding from the Fondation de l'Avenir pour la recherche médicale (40k€) for initial phase development. Two PU sensor kits were provided at no cost by PU Sensor AB.

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KS3.4

ELEVATING HEALTHCARE: THE PROGRESSIVE IMPACT OF AI ON WOUND IMAGING AND BEYOND

Sofia Zahia¹¹ *Imito AG, Switzerland*

Artificial Intelligence (AI) has emerged as a transformative force in healthcare. In this presentation, we will explore the fundamentals of AI, focusing on its important role in wound care. By leveraging advanced algorithms and machine learning techniques, AI-powered wound imaging systems can now offer precise wound measurement, progression tracking, and risk prediction with unprecedented accuracy and speed.

This talk will highlight practical applications of AI in wound care, showcasing how these technologies are being integrated into clinical practice to improve patient outcomes.

In addition to the benefits, the presentation will also address the limitations and challenges of AI integration, including data privacy concerns, the need for large, high-quality datasets, and the importance of maintaining a human-centered approach in healthcare.

By the end of this session, attendees will have a comprehensive understanding of how AI is revolutionizing wound care and what the future holds for this exciting intersection of technology and medicine.

KS4.1

LOWER LIMB EXOSKELETONS TO ASSIST GAIT, FOR DAILY LIVING ACTIVITIES AND REHABILITATION

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Introduction and context: Bipedal locomotion is crucial for daily life, but many people face limitations due to disabilities, leading to slower walking speeds, reduced endurance, and difficulties with stairs or even requiring a wheelchair. These challenges can limit sports participation and social interactions.

Robotic advancements have led to the creation of lower limb exoskeletons, motorized wearable devices designed to enhance mobility. These devices either mobilize the legs [1] using precomputed gait patterns or assist walking by adapting to the user's intent and abilities [2-5].

Objectives: Overall, lower limb exoskeletons (LLE) are devices to assist in walking for daily living tasks, to assist in climbing and descending stairs, and are aids to sit-to-stand and secure balance [6][7]. LLE are also used for rehabilitation, for pathologies such as spinal cord injury (SCI), stroke, multiple sclerosis (MS), Parkinson's disease, and other types of diseases. The main concern with assisting walking is that promoting intensive physical activity improves the physiological functioning of the human body (blood circulation, bone strength, digestion, urinary bladder health,..) [8][9]. The presentation covered by this summary highlights three solutions, each for specified objectives (fig. 1). First, TWIICE is a lower limb exoskeleton actuated at the flexion/extension of the hips and the knees. It is capable of pure mobilization and/or partial assistance and targets rehabilitation in people with SCI and stroke, or even daily walking. Second, autonomyo provides an actuated abduction/adduction, in addition to the flexion/extension of the hips and the knees. It mainly targets partial assistance to gait and balance in people with neuro-muscular dystrophy and multiple sclerosis. Both, rehabilitation and daily walking are possible with autonomyo. Finally, eWalk is a bilateral powered hip orthoses that assist the hip in daily activities and is dedicated to healthy users.

Achievements and results: The following challenges have driven the design of our LLE 1) simplicity to ease the implementation and increase the accessibility to people with lower limb impairments, 2) well-defined needs and specifications to decrease time-to-evaluate the technology 3) development of appropriate control strategies to effectively assist gait and balance. These challenges and different use case implementations will be covered.

TWIICE and autonomyo took part in clinical trials, at the University Hospital of Vaud in patients with NMD and MS, and at the Swiss Center of Paraplegics of Nottwill in people with SCI. The conditions, the protocols, and the results of these clinical trials will be presented and discussed.

Figure. 1 Lower limb exoskeletons developed at EPFL. From left TWIICE [1], autonomyo [2], and eWalk [3]-[5]



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KS4.3

ELECTRICAL STIMULATION FOR PREVENTING OR TREATING PRESSURE ULCERS IN INDIVIDUALS WITH SPINAL CORD INJURY: CURRENT KNOWLEDGE.

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Individuals with spinal cord injury (SCI) are at high risk of developing pressure ulcers (PUs) due to factors like reduced mobility, muscle atrophy, impaired circulation, and decreased pressure-relief capabilities. Up to 85% of individuals with SCI develop a PU, with a 37-39% incidence during inpatient rehabilitation in the Netherlands. Moreover, 40-80% of those who develop a PU experience a recurrence. Current PU prevention strategies, based on international guidelines, often fall short.

In this keynote, we will discuss electrical stimulation (ES) for preventing and treating PUs in individuals with SCI. Emerging research shows ES as a promising method to alleviate interface pressure, enhance blood flow, and increase muscle mass.[1] Additionally, ES is recognized as an adjunctive therapy for wounds unresponsive to standard treatments. By activating the body's natural bioelectrical response, ES promotes angiogenesis and supports tissue development and normal wound repair.[2] Ongoing trials and recent scientific evidence on ES as a treatment option will also be addressed.

Despite these promising findings, the effectiveness of ES as a PU-preventive measure remains under-researched. A prospective multi-center randomized controlled trial is currently being conducted in the Netherlands to investigate the effect of ES on PU incidence. The intervention group receives usual care plus ES for 1 hour a day, 4 days a week, for a year, while the control group receives only usual care. To assess PU incidence at 6 months, a logistic regression analysis was performed comparing the intervention and control groups. Preliminary results from the first 42 participants showed an odds ratio of 0.8 (95% CI: 0.2-3.1) in PU incidence between the groups after 6 months. This suggests a 18% reduced risk of PU development in the intervention group.

In addition to prevention, ES may also be a valid treatment option. Since 2017, international guidelines have recommended ES as a potential treatment for PUs, although it is not a first-line therapy and should be administered by a trained professional.[3] A 2020 Cochrane review showed that ES increases the proportion of healed PUs, though its effect on healing time remains uncertain.[4] A 2022 meta-analysis confirmed ES's potential in reducing PU wound area but called for better-controlled studies.[5] The Wound Healing Society has updated its guidelines to include high-voltage monophasic pulsed current ES for treating chronic PUs.[6]

The lack of consensus over the evidence of the preventive and therapeutic effect of ES does not diminish its potential as a valuable addition to standard wound care. More controlled studies are needed to determine the best use of ES for preventing and treating PUs.

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COI: Not applicable

KS4.4

THE ART OF PREVENTION; PREVENTION IS SO MUCH MORE THAN JUST AVOIDING PRESSURE ULCERS: IT IS AN ART TO REPAIR THE VULNERABLE BEFORE THE DAMAGE IS DONE.

Menno van Etten¹

¹ Tidewave Medical AS, Norway

Introduction: Immobile individuals are in the need for a lot of care to prevent the adverse events of immobility, among others pressure ulcers. Good care is an art based on knowledge, skills and competence. The art of repositioning is an important part of the prevention of adverse events.

Methods: Immobile individuals are in the need for a lot of care to prevent the adverse events of immobility, among others pressure ulcers. Good care is an art based on knowledge, skills and competence. The art of repositioning is an important part of the prevention of adverse events.

Prevention has several challenges. Like if the prevalence of what you are preventing becomes low, or when the direct effect of certain preventive actions are difficult to prove, or when positive effects can be difficult to value, like the cost of no pressure ulcers. There are more and more examples where management cynically reduces investments in prevention.

Results: Please insert your text here

Automation of care functions can be a way of saving money, since these may reduce the need for human care. But is replacing nurses' warm hands with automated preventive tools feasible for immobile and vulnerable individuals?

To prevent adverse events 'keep the patient moving' is one of the key factors. Temporary findings of a continuously and slow-moving cradle shaped mattress used on immobile patients, with and without pressure ulcers, will be discussed.

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COI: Please declare any funding of the research by industry here

I work as a Competence Manager for Tidewave Medical AS

KS5.1

UNDERSTANDING THE VICIOUS CYCLE OF PRESSURE ULCER FORMATION AND ITS PROGRESS WITH TIME

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The most recent edition of the International Clinical Practice Guideline for the Prevention and Treatment of Pressure Ulcers/Injuries was released in 2019. Shortly after, in 2020, the first edition of the SECURE Prevention expert panel report, focusing on device-related pressure ulcers/injuries, was published as a Special Issue in the Journal of Wound Care. A second edition followed in 2022. This presentation is based on the above consensus publications and reviews our current understanding of the causes of pressure ulcers/injuries (PUs/PIs) as detailed in these globally recognized works. This literature specifically addresses the impact of prolonged soft tissue deformations on the viability of cells and tissues in the context of PUs/PIs related to bodyweight or medical devices. Prolonged soft tissue deformations initially result in cell death and tissue damage on a microscopic scale, potentially then leading to development of clinical PUs/PIs over time. Localized, elevated soft tissue deformations, also known as mechanical stress concentrations in soft tissues, can cause microscopic damage within minutes, however, it may take several hours of continued mechanical loading for this initial cell and tissue damage to become visible and clinically recognizable. Superficial tissue damage primarily stems from excessive shear loading on fragile or vulnerable skin, whereas deeper PUs/PIs, known as deep tissue injuries, typically arise from stress concentrations in soft tissues at body regions over sharp or curved bony prominences, or under stiff medical devices being in prolonged contact with skin. This talk is aimed at promoting better understanding of the pathophysiology of PUs/PIs, highlighting that primary prevention must focus on alleviating exposure of cells and tissues to stress concentrations. This can practically be achieved by reducing the intensity of the strain/stress exposures in soft tissues and/or by decreasing the tissue exposure time to such stress concentrations.

KS5.2

LOWER LIMB ULCERATION - MORE THAN MEETS THE EYE

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Introduction: This presentation considers the similarities which exist between pressure ulceration (PU) and diabetic foot ulceration (DFU). It aims to describe what is known to be shared both in theory and practice of these wound types. It goes on to detail the current literature surrounding the role of inflammation in both wound types. PU occurs following prolonged exposure to pressure or pressure in conjunction with shear, either due to immobility or medical devices. As a result, inflammation occurs causing cell damage. While DFU is not associated with immobility, it is associated with altered mobility occurring as a result of DM complications. Both types of lesions are increased in the presence of multi-morbidity. The prediction of either type of ulceration is challenging. Current practices of risk assessments are reported to be ineffective at predicting when ulceration will occur. While systemic inflammation is easily measured the presence of local or sub-clinical inflammation is harder to discern. In patients at risk of either DFU or PU clinical signs and symptoms of inflammation may be masked and systemic biomarkers of inflammation may not be elevated sufficiently to predict imminent damage until ulceration appears. The current literature suggests that the use of local biomarkers of inflammation at the skins surface namely oedema and temperature may identify early tissue damage.

KS6.1

WHEN YOU SHOULD THINK ABOUT OTHER AETIOLOGIES IN PRESSURE ULCERS?

Kirsi Isoherranen¹¹ Helsinki University Hospital, Helsinki Wound Healing Centre, Finland

Introduction: Differentiating PIs from conditions of similar appearance is imperative to minimize complications and implementing prompt treatment. For accurate diagnostics, it is essential to take a comprehensive patient history and to assess the clinical presentation of the ulcers. Although commonly recognized and diagnosed, stage 2, 3 and 4 PIs occasionally prove to be difficult to pinpoint, with undefined characteristics and similarities in presentation to several other conditions.

Methods: The presentation is a narrative review of the literature considering atypical causes in ulcers similar to pressure ulcers.

Results: Differential diagnoses should be considered if the ulcer presents on the extensor surfaces of limbs, the dorsum of the foot or the fingertips, since these areas are typical for PI formation. Also, if the pressure ulcer does not show healing signs after 4-12 weeks of proper local treatment and off-loading, an atypical cause should be suspected. These atypical causes include herpes zoster, pyoderma gangrenosum, necrotizing fasciitis, calciphylaxis, Marjolin's ulcer and other malignancies.

Conclusions: Keeping in mind differential diagnosis is imperative to prevent delay in diagnosis and harm to patient. Atypical causes can also mimic pressure ulcers and it is important to recognize the warning signs.

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Management, 2023;24(2 Sup1):s1-76

COI: No funding regarding this presentation

KS6.2

DIFFERENTIAL DIAGNOSTICS IN PUS AND OTHER SKIN INJURIES
(MASD, MARSI)**Dimitri Beeckman¹**¹ Ghent University, Belgium and Örebro University, Sweden

Differentiating between various skin injuries, such as pressure ulcers (PUs), moisture-associated skin damage (MASD), and medical adhesive-related skin injuries (MARSI), remains a complex and critical task in clinical practice. Accurate diagnosis is essential for appropriate treatment and prevention strategies, directly impacting patient outcomes and healthcare efficiency.

This keynote presentation will address the nuances of differential diagnosis in skin injuries, focusing on the distinctions between PUs, MASD, and MARSI. Emphasizing the importance of precise clinical assessment, the presentation will provide a detailed overview of the characteristic features, etiologies, and progression of these skin conditions.

Drawing on current evidence and clinical guidelines, the presentation will introduce a structured diagnostic framework designed to aid clinicians in making accurate and timely diagnoses. The framework will include visual assessment tools, diagnostic criteria, and decision-making algorithms that distinguish between similar-looking skin injuries, ensuring that each condition is managed with the most appropriate interventions.

Real-world case studies will be used to highlight common diagnostic challenges and demonstrate the application of this framework in clinical settings. Attendees will gain valuable insights into how to refine their diagnostic skills, reduce misclassification, and improve patient care by tailoring treatment strategies to the specific type of skin injury.

This session will equip healthcare professionals with the knowledge and tools necessary to navigate the complexities of differential diagnosis in skin injuries, ultimately enhancing patient outcomes and advancing clinical practice standards in wound care.

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KS6.3

PRESSURE ULCERS IN PALLIATIVE CARE

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Pressure ulcers pose a complex and significant challenge within palliative care, contributing substantially to morbidity and exacerbating the overall burden in patients with advanced illnesses. This presentation seeks to provide an in-depth analysis of patient experiences with palliative wounds, with a focus on both the clinical and psychosocial dimensions of pressure ulcers in this population.

The presentation begins by defining the concept of palliative wound care, establishing a foundation for understanding the unique characteristics and challenges associated with these wounds in end-of-life settings. Following this, the discussion delves into a thorough examination of patient experiences, underpinned by qualitative data that illustrate the extensive physical and psychological impacts of pressure ulcers. These insights highlight the significant challenges patients face in maintaining quality of life and dignity amidst such debilitating conditions.

The concluding section addresses symptom management, reviewing current evidence-based strategies for the control of pain, exudate, infection, and other complications linked to pressure ulcers in palliative care. The effectiveness of these interventions is critically appraised, with a particular emphasis on optimizing patient comfort and minimizing wound-related suffering. The presentation culminates with recommendations for the integration of palliative wound care into broader care strategies, underscoring the importance of interdisciplinary approaches to improve outcomes for patients affected by pressure ulcers in palliative care settings.

COI: I declare no conflict of interest

KS6.4

HUMAN RESOURCES IN PUS MANAGEMENT

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Human resources (HR) play a vital role in the management of pressure ulcers (PUs), as the injuries to the skin and underlying tissue resulting from prolonged pressure on the skin and suspected to be in line with quality of care including staffing. Effective PUs management involves a multidisciplinary approach, with human resources supporting the necessary systems, training, and processes. Adequate staffing is important to sustain quality of patient care (Aiken, et al. 2002; Needleman, et al. 2002; Newhouse et al., 2013). The key aspects of human resources in PUs management includes Staff Training and Education as the healthcare staff must be adequately trained in PUs prevention and management (risk factors, positioning, skin care, specialized equipment usage). There is need for Qualified Personnel as recruiting staff with the right qualifications and expertise in wound care can improve the quality care. The personnel with specialized skills and identification of competencies and hierarchy in healthcare teams with mutual respect of members with different skills level are needed. Regular assessment of staff performance regarding PUs management is essential. Skills shortages occur where there is an insufficient supply of persons with the appropriate skills. They do arise when employers are unable to recruit staff equipped with the required set of skills in the current labour market (Quintini, 2011). Human and material resources are essential to implementing interventions directed to manage PUs (Pokorná et al, 2022). Thus, developing Policies and Procedures for PUs prevention and treatment across the organization ensures consistent and high-quality care. The high quality-of-care needs evaluation systems including metrics related to wound care, compliance with protocols, and patient outcomes which has to correlate on Employee Engagement and Retention. Engaging healthcare staff in quality improvement initiatives in PUs management can enhance job satisfaction. Another important issue is Interdisciplinary Collaboration which facilitates communication and collaboration among various healthcare professionals involved in PUs management, including nurses, physicians, dietitians, and physical therapists and also among professionals from different fields and specializations. The best trained and skilled professionals could be in place but there is need to ensure sufficient human resources allocation to areas with higher incidences of PUs (e.g., long-term care facilities or intensive care units). This might involve scheduling more staff during peak hours and it must be based on proper Resource allocation. For the identification of human resources requirement there is also necessity for Data Collection and Analysis. Data about PUs prevalence and management outcomes as well as patient case mix and other relevant factors. An example from the Czech Republic analyses will be presented. This information can advise training needs and resource (human and material) allocation. Last but not least the Supportive Work Environment plays an important role in addressing staff burnout and promotes work-life balance, allowing healthcare providers to deliver better care to patients. Focus on these areas, can significantly contribute to the effective management of PUs, ultimately leading to improved patient outcomes and satisfaction.

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COI: The author declares no conflict of interest.

KS7.1

MEDICAL DEVICE RELATED PRESSURE INJURIES (MDRPI)- UPDATE 2024

Elizabeth Ayello¹

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Research supports MDRPI occur sooner than pressure injuries from other etiologies

Documentation

Several guidelines exist. Most clinicians include: ETIOLOGY- is it medical equipment (e.g. IV tubing, respiratory mask, tracheotomy tubes, compression bandaging system) or patient's personal item (eyeglasses, toys etc.) LOCATION of the device related pressure injury
TYPE of device- not all brands same material.

Facilities need to track their MDRPI prevalence and incidence data.

Classification systems

Pressure injuries on skin- varies by country Grading System or NPIAP staging system

Pressure injuries on mucosa- Some standardized tools are: Reaper Oral Mucosa Pressure Injury Scale (ROMPIS), Modified- ROMPIS, Nasal mucosal pressure Injury scale, modified mucosa grading system urinary catheter mucosal pressure injuries

Not all countries classify MDRPI, they are just reported as the number, type of device and location of the MDRPI.

Knowledge and Education

Research supports that nurses' knowledge of MDRPI benefits from ongoing education as far as initiatives using standardized protocols including use of algorithms/care bundles to prevent these pressure injuries. Common interventions include topical products for skin protection, prophylactic dressings, repositioning of tubes and removal of devices when no longer needed.

There is ongoing scientific inquiry into the characteristics of the medical devices (for example- mechanical stiffness, size/fit of the devices, the role of securement methods (for example tightness) and the how they impact on MDRPI occurrence as well as the factor of duration of the device use.

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KS7.3

CLINICAL STUDY ON THE RELIEF OF CONTACT PRESSURE BY A NOVEL AIR MATTRESS IN NEONATES

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Introduction: Pressure ulcers (PUs) severely impact health outcomes in neonatal intensive care, with up to 28% prevalence and doubled mortality rates. Due to their not fully developed stratum corneum, neonates are highly susceptible to PUs because of a lack of adequate support surfaces. The main risk areas are the occipital region of the head and the hip, where immobility due to prolonged pressure, combined with the body proportions of newborns, increases the risk. Current mattress options, like conventional foam mattresses, are unsuitable for this vulnerable population because they are designed for older infants and do not account for the diverse weight and size variations in neonates. Using a specific air mattress is expected to redistribute pressure more evenly, reducing local interface pressure, potentially lowering PU incidence, and enhancing patient comfort.

Methods: A novel air-filled mattress, consisting of three different compartments (head, trunk and feet), was developed. A Swissmedic accredited clinical trial was conducted on a cohort of 19 newborns to investigate the effect of an air mattress on localized pressure impact and distribution, as well as physiological stress levels, as assessed by vital signs and stress assessment scales. The current standard of care, a foam mattress, was used as a control, with both surfaces tested in a randomized order. The local pressure on the different anatomical areas (head, trunk and the entire body surface) were evaluated independently. The risk of PU development was categorized based on measured pressure impacts (1 kPa as 'no risk', 1-2.5 kPa as 'low risk', 2.5-4.27 kPa as 'potential risk', and above 4.27 kPa as 'high risk').

Results: In the clinical trial, the head area indicated a decrease of 23±14% in interface pressure when using the air mattress (1.36±0.21 kPa), compared to the foam mattress (1.84±0.49 kPa). The effects on the trunk and full body surface were less pronounced, with pressure reductions of the air mattress of 12±10% (1.12±0.14 kPa vs. 1.28±0.19 kPa) and 15±9% (1.18±0.14 kPa vs. foam 1.40±0.21 kPa). The maximal measured values for the head, trunk and the entire body surface were in average 3.26±1.21, 3.78±1.24, and 4.12±1.35 kPa, respectively, for the air mattress, and 5.1±2.47, 4.08±1.35, and 5.49±2.37 kPa, respectively, for the foam mattress. The values indicate a 'high risk' for the foam mattress on the head and the entire body surface, while a 'potential risk' was observed in the trunk area. The air mattress demonstrated a potential PU risk across all three areas.

Conclusions: Our results demonstrated that the air mattress achieved lower interface pressures compared to a conventional support surface, particularly in high-risk areas for neonates, such as the head. Especially, the pressure peaks could be reduced to a lower PU risk category. The potential of using innovative, segmented designs that are tailored to meet the specific needs of highly vulnerable paediatric patients was demonstrated.

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KS8.1

INVOLVING PATIENTS IN THE RESEARCH PROCESS, HOW SMALL THINGS CAN MAKE A BIG IMPACT

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Introduction: Patient involvement in identifying what needs to be researched and how this is conducted is increasingly being recognized for its importance and value to the research that is generated. However, involving patients from vulnerable and less well-represented groups is an ongoing challenge.

This presentation will provide examples on how patients have been involved in wounds-related research, what lessons we have learned and what impact this has made. It will also provide some key recommendations from other areas of research that can be translated to pressure ulcer related research and practice. Patient and carer narratives will be included that may help inform practice and research

COI: I have no COI to declare for this presentation

KS9.1

THE EPIDEMIOLOGY AND BURDEN OF SKIN CONDITIONS IN OLDER CARE DEPENDENT PEOPLE

Jan Kottner¹

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Introduction: The population of people being 65 years and older is growing. Skin ageing, systematic diseases, medication, and functional limitations increase the risk for developing skin conditions and diseases.

Methods: Review of empirical evidence and critical discussion.

Results: Xerosis cutis, androgenetic alopecia, seborrheic keratosis, fungal infections, actinic keratosis are the most frequent skin conditions in older people. In long-term care the incidence of intertrigo, skin tears, and incontinence-associated dermatitis is very high. The overall burden of skin diseases is highest at the end of life. There are overlaps regarding etiology, risk, and preventive treatments for many skin conditions.

Conclusions: Older people are affected by many skin conditions and they play a large role in seeking healthcare. The majority don't need specialized medical treatment. New management approaches must be developed to cope with the ever-growing group of elderly people with skin problems.

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COI: None

KS9.2

SKIN INTEGRITY: CLINICAL, COMPOSITIONAL AND BIOMECHANICAL CONSEQUENCES OF AGEING

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Skin ageing is a complex process involving the additive effects of skin's interaction with its external environment, predominantly chronic sun exposure - termed photoageing - upon a background of time-dependent intrinsic ageing. The clinical consequences of skin ageing are primarily apparent on sun-exposed areas such as the face and forearm, manifesting as deep, coarse wrinkles, dryness, rough-textured appearance, telangiectasia and irregular pigmentation. Although primarily viewed as a cosmetic concern; ageing skin also experiences significant functional decline, resulting in increased laxity, reduced elasticity and fragility. Through a combination of histological analysis and non-invasive biomechanical testing, the fundamental differences in skin architecture and composition arising as a consequence of both time-dependent intrinsic ageing and photoageing have been elucidated. Intrinsic skin ageing causes decline to both resilience and elasticity which is characterised histologically by modest flattening of the dermal-epidermal junction and disorganisation of the elastic fibres of the dermis. Chronic sun-exposure causes fundamental changes to the histological appearance of skin, exemplified by profound flattening of the dermal-epidermal junction and widespread disruption to the arrangement of the dermal elastic fibres. These changes are reflected by an extreme alteration in biomechanical function with a severe loss of skin resilience and elasticity, fatigue, hysteresis and viscous "creep". As populations age globally, the maintenance of skin health and integrity is increasingly important. Future dermatological research must prioritize inclusivity and equity, addressing the diverse needs of an ageing population.

KS9.3

MYTHS AND REALITIES ABOUT PRESSURE INJURIES IN FRAIL ELDERLY PATIENTS

Sylvie Meaume¹

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Pressure injuries (PI) are common in geriatrics and are not always preventable at the end of life and in the most dependent or highly comorbid very old patients. There are very common PI exposing prostheses (hip, knee) with a terrible prognosis and which must be prevented. PIs in the elderly are mainly located in the sacrum or heel. It may not be the same disease. Sacral PI has long been confused, at an early stage, with associated incontinence dermatitis (AID) which requires different treatment. At an advanced stage, shear forces can slow its progress and require treatment with negative pressure. Osteitis is a common complication which has particularities in its geriatric management. Heel PIs are frequently associated with peripheral arterial disease and favored by pressure and low blood flow, often during an acute episode. Treatment is initially a return to normal blood volume and revascularization if possible. Undernutrition is very common among sick elderly people and must be managed appropriately. Ethical considerations are particularly important to take into account in the elderly and palliative care of patients with PI has certain specificities. The management of PI is multiprofessional and the geriatrician as specialist in elderly patients plays an important role in their evaluation and treatment.

KS10.1

EXPLORING CONTEMPORARY PERSPECTIVES ON THE DIAGNOSTICS, DIFFERENTIAL DIAGNOSTICS, AND CLASSIFICATION OF INCONTINENCE-ASSOCIATED DERMATITIS

Dimitri Beeckman¹

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Incontinence-associated dermatitis (IAD) is a prevalent condition in healthcare settings, often misdiagnosed or confused with other skin injuries such as pressure ulcers or fungal infections. Accurate diagnosis, differential diagnosis, and classification of IAD are essential for effective treatment and prevention, directly influencing patient outcomes and quality of care.

This keynote presentation will explore contemporary perspectives on the diagnosis, differential diagnosis, and classification of IAD. By integrating the latest research and clinical guidelines, the presentation will provide an in-depth analysis of IAD's distinct clinical features, pathophysiology, and risk factors, distinguishing it from other skin conditions commonly encountered in incontinent patients.

The session will introduce advanced diagnostic tools and classification systems designed to enhance the accuracy of IAD identification and severity assessment. Emphasis will be placed on the importance of a systematic approach to differential diagnosis, ensuring that IAD is correctly differentiated from similar skin injuries such as MASD (Moisture-Associated Skin Damage) and contact dermatitis, which require different management strategies.

Through case studies and practical examples, attendees will gain a deeper understanding of the challenges and solutions in diagnosing and managing IAD. The session will also address emerging trends and innovations in the classification of IAD, offering insights into how these developments can be integrated into everyday clinical practice.

Healthcare professionals attending this session will leave with a comprehensive toolkit for improving the diagnosis and management of IAD, ultimately enhancing patient care and contributing to better clinical outcomes in the management of skin conditions associated with incontinence.

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KS10.2

PREVENTION OF INCONTINENCE-ASSOCIATED DERMATITIS (IAD) IN ADULTS: THE STATE-OF-THE-SCIENCE

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Introduction: The prevalence and incidence of incontinence-associated dermatitis (IAD) in people with incontinence is high. Prevention of IAD is critically important to maintain and to improve skin integrity.

Methods: Review of empirical studies and reviews.

Results: IAD prevention starts with risk assessment. In addition to being incontinent, higher age, higher stool frequency, being female, and limited mobility are risk factors for IAD development. No continence product works best for everyone but absorbent products should have high absorptive capacity and breathability. During skin cleansing additional exposure to water and surfactants must be reduced. The use of topically skin protection products is recommended.

Conclusions: Every person who is incontinent is at risk for IAD development and in need of prevention. IAD prevention is a complex intervention and high quality pragmatic clinical trials are needed to compare skin protection strategies.

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COI: Arjo, Federal Ministry of Education and Research (Germany), German Network for Quality Development in Nursing (Germany)

KS11.1

CARE FOR RARE: SPOTLIGHT ON SPECIAL CHILDREN FACING BOTH RARE DISEASES AND PRESSURE INJURIES

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Introduction: Rare diseases are defined as a huge and assorted pool of diseases (around 8,000-10,000) labeled as such because of their low prevalence in the world population (affecting no more than 5 per 10,000 citizens in the European Continent). Approximately 80% of cases are of genetic origin, the remaining 20% are multifactorial diseases due not only by a peculiar susceptibility but also by other factors such as social, environmental, dietary et al. Despite their number and heterogeneity, RDs are associated by the difficulty for the patient in obtaining a proper and timely diagnosis, the rare availability of an appropriate definitive management and an often-chronic disabling disease course affecting both the child and the family/social burden.

Methods: The biggest problem today lies in recognizing the early stages of pressure ulcers and in implementing every useful measure to prevent comorbidities that more often than in the "normal" population can have a strong impact on the quantity and quality of life. PUs are retrospectively analysed in a cohort of 300 consecutive patients admitted because of a RD in different wards, depending on the most compromised anatomical area.

Results: The setting has been represented respectively by an ICU (53%), acute (11%) or chronic (36%) medical or surgical department. Pressure ulcers at onset bypassed the first stage and in 78% of cases were diagnosed at stage III already 48 hours after admission.

Early genetic diagnosis allows for the implementation of a tool of preventive procedures including assistance with a 1:1 nurse/patient ratio, re-examination of the skin from head to toe every 3 hours, keeping the patient uncovered and lying on a fluidized positioner. Early mobilization and protection of the skin with a barrier of ozonated oils are valid preventive procedures in addition to the previous ones. When the skin integrity is impaired, redness and even slight cuts, abrasions, ulcers and incisions draw the more common puzzle of comorbidities to be stopped immediately in their rapid progression.

Conclusions: Prevention of PUs is now possible but at the cost of specific education on the subject in each member of the Wound Care Team, of a uniformity of views, of an exchange with sector specialists who are often not considered in patients affected by PUs intended as a primary pathology: dysmetabolists, rheumatologists, pulmonologists, geneticists, experts in neuromuscular and neurodegenerative diseases.

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<https://www.osservatoriomalattierare.it/malattie-rare>

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COI: Please declare any funding of the research by industry here

KS11.2

GOOD CLINICAL PRACTICE FOR PREVENTING PRESSURE ULCERS IN PEOPLE WITH SPINAL CORD INJURIES

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Introduction: Individuals with spinal cord injury (SCI) are at a significantly increased risk of developing pressure ulcers/injuries (PU/PI) due to factors such as immobilization, altered sensory perception, and post-injury skin and tissue changes. The occurrence of PU/PI profoundly affects both the quality of life for individuals and societal resources, leading to decreased community participation, severe health complications, and higher healthcare costs. Although guidelines exist for PU/PI prevention and treatment, a gap persists between these recommendations and their practical implementation in clinical settings.

Objective: To develop and validate a Danish clinical practice guideline for the prevention and treatment of PU/PI in individuals with SCI.

Methods: The ADAPTE method, which systematically adapts existing guidelines to a new cultural and organizational context, was employed in this study. The adaptation process was carried out in three phases: setup, adaptation, and finalization. Stakeholders, including individuals with SCI and multidisciplinary healthcare providers, were extensively involved throughout the process. A comprehensive search for relevant clinical practice guidelines was conducted, leading to the development of a draft Danish guideline. This draft underwent external review through focus group meetings with stakeholders, with feedback subsequently analyzed and integrated into the final guideline.

Results: The adapted Danish clinical practice guideline encompasses 22 topics and 121 recommendations focused on PU/PI prevention and treatment for individuals with SCI. Stakeholders responded positively to the guideline but highlighted the need for concise, user-friendly quick guides in addition to the comprehensive document. The external review identified challenges in implementing the guideline within a complex healthcare environment, emphasizing the necessity of tailored dissemination strategies.

Conclusion: The development of the Danish clinical practice guideline for PU/PI in individuals with SCI is a crucial step toward closing the gap between evidence-based recommendations and clinical practice. The broad involvement of stakeholders ensured the guideline's relevance and applicability. However, the moderate to low evidence in the included guidelines highlights the need for ongoing research and systematic updates. Future efforts should focus on effective implementation strategies, including targeted education, training, and the development of accessible quick guides to facilitate knowledge transfer in clinical settings.

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COI: None.

KS12.2

GRADE APPRAISAL EXPLAINED

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In healthcare, the quality appraisal of evidence is a pivotal process, ensuring that clinical guidelines are based on the best available research. Quality appraisal involves systematically evaluating the credibility, relevance, and findings of research studies to inform clinical decision-making. This step is necessary to identify the strengths and limitations of evidence, thereby safeguarding against the implementation of biased or unreliable guidelines. The GRADE (Grading of Recommendations Assessment, Development and Evaluation)¹ system is a widely adopted framework designed to appraise the quality of evidence and the strength of recommendations. GRADE categorises evidence into four quality levels—high, moderate, low, and very low—based on factors such as study design, consistency of results, and directness of evidence. Appraising evidence using GRADE involves a transparent and structured approach. This includes assessing study limitations, inconsistency, indirectness, imprecision, and publication bias. Each factor can lead to downgrading the quality of evidence, while large effects, dose-response gradients, and plausible confounding can upgrade it.

Integrating the GRADE approach into guideline development enhances the reliability and applicability of recommendations. By systematically evaluating the quality of evidence, GRADE ensures that guidelines are not only evidence-based but also transparent. This process helps bridge the gap between research and clinical practice, ultimately leading to improved patient outcomes. Understanding and applying the GRADE system for quality appraisal is crucial for developing robust clinical guidelines. This presentation will elucidate the importance of quality appraisal, detail the GRADE process, and demonstrate how it is being utilised in updating the 2019 International Pressure Ulcer Prevention and Management clinical guidelines².

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KS12.3

ENHANCING PATIENT OUTCOMES THROUGH EFFECTIVE IMPLEMENTATION OF PRESSURE ULCER GUIDELINES

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Introduction: Pressure ulcers remain a significant challenge in healthcare and community settings, despite the availability of evidence-based guidelines for their prevention and treatment¹.

Methods: A comprehensive literature review was conducted to evaluate the impact of guideline implementation on pressure ulcer incidence, patient quality-of-life, and healthcare costs.

Results: The implementation of guideline recommendations, including multifactorial evidence-based interventions and care bundles, demonstrated a significant reduction in pressure ulcer incidence and improvement in patient outcomes across diverse healthcare settings²⁻⁴. Despite these benefits, challenges persist in guideline implementation, primarily due to healthcare professional's lack of awareness and understanding of their existence and importance⁵. Strategies such as education programs and the development of guidelines using clear language and easy-to-follow recommendations are crucial for enhancing guideline uptake⁶. Furthermore, involving patients and caregivers in pressure ulcer prevention and treatment is essential for fostering self-care and encouraging active participation in guideline-based care⁷.

Conclusions: Implementing guideline recommendations significantly improves pressure ulcer prevention and patient outcomes. However, to achieve the full potential of these benefits, it is vital to address the challenges of guideline implementation through increased awareness, education, and patient involvement. These strategies are essential for improving the overall outcomes of pressure ulcer prevention and treatment.

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COI: The authors have no conflict of interest to declare.

A2.1

DEVELOPMENT OF A PRESSURE INJURY PREVENTION ALGORITHM USING NIRS AND ULTRASOUND

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Introduction: Pressure injuries (PIs) are a complex and costly healthcare problem. The multitude of risk factors and lack of personalized assessment tools hinder effective prevention. We aim to develop the foundation for a novel prevention algorithm that integrates the use of near-infrared spectroscopy (NIRS), ultrasound, and individual risk factors to accompany the Smart Sheet – a soft, flexible, and stretchable pressure/shear sensing array designed for continuous monitoring – creating a promising solution for PI prevention.

Methods: A foundational NIRS study examined the relationship between extrinsic applied pressure and soft tissue oxygenation, with the consideration of intrinsic factors (age, sex, tissue thickness). Healthy adults (n=15) underwent pressure application on the rectus femoris muscle and tissue oxygenation monitoring via NIRS. Current studies have been expanding on the aforementioned work by increasing the population size (n=60), including additional intrinsic factors (skin pigmentation and tissue fat percentage) and focusing on the bony prominence of the heel.

Results: Analysis revealed an inverse relationship between applied pressure and tissue saturation index (TSI). Variations in TSI and recovery time between individuals suggest the influence of intrinsic factors. In Figure 1, a representative graph highlights the common pattern of TSI in percentage and pressure changes over time, where the viscoelastic behaviour shows the elastic and creep regions.

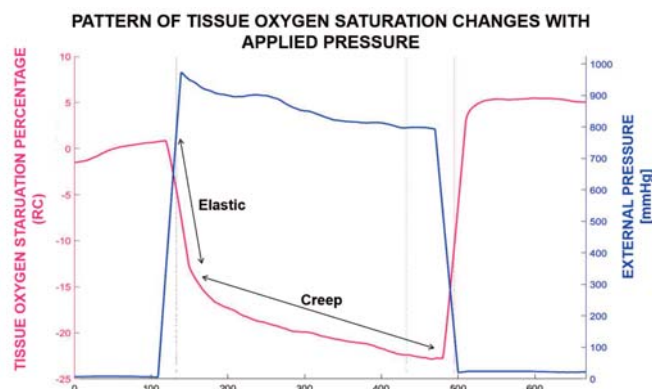
Conclusions: This study offers insights into the interplay between pressure, oxygenation, and PI risk. Future work will focus on the algorithm development and integration with the pressure sensor array (Smart Sheet) designed for wheelchair and bed applications for a comprehensive, personalized PI prevention solution.

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COI: No conflict of interest to report.

Figure 1:



A2.2

DEVELOPMENT OF ANTI-PRESSURE ETT HOLDER

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Introduction: Many medical equipment is used to support medical treatment in the intensive care units (ICUs); therefore, medical device-related pressure injuries (MDRPI) is also increasing. Studies conducted to determine the risk factors affecting the occurrence of MDRPIs in ICU have revealed that 15.3-63.7% of MDRPIs have mucosal membrane pressure injuries (MMPIs).(1,2) It has also been reported that endotracheal tube (ETT) is the most common medical device causing MMPIs(3), with rates of ETT-related MMPIs ranging from 7% to 45%.(4) It has been reported that increasing the frequency of ETT repositioning from 12 hours to 4 hours decreased the prevalence of ETT-related MMPIs from 16% to 10%.(5)

Methods: The waterfall method (analyses, design, development, test, integration) was followed. Through literature and market research, it was realized that there was a need for a device to remind the repositioning time of the ETT and that the products on the market could not provide this, so there was a need for a sensorized ETT holder. It is planned to develop an ETT holder with a light sensor that helps to fix all ETTs, with the help of a compressible ring suitable for ETT numbers and a sliding tube shuttle, allowing all ETTs to be repositioned side by side, reducing the pressure of the ETT with support pads on the upper and lower lip used.

Results: The design is completed with a device that facilitates repositioning, reminds nurses of the repositioning time they need during busy working hours, and can only remind the nurse with a visual stimulus without disturbing the patients. Unless the ETT holder is repositioned, the warning will continue to sound as there is no angle difference between the circuit and the ETT holder.

Conclusions: With the design, the design of a product that reminds the repositioning time with visual stimuli, can be used with every ETT number, and prevents ETT-related MMPIs has been completed.

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COI: The author does not declare any financing.

A2.3

TELEMEDICINE IN PREVENTION AND TREATMENT OF PRESSURE INJURY AND PRESSURE INJURY RECURRENCE AFTER FLAP SURGERY

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Introduction: Barriers and challenges related to transportation, climate, and costs may impact the follow-up services related to PI prevention and treatment. New ways of providing satisfactory and safe follow-up are needed, and telemedicine shows improving possibilities. This presentation aims to present the occurrence and risk factors of PI and PI recurrence (PIR) in people with SCI in Norway, and further to examine health-related quality of life (HRQoL), healing, satisfaction, safety and patient-empowerment following a newly developed remote multidisciplinary program in prevention and treatment of PI and PIR.

Methods We present results from a national, retrospective study regarding PI occurrence in all persons acquiring SCI in Norway between 2004 and 2014 and a retrospective single-center study regarding PIR in all patients having a flap surgery between 2008 and 2018. Furthermore, a longitudinal telemedicine study regarding PIR post flap-surgery in patients with SCI. Finally, two RCTs, one regarding PI occurrence after discharge from acute care rehabilitation, and one regarding treatment, cost-utility (CUA) and environmental impact of remote follow-up.

Results: The national, retrospective study included 1012 individuals, 742 men (73%) and 270 women (27%). Mean age at injury was 48 years (standard deviation [SD], 19 years). The period prevalence of PI was 16% (95% confidence interval [CI], 0.14–0.19). Identified associations with PI were completeness of the SCI (odds ratio [OR] = 0.1), injured abroad (OR = 2.4), bowel dysfunction (OR = 13), bladder dysfunction (OR = 9.2) and comorbidity, e.g. diabetes mellitus type 1 (OR = 7.9).

The retrospective PIR study identified a recurrence rate of 46 % (25/54), 29% among the females (2/7) and 49% among the males (23/47). The longitudinal study included 13 men. Median age at flap surgery was 66 years (SD, 11.5), and the PIR was 38% (5/13). All participants scored high on satisfaction, confidence and acquirement of new knowledge and skills regarding remote follow-up.

The first RCT included 41 participants, 20 receiving telemedicine vs 21 in the control group, and a PI occurrence of 10% (2/20) in the telemedicine group vs 9.5% (2/21) among the controls. The participants scored high on satisfaction, confidence, and acquirement of new knowledge.

The second RCT, included 56 participants, 28 in each group. The results showed no significant differences in HRQoL (P values from 0.09 to 0.88), PI healing (p= 0.32), time to healing, experienced satisfaction, safety, patient-empowerment, transportation costs or emission of greenhouse gases. The CUA estimated a mean cost of € 8819 per patient in the telemedicine group and € 3607 in the control, with 0.1 quality adjusted life years gained in favor of telemedicine.

Conclusions PI and PIR are a serious problem in people with SCI. Remote multidisciplinary prevention and treatment shows promising results regarding PI and PIR, as well as in feedback from the participants. We recommend our PI follow-up@home program to be implemented in prevention and treatment for people in need of long-term healthcare services.

A2.4

STOP PRESSURE ULCER ,VIDEOS AS A LEARNING METHOD FOR STUDENTS AND PROFESSIONALS OF SOCIAL AND HEALTH CARE

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Introduction: In nursing education is important to teach the principles of pressure ulcer prevention and treatment. A Finnish University of Applied Sciences has developed together with University Hospital teaching model that integrates nursing students' learning to the development of the awareness of pressure ulcer risk and prevention among health professionals. The teaching model has produced three videos, which were published in International STOP Pressure Ulcer Day in years 2021 "Prevent Pressure Ulcer Injury", 2022 "Prevent Pressure Injury –Transfer a Patient and Medical Devices" and 2023 "Prevent Pressure Injury - Surfaces and Positioning of a Patient. The aim of videos is to increase the knowledge of pressure ulcer risk factors and prevention method and arise the awareness of pressure ulcers impact to patient's quality of life and costs of pressure ulcers for social and health care.

Methods: The developed learning method produce video with STOP Pressure Ulcer content. The learning objective is that a student recognizes patients with pressure ulcer risk and has skills to prevent pressure ulcers. The video producing project lasted three months, including three distance learning teaching sessions by teams, one face to face workshop and one whole day for video recording. The pre-task for students was to read in Finnish translated International Guideline for Pressure Ulcer Prevention and Treatment, which is published in www.shhy.fi and get familiarised the first version of manuscript of video. Each distance learning session included a nurse teacher's lecture related to International Guideline and reflective discussion of how this is integrated to video manuscript.

The workshops implemented in campus or at hospital. In the workshops the students familiarized to pressure ulcer prevention devices and practiced how to use them under the supervision of professionals of pressure ulcer expert team. Videos were recorded in authentic environment; patient's rooms at ward, intensive care unit, operating room and ambulance. The professionals of pressure ulcer expert group accepted the videos before publishing.

Results: Three videos were published in International STOP Pressure Ulcer Day as follows: 2021 Prevent pressure injury (after two years of publishing 4 000 times opened) . 2022 Prevent Pressure Injury – Transferring a Patient and Medical Devices ((after one year of publishing 1700 times opened) . 2023 "Prevent Pressure Injury - Surfaces and Positioning of a Patient (after 4 months of publishing 1800 times opened). The videos are open access material.

Conclusions: The Prevent Pressure Ulcer videos are evidence based, cost effective learning material for students of social and health care as well as professionals. Videos are open access and easy to integrate studies in higher education (EQF 6-7) as well as institutional level (EQF 5-4) and can be applied to professionals' further education in social and health care organisations, like hospitals, health care centres and nursing homes.

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COI: No

1.1

EFFECTIVE TREATMENT OF PRESSURE ULCERS WITH THE NPWT IN SPINAL CORD INJURED PATIENTS - FINAL RESULTS OF THE CASE SERIES

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Introduction: Patients with spinal cord injury (SCI) tend to develop Pressure ulcers (PUs) due to long-term immobility. Generally, 41 % SCI patients suffer for the PUs in the first year after injury. In addition, 37 % of SCI patients develop PUs during their acute care hospitalization. Factors contributing to a PUs are immobility, moisture, and skin irritation. In clinical and laboratory experience, NPWT treatment removes interstitial fluid from wounds, reduces bacterial colonization, and increases wound blood flow, which has contributed to faster wound closure.¹

Methods: Clinical case series – an academic clinical study.

Ten SCI patients with PUs treated with NPWT and Medical Grade Honey (MGH) dressing. All patients were monitored until wound closure followed by plastic surgery or primary suture.

Results: NPWT treatment was done in 10 patients (1 female, 9 male), total wound closure was achieved in 6 male patients. In one patient the wound was closed after NPWT and MGH treatment by primary suture. In 5 patients (50 %) the NPWT and MGH treatment were used before the wound closure provided by plastic surgery (flap surgery).

Average age in our sample was 53.8 years (min. 27, max. 75 years), wound dressing interval (NPWT exchange): 3-5 days. Average duration of NPWT application: 29 days (min. 19, max. 53 days). The average number of dressings changes 7.7 NPWT applications (min. 5, max. 15 NPWT applications). The NPWT device* in combination with a MGH- dressing (a completely innovative approach in the Czech Republic) was used in all patients. Barrier regimen was applied in 100% of patients due to systemic infection.

Conclusions: Our case series has proven benefit of NPWT in SCI patients with PUs. Closure of the wound and antiseptic treatment with Medical Grade Honey (MGH) was effective in the preoperative period before the plastic surgery or before the primary suture of the wound in 60 % of SCI patients.

Acknowledgement: This report was Supported by Ministry of Health, Czech Republic – conceptual development of research organization (FNBr, 65269705).

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* Carilex®VT 200

COI: The study was supported by industry (Egeria Medizintechnik and Leram) who have loaned NPWT medical devices but did not influence the study results.

1.2

POSTURE, MOBILITY AND PRESSURE SIGNATURES OF COMMUNITY DWELLING INDIVIDUALS WITH PRESSURE ULCERS: STRATIFYING EXPOSURE TO SUPPORT PERSONALISED CARE

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Introduction: Individuals residing in the community can spend prolonged periods of time in bed or chair, particularly those with mobility impairments [1]. This can result in local tissue damage in the form of pressure ulcers. It has been recently demonstrated that pressure monitoring can be used to assess posture and mobility in vulnerable individuals [2]. However, there is a need to combine posture and mobility data with interface pressure parameters to fully explore the exposure to harmful loads. Therefore, the aim of the present study was to evaluate posture, mobility, and pressure profiles in a cohort of community residents who had pressure ulcers.

Methods: This study represents a secondary analysis of the Quality Improvement project 'Pressure Reduction through COntinuous Monitoring In the community SETting (PROMISE)'. In total 22 patients were selected from 105 recruited community residents. Pressure data were collected with a commercial continuous pressure monitoring system* between 5 hours and 4 days. This data was analysed with an intelligent algorithm involving machine learning [2,3] to determine posture and mobility events. Duration and magnitude of pressure signatures e.g., peak pressure gradient, of each static posture were estimated. Injury thresholds were identified based on a sigmoid relationship between pressure and time exposure [4], calculated to determine a low, moderate, high, and very high categories.

Results: Patients revealed a wide range of ages (30-95yo), BMI (17.5-47kg/m²) and a series of co-morbidities, which may have influenced the susceptibility to skin damage. Posture, mobility, and pressure data revealed a high degree of inter-subject variability. Largest duration of static postures ranged between 1.7 to 19.8 hours, with 18 patients spending at least 60% of their monitoring period in static postures which lasted >2 hours. Fig. 1 depicts the percentage of monitoring time in each exposure threshold (green, yellow, orange, red). Data revealed that some patients e.g., Pt2 spent most of their time (~84%) in the green category. By contrast, there were patients e.g., Pt6, Pt13, P17 whose combined mobility and pressure signatures fell in the red category for >80% of their time.

Conclusions: This represents the first study to combine through intelligent algorithms posture, mobility, and pressure data from a commercial pressure monitoring technology. The community residents included in this analysis had acquired a pressure ulcer at the time of monitoring and many exhibited trends which exposed their skin and subdermal tissues to prolonged pressures during static postures. These indicators will undergo further refinement and validation prior to prospective clinical trials.

References:

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[2] Caggiari, 2020, *Clinical Biomechanics*.

[3] Caggiari, 2021, *Medical Engineering & Physics*.

[4] Gefen, 2009, *Nursing Standard*.

*ForesitePT, Xsensor, Canada

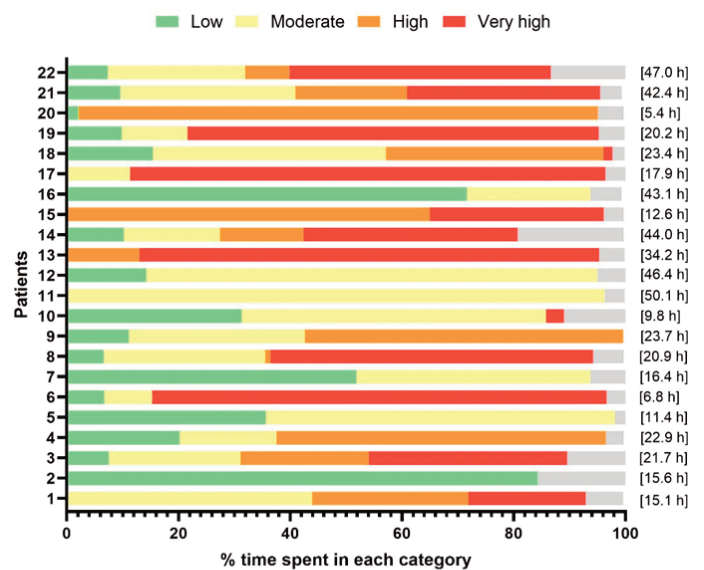


Fig. 1: Percentage of monitoring period [in brackets on the right] in each exposure threshold (green, yellow, orange, red), for all 22 patients.

1.3

VIRTUAL TECHNOLOGIES IN PRESSURE ULCER/INJURY ASSESSMENT

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Introduction: Pressure Ulcer virtual technologies has been used widely in the current era. In this narrative review, we aim to synthesize current research on virtual technologies for PU assessment, focusing on their potential benefits, limitations, and future directions. Pressure ulcers (PUs) are a major healthcare burden, causing significant morbidity and mortality. Virtual technologies offer promising avenues for improving PU assessment, but their effectiveness and impact need further exploration.

Methods: We searched PubMed, EMBASE, CINAHL, and Cochrane Library from January 2000 to Feb 2024 using relevant keywords like virtual reality, augmented reality, artificial intelligence, machine learning, pressure injury, pressure ulcer, PU assessment, PI assessment. Studies investigating virtual technologies for PU assessment in adult populations were included. We excluded studies with specific technology limitations or not published in English. We identified studies exploring various virtual technologies, including telemedicine consultations, image analysis tools, and sensor-based monitoring systems.

Results: Telemedicine consultations showed promise for improving accessibility and early diagnosis, particularly in remote settings. Image analysis tools offered potential for objectivity and reduced inter-rater variability in wound characterization and staging. Sensor-based monitoring systems held potential for early detection of pressure complications, but further validation and research are needed. These findings suggest that virtual technologies have the potential to enhance PU assessment across diverse settings.

Conclusions: Virtual technologies hold promise for revolutionizing PU assessment, potentially leading to improved access, earlier interventions, and better patient outcomes. Further research is crucial to optimize their clinical integration and ensure ethical and effective implementation in routine practice.

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COI: No conflict of interest

1.4

CONNECT BEDRIDDEN PATIENTS TO WEARABLE, WIRELESS PATIENT ORIENTATION AND ACTIVITY SENSORS TO ENHANCE THE HEALING OF PRESSURE ULCERS THROUGH EFFECTIVE AND MONITORED REPOSITIONING.

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Connect bedridden patients to wearable, wireless patient orientation and activity sensors to enhance the healing of pressure ulcers through effective and monitored repositioning.

Introduction: Despite the evidence-based use of patient repositioning as an essential strategy for pressure ulcer (PU) prevention, few experiences address the question of the positive impact of repositioning on PU healing. The present study aimed to evaluate the effect of enhancing repositioning using wearable, wireless, patient orientation, and activity sensors on PU healing.

Methods: The study was conducted in July 2022 for six months in a unit with long-staying patients and a high percentage of patients with PUs. A PU treatment and prevention guideline was adopted alongside awareness sessions and coaching. Wearable sensors, which can monitor and detect patients' positions and alarm staff when turning or repositioning patients, were used primarily for bedridden patients with PUs. The healing score is based on the Wound Care assessment- Bates-Jensen Wound Assessment tool wherein 13 total score represents that the wound surface covered is intact and the wound bed has clinically improved.

Results: The intervention had a profound and positive impact on repositioning compliance. With the aid of sensors, it was increased from a modest 34% in January 2022 to achieve a remarkable target of 100% in November and December (Figure 1). The percentage of repositioning compliance was 31.83 ± 4.07 in the pre-, while in the implementation period, it was 91.33 ± 14.77 , which was statistically significant ($p < 0.0001$) using the Wilcoxon Rank-SUM test. Similar positive results were observed for the Average of healing Score which decreased from 35 in January 2022 to 13 in December 2022 (Figure 2). Indeed, the average healing Score dropped significantly from 36 ± 2.10 to 17.5 ± 4.85 (difference: 18.5 [95% CI: 13.69 – 23.30], $p < 0.0001$).

Conclusions: The utilization of the sensor to strengthen nurses' behavior and level of care has not only greatly improved repositioning compliance but also played a pivotal role in improving PU healing despite its acknowledged limitations in controlling other curative factors. It could catalyze further research, particularly interventional controlled trials, to confirm the specific protective effect of repositioning on PU healing.

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COI: NA

Figure 1: Improvement of staff compliance for patient repositioning with PU (stage ≥ 3) during sensor implementation



Figure 1: Improvement of pressure ulcer healing during sensor implementation



1.5

WHEN SURGICAL DEBRIDEMENT OF A PRESSURE ULCER IS NOT AN OPTION

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Introduction: Category III and IV pressure ulcers are wounds with full thickness skin loss. Devitalised tissue such as slough or eschar may be present on some parts of the wound bed, or even completely cover an unstageable pressure ulcer. These tissues must be eliminated to promote granulation tissue development and the healing process. Surgical debridement is a rapid method of eliminating these devitalised tissues. However, in certain clinical situations involving patients with pressure ulcers, surgical debridement is not an option.

Methods: Being involved in complex clinical situations of patient with severe pressure ulcers with no surgical option for these complex wounds' treatment, wound care nurse specialists explored different method of debridement at bed side minimising any potential complication such as bleeding and pain. Negative pressure wound therapy with instillation (NPWTi) provides wound cleansing capabilities, utilising reticulated open-cell foam dressings along with traditional negative pressure wound therapy (NPWT) benefits.

Results: In this case series, removal of slough, infection control and promoting granulation tissue development were reached a short timeframe, using the NPWTi to minimise complication such as risk of bleeding and pain when debriding severe pressure ulcers. When complete debridement and granulation tissue development was achieved, the NPWT was used to reduce the overall size of the wound and to promote wound closure.

Conclusions: The use of NPWTi may contribute to reduced length of therapy, reduced number of sharp or surgical debridements, and shortened time to wound closure when compared with standard of care dressings or traditional NPWT.

References:

Silverman RP. Negative Pressure Wound Therapy With Instillation and Dwell Time: Mechanisms of Action Literature Review. *Eplasty*. 2023 Aug 30;23:e54. PMID: 37743964; PMCID: PMC10517669.

COI: We declare no conflict of interest or industry funding.

1.6

TURNING A SMARTPHONE INTO A MEDICAL GRADE DEVICE; A POSITIVE IMPACT UPON PRESSURE ULCERS

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² Healthy io, London, United Kingdom

Introduction: A study by Gray et al in 2019, showed marked variations in wound care in the community, with underuse of evidence-based practices (e.g. compression bandages) and overuse of practices that are not supported by robust research evidence. Prior to the use of the digital wound assessment solution there was no data and therefore no oversight and assurance regarding the quality of wound care provided within organisation. The only data showed high rates of incidents reflecting some of the risk and quality held within the wound care pathway.

The use of handheld digital technologies is growing area of interest within clinical care delivery. One area where a digital platform lends itself to supporting clinical practice is that of wound care and in particular pressure ulcers (PUs). AI technology within the app ensures quality of imagery: distance, orientation, blur, lighting conditions, colour recognition in addition to auto detection of the outline of a wound to give a consistent and comparable surface area measurements.

Methods: A pilot study in a UK community Trust deployed the app to 2 district nursing teams over an 18-month period. The digitally enabled technology facilitates a holistic wound assessment to be completed at the point of care and supports reduction in variation of care through:

- Consistent wound imagery and measurements using AI powered wound measurement.
- Standardised wound type specific in-App assessment flows aligned to National Wound Care Strategy Programme best practice.

Results: Tangible organisational benefits driven through digitally enabled wound care demonstrated proactive care and early intervention and prevention by the:

- Flagging of deteriorating and static wounds
- Provision of data insights of inaccurate diagnosis and treatment gaps
- The remote clinical oversight of all wounds including pressure ulcers
- Visual timelines of each pressure ulcer- allowing for immediate scrutiny by clinicians either at the point of care or remotely

Conclusions: The use of a digitally enabled wound assessment app has transformed wound care within the 2 district nursing teams. The PU clinical pathway guides the end user through a standardised PU specific assessment flow meaning greater consistency in completed data sets and less variation in documentation.

References:

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COI: Nothing to declare

1.7

INVESTIGATING THE ATTITUDE OF THE MDT TOWARD CURRENT PRESSURE ULCER MANAGEMENT AND THE INTRODUCTION OF NOVEL TECHNIQUES

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Introduction: The multidisciplinary team (MDT) is vital for the safe, accurate and gold standard prevention and treatment of pressure ulcers. Their attitudes to the implementation of novel monitoring, prevention and treatment systems is vital for their respective success. Studies have shown that members of the MDT are unclear as to their role in the prevention and management in pressure ulcer treatment and their understanding of gold standard PU management is poorly understood (1).

This lack of knowledge is further highlighted in the community, with nursing home Healthcare professionals (HCPs) being shown to have little to no education on PUs which is concerning as the people they are looking after are the most prone to them (2).

Methods: We undertook a focus group of members from an MDT in a large teaching hospital. The range of the MDT included those who are clinical as well as non-clinical members of staff involved in IT and procurement.

We asked these members to use a novel monitoring application that was suggested to be introduced to gain their feedback on this application, as well as their general opinion on pressure ulcer monitoring. We took these members from a teaching hospital who monitored their pressure ulcers using paper and discussed the challenges with this.

Results: The main themes that came up as the issues with pressure ulcer monitoring included "Information not being transferred with the patient when they move to a ward or community" "lack of standardization" "Notes on pressure ulcers being lost, documented poorly or not documented"

The clinical members of staff focused mostly on the usability of the application and how it would operate and interact with the other application they were being asked to use whereas the non-clinical staff focused more on the cost-benefit of the application and regulatory data issues of the picture taking.

Conclusions: Members of both the clinical and non-clinical MDT are open and keen for an improvement in the monitoring of pressure ulcers. The issues around the monitoring surround the lack of standardization between shift worker documentation leading to confusion and poor care.

The introduction of an application that allowed for photographic monitoring as well as standardization with the dimeter, depth and grade of the pressure ulcers will benefit the HCPs that are in charge of monitoring and treating the PUs. National guidance and checklists for pressure ulcer management is useless if the tools 'on the ground' are not fit for purpose.

To our knowledge this is the first time clinical and non-clinical members of staff have been consulted simultaneously about introducing or changing the current practice.

References:

1) Samuriwo 2012 Pressure ulcer prevention: The role of the multidisciplinary team (*British Journal of Nursing*)

2) Lee 2022 Bridging the Knowledge gap for pressure injury management in nursing homes (*Environmental Research and Public Health*)

COI: £50,000 from Innovate UK

£17,500 from Bristol University

2.1 A DIAGNOSTIC APPROACH TO PRESSURE ULCER IMPROVEMENT

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Introduction: Pressure ulcers are in the top ten harms within NHS care in England. Despite many and varied approaches to delivering preventative strategies they continue to be costly to the NHS and a significant harm to patients and distressing to the staff in whose care they develop. In 2023 a set of new evidence based clinical recommendations and pathway were published aiming to both standardize and improve care delivery (National Wound Care Strategy 2023). To support rollout and uptake of these an implementation programme is planned.

Methods: To support implementation 2 main activities have been undertaken. A systematic review of the literature around implementing pressure ulcer prevention, and a diagnostic approach with 2 organisations. 1 organisation is an integrated provider (hospital and community) and focused on their ED department, the other is an Integrated Care System (2 hospital providers and 2 community providers and 1 integrated plus care homes) took a system wide approach.

The co-produced diagnostic focused on 5 main key lines of enquiry

- Leadership and governance
- Patient safety
- Education and clinical pathways
- Digital, data and information and
- Coproduction

Results: The literature review identified 5244 records, 2601 were de-duplicated in Covidence, title and abstract screening completed - 3601 records. 2485 were excluded 1088 assessed at full text screening stage. 28 were not accessible, 45 studies which met our eligibility criteria. Figure 1 These provide evidence of quality improvement and interventional studies in people with existing, and at risk of pressure ulcers from 15 different countries, from across the lifespan. The interventions and programmes implemented within the included studies mostly included a combination of staff education and training, equipment, skin care, leadership and updated policy and guidance.

The diagnostic work identified multiple themes which included inconsistencies in standards and processes across and within organisations, this covered all areas of the KLOEs from Board level oversight through education delivery and use of data. Over reliance on incident reporting as the source of 'truth' which generated uncertain level of assurance at system level and high workloads for specialists validating information. Education delivery varied across the organisations sometimes in line with local needs but there was a lack of clarity about the impact it made and this had not been formally evaluated. The evidence of links between the education and care pathway were also variable and it was identified that education was also delivered in a siloed way from other specialisms within the system which could impact on preventative care delivery.

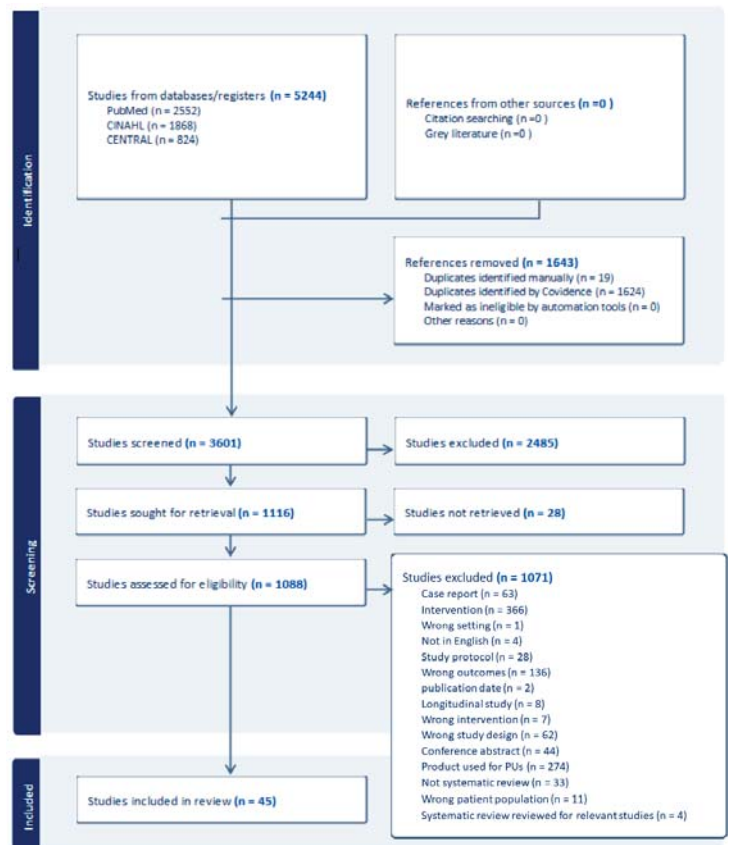
Conclusions: It is crucial to understand the baseline from which to work when aiming to deliver a large scale implementation programme such as is planned. The work undertaken so far has helped to understand the challenges within systems and a the bedside which will be used to help formulate the approach and develop appropriate supporting tools and enablers.

References:

National Wound Care Strategy Programme: (2023) Pressure Ulcer Recommendations

and Clinical Pathway <https://www.nationalwoundcarestrategy.net/wp-content/uploads/2024/05/NWCSP-PU-Clinical-Recommendations-and-pathway-Updated-21st-May-2024.pdf>

COI: None



2.2

ACHIEVING HAPI-NESS BY REDUCING HAPI STAGE 2 AND HIGHER IN THE MEDICAL SURGICAL/ONCOLOGY UNIT.

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² Kaiser Permanente Anaheim Medical Center, Anaheim, United States

Introduction: Every year, millions of patients in the United States develop Hospital-Acquired Pressure Injuries (HAPIs), resulting in discomfort, heightened infection risks, prolonged hospital stays, increased treatment expenses, and thousands of associated fatalities. Given the myriad challenges confronting today's nursing staff, it is imperative to employ effective strategies to forestall the onset of these pressure injuries. Within our organization, the severity of patients' conditions is notably high, with a substantial portion at risk of developing pressure injuries. By introducing HAPI-NESS within our Medical Surgical/Oncology Unit, alongside thorough assessment and consistent reinforcement of preventive measures, we successfully decreased the incidence rate of hospital-acquired pressure injuries stage 2 and greater in the last four years.

Methods: Adult patients admitted to a non-profit hospital in the Medical-Surgical/Oncology Unit were selected for this quality improvement initiative. The HAPI-NESS approach to preventing pressure injuries is as follows:

- **New Focus:** Established "Tissue Tuesday" rounding to identify patients at high risk of developing hospital-acquired pressure injuries.
- **Extensive approach to prevention:** Reinforcement of the Pressure Injury Prevention protocol and increasing accountability. Skin Champions education twice a year on current evidence-based practice and trends in pressure injury prevention.
- **Skin Champions empowerment** through peer-to-peer re-education on skin assessment, prevention, and documentation.
- **Sustainability:** Every shift, two Licensed Registered Nurses conduct skin assessments, weekly photos, monthly meetings, and quarterly pressure injury prevalence studies to ensure compliance with the pressure injury prevention protocol. In addition, the team created a hospital-acquired pressure injury (HAPI) escalation and reporting process.

Results: The HAPI-NESS approach reduced HAPI stage 2 and all HAPI categories following interventions. The Medical Surgical/Oncology Unit has been HAPI-free for over 1684 days, with significant cost savings of approximately \$20,900 to \$151,700 per HAPI (Tomlinson et al., 2024). In Q3 2019, the HAPI rate per 1000 patient days was 0.54. In Q4 2019, the team initiated the HAPI-NESS approach. In Q1 2020- Q4 2020: 0, Q1 2021- Q4 2021: 0, Q1 - Q4 2022: 0, Q1- Q4 2023: 0, and Q1 2024: 0.

Conclusions: Implementing the HAPI-NESS approach to the Medical-Surgical Oncology unit has maintained a HAPI stage 2 and all HAPI rates of zero. Achieving HAPI-NESS goals contributes to improved patient outcomes, safety, and considerable cost savings.

References:

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COI: Please declare any funding of the research by industry here.

I have no financial interests or relationships to disclose regarding the subject matter of this presentation.

2.3

DEVELOPMENT OF A SPECIALIZED ACTION PLAN TO INCREASE THE DOCUMENTATION OF RISK-ASSESSMENT AND CARE BUNDLE PLANS IN MEDICAL RECORDS

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Background: A dedicated specialist nurse for pressure ulcer prevention has been employed at a 900-beds University Hospital with the primary objective of reducing hospital-acquired pressure ulcers since 20121.

Annual pressure ulcer prevalence have been conducted since 2012, along with a medical record audist focusing at documentation related to risk assessment and care bundle plans.

The most recent prevalence data (2024) indicated a prevalence rate of 5.3%. However, a notable deficiency in documentation within medical records across all departments persists. Specifically, in 314 out of 376 medical records reviewed, the documentation pertaining to risk assessment and care bundle plans was found to be incomplete.

Furthermore, in instances where pressure ulcers occurred in hospitalized patients, documentation regarding risk assessment and care bundle plans was also deficient in clinical practice.

Consequently, a specialized action plan was developed to address this issue by focusing on enhancing documentation within medical records. The primary objective of this particular action plan was to increase the completion rate of risk assessments and care bundle plans documented in medical records.

Methods: The specialized action plan was developed with focus on problems, efforts and measures, goals and indicators and also who is responsible for the indicators:

Problems What does the problem consist of?	Efforts and measures Which activities need to be performed?	Goals and sub-goals Measurable indicators	Indicators	Responsible for the efforts	Follow up? When?
Inadequate documentation of risk assessment among hospitalized patients	Education in risk assessment within medical records 10 min x 3	Rate of documented risk assessment	80 %	Names	date
Care bundle (HUSKE) are not used systematically The daily skin assessment is not adequately conducted	Education in care bundle (HUSKE) within medical records Optionally, bedside skin assessment – hands-on approach 10 min x 3	Rate of documented Care bundles (HUSKE) in medical records Rate of patients with completed daily skin assessment	80 %	Names	date

The specialized action plan was disseminated across 35 departments spanning two hospitals. Through email correspondence, each department, including both leadership and frontline staff, was contacted to schedule appointments. Collaboratively, tailored teaching sessions were developed in conjunction with each department, ensuring alignment with their specific needs and circumstances. Deliberations encompassed factors such as scheduling teaching sessions at opportune times, accommodating evening and night shift staff, and selecting appropriate locations within the departments for the sessions

Conclusions: Despite extensive efforts and the implementation of a specialized action plan, only two departments have thus far attained the predetermined objective of achieving an 80% completion rate for risk assessments and care bundle plans in medical records. Additional data detailing the outcomes of the specialized action plan will be presented at the 2024 EPUAP (European Pressure Ulcer Advisory Panel) annual meeting.

References:

1. Fremmelevholm, Aase; Soegaard, Knaerke: Pressure Ulcer prevention in hospitals: a successful nurse-led clinical quality improvement intervention. *British Journal of Nursing* 2019, Vol 28, No 6: Tissue Viability Supplement

COI: I have no conflicts of interest to report.

2.4

EPIDEMIOLOGY OF PRESSURE ULCERS IN SPAIN. 2001-2022. PREVALENCE AND EPIDEMIOLOGICAL TREND.

Joan-Enric Torra i Bou¹, J.Javier Soldevilla-Agreda², Francisco Pedro García Fernández³, Pedro Pancorbo-Hidalgo³, Manuel Rodríguez-Palma⁴

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² Servicio Riojano de la Salud, Spain

³ Universidad de Jaén, Spain

⁴ Diputación de Cádiz, Spain

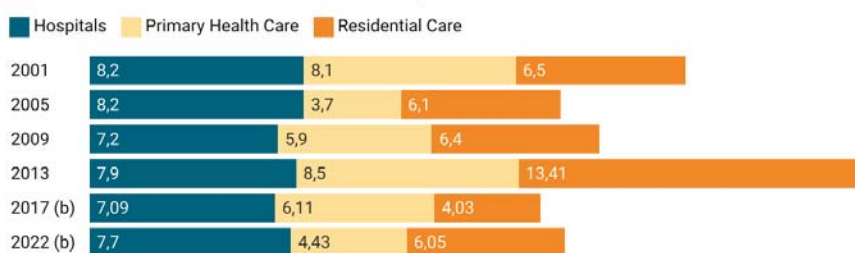
Introduction: The availability of epidemiological data on pressure ulcers (PU) at the national level is a fundamental step towards understanding this important health problem, both for health professionals themselves and for society and governmental bodies. On the other hand, the availability of time series makes it possible to visualise the epidemiological trend of this problem.

Methods: Since 2001, the GNEAUPP (Spanish Pressure Ulcer Advisory Group) has developed 6 national studies on the prevalence of PU in Spain. In these studies, members of the GNEAUPP and other healthcare professionals interested in this subject have been invited to provide information about the realities of their facilities based on three main scenarios: hospitals, primary care and social and health care in order to establish the prevalence and main characteristics of patients with PUs and the characteristics of these injuries as well as a description of the prevention material used.

Results: Six studies have been carried out, in 2001, 2005, 2009, 2013, 2017 and 2022. Prevalence data are presented in the graph. Data are also available on the total population included in each study and care scenarios, as well as on patients and injuries (category, locations, origin...), and in the case of hospitals, data segmented by different types of units.

Epidemiology of Pressure Ulcers in Spain. Period 2001-2022. Prevalence in %

Data from the 6 PU National Prevalence Surveys GNEAUPP



(a) Data reported by professionals related to the GNEAUPP and not by the institutions (b) In the 2017 and 2022 studies, the conceptual framework of DEPENDENCE-RELATED CUTANEOUS INJURIES is adopted so that friction, shear or mixed injuries are reported as independent entities, so the figure for prevalence of PU is lower by excluding these entities that were previously reported as PU.

(c) In the 2017 survey, the sample of residential care facilities was very small, which conditions the validity of the information. (d). All studies are available in open access in Gerokomos, the GNEAUPP's Journal.

Gráfico: Dr. Joan Enric Torra Bou, GNEAUPP • Fuente: GNEAUPP • Creado con Datawrapper

Conclusions: Our time series is the longest and most comprehensive available at the national level. It has been very useful for us to understand the problem at the national level and has allowed us to see the epidemiological trend as well as the impact of the economic crisis of 2008-2010 and the COVID pandemic. The methodology used in our studies has both positive and negative aspects. On the positive side, we can highlight the fact that the information provided is very close to reality, as it is provided by professionals and not by the institutions themselves. On the negative side, it should be pointed out that those who provide the information are professionals who are motivated about the PUs, which would place us in a scenario based on facilities which are most likely to be the ones with the lowest prevalence figures.

The authors declare that they have no COI. The studies have been financed with GNEAUPP funds.

COI: The authors declare that they have no COI. The studies have been financed with GNEAUPP funds.

2.5

WORDS4WOUNDS. A COMMUNITY OF PRACTICE TO ADVANCE PRESSURE INJURY PREVENTION AND MANAGEMENT IN AGED CARE.

Suzanne Kapp¹

¹ Regis Aged Care, Camberwell, Australia

Introduction: Prevention and management of pressure injuries requires a team approach and the engagement and expertise of nursing teams in residential aged care (long term care) is critical to positive resident outcomes and timely and effective engagement with the wider health care team. Nurses who work in aged care have varying levels of knowledge and skill, so innovative and convenient approaches are required to build individual, team and organisational capacity for pressure injury prevention and management in aged care.

Methods: A community of practice, called "Words4Wounds" was established in a residential aged care service in Australia. The community meets virtually for one hour at a set time each week, with nurses from across Australia invited to join. Attendees may drop in and out of the virtual community catch ups as they need and other employees from support services within the organisation are invited to promote shared understanding and organisational wide responsibility for wound prevention and management. Discussion at Words4Wounds is guided by the needs of those who attend and the benefits include access to a wound specialist for general advice about resident care, a safe place to debrief about residents who have challenging wounds, a community to celebrate successes with, and the opportunity to build collegial relationships with other like-minded nurses.

Results: Of the 28 Words4Wounds catch ups over the last six months, 75% of discussions have focused on prevention and management of pressure injuries, this highlighting the need that aged care nurses have for related information, advice and support. Those who have attended have found the Words4Wounds community supportive and through participation, areas for organisational improvements have been identified and progressed. The opportunity to gain timely expert advice regarding wound management has been the main draw card of Words4Wounds, highlighting the need to maintain this support while also building leaders in pressure injury prevention and management within the organisation. Through this, process and system factors can be advanced to optimise high quality care and the best outcomes for residents.

Conclusions: Words4Wounds is a community of nurses who share information and experiences to learn from each other and to optimise pressure injury prevention and management in aged care. This presentation will describe the approach taken for Words4Wounds and key outcomes arising so that others may consider adopting such an initiative for advancement in pressure injury prevention and management in their health care setting.

References:

COI: Nil funding to declare.

2.6

ASSESSING NURSES' KNOWLEDGE ON PRESSURE ULCERS USING THE PUKAT 2.0: AN EVIDENCE-BASED WAY TO GUIDE AN INSTITUTIONAL CONTINUOUS EDUCATION PROGRAM

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Introduction: Pressure ulcers impose a significant burden on patients and healthcare systems. Preventing and treating pressure ulcers should be a priority for institutions as they are indicators of patient safety and quality care. Despite evidence-based recommendations, their prevalence and incidence remain high across settings which could be related among others to insufficient knowledge. Therefore, the first part of our project focuses on assessing nurses' knowledge about pressure ulcers to develop a tailored education program in a tertiary hospital in Switzerland.

Methods: A cross-sectional survey was sent by email to 483 nurses of every department at a tertiary hospital between October and November 2023. Participants completed an anonymous questionnaire via online survey tool, which included a brief sociodemographic form and a French translation of the Pressure Ulcer Knowledge Assessment Tool (PUKAT). Data were stored on a secure server in Switzerland and analyzed using descriptive statistics.

Results: A total of 99 nurses participated, resulting in a participation rate of 20.5%. Most respondents were women (n = 76), with the most representative age range being 30 to 39 years old (n = 33). Participants worked across all departments. Results showed an overall mean percentage of correct answers at 46.4%. Nurses demonstrated a high level of knowledge in "risk assessment" with 89.5% correct answers and in the "specific patients" category with 59.9% correct answers. However, the results highlighted insufficient knowledge in the other categories, with correct answer percentages of 31.9% in "prevention," 36.6% in "nutrition," 47.8% in "classification and observation".

Conclusions: Our results align with existing literature, which reports insufficient knowledge among nurses regarding pressure ulcers, as we obtained a score of less than 60% correct answers. In alignment, the lowest levels in the areas of prevention and nutrition were obtained. However, nurses in our study demonstrated a higher level of knowledge in "risk assessment" and "specific patient" categories. These results underscore the need to focus on prevention and nutrition interventions when developing the educational program and support the involvement of interprofessional educators. This program will be based on the learning outcomes from the EWMA curriculum for nurses at levels 4/5, incorporate specific content to improve these preliminary results and a literature review focusing on existing educational interventions for pressure ulcers. Knowledge and attitudes towards pressure ulcers will then be measured annually to adapt the educational program. This project illustrates how institutions can use a validated tool to develop targeted and contextualized educational programs.

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* LimeSurvey©

COI: This study did not receive any funding by industry

3.2

NEW PROTOCOL FOR IAD TREATMENT IN PEDIATRIC PATIENTS: STABLE OZONIDES

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Introduction: Incontinence associated dermatitis (IAD) in pediatric population is often a neglected or misdiagnosed issue frequently confused with diaper dermatitis and its treatment is still limited to strong cleansing and hygienic practices followed by thick creams applications. The traditional approach is not respectful of pain caused by thick cream removal at each change. We present results obtained on a consecutive series of children presenting with different grade of IAD treated with a protocol consisting in the application of new stable Ozonides-based products.

Methods: Since March 2022 Children aged 0 to 18, presenting with any GLOBIAD stage of IAD, were enrolled in the study. The sample followed a specific protocol at changes based on stable ozonides products (spray and barrier cream application) (Table 1). Pain at changes and healing progression were monitored respectively at each diaper change and daily. Care givers were asked to compile an audit on "feasibility of ozonides protocol application" eventually comparing it to the traditional approach when previously experimented.

Results: From March 2022 to April 2024, 35 consecutive children, average 2.2 +/- 1.6 years were included in the study. GLOBIAD staging was: 11.4% 1A; 5.71% 1B; 45.71% 2A; 37.14% 2B. A dramatical decrease was observed after 24hours since first application. No superinfections nor adverse events or allergies occurred during treatment. Re-epithelization occurred after a mean of 7.3 days (Fig. 1A;B;C); no scarring sequelae, neither pigmentation alterations occurred. No relapses occurred when barrier cream was used as maintenance treatment.

Conclusions: Stable ozonides products are a valid, practical, and safe option for IAD treatment in pediatric population, regardless of its stage and causing pathology.

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1. Marinova, P. (2023). THE EFFECT OF TOPICAL APPLICATION WITH OZOILE® AS A NOVEL METHOD IN THE COMPLEX TREATMENT OF SOFT TISSUE INFECTIONS AND CHRONIC WOUNDS. *Trakia Journal of Sciences*, 21(3).

COI: no COI to disclose

Table 1: selection criteria

SELECTION CRITERIA	
INCLUSION CRITERIA	EXCLUSION CRITERIA
CHILDREN AGE 0-18	AGE >18 YRS
ANY IAD STAGE	LACK OF CARE GIVERS' COMPLIANCE TO PROTOCOL
ANY COMORBIDITIES	CONTEMPORARY USE OF DIAPERS WIPES, CREAMS OR SOAPS

Figure 1: A) IAD 2A at T0; thick cream debris due to traditional approach are observable; B) Lesion after 48 hours since stable ozonides application; C) re-epithelization at 8 days.



3.3

PROGNOSTIC FACTORS FOR THE DEVELOPMENT OF INCONTINENCE-ASSOCIATED DERMATITIS (IAD): A SYSTEMATIC REVIEW.

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Introduction: Incontinence-associated dermatitis (IAD) is caused by prolonged exposure to urine and/or faeces, which can significantly impact patient comfort and quality of life. Although risk factors for IAD have been described, a systematic review and evidence appraisal on prognostic factors has not yet been conducted. Therefore, the following review question was developed: What are the prognostic factors associated with the development of IAD in incontinent patients?

Methods: A systematic review was conducted following a review protocol published previously (Deprez et al., 2023). Prospective and retrospective observational studies or clinical trials that described prognostic factors associated with IAD were included. There were no restrictions regarding setting, time, language, participants, or geographical regions. Exclusion criteria included reviews, editorials, commentaries, methodological articles, letters to the editor, cross-sectional and case-control studies, and case reports. Searches were conducted from inception to May 2023 in MEDLINE, CINAHL, EMBASE, and the Cochrane Library. The studies were assessed by two independent reviewers using the QUIPS and the CHARMS-PF for data extraction. Evidence was summarized descriptively and using the 'vote counting based on direction' method. The overall certainty of evidence was assessed using adapted GRADE criteria.

Results: The review included twelve studies and identified fifteen potential predictors. Moderate quality evidence suggests that increased stool frequency, limited mobility, and friction/shear problems are risk factors for IAD development. Female sex, older age, vasopressor use, and loose/liquid stool are risk factors supported by low-quality evidence.

Conclusions: Female sex, older age, increased stool frequency and loose/liquid stool, vasopressor use, limited mobility, and friction/shear problems are risk factors for IAD development. The predictive validity of other prognostic factors is unclear. There is substantial methodological variability across studies, making it challenging to make comparisons. Large-scale cohort studies in different settings that incorporate our review findings should be conducted in the future.

References:

- Deprez, J., Kottner, J., Eilegård Wallin, A., Ohde, N., Bååth, C., Hommel, A., Hultin, L., Josefson, A., & Beeckman, D. (2023). What are the prognostic factors for the development of incontinence-associated dermatitis (IAD): a protocol for a systematic review and meta-analysis. *BMJ Open*, 13(7), e073115. <https://doi.org/10.1136/bmjopen-2023-073115>

COI: This work was supported by Swedish Science Foundation (Vetenskapsrådet), grant number 2021-02653.

3.4

DEVELOPMENT AND PSYCHOMETRIC TESTING OF A KNOWLEDGE INSTRUMENT ON INCONTINENCE-ASSOCIATED DERMATITIS FOR CLINICIANS: THE KNOW-IAD

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Introduction: Effective management and assessment of incontinence and its associated dermatitis (IAD)—a skin condition resulting from faecal and urinary incontinence—are critical skills for clinicians to prevent adverse outcomes, such as pressure injuries (PIs). Despite its importance, validated tools to measure healthcare professionals' understanding of IAD are notably absent. This study aimed to develop and validate an instrument designed to assess clinicians' knowledge of incontinence-associated dermatitis and evaluate its psychometric properties.

Methods: The methodology for this study was structured into three distinct phases: an initial literature review, a consensus process involving a panel of experts, and subsequent pilot testing of the developed tool. The initial development phase utilised an extensive literature search to construct a preliminary assessment tool, which was then refined through feedback from a panel comprising 15 seasoned clinicians and consumers. This expert panel provided valuable insights that helped determine item- and scale-level content validity ratios (CVRs) and content validity indices (CVIs). The refined instrument was then pilot-tested with 204 clinicians during the period from September to November 2019. The data collected from this phase underwent confirmatory factor analysis and composite reliability testing to validate the tool's effectiveness.

Results: The 18-item assessment tool for incontinence-associated dermatitis (IAD) covered three domains: aetiology and risk, classification and diagnosis, and prevention and management. The tool demonstrated high content validity ratios (CVRs) and indices (CVIs) for relevance and clarity. Confirmatory factor analysis confirmed the construct validity for aetiology and risk, and prevention and management, but not for classification and diagnosis. Composite reliability was solid for the validated domains. Respondents showed strong knowledge in aetiology and risk (72.6% correct responses), reasonable in prevention and management (64.0%), and moderate in classification and diagnosis (40.2%)

Conclusions: The instrument demonstrated good psychometric properties and provides preliminary evidence that it can be applied to evaluate clinician knowledge about incontinence-associated dermatitis.

References:

Barakat-Johnson M, Beeckman D, Campbell J, et al. Development and psychometric testing of a knowledge instrument on incontinence-associated dermatitis for clinicians: The Know-IAD. *J Wound Ostomy Continence Nurs.* 2022;49(1):70-77.

COI: None to declare.

4.1

ARE THERE PHYSIOLOGICAL DIFFERENCES IN RESPONSE TO INJURY DEPENDING ON SKIN TONE -A SCOPING REVIEW

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Are there physiological differences in response to injury depending on skin tone – a scoping review

Introduction: Pressure ulcers are localised areas of tissue damage which arise from excess pressure and/or shearing forces, usually occurring over a bony prominence¹. While studies mainly focus on risk factors, the potential role of skin pigmentation in pressure ulcer development remains under-investigated. This scoping review explores existing literature examining physiological differences in pressure ulcer response among individuals with differing skin tones.

Methods: This was a scoping review. Articles meeting the inclusion criteria were retrieved from electronic databases including PubMed, CINAHL, Scopus, Cochrane, and EMBASE, using the keywords "pressure ulcer," "skin pigmentation," "melanin," and "risk factor." Data were extracted including study design, method of evaluation, key findings, and limitations and analysed using a narrative synthesis.

Results: Five papers met the inclusion criteria. Analysis of findings suggest the following mechanisms as being important in terms of response to injury among those with dark skin tones: melanin which can modulate the inflammatory response in the skin. Excessive inflammation can exacerbate tissue damage in pressure ulcers; gland pore size: people with dark skin have increased apocrine and apocrine glands and greater sebum secretion. Excessive sebum creates a moist environment on the skin, which may increase shear forces; transepidermal water loss: people with dark skin tones often experience higher levels of transepidermal water loss resulting in lower water content in the stratum corneum, contributing to variations in skin hydration; reduced responsiveness of blood vessels: altering vascular function.

Conclusions: Physiological differences in skin and tissue structure contribute to alterations in the response to pressure ulcer development among individuals with dark skin. Recognising these differences is important for targeted prevention strategies within diverse populations. However, further research is needed to explore the mechanisms underlying this association.

References:

EPUAP, NPIAP, PPPIA. *Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline. The International Guideline. 2019.*

COI: We declare there is no funding for this research.

4.2

COMPREHENSIVE EVALUATION OF HYBRID PHYSICAL PROCEDURES IN THE TREATMENT OF CHRONIC ULCERS: EFFECTS ON FIBROBLAST PROLIFERATION AND MICROBIAL SURVIVAL

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Introduction: Treatment of chronic wounds requires a combination of healing support and infection control. This study evaluates the hybrid physical procedures in the treatment of venous ulcers for its dual efficacy in controlling fibroblast proliferation and reducing microbial survival, which is essential for advanced wound healing.

Methods: We examined the effects of the combination of PEMF, TOT, LLLT Red & UV, topical ozone treatment on L929 mouse fibroblasts and microbial strains (*Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Candida albicans*), focusing on cell viability, biofilm biomass, and microbial survival under various treatment settings.

Results: The results indicate specific treatment parameters that simultaneously enable stable fibroblast proliferation, and biofilm reduction. In particular, the three-species biofilm of *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida albicans* showed a significant reduction after 30 minutes of exposure, with a $48.2 \pm 3.5\%$ decrease in metabolic activity and a significant reduction in colony-forming units, demonstrating the strong antimicrobial effect of the treatment.

Conclusions: The examined treatment method has demonstrated significant efficacy in control of fibroblast proliferation activity and reducing the presence of microorganisms. Its effectiveness, evidenced by the study and supported by clinical observations— including accelerated reduction of the wound area and alleviation of patient discomfort —establishes it as a fundamental element of comprehensive wound care strategies. Given these promising outcomes, the method merits extensive clinical investigation to fully ascertain its potential benefits in wound management

References: n/a

COI: Research commissioned by INVENTMED Ltd.

4.3

COMPUTATIONAL MODEL OF THE SKIN: EFFECTS OF DIFFERENCES BETWEEN INDIVIDUALS

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Introduction: Skin, the body's largest organ, serves as a protective shield against various external threats like pathogens, UV radiation, chemicals, and injuries. It consists of three layers: the epidermis, dermis, and hypodermis, each with distinct functions determined by cell types and protein-network composition. Factors such as genetics, lifestyle, and age influence skin thickness, appearance, and integrity; aging often results in visible changes. Skin damage, e.g. due to pressure, triggers gap closure and healing processes that produce new tissue and typically also scarring, altering the new tissue structure and elasticity. Therefore, the newly formed tissue, and especially the scar location exhibit differences in appearance, texture, function, stiffness, and sensitivity to UV radiation. Research on skin lesions and scarring, though vital, poses ethical and logistical challenges when conducted on deceased bodies and living volunteers.

Methods: We built computational models a skin model, including the representative tissue layers in a simplified form. We generated computational models based on previously reported experimental results from individuals of varying gender or age, which provided the thickness and mechanics of the skin layers. The layers were modelled using finite element analysis as initially flat elastic or viscoelastic materials. With these models, we test effects of damage and repair, and also formation of scars.

Results: We provide a series of skin models with layer changes according to an individuals' gender or age, demonstrating the effects on biomechanical and mechanobiological responses following controlled damage. We model the interplay between various factors influencing gap closure in wound healing and scar formation, demonstrating complex changes in skin structure and function following ulceration damage.

Conclusions: The utilization of finite element skin models offers a promising avenue for understanding the complex processes involved in damage-induced wound closure and scar formation. The computational models may allow to better predict damage effects of specific conditions, rate of healing, and treatment outcomes in individuals.

COI: No conflict of interest.

4.4

EVALUATING AGE RELATED CHANGES IN MUSCLE PROPERTIES USING B-MODE ULTRASOUND AND SHEAR WAVE ELASTOGRAPHY

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² University Hospital Groups AP-HP-Sorbonne-Universit , Charles Foix Hospital - Department of long term care for elderly, Ivry-sur-Seine, France

Introduction: Pressure Ulcers (PUs) are caused by "prolonged exposure to mechanical stress that exceeds the skin and underlying soft tissues' tolerance"(1). Age is a potential indirect causal factor (2). Research has highlighted the importance of local mechanical deformations in the onset of PUs (3), especially local strain in muscle tissue (4).

Various scientific communities are developing emerging technologies that can quantify risk factors of PUs. Ultrasound (US) imaging of the rectus femoris (RF) muscle at bedside has shown promising results in the clinical assessment of the elderly (5), and has recently been correlated with PU occurrence (6). Shear wave elastography (SWE) is an US based technology that can quantify biomechanical properties of the muscle by measuring an approximation of the stiffness (7). However, it is unclear how to integrate these technologies in the clinical evaluation of PU risk. The aim of the present work is to evaluate a protocol based on US and SWE to quantify changes in muscle properties with ageing.

Methods: This preliminary evaluation included two groups of 6 young adults and 6 healthy elderly, with a sex ratio of 1:1, a mean age of 23.5 (± 1.5) and 69.7 (± 6.3), respectively. The RF was evaluated using US and SWE to measure three parameters: muscle thickness (MT), cross-sectional area (CSA), and elasticity modulus (EM). The muscle was evaluated in two positions: at rest (R) and during passive stretching (PS). To aid result interpretation, we computed the ratio between the PS and R positions for each parameter. We compared the two groups using the non-parametric Mann Whitney test.

Results: The MT was significantly reduced in the elderly group at R position while the EM was significantly increased at the PS position. On the other hand, ratios of both MT and EM were statistically increased in the elderly group.

Conclusions: Muscle properties changes in elderly can be quantified using US and SWE. Using ratios of MT and EM values between PS and R positions is a promising tool for clinical interpretation and reducing interindividual variability in the perspective of PU risk estimation.

References:

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COI: This work was supported by the Fondation de l'Avenir (grant number AP-RM-23-036).

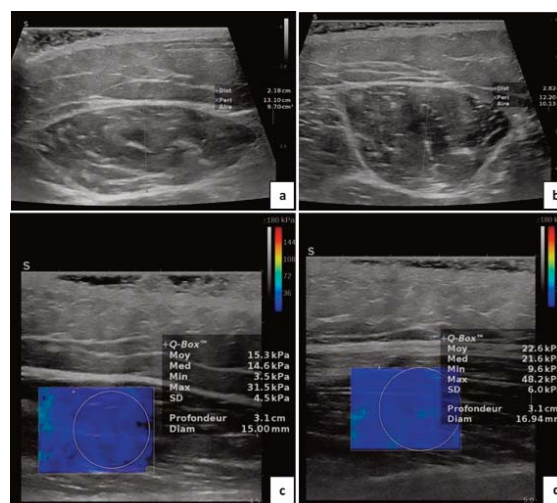


Figure 1. Ultrasound/elasticity of the rectus femoris in the rested (a and c) and passively stretched (b and d) positions. Images a and b show the measurement of variables in B-mode (transverse section): thickness (Dist) and surface area (aire). Images c and d in SWE mode (longitudinal section) show the elasticity module of the muscle by giving an average value (Moy) of the colour map within the circle chosen by the operator (Q-Box).

	Parameters	Young	Elderly	P-value
		Average (SD)		
Rested rectus femoris	MT (cm)	1.9 (0.32)	1.3 (0.26)	0.009*
	CSA (cm ²)	6.6 (1.9)	5.8 (1.2)	0.589
	EM (kPa)	14.9 (1.2)	13.1 (2.4)	0.240
Passively stretched rectus femoris	MT (cm)	2.6 (0.3)	2.4 (0.38)	0.485
	CSA (cm ²)	7.4 (2.3)	5.9 (1.5)	0.132
	EM (kPa)	25.9 (4.4)	39.2 (7.6)	0.004*
Ratio Passively stretched / rested	MT	1.4 (0.1)	1.9 (0.22)	0.009*
	CSA	1.1 (0.1)	1.0 (0.17)	0.485
	EM	1.8 (0.5)	3.1 (1.2)	0.009*

Table 1. Preliminary results of two healthy groups composed of 6 subjects each. Parameters: MT - muscle thickness; CSA - cross sectional area; EM - elasticity modulus. The variables are presented as an average value (standard deviation) and the two groups were compared using the Mann Whitney test; a p-value under 0.05 was considered statistically significant (*)

4.5

PORO-ELASTICITY TO CAPTURE THE TIME-DEPENDENT MECHANICAL BEHAVIOR OF IN VIVO HUMAN SKIN DURING AN EXTENSION TEST.

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Introduction: Pressure ulcers have been shown to result from mechanisms occurring at different length and time scales, e.g., the damage follows an excessive deformation or ischemia-reperfusion processes. Over the last decade, research in biomechanics has focused on the evaluation of the stiffness as a surrogate measurement of injury risk, overlooking the time dependent parameters. Poromechanics is promising: it accounts for the multi-phasic aspect of the tissue and allows for the introduction of time-dependent processes such as ischemia-reperfusion. This study is a simplified application of such a model on a healthy in vivo human skin tested in extension.

Methods: Uni-axial extension measurements on a female left upper arm collected with the device described in [1] were shared by Chambert et al. Four loading-sustaining-unloading cycles were performed at a speed of 1mm.s⁻¹ until an extension of 8.1mm. A curved bi-layered geometry representing the cutis and the subcutis was generated.

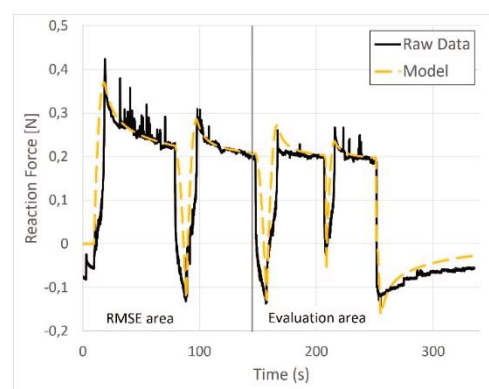
A poro-hyper-elastic model was implemented in FEniCSx [2]. The porosity, Poisson's ratio and, synovial fluid viscosities were fixed. The Young's moduli and permeabilities were set for calibration. A root mean square error cost function was introduced for the two first cycles only. All the cycles were then computed for validation.

Results: Table 1 summarizes the final parameters used in Figure 1. A cost function value of 7.04×10^{-3} Pa was reached. The model response allows to reproduce the behavior of the full experiment. During a stretching, the interstitial fluid is drawn in (pores' dilation). Conversely, during a release, a reflux is observed. Due to a lower permeability in the cutis, most of the fluid flow is concentrated in the subcutis.

Table 1: Mechanical parameters (fixed and calibrated) of the model

Cutis	Subcutis	Interstitial Fluid	Unit
Young's modulus	5.92×10^6	51.2×10^3	Pa
Poisson's ratio	0.45	0.3	-
Intrinsic permeability	4.42×10^{-14}	3.61×10^{-13}	m ²
Initial porosity	0.2	0.4	-
IF viscosity	-	-	5×10^3 Pa.s

Figure 1: Evaluated response of the model superimposed with the experimental data.



Conclusions: This study supports the use of poromechanical modeling to account for the time-dependent behavior of in vivo human skin. The identified parameters are consistent with the literature. The model was able to predict the response of the last two cycles even if it had been calibrated on the first two cycles. Coupling with a second compartment, representative of microvasculature, could offer insights into biochemical and mechanical reactions during mechanical load application.

References:

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4.6

STANDARDISING SUPPORT SURFACE EVALUATION: EXPLORING METHODS FOR PERFORMANCE AND FUNCTIONALITY ANALYSIS

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Introduction: Selecting a reliable class of support surface to prevent pressure ulcers (PU) has exhibited high uncertainty due to poor evaluation methods and a lack of objective evidence (Shi et al., 2018; McInnes et al., 2018). Current strategies disregard anatomical characteristics and use subjective outcome measures, such as patient experience, as criteria for measuring mattress performance, confusing decision-makers on which products are reliably effective (Matsuo et al., 2011; McInnes et al., 2018). As such, there is a need for future guidelines to define a standard methodology that provides validated evidence of a mattress's relative performance and function in reducing the incidence of new PUs.

Methods: A statistical procedure defined the variables and outputs influencing the function and performance of support surfaces, developing a systematic approach for a methodology to enable a standardised evaluation in a range of clinical and non-clinical settings.

Results: The results demonstrate how using fundamental engineering and careful control of measurement methodology is required to make robust comparisons of support surfaces.

Conclusions: Influencing effective PU prevention requires products supported by verified testing methods, driving a new initiative for performance-based evaluation of support surfaces. Without standardising performance measurements, the ambiguity surrounding effective support surfaces will remain, limiting innovation towards a better solution. Therefore, approaching a new method will aid opportunities to rethink how support surfaces should impact PU outcomes.

References:

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5.1

EVALUATING EFFECTIVENESS OF CARE BUNDLES ON THE INCIDENCE OF PRESSURE ULCERS IN SURGICAL PATIENTES: A SYSTEMATIC REVIEW

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Introduction: The prevalence of post-operative pressure ulcers (PU) is high (18.96%)(1). Evidence shows care bundles as an effective strategy for preventing PUs(2,3). We aimed to identify care bundle strategies used in surgical patients and its effectiveness in preventing PUs.

Methods: A systematic review conducted according to PRISMA guidelines. The database search included: Scopus, Web of Science, MEDLINE, Embase, CINAHL, Cochrane Library, and LILACS. Original prospective studies reporting care bundles (2 or more preventive measures) and the incidence of PUs in surgical patients were included.

Results: Five studies were included. One to nine interventions were performed in the preoperative phase(4–8) and five to six in the postoperative phase(4,5,7,8). Table 1 shows the preventive measures used across the studies. Notably, PU risk assessment(4,5,7,8) and skin assessment(4,6–8) emerged as the most frequently implemented strategies. Overall, the meta-analysis demonstrated a statistically significant reduction in PUs, nearly 80% when employing bundles of interventions (RR = 0.23; 95%CI: 0.11 to 0.48; I² = 14.4%)

Conclusions: The meta-analysis revealed that implementing a care bundle approach, particularly including PU risk assessment, skin assessment, and the use of prophylactic dressings, may significantly reduce PUs by nearly 80%. This highlights the effectiveness of bundled preventive strategies in surgical patients.

Table 1 - Summary of the pre and postoperative measures

Author	Preoperative Stage	Postoperative Stage
Cherry et al. (2012)	<ul style="list-style-type: none"> PU risk assessment upon admission. 	<ul style="list-style-type: none"> Perform a skin assessment (including assessment of PU risk) on admission. Reposition patients regularly (at least every 2 hours). Elevate the patient's heels. Follow hospital protocols for managing any breaks in skin integrity. Monitor the incidence of Hospital-acquired pressure ulcers (HAPUs) continuously.
Aloweni et al. (2023)	<ul style="list-style-type: none"> PU risk assessment using the SPURS (Surgical Pressure Ulcer Risk Score) tool. Apply prophylactic foam dressing on high-risk areas (foam dressing on heel, foam dressing on sacral area). Patient education. 	<ul style="list-style-type: none"> Pressure redistributing devices (alternating air mattress, heel boots, sliding sheet, positioning wedges). Use of sliding sheets during transfer and positioning. Reposition patients regularly (every 2 – 3 hours). Encourage early mobilization. Provide good nutrition (monitor intake and output). Optimize postoperative pain management.
Li et al. (2021)	<ul style="list-style-type: none"> Emergency initiation (the surgeon informed the operating room and the anesthesiology department to coordinate and prepare surgical materials one hour in advance; specialist nursing team members take responsibility). Provide a quiet and comfortable environment. Implement the blood pressure management model integrating surgeon, nurse, and patient efforts to achieve "quiet, painless, systolic blood pressure of 110 to 120 mmHg, heart rate below 70 beats/min"; require aortic dissection (AD) patients to lower their blood pressure to the target value within 5 to 10 minutes. Ensure medical staff cooperation to reduce waiting time for the transfer process of AD patients. Closely monitor the condition during the transfer process of AD patients. Shorten the transfer path. Handle the transfer carefully. 	None.
Wang et al. (2018)	<ul style="list-style-type: none"> Skin inspection. Positioning aids. Medical devices or/and equipment. Thermal regulation. Interprofessional communication. 	<ul style="list-style-type: none"> Skin inspection. Positioning aids. Medical devices or/and equipment. Thermal regulation. Interprofessional communication.
Romito et al. (2018)	<ul style="list-style-type: none"> Patients scheduled for surgery were screened using the Scott Triggers® criteria. 	<ul style="list-style-type: none"> Use of the Scott Triggers® Tool into the daily staff workflow care environments. The skin was assessed postoperatively for evidence of PU (changes in skin integrity, skin color, skin temperature, inflammation, and pain levels). The Perioperative Clinical Nurse Specialists (CNS) rounded on patients who received advanced perioperative pressure ulcers (PPU) interventions 24 and 72 hours postoperatively. Patients at high risk for PPU received prophylactic dressings (a five-layered silicone foam). The perioperative CNS closed the loop by rounding on patients postoperatively to deliver feedback to perioperative nurses.

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COI: None.

5.2

DEVELOPMENT OF A HOME CARE SSKIN BUNDLE FOR NEUROLOGICAL PATIENTS: A MIXED-METHODS IMPLEMENTATION SCIENCE STUDY PROTOCOL

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Introduction: Neurological patients experiencing mobility impairments are susceptible to pressure ulcers (PUs) (1). Although the SSKIN bundle is a widely adopted intervention in hospital settings, its utilization by family or informal caregivers at home is less frequent(2). Our research aims to adapt the SSKIN bundle into an evidence-based, preventive toolkit for use in domestic environments by non-professional caregivers to prevent PUs after hospital discharge.

Methods: This study employs a quasi-experimental design with a mixed methods approach, utilizing the Consolidated Framework for Implementation Research (CFIR)(3) to develop and apply a tailored care protocol. It is structured into five stages, aligned with the Plan-Do-Check-Act (PDCA) cycle for continuous improvement(4). This protocol follows a structured five-stage process based on the Plan-Do-Check-Act (PDCA) cycle for continuous improvement. We will recruit adult patients with neurological issues at risk of developing PUs and their caregivers. Follow up will be as per Figure 1. The development of the SSKIN bundle-H will incorporate insights from a scoping review, initial patient and caregiver interviews, and recommendations from a panel of experts. During the implementation phase, we will engage the same demographic to introduce and personalize the new care bundle, refining it based on feedback from both patients and caregivers.

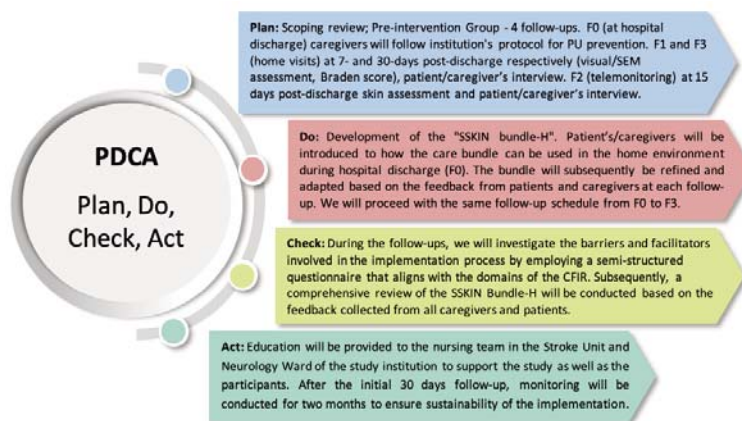


Figure 1 - Organization of the study within the continuous improvement cycle.

Results/Conclusion: Our goal is to create a care bundle tailored for home use by lay caregivers and patients to prevent PUs effectively. Hospital personnel will introduce the SSKIN Bundle-H to patients and caregivers, providing guidance on customization to meet individual needs. Through identifying both the facilitators and barriers to implementing this new care bundle, we anticipate that a personalized, patient-centered approach will promote the adoption of evidence-based strategies in home settings.

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5.3

PRESSURE ULCERS PREVENTION IN HOSPITAL EMERGENCY SERVICES

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Introduction: Pressure ulcers management is challenge in different care settings (1). Pressure ulcer prevention protocols (which include early nursing care/interventions) should be implemented as soon as possible (2) and nursing team should implement preventive measures based on the best available evidence (3), clinical and demographic-related risk factors (4,5) and hospital emergency services' characteristics (6). Thus, the main objective of this scoping review is to map the available evidence on the nursing care provided to prevent the development of pressure ulcers in hospital emergency services.

Methods: Scoping review that follows the PRISMA-ScR and JBI guidelines. The inclusion criteria were based on the PCC mnemonic. The main variables of interest were the nursing care provided to prevent the development of pressure ulcers (Condition) reported in studies developed in hospital emergency services (Context) with adult participants (Population). The scoping review protocol was registered on the Open Science Framework platform.

Results: During the selection process, 175 articles were identified in different databases. Applying the inclusion and exclusion criteria, 20 studies were included in the scoping review. The preventive measures for the development of pressure ulcers were mapped and grouped into 9 categories such as: "risk factors and risk assessment", "support surfaces", "dressings for prevention of pressure ulcer/injury", "skin and tissue assessment", "repositioning and early mobilization", "preventive skin care", "nutrition in pressure ulcer/injury prevention", "health education" and "vital signs management". The instruments for assessing the risk of developing pressure ulcers/injuries mentioned in the studies are the Braden, Waterlow and Norton scales. The most documented tool for assessing the risk of developing pressure ulcers/injuries in hospital emergency services was the Braden Scale.

Conclusions: International literature identified several preventive interventions that could be implemented in hospital emergency services to avoid pressure ulcers development. However, is crucial that those presentive interventions were systematic implemented (in combination) since hospital admission.

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COI: The authors declare no conflict of interest.

5.4

SEAMLESS - INTELLIGENT SENSING TO PROMOTE SELF-MANAGEMENT OF POSTURE AND MOBILITY IN COMMUNITY DWELLING INDIVIDUALS - WORK PACKAGE 1 - REALIST EVALUATION OF THE USE OF CONTINUOUS PRESSURE MONITORING IN THE COMMUNITY SETTING.

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Introduction: Pressure Ulcers (PUs) represent a major burden to populations worldwide and have been attributed with the highest disability index for dermatological conditions (Spilsbury, Nelson et al. 2007). PUs impact on a patient's quality of life (QoL) impacting on emotional, physical, mental, and social wellbeing (Moore and Cowman 2009). Continuous pressure monitoring (CPM) can both monitor and promote mobility, helping to support self-management and timely interventions. A previous Quality Improvement project implemented CPM in community trusts from 2017-2021 (PROMISE(Aylward-Wotton.N 2020)), demonstrated several benefits to patients including improved self-awareness, pressure ulcer healing, and better selection of support surfaces.

The trusts involved in PROMISE continue to use CPM as standard practice. There is a need to evaluate how the technology is being used and where improvements to the design and functionality of the device could improve implementation. The overall study will produce three work packages. For the purpose of this abstract Work package 1 will be presented.

Methods: Using a realist methodology we have conducted a scoping review and realist evaluation to develop program theories to explain how CPM works, for whom, under what circumstances, how and why?

Work package 1 will utilise reports and interviews from PROMISE alongside the scoping review, to develop 'hunches' as to how CPM works, for whom, under what circumstances and why (Manzano 2016). We have also undertaken focus groups, observations and interviews with patients, carers and practitioners in different settings to further refine the program theories.

Results: The scoping review identified twenty journal articles and conference papers relevant to the development of initial program theories. These combined with the focus groups, observations and interviews have identified four program theories. These have focused around:

- The impact the colour image has on the patients, carers and clinicians level of understanding in pressure ulcer prevention and management
- The impact the clinicians knowledge and experience has on their ability to utilize the data provided by CPM
- The impact the team's capacity, and ease of use may have on the teams decision to utilise CPM in different circumstances and why
- The impact on the team's ability to implement CPM and how this is affected by organisational pathways and leadership

Conclusions: The use of CPM in the community setting may impact clinical outcomes through multiple contexts and mechanisms. Understanding how CPM is used in different settings, in different circumstances and why may help us to improve the technology and its implementation in the future.

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COI: I have nothing to declare.

5.5

THE PRESSURE INJURY PREVENTION AND PRACTICE IMPROVEMENTS IN NURSING - INTENSIVE CARE UNIT (PIPPIN-ICU) STUDY

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Introduction: Critical care patients have a significant risk of developing a pressure injury (PI) with global ICU prevalence estimated at 25.9-27.3%¹. PIs cause pain, prolong ICU length of stay, lead to increased morbidity and mortality and cost the Australian health system 5.5 million AUD annually^{2,3}. This study aimed to reduce the number of ICU-acquired PIs through development and implementation of a comprehensive PI prevention program.

Methods: The PIPPIN-ICU study used realist evaluation and quality improvement methodology to evaluate PI prevention practices in one Level 6 ICU from August 2022 to March 2024. Data was collected using observational studies of prevalence, cross-sectional surveys of nurses' knowledge and attitudes towards PI prevention, and administrative data on incidence. Structured Plan-Do-Study-Act (PDSA) cycles were used to implement an evidence-based PI prevention program.

Results: Baseline data identified that 25.0% of ICU patients (n=12) had a PI. PI incidence was 19.2 per 1,000 bed days prior to study commencement. Nurses' knowledge towards PI prevention was low with a composite score of 54.6% on the PUKAT 2.0⁴. Attitudes towards PI prevention were positive with a composite score of 81.7% on the APuP instrument⁵. Seven structured rounds of PDSA cycles were conducted. Targeted education was implemented, and 91% (n=102) staff completed the education. Evidence-based interventions included implementing the SSKINCARE mnemonic, enhancing fundamental care practices, focusing on preventing medical-device related PIs, and trialling the SEM scanner*. PI incidence reduced to 11.9 per 1,000 bed days after study commencement. Nurses' knowledge towards PI prevention increased following study completion (PUKAT 2.0 composite score = 65.7%, p<0.001). Nurses' attitudes towards PI prevention also increased with statistically significant increases in sub-scale score for 'Personal Competency' (p=0.003) and 'Confidence in Prevention Effectiveness' (p=0.049).

Conclusions: PIs are preventable in ICU settings. Structured education and clinical leadership are required to transform PI prevention activities from a set of optional tasks to a priority nursing activity that prevents harm. This presentation will share findings from the study and the educational interventions implemented to improve pressure injury prevention.

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*Provizio®

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5.6

UNVEILING THE HIDDEN EPIDEMIC: PRESSURE INJURIES IN
NURSING HOME RESIDENTS WITH DARKER SKIN TONES -
RESULTS OF A PROSPECTIVE COHORT STUDY

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Introduction: Pressure injury prevalence and incidence are safety indicators among older people residing in nursing homes. A considerable proportion of the world's population has a predominant skin color characterized by the presence of melanin. Yet, evidence is scarce on the number of nursing home residents with darker skin tones who develop pressure injuries. The objective of this study was to determine the prevalence and incidence of pressure injuries in an older adult population residing in nursing homes in Sri Lanka.

Methods: A prospective multisite cohort study was conducted July to October 2023. A consecutive sample of 210 residents aged ≥ 60 years old from nine nursing homes in Sri Lanka consented to participate in the study. Data collection included structured observations and chart audits. Residents' sociodemographic characteristics, skin tone (Fitzpatrick classification), pressure injury risk (Braden scale) and presence of pressure injuries were collected at baseline. Pressure injuries were classified according to international clinical practice guidelines. All residents were followed up weekly for twelve weeks or until detection of a new pressure injury, death, discharge, or transfer. Pressure injury point prevalence was determined by the number of residents with pressure injuries at baseline, while cumulative incidence and incidence density were calculated on the number of residents who developed new pressure injuries during the follow-up period. Ethical clearance was obtained from Australian and Sri Lankan ethics review committees.

Results: Participants aged 60 to 105 years (mean 77.3 years; SD \pm 8.5), predominantly exhibited light brown to dark brown skin tones (96.7%) or deep black tones (3.3%). Based on the Braden scale, 29.5% of residents had a risk of pressure injury. At baseline, the point prevalence of pressure injuries was 8.1% (17/210) (95% confidence interval 4.8%–12.6%). Pressure injury cumulative incidence was 17.1% (36/210) (95% confidence interval 12.3%–22.9%). Pressure injury incidence density was 15.8 per 1000 resident weeks (95% confidence interval 11.1–21.9 per 1,000 resident weeks). Most pressure injuries were located on the ankle, both at baseline (29.4%; 5/17) and during follow-up (27.8%; 10/36). Stage I pressure injuries were predominant, constituting 58.8% at baseline and 44.4% during follow-up.

Conclusions: Approximately one-sixth of nursing home residents in this cohort experienced a new pressure injury within 12-weeks. Despite limitations in staffing and resources, it is imperative to prioritise pressure injury prevention in nursing homes. Although early detection of pressure injuries among individuals with darker skin tones is challenging, our results demonstrates that visual skin assessments can successfully identify stage I pressure injuries. To mitigate pressure injury risk, routine visual skin assessments, particularly focusing on the lower extremities, are essential. Ensuring staff are adequately trained in visual skin assessment techniques in nursing homes is therefore crucial.

COI: None

6.1

RELIABILITY AND VALIDITY OF SITTING POSTURE ANALYSIS SYSTEM USING A TIME_OF_FLIGHT SENSOR CAMERA FOR INDIVIDUALS WITH PERMANENT WHEELCHAIR USE

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Introduction: According to the World Health Organization (WHO), 10% of people with disabilities require a wheelchair for mobility, amounting to approximately 65 million individuals globally. Wheelchairs are crucial for the autonomy and social integration of many people with disabilities. For those with neuromuscular impairments, adjusting their posture while seated in a wheelchair can be challenging (Strobl, 2013). Poor positioning can lead to significant orthopedic and skin issues (Groah et al., 2015), impact respiratory function (Lin, 2006), exacerbate spasticity (Myhr, 1993), affect upper limb abilities (Rostahe, 2017), and reduce overall autonomy. Proper positioning is essential for enhancing quality of life (Hubbard, 2004).

Traditionally, optimal wheelchair posture is determined by a multidisciplinary team, including a physical medicine and rehabilitation (PM&R) physician, an occupational therapist, and, if necessary, an orthotist and a medical equipment supplier. In France, posture evaluation is primarily conducted using the Postural Control Measurement Scale for Seated Adults (MCPAA) (Gagnon et al., 2005), which, despite being validated, is time-consuming and cumbersome. Some measures also exhibit reliability limitations (Barks et al., 2018). The Seated Posture Scale (SPS) (Barks et al., 2015) is another existing scale but is less commonly used. These scales provide an initial assessment, but their application in daily practice by caregivers remains limited (Dupitier, 2013).

The Repositioning Project aims to develop a wheelchair posture evaluation solution using AI-based 3D localization and tracking algorithms through time-of-flight sensor depth cameras.

The study aims to demonstrate the reliability and validity of this solution by:

- Calculating the intraclass correlation coefficient (ICC) across multiple data sets.
- Conducting a correlation analysis between MCPAA measurements and data collected by the new device.

Methods: This clinical investigation seeks to evaluate the device's reliability across 10 measurement sets and its validity relative to the MCPAA scale. The study will verify the clinical performance (reliability and validity) of the device, with prior safety verification conducted by biomedical engineers. Primary Outcome Measures:

- Reliability Evaluation: Intraclass correlation coefficient (ICC) between BePoW measurements (12 data points per measure for intra-ICC).
- Validity Evaluation: Pearson's correlation coefficient (r) between raw goniometric measures and BePoW measures, and Cohen's kappa coefficient between recorded measures (BePoW/MCPAA).

Following COSMIN guidelines (COSMIN Risk of Bias tool to assess the quality of studies on reliability or measurement error of outcome measurement instruments), the sample size is set at 60.

Results: The study is currently in the recruitment phase, with 25 patients already included. Preliminary results will be presented at the upcoming conference.

Conclusions: This approach aims to establish a reliable and valid posture analysis system using time-of-flight sensor depth cameras, facilitating better daily posture management for individuals with permanent wheelchair use.

COI: no funding to declare

6.2

CANMOP, AN OTHER VIEW OF PRESSURE INJURIES CARE IN NURSING HOME

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Introduction : Les équipes soignantes d'EHPAD ont quotidiennement recours à des dispositifs médicaux dans le cadre des soins d'escarres (1). Le plus fréquemment, le processus décisionnel à l'origine de la mise en place de ces outils laisse peu la place à l'expression des envies et attentes de la personne accompagnée. Sur un second plan, l'acceptabilité, l'utilisabilité comme l'efficacité de ces dispositifs médicaux dépendent de leur nature et du contexte dans lequel se déroule l'usage (2).

L'utilisation du modèle canadien de la participation occupationnel (MCPO) (3) permet de préciser la participation occupationnelle d'un individu ou d'une communauté au regard de leurs besoins ainsi que de leurs possibilités occupationnelles. Ce modèle, appliqué au domaine des soins d'escarres, permet d'identifier des liens déterminants entre les expériences passées d'un individu et son contexte environnemental.

Methods: L'étude POSCAR était observationnelle, descriptive et comparative. Elle avait pour objectif principal de contextualiser la mise en place des dispositifs de prévention d'escarres et de décrire la place qu'occupaient les résidents dans ce processus selon le modèle MCPO. Un questionnaire à destination des ergothérapeutes exerçant en EHPAD a été diffusé et a permis l'obtention de 51 retours.

Neuf entretiens semi-directifs ont été réalisés auprès de personnes en charge de la mise en place des dispositifs médicaux dans le cadre des soins d'escarres en EHPAD. L'analyse thématique réalisée (4), reposant sur une approche inductive en lien avec la théorie ancrée (5), cherchait à mettre en exergue les points communs comme ceux différenciant les pratiques des établissements partenaires selon leurs propres verbatims.

Results: Les résultats rapportent que moins de 15% des établissements sollicitent l'avis des résidents pour la mise place d'un dispositif les concernant. La consommation des dispositifs est significativement différente selon les EHPAD partenaires. Les professionnelles évoquent une méconnaissance des recommandations de bonnes pratiques (85%) et qu'ils se basent davantage sur les conseils de commerciaux. Le MCPO a permis de mettre évidence des déterminants favorisant la participation occupationnelle des personnes accompagnées.

Conclusions: Les constats mis en évidence identifient une très faible participation des personnes accompagnées à la prise de décision concernant l'utilisation de dispositifs médicaux. Un besoin d'innovation reste prégnant dans ce domaine de soins mais nécessite une évaluation holistique. Le recours à la méthodologie de recherche « Choose With Care » pourrait permettre de favoriser une mise en évidence des besoins actuels et de réponses adaptées à ceux-ci.

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6.3

UTILISATION DE L'INTERDISCIPLINARITÉ ET DE LA CRÉATIVITÉ AUPRÈS DES ÉQUIPES SOIGNANTES COMME MOYEN DE SENSIBILISATION AUX PLAIES DE PRESSIONS.

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Introduction: En raison d'un déficit de perfusion périphérique lié à une maladie cardiovasculaire, les patients de chirurgie vasculaire ont un risque élevé de développer des escarres. En association avec certaines comorbidités, les patients porteurs d'escarres voient leur risque de complications augmenté de 1.5 (1). Dans le cadre de l'enquête annuelle de prévalence de 2021, les résultats révèlent la présence de quatre patients porteurs d'escarres sur 33, soit une prévalence de 12%. L'évaluation clinique de l'état cutané, devant être remplie dans les 24 premières heures suivant l'admission du patient, était réalisée dans seulement 13% des situations. A l'inverse, 87% des scores de Braden était renseignés. Des chiffres similaires ont été recensés lors de l'enquête de prévalence de 2022.

Methods: Dans un souci d'amélioration continue des pratiques, un groupe local de performance en soins (GLPS) a été créé. Ce dernier s'est penché sur les résultats des audits internes et a ainsi pu identifier deux axes d'améliorations possibles afin d'augmenter les compétences soignantes : 1) affiner les connaissances des outils et ressources disponibles liés à la prévention d'escarre et 2) mieux expliciter le rôle des différents intervenants. Il a donc été décidé de mettre sur pied une semaine de sensibilisation aux escarres. Dans ce cadre, cinq ateliers ont été proposés visant une harmonisation des pratiques et une amélioration connaissances sur les ressources disponibles. Le GLPS a pu identifier plusieurs thèmes : évaluation clinique de l'état cutané, reconnaître une escarre et son stade, positionnement et support de réduction de pressions, présentation du score de Braden et du score de Kondrup. Afin de toucher le plus de collaborateurs possible, ces ateliers de 30 minutes ont été, pour la plupart, dispensés deux fois sur la même journée par une équipe interdisciplinaire.

Results: Au total, 66 personnes ont participé à cette semaine de sensibilisation. Un audit à six mois démontre globalement une amélioration des pratiques. L'évaluation clinique de l'état cutané est remplie dans 36% des situations et malgré une diminution du remplissage du Braden, ce dernier reste documenté à 76%. Seulement deux patients sont porteurs d'escarres sur 38 soit une prévalence de 5%. Des retours positifs et une grande satisfaction de la part de l'équipe soignante a été relayé au travers de questionnaires.

Conclusions: Au cours de cette semaine de sensibilisation, il a été démontré à quel point l'interdisciplinarité était un élément central dans la prise en charge des plaies de pression. Les différents intervenants ont fait preuve de créativité dans leur communication et ont ainsi pu proposer des ateliers dynamiques et participatifs. Les retours reçus des intervenants et des collaborateurs ainsi que les résultats obtenus démontrent que le sujet et la forme choisie pour cette semaine ont eu un impact positif au sein de l'équipe soignante. Il est très probable qu'une telle semaine soit reconduite à l'avenir.

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6.4

COORDINATION DE LA PRISE EN CHARGE GLOBALE DES PATIENTS PRÉSENTANT UNE ESCARRE DANS LE CADRE D'UN PROTOCOLE DE COOPÉRATION DE SOINS IDE/ MÉDECIN MPR AU SEIN DU CENTRE EXPERT PLAIES CHRONIQUES D'ILLE ET VILAINE (PÔLE SAINT HELIER)

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Introduction: Le Pôle MPR Saint Hélier a fait évoluer son offre de soins pour les patients en situation de handicap porteurs d'escarres en hybridant les possibilités d'accès à l'expertise plaies chroniques : en 1998 l'offre était constituée de consultations physiques par un médecin et de possibilité d'hospitalisations, dès 2014 mise en place d'un suivi à domicile en télé-médecine par protocole de soins Ide expert plaies /Médecin, depuis fin 2022 il coordonne le centre expert plaies chroniques d'Ille et Vilaine co-porté par le CHU de Rennes et l'HAD 35. Ce travail porte sur l'analyse spécifique des prises en soins des patients porteurs d'escarres depuis 2022

Methods: Issus de la base de données de l'expérimentation, 112 patients présentant des escarres sont identifiés.

L'analyse porte sur les statistiques descriptives automatisées de cette sous population : données populationnelles, types de demandeurs, types de parcours de soins proposés, examens complémentaires réalisés. La revue des dossiers est en cours pour évaluation des résultats de la prise en charge des patients.

Results: Les demandeurs sont 50% IDE / 50% médecin. 90 % des patients habitent le département, âge moyen : 67 ans 20% consultations physiques, 60% téléconsultation, 20% téléexpertise. Les types de parcours seront spécifiés (indicateurs de pertinence / performance). Un peu plus de 10% a été hospitalisé. Les autres patients ont pu rester à domicile.

Conclusions: L'escarre avant la demande évoluait depuis plus d'un an dans 1 cas sur 5. Garantir l'accès au soin adapté est en enjeu socio économique incluant la notion de qualité de vie. L'hybridation des parcours est un axe intéressant pour améliorer la pertinence des soins proposés, limiter le passage au stade 3 et éviter les hospitalisations. Une enquête de satisfaction complètera en 2024 les indicateurs suivis actuellement.

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COI: none

7.1

UNDERSTANDING ANATOMY: PRESSURE ULCERS

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Introduction: The use of a numerical pressure ulcer categorization system is common across the world, yet they are widely open to interpretation. Kottner et al (2022) state that the dissimilarities between these commonly used classification systems are a limitation impeding clinical and scientific communication. However, the conceptual meaning of the categories described is comparable and the current evidence does not indicate that one classification is superior to another.

In clinical practice education deliver and use for actual pressure ulcers is challenging as most of what is delivered is based on what is a fundamentally flawed set of diagrams that relate to the layers of tissue.

Methods: A short survey was undertaken to understand how clinicians categorized what had been identified as 'difficult' areas, these were areas of the body that did not align with the categorisation tools such as ears.

Results: The survey identified considerable variation in what number these would be allocated with varying rationales provided for the decisions made.

Actions: A set of new resources were commissioned based on real anatomical images (figure 1) and a series of illustrations produced to identify to clinicians where the standard of epidermis, dermis, subcutis, muscle, bone does not apply (figure 2). The wording of categories used were reviewed and amended to include additional tissue types such as cartilage and tendon and these were included in an update of the existing pressure ulcer clinical recommendations and pathway. (National Wound Care Strategy 2024)

Conclusions: It is hoped that the new categorisation support tools will assist clinicians when allocating a numerical category to wounds. This will be evaluated as part of the pressure ulcer implementation programme.

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COI: None

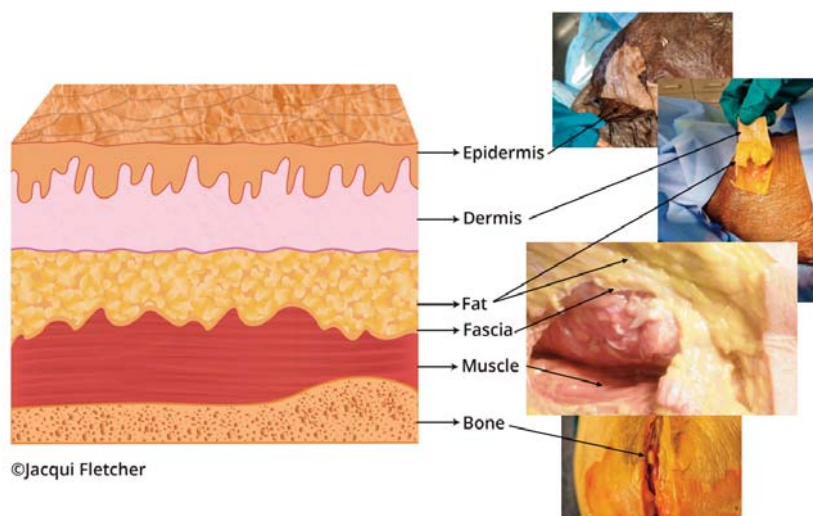


Figure 1 linking the skin diagram to reality

7.2

NURSING STUDENTS' ATTITUDES TOWARDS PRESSURE ULCERS PREVENTION

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Introduction: Nurses are essential for assess and maintain skin and tissue integrity (1). Adequate training and education for future nurses, focused on prevention, early diagnosis and treatment is essential to improve patient safety. Consequently, it is essential to analyze the nursing students' knowledge and attitudes towards pressure ulcers prevention (2,3). So, the main goal of this study is to evaluate nursing students' attitudes towards pressure ulcers prevention.

Methods: A quantitative, prospective, descriptive and cross-sectional study carried out with 71 Portuguese Nursing Students (3rd year of the Nursing Degree Course). Data were collected through an online questionnaire with participants' sociodemographic characterization and the assessment of their attitudes towards pressure ulcer prevention, using the Portuguese version of "Attitude Towards Pressure Ulcers Instrument" (APU-PT). The APU-PT include 5 categories: "Importance"; "Responsibility"; "Obstacles/Barriers"; "Confidence in effectiveness"; and "Personal Skills" (4). The scores were calculated according to the mean value obtained in each category. The participants with "better attitudes" have lower means and the participants with "negative attitudes" have higher means. All participants gave informed consent prior to the study development. Descriptive statistics were used to analyze the collected data.

Results: The study sample is mainly composed of female students (80%) aged between 19 and 37 years. All participants (100%) developed their knowledge about pressure ulcers prevention during the Nursing Degree Course and the majority already had experience in this field during clinical practice internship (87%). The participants had more positive attitudes towards pressure ulcers in "Confidence in effectiveness" (M=1.37), "Responsibility" (M=1.46) and "Importance" (M=1.94) categories. On the other hand, they presented more negative attitudes in "Obstacles/Barriers" (M=2.26) and "Personal skills" (M=2.13) categories.

Conclusions: Nursing students who participated in this study manifest more positive attitudes related to the relevance and impact of effective pressure ulcer prevention, the attribution of responsibility for pressure ulcer prevention and the importance of nurses' intervention (based on the best available evidence) to preventing pressure ulcers. The most negative attitudes were related to the factors that affect the effective pressure ulcer prevention and their individual competences/skills about pressure ulcer prevention.

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COI: The authors declare no conflict of interest.

7.3

PURPOSE T AT A UNIVERSITY HOSPITAL: A QUANTITATIVE RETROSPECTIVE PRE-POST EVALUATION

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Introduction: Pressure ulcers (PUs) are preventable adverse events and serve as quality indicators in healthcare. With a prevalence exceeding 0% to 70%, PUs significantly affect the health-related quality of life of affected individuals and incur high costs for the healthcare system. Efficient, effective, and reliable prevention is essential, and according to international guidelines, prevention begins with the identification of patients at risk (1). The Modified Norton Scale (MNS) is a pressure ulcer risk assessment instrument (PU-RAI) that was developed in 1962 and updated 1987 (2). Pressure Ulcer Risk Primary or Secondary Evaluation Tool (PURPOSE T) is a validated PU-RAI (3,4).

Objective: This study evaluates the impact of implementing PURPOSE T on the prevalence of PUs. PURPOSE T was introduced in 2021 at a university hospital, replacing the MNS. The study quantifies PU prevalence before and after the introduction of PURPOSE T to assess its efficacy in prevention.

Methods: A retrospective record review with a descriptive, comparative, and quantitative design at a university hospital in Sweden with approximately 900 beds. The analysis is based on all point prevalence measurements (PPMs) from 2018 to 2023.

Results: After the introduction of PURPOSE T, the prevalence of category I PUs increased from 7.6% of all patients to 9.6%, marking a 26.4% increase in diagnosed cases. In contrast, the prevalence of more severe categories significantly decreased: category II by 9.9% (from 7.1% to 6.4%), category III by 39.3% (from 2% to 1.2%), and category IV by 49.1% (from 1.2% to 0.6%). Notably, the December 2022 measurement was the first PPM with no category IV PUs at the hospital.

Conclusions: PURPOSE T effectively identifies patients with early-stage PUs, as well as significantly reduces the prevalence of more severe PU categories. This suggests that PURPOSE T can improve early detection and intervention, thereby enhancing overall patient outcomes and reducing the burden on the healthcare system.

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COI: Nothing to declare.

7.4

CONSTRUCTION OF THE CHINESE VERSION SCALE OF PRESSURE INJURY PREVENTION BEHAVIORS FOR ORTHOPEDIC INPATIENTS

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Introduction: The importance of "Patient and Family Engagement" was recognized as one of the key components in the outline of the 2023 Global Patient Safety Report (World Health Organization 2023). Pressure injuries (PI), also known as pressure ulcers (PU) or decubitus, were common and concerning patient safety events (Bates et al. 2023). It was emphasized that there was a need to enhance the awareness of the necessity for active involvement of patients, their families, and caregivers in the diagnosis, treatment, and management of patient safety in various healthcare institutions at all levels. However, there is a lack of the tool to assess the level of their participation behaviours.

Methods: Guided by the theory of "patient participation in patient safety", an item pool was initially constructed through literature review and patient interview, and Delphi expert consultation method was used to evaluate and screen items. From October to November 2021, the convenient sampling method was adopted to select 160 inpatients of Orthopedics Department of West China Hospital of Sichuan University as research objects for questionnaire survey, project analysis, reliability and validity test.

Results: The formed Chinese Pressure Injury Prevention Behavior Assessment Scale (Patient Version) contained 21 items in 3 dimensions. The Cronbach's α coefficient was 0.947, and the broken half reliability coefficient was 0.873. The content validity index at scale level was 0.958, and the content validity index at item level was 0.909-1.000. Exploratory factor analysis showed that the cumulative variance contribution rate of the three common factors was 61.931%.

Conclusions: It is preliminarily verified that Chinese Pressure Injury Prevention Behavior Assessment Scale (Patient Version) has good reliability and validity, which can be used to evaluate the current situation of orthopaedic patients participating in the prevention of stress injury behavior and provide a basis for the corresponding intervention measures.

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COI: Key Research and Development Project of Science and Technology Department of Sichuan Province, China (2020YFS0298)

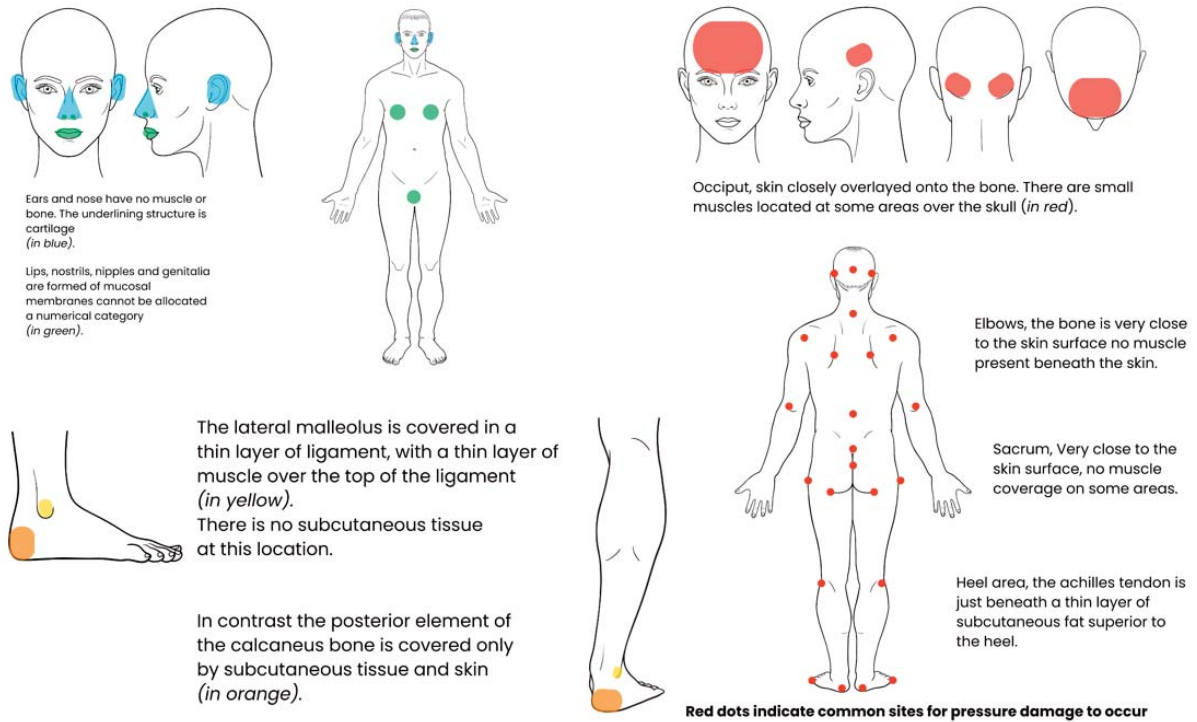


Figure 2 showing areas where additional consideration of the location is important due to variation in the underlying tissues. Diagrams © Claire Gillespie University Hospitals Sussex

7.5

REAL WORLD DATA TO SUPPORT CONTINUOUS QUALITY IMPROVEMENT IN PRESSURE INJURY PREVENTION

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² Smith and Nephew, United States

Introduction: In the United States, rates of hospital-acquired pressure injuries (HAPI) have increased in recent years¹. In fact, they are the only hospital-acquired condition continuing to rise, up 6% over 2014 baseline levels¹. PI are known to cause alterations to the patient's functional recovery as they may result in infection, cause pain, and extend the length of hospitalization and/or treatment².

One 280-bed regional community hospital in West Virginia has been on a continuous quality improvement journey for the reduction of HAPI, documenting their results as measured by HAPI incidence since January 2012.

Methods: The purpose of this analysis is to describe how the consistent collection and analysis of HAPI incidence data has allowed this hospital to validate their clinical, economic, and operational outcomes, and to adjust PIP strategies accordingly. Hospitals in the US commonly engage multidisciplinary teams in the process of value analysis. These Value Analysis Teams (VAT) consider a variety of factors impacting product selection such as clinical outcomes, product quality and comparisons, financial analysis, and education³. The VAT observed HAPI incidence data for all inpatient visits between January 2012 – March 2024, during which time they were able to make data-driven decisions for the purchase of soft silicone multi-layered foam dressings from three different manufacturers and a repositioning reminder system (RRS). Through the analysis of longitudinal, retrospective, real-world data, this hospital has been able to make data-informed decisions to enhance pressure injury prevention (PIP) protocols and product selection.

Results: Average annual HAPI incidence was analyzed retrospectively to allow comparison of outcomes of product use during time periods of varying lengths. Annual averages show that the use of Dressing 1 (January 2012 to December 2016) resulted in 10.40 HAPI per year, Dressing 2 (January 2017 to July 2021) an average of 5.56 HAPI per year, and Dressing 3 (July 2021 to March 2023) an average of 26.29 HAPI per year.

To further enhance their PIP efforts, RRS was implemented in six patient care areas in November 2022, and in April of 2023 the transition was made back to Dressing 2. During the first 12-month period that the RRS and Dressing 2 were used in conjunction, there was an average of just 1.25 HAPI.

Conclusions: This analysis demonstrates how the use of longitudinal, retrospective, real-world data can support the calibration of PIP protocols and product selection to strengthen clinical, economic, and operational outcomes.

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COI: Stephanie Constable received a consultancy fee for their time participating in the development and writing of this manuscript. Mandy Spitzer is an employee of Smith and Nephew.

8.1

UTILISER UNE CHECK LISTE POUR LA PRÉVENTION DES ESCARRES À L'HÔPITAL : UN ENJEU MAJEUR

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¹ SFE, France

Introduction: Lors de la première vague de Covid-19, une enquête de la Société Française de l'Escarre (SFE) a montré sur un échantillonnage de 948 patients que la prévalence des escarres chez les patients hospitalisés était de 17,2%, notamment en réanimation en raison de la prise en charge spécifique en décubitus ventral (DV). Ce taux était le double du taux de prévalence habituel à l'hôpital (8,6% en 2014 selon l'enquête décennale PERSE-SFE).

La SFE a élaboré une check list des soins de prévention, adaptée aux spécialités ou secteurs hospitaliers les plus à risque de survenue d'escarres (gériatrie, réanimation, services de médecine).

Methods: L'objectif de ce travail est de démontrer si les préconisations des check list utilisées lors de la période Covid ont un effet sur le taux de prévalence à l'hôpital en post pandémie.

Chaque check list reprend les fondamentaux des soins de prévention en les organisant de façon pratique et pointe les spécificités propres aux différentes spécialités dans une approche utilisable facilement par chacun au quotidien pour chaque patient.

Results: L'étude a montré une très bonne appropriation de la check list par les soignants. La méthode « check list » a permis d'optimiser leur organisation, et d'adapter le matériel d'aide à la prévention en le personnalisant au risque du patient. Les résultats montrent une amélioration des soins de prévention d'escarre. L'étude a également montré une amélioration de la qualité de vie au travail avec un gain de temps pour les soignants.

Conclusions: En conclusion, cette étude démontre tout l'intérêt d'utiliser la méthode « check list » pour optimiser la prévention d'escarre. Les résultats montrent qu'il s'agit d'un important levier pour diffuser largement les bonnes pratiques de qualité des soins pour une meilleure prévention des escarres.

COI: No funding of the research by industry

8.2

CLINICAL NURSE SPECIALIST AND CLINICAL NURSE CERTIFIED IN WOUND CARE : COMPLEMENTARITY IN THE MANAGEMENT OF PATIENTS LIVING WITH PRESSURE ULCERS IN HOME CARE SETTING.

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Introduction: To address the increasing issues of wound healing, particularly pressure ulcers in adult patients receiving home care, the development of professional skills and expertise is essential. For the past few years, there have been two specialized nursing roles: the Clinical Nurse Specialist (CNS) and the Clinical Nurse Certified in Wound Care (CNCWC)

The question is, how do these two roles differ and complement each other?

Methods: To specify the distinct characteristics of these two roles, an analysis of training curricula, competencies, roles, and types of interventions within a home care institution in Geneva was conducted.

Results: The training for a Clinical Nurse Certified in Wound Care is a CAS or DAS program. The Clinical Nurse Specialist has a Master of Science degree.

Within the institution, the CNCWC's activities are primarily at the micro and meso levels (patients and teams). They have a wide range of skills, from clinical expertise to an andragogical approach with patients and professionals. They provide first and second-line support in complex situations with a predominantly individual approach. They design and conduct training sessions contributing to the professional development of healthcare workers. Additionally, they help adapt institutional reference documentation in line with Evidence-Based Practice (EBP). The CNCWC can participate in research. Their expertise helps improve clinical outcomes, thus reducing costs (Morell et al. 2024).

The Clinical Nurse Specialist role is currently being implemented within the institution. Concerning wound care and healing, the Clinical Nurse Specialist's activities would be mainly at the macro and meso levels (systems and teams). The CNS is responsible for translating evidence-based results into the local care context. They can design, implement, and evaluate research and care programs. They contribute to cost reduction, fewer hospitalizations, and increased patient satisfaction (Morell et al. 2024). They have a more systemic approach to complex situations.

Discussion: Towards complementarity of roles and functions?

These two roles, based on the best available evidence, seem to offer two different yet complementary perspectives. One has a more "macro," systemic, and methodological approach. The other has a more "micro," individualized, and practical approach.

Both work towards common goals of improving the quality and safety of care, controlling costs, and reducing hospitalizations for patients living with or at risk of pressure ulcers.

The combined use of these two complementary roles could improve the prevention and care of pressure ulcers in the home care sector.

Further, more in-depth research is necessary.

COI: No conflict of interest

8.3

MISE EN PLACE D'UNE « SALLE D'ERREUR » POUR AMÉLIORER LES ATTITUDES DE SANTÉ DANS LA PRÉVENTION DES ESCARRES

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Implementation of an « Error room » to improve healthcare attitudes in the prevention of pressures ulcers:

INTRODUCTION: The escalation of pressure ulcer prevalence across Switzerland has prompted proactive measures within healthcare institutions. Among these, our hospitals have pioneered an inventive approach with the introduction of the Error Room, a playful simulation workshop aimed at improving pressure ulcer prevention practices. The aim is to improve clinical practice and ultimately reduce the incidence of pressure ulcers.

METHODS: The Error Room serves as a dedicated platform for enhancing observation skills, fostering effective communication, and promoting interdisciplinary collaboration among healthcare professionals. This initiative involves the creation of a simulated patient case with intentional errors in pressure ulcer prevention, providing participants with an immersive learning experience.

RESULTS: This presentation delineates the development and implementation of this innovative teaching tool, alongside preliminary findings from the assessment of caregivers' attitudes towards pressure ulcer prevention utilizing the Attitude towards Pressure ulcer Prevention instrument (APuP).

CONCLUSIONS: The prevention of pressure ulcers remains a challenge and innovative approaches to improve clinicians' attitudes toward this theme may be helpful.

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COI: No funding of the research by industry

8.4

PRÉVENTION DES ESCARRES : PATIENT-ACTEUR

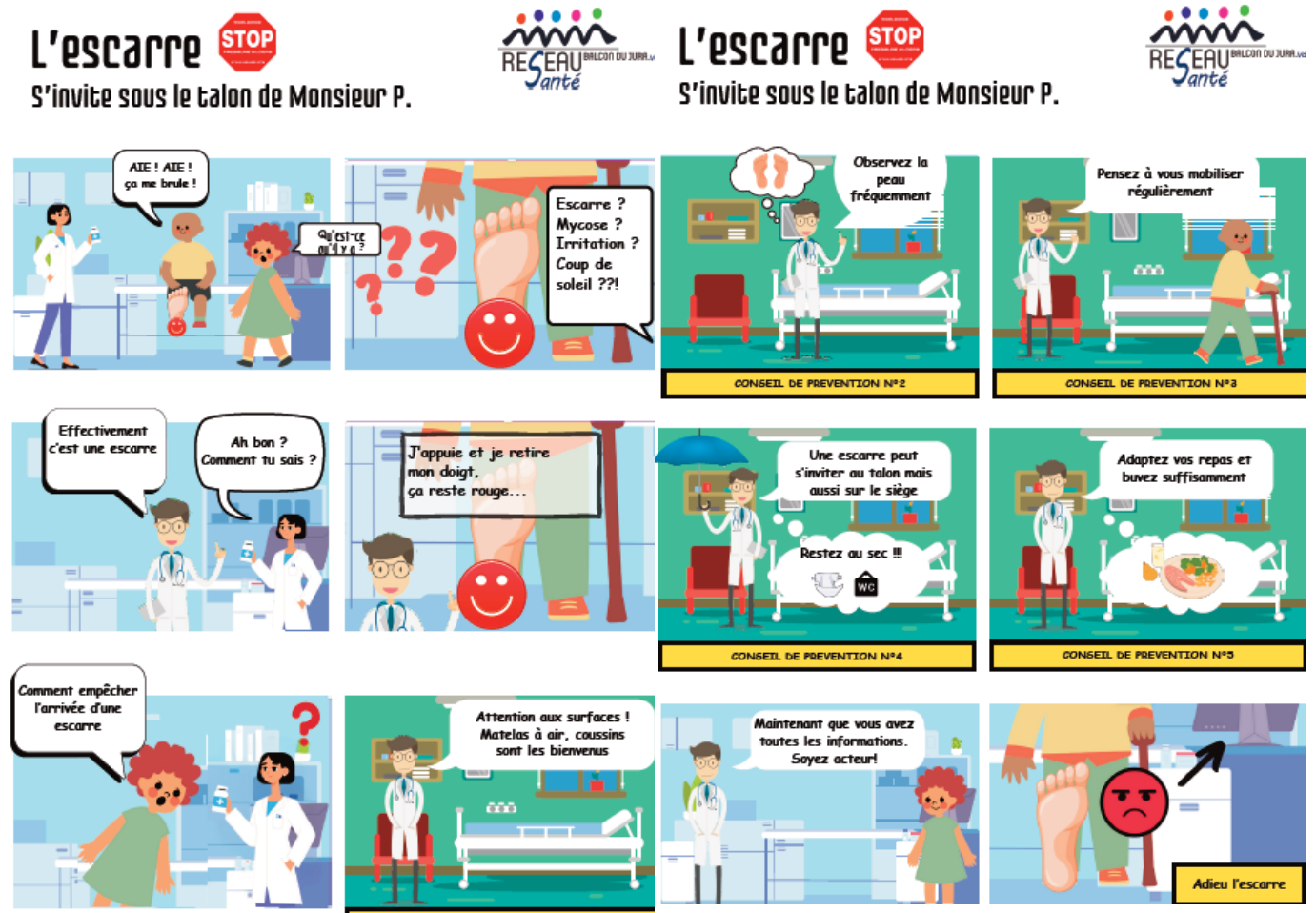
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Introduction: Présentation d'un outil pour renforcer le partenariat avec le patient

Methods: Création d'une bande dessinée:



9.1

INFLUENCE OF LOCALISED COOLING ON REPEATED SHEARING STRESS AND FRICTION AT THE HEEL

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Introduction: Pressure ulcers (PUs) arise from sustained pressure and repeated shear causing localised damage to the skin(1). Evaluating the tolerance of human skin to shearing forces may help prevent the development of PUs and improve patient care. Prior research has shown increased skin temperature and humidity decrease mechanical stiffness and strength of the skin, and increase interface friction(2). Our recent data indicated a dose-response reduction in the coefficient of friction (CoF) in the index finger pad following a period of thermal pre-cooling(3). However, the interactions of different skin temperatures on shearing forces at the heel are not well understood. This study aimed to investigate how different levels of localised cooling at the heel influence the CoF at the skin interface during repeated shearing stress.

Methods: Twelve healthy participants (8M/4F; 24±5y; 73±10Kg; 175±10cm) partook in 3 experimental sessions in a randomised cross-over design. Participants underwent a standardised shearing protocol at the centre of the heel, involving a 60s thermal pre-conditioning phase, and 10 repeated bidirectional axial shearing movements. The heel was placed on a custom-built friction rig with integrated thermal plate. The friction rig was mounted on a linear rail system and attached to a servomotor to displace the friction rig by 10cm (3.3cm/s). The thermal plate was set to either 38°C, 24°C, or 16°C. Skin conductance was taken pre-and post the 10 repetitive shearing movements. Data were analysed using a two-way repeated measures ANOVA.

Results: There was a main effect of repetition ($P=0.020$) on the CoF at the heel (Figure 1A), with friction increasing from repetition 1 to 10 across all temperature conditions (mean difference +0.3 (35% increase), 95%CI [0.04, 0.56], $P=0.018$). There was also a main effect ($P=0.047$) of temperature and CoF was greater in the 38°C (mean 1.38, 95%CI [1.02, 1.73]) condition compared to 24°C (mean 0.91, 95%CI [0.62, 1.21]) and 16°C (mean 0.97, 95%CI [0.63, 1.31]). No interaction effect was observed ($P=0.102$). There were no significant differences observed on skin conductance for time ($P=0.062$), temperature ($P=0.639$) or interaction ($P=0.110$; Figure 1B).

Conclusions: Both milder (24°C) and more pronounced (16°C) cooling decrease kinetic friction during a repeated shearing stress protocol compared to warmer temperatures (38°C). The use of cooling may offer therapeutic benefits for PU prevention by minimising frictional forces at the skin interface of the heel.

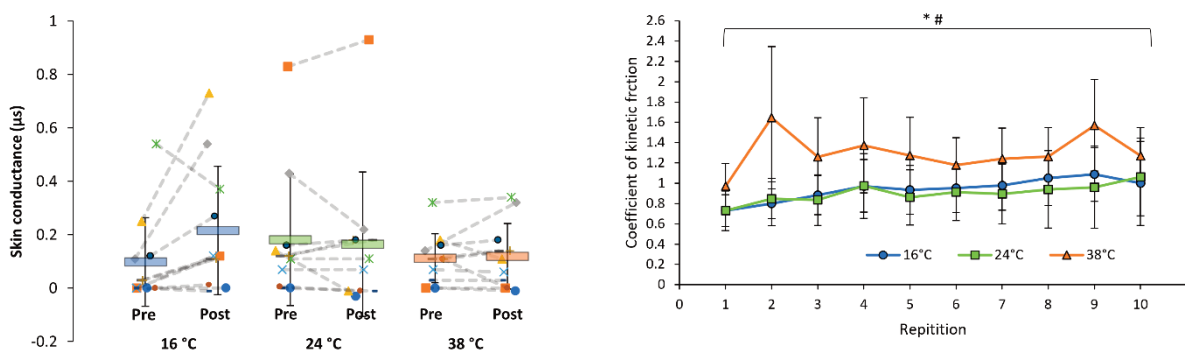


Figure 1. (A) CoF during a standardised protocol consisting of 10 repeated shearing movements. Data ($n=12$) are presented as means and $\pm 95\%$ CI. *Main effect of time ($P<0.05$). #main effect of temperature ($P<0.05$). (B) Skin conductance pre-and post the shearing protocol. Data ($n=11$) are presented as individual responses. Group mean values are denoted by horizontal bars and \pm SD.

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9.2

PILOT STUDY ON THE EFFECTIVENESS OF SULFUROUS THERMAL WATER IN WOUND HYGIENE: SPA WOUND CARE.

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Introduction: The effectiveness of sulfurous thermal waters (STW) in the treatment of complex wounds has been known since ancient times. In recent years, the outbreak of chronic lesions with complex biofilms, colonized by multi-drug resistant germs increased the interest in not pharmacological molecules. The effectiveness of STW is related to the presence of a gas transmitter, the hydrogen sulfide, diffusing freely through the skin, elicits local and systemic effects as promoting the healing of acute, chronic and infected wounds by transforming into pentathionic acid (H₂S₅O₆). We present the results of a pilot trial evaluating the effects of raw microbiologically pure STW, in the wound hygiene

Methods: The raw STW of Acque Albule spa, Italy, testing negative to the presence of pathogens, was bottled at its spring under aseptic conditions in sterile glass or chemical-proof plastic bottles. The half-life of the water was considered 7 days in absence of precipitates. Patients' selection criteria are reported on Table 1. After Wound swab Sampling, Ph and TEWL measuring, two Topical applications of STW, 20 minutes on soaked gauzes preceded and followed Wound hygiene and macrodebris removal. Primary and secondary dressings for exudate management only, fixation and off-load were allowed. Dressing change is planned at 24-48 hours depending on the exudate. Parameters reassessment was repeated once a week until re-epithelialization. The protocol was suspended in case of wound worsening, local or systemic signs of superinfection.

Results: In 45 days, 14 patients, mean age of 72 years were enrolled. Twentyone lesions were treated: 8 PU, 5 vascular ulcers, 2 IAD, 2 dehiscences, 2 vasculitic ulcers, 2 Lymphatic ulcers. Of these, 17 lesions had a positive swab, 8 were MDR microorganisms. None reported superinfections, adverse events, pain or wound worsening. 80.9% of the lesions had complete re-epithelialization within one month (Figure 1), the rest re-epithelialized in 1.5 Month. TEWL and pH values progressively decreased during treatment.

Conclusions: STW were effective in the wound hygiene of difficult wounds regardless of their etiology and bacterial contamination. A clinical trial on the use of the same thermal water to provide early hydrokinesis rehabilitation of wounded patients is currently being studied.

References:

1. Xu M., et al. Exogenous hydrogen sulfide supplement accelerates skin wound healing through inhibition of oxidative stress and enhancement of vascular endothelial growth factor. *ExpDermatol.* 2019;28:776-785

COI: no COI

Table n.1: Inclusion and exclusion criteria

INCLUSION CRITERIA

- PATIENTS >18 YEARS OLD
- ANY COMORBIDITIES EXCEPT VERY SEVERE I AND II IMMUNE DEFICIENCIES
- ANY SYSTEMIC DRUG THERAPY
- ANY ASSOCIATED DRESSING (EXCEPT PEROXIDES, POVIDONE, INTERACTIVE AND ANTIBACTERIAL DRESSINGS)

- ACUTE OR CHRONIC WOUNDS REQUIRING VULNOLOGICAL TREATMENT

- GENITAL/ORAL WOUNDS

- INFECTED WOUNDS, INCLUDING MDR

- BIOFILMED WOUNDS

EXCLUSION CRITERIA

- UNEXPLORED OR ENTERIC FISTULAS, EXPOSURE OF FASCIA, VESSELS, BONES, ORGANS



Figure 1: PU and psoriasis after ICU admission for Legionella pneumonia

9.3

THE EFFECT OF MUSIC THERAPY ON DRESSING PAIN IN INTENSIVE CARE PATIENTS WITH PRESSURE INJURY

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Introduction: Dressing pain is pain experienced during the process of applying or removing a dressing to a wound. Music therapy is known to significantly reduce pain, anxiety and muscle tension levels during dressing changes. The aim of this study was to evaluate the effect of music therapy on dressing pain in unconscious intensive care patients with pressure injury.

Methods: The study was a one-group quasi-experimental design. The study was conducted with 39 patients in the intensive care unit of a hospital in İstanbul. Each patient received two dressings, totaling 78 dressings. Music therapy was applied in one of the dressing and no application was applied in the other. Behavioral pain score and vital signs of the patients were measured before, during and after dressing. Adult patients with stage 2-3-4 pressure injuries, Glasgow coma score of 8 points or more, intubated patients with stable hemodynamic status were included in the study. Patients with infected wounds, deep sedation, hearing and neurological problems were excluded. The type of music preferred by the patients was played with special headphones at 60 decibels. Ethical permissions were obtained to conduct the research

Results: The mean age of the patients was 73.23±1.44 years and 56% were female. The most preferred music genres were Turkish folk music and Turkish classical music. The post-dressing diastolic blood pressure ($p=0.038$) and the mean arterial blood pressure was higher ($p=0.034$) in patients who received the traditional method. There was no statistically significant difference other vital signs ($p>0.05$). The behavioral pain level was lower in the musictherapy method ($p<0.001$).

Conclusions: Musictherapy may be effective in reducing dressing pain in unconscious patients. Incorporating musictherapy can provide a holistic approach, ensuring that patients are both physically and emotionally comfortable. However, individual preferences and sensitivities should be taken into account when implementing musictherapy interventions.

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COI: The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

9.4

THE SMART SHEET: A SOFT AND SHAPE-CONFORMABLE CAPACITIVE SENSING ARRAY FOR PRESSURE INJURY PREVENTION

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Introduction: Pressure injuries (PIs) are one of the most burdensome, costly, and fatal secondary medical conditions, impacting quality of life and healthcare systems. Populations most susceptible to the formation of this chronic wound are bedridden patients, the elderly and spinal cord injury (SCI) population, with an estimated 95% of adults living with SCI developing at least one in their lifetime¹. It remains a significant healthcare problem, with current prevention methods being reactive. We introduce the "Smart Sheet", a soft, flexible, and stretchable sensor array for continuous pressure and shear monitoring, designed for proactive PI prevention^{2,3}.

Methods: The Smart Sheet incorporates capacitive sensing units embedded within a silicone elastomer base, coated with stretchable electrodes and fabric, to create a sheet of pressure and shear sensors. In-lab tests with a mechanical analyzer characterized the accuracy, sensitivity, and long-term measurement capabilities of the Smart Sheet. Current user trials with healthy and able-bodied individuals validate the Smart Sheet's performance and user comfort on different surface profiles while comparing it to existing solutions. A prevention algorithm that leverages individual risk factors is also under development in parallel.

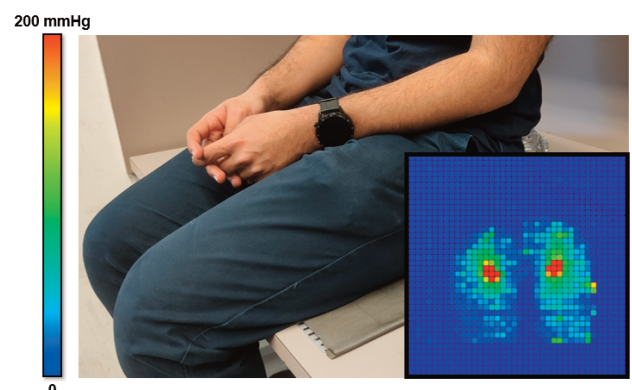
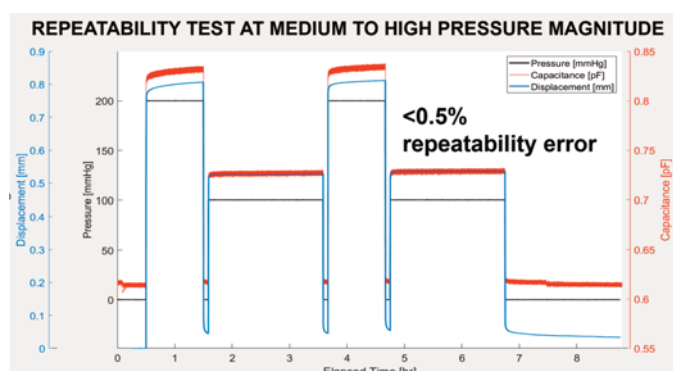
Results: The Smart Sheet demonstrates potential for reliable monitoring, matching or exceeding capabilities of existing market products (user trials ongoing). It accurately measures pressure within the desired pressure range for PIs (0-200 mmHg, $\pm 4\%$ error) with low-repeatability error ($<0.5\%$) and detects 2D shearing forces up to 1N. In Figure 1, the sensitivity and repeatability performance are shown across an 8-hour experiment², where in Figure 2, the pressure heatmap is shown of a male participant sitting on the Smart Sheet, highlighting the ischial tuberosities, which are experiencing over 200 mmHg of pressure. The main advantages of the new system are its better conformability to surfaces thanks to its stretchable nature, and its design for widespread adoption, beyond the clinical setting.

Conclusions: The Smart Sheet offers a promising solution for real-time, personalized monitoring and risk-assessment for PI prevention. Future work involves refining the system based on user feedback, expanding user trials to broader populations, and integrating the prevention algorithm that is being developed simultaneously.

References:

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COI: No conflict of interest to report.



10.1

A REMOTE EXPERT WOUND NURSE CONSULTATION INTERVENTION FOR PRESSURE INJURY PREVENTION AND MANAGEMENT: INTERVENTION DESIGN AND RESULTS OF A FEASIBILITY STUDY AND PILOT RANDOMISED CONTROLLED TRIAL

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Introduction: The need for equitable access to specialist wound management nurses and building of capacity in the aged care work force was the impetus for a project that sought to innovate the care provided to residents of aged care who have or are at risk of pressure injuries. The project included the design and evaluation of a remote expert wound nurse consultation intervention.

Methods: The intervention was designed using evidence-based studies and local and international standards and guidelines for pressure injury prevention and management. The intervention involves residents, family members, nurses and personal care workers meeting with an expert wound nurse via videoconferencing over 12 weeks for assessment, care planning, monitoring, education and support. The project included a feasibility study to determine if the intervention was acceptable (liked and satisfactory), feasible (able to be done), and if fidelity in delivery (as intended) could be achieved. A pilot RCT was also completed. The intervention and pilot RCT protocol have been published.

Results: In total nine aged care Homes in Australia, two nurse consultants, 77 nurses and 65 residents (49 who had pressure injuries and 16 who were at very high risk) were involved in the project. 98% of the residents who remained in the Homes for the monitoring period received the intended number of consultations. During the feasibility study (n=40 residents), acceptability from the nurses perspective was high. Information technology issues and competing clinical demands were at times problematic for nurses. The pilot RCT (n=25) results indicated that RCT processes were successful however sample achievement and data collection was challenging. Overall, 94% (all except one) of the residents who were at very high risk of developing a PI and who received the full intervention remained PI free during their time in the project (and this PI healed during the project). 76% of the residents who had pressure injuries and who received the full intervention were healed at the end of their time in the project.

Conclusions: Positive outcomes were achieved during the feasibility study and pilot RCT, specifically the intervention was found to be acceptable, feasible, done as intended and could be tested in a pilot RCT. A larger, definitive RCT is required to establish the clinical and cost evidence effectiveness of the intervention.

COI: The project was funded via a competitive State government grant. Several of the study investigators are consultants for a wound product company that also contributed some funding to conduct the project.

10.2

COMBINING ARTIFICIAL INTELLIGENCE AND A DYNAMIC SITTING SYSTEM TO PROMOTE PRESSURE RELIEF

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Introduction: Amongst the seating systems available, the majority offers static support, with generic cushions unable to adapt user position and allow movements, limiting the possibility to actively self-managing posture [1]. Over the last decades, interface pressure monitoring technologies have been employed to assess the seat conditions and promote optimal postures. It has been recently demonstrated that these systems can inform posture and mobility [2], with artificial intelligence (AI) algorithms able to classify static postures [3]. However, technical challenges are represented by the integration of AI with seating systems to automatically provide postural correction, pressure relief, and corresponding PU prevention. Our work aimed at integrating AI with a dynamic seating system*, to automatically detect postural changes whilst sitting, promote postural support while maintaining skin health.

Methods: Twelve healthy individuals were recruited under institutional ethics and asked to sit on the Aergo chair while adopting five different static postures, held for 10 minutes each and allocated in a random order. The chair was set up in a responsive mode which involved automatic adjustments in the internal air cell pressure following postural changes. Continuous measurements included interface pressure** at the seat support, and internal pressure of the air cells. Sensitivity and specificity of all parameters in detecting postural changes was evaluated using the Area under the Receiver Operating Characteristic (AUC) curve and Principal Component Analysis (PCA) was applied to a data set representing the most accurate parameters to identify clusters indicative of static postures. Their prediction was assessed with Convolutional Neural Network (CNN), using a dataset of images representing the pressure distribution.

Results: AUC revealed interface pressure parameters e.g., contact area, centre of pressure, the most accurate in detecting postural changes ($AUC \geq 0.6$). Internal pressure signals at the seat interface, which provide pelvis and thigh support, revealed AUC values ≥ 0.6 . Closer examination of the data highlighted clear inter-subject differences. PCA revealed subject-specific separate clusters indicating the different postures (Fig.1). Prediction of the static postures with CNN revealed a low accuracy of ~20%, that can be explained by the automatic adjustments in inflation/deflation of the air cells following postural changes, which compensated differences in pressure points at the seat interface.

Conclusions: We demonstrated that combination of an optimal dataset of internal and interface pressure parameters and intelligent algorithms have the potential to identify clusters of postures. Our subject-specific findings were the result of the fact that the participants adopted postures in a random order. In addition, the low accuracy of CNN highlighted the capability of *** technology to compensate for postural asymmetry. These results put the basis for technical innovation where the air cells automatically identify movements patterns and establish support requirements, for comfortable, continuous transition of postural support and proactive relief of pressure points.

References:

[1] Strobl et al., 2015

[2] Caggiari et al., 2019, 2020

*Aergo chair

** SumitomoRiko, Japan

*** Aergo Health

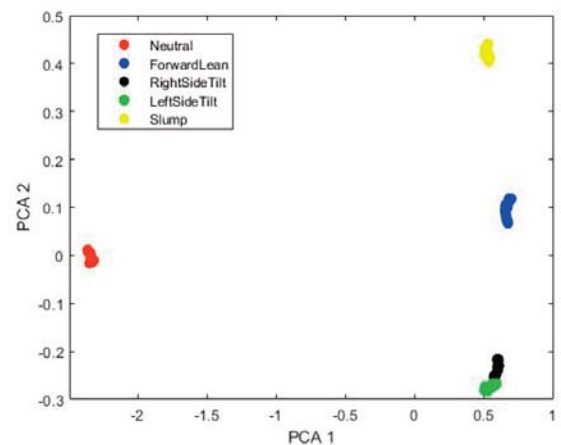


Fig.1: Clusters representing the different postures for one participant

COI: This study has been supported by institutional funding from the Institute for Life Sciences

10.3

EXPLORING THE TIMING OF INFLAMMATORY UPREGULATION AND SKIN TISSUE RECOVERY AFTER ORONASAL MASK APPLICATION

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Introduction: Non-invasive ventilation (NIV) masks, save lives in health care settings but are a common cause of tissue injuries due to the pressure and shear loads on skin and soft tissue. Research has explored methods for objectively detecting early-stage tissue damage (1), but these have not been translated in the daily work by the health care staff. Today, the nurses are not able to detect a pressure ulcer until the damage is visible, and a device-related pressure ulcer at the bridge of the nose could quickly develop from a stage 1 to a stage 4 because the lack of soft tissue (2). As a result, there is little standardization in device application and skin health checks to prevent pressure ulcers. In the etiology of device related pressure ulcers, inflammation plays a significant role. However, the exact nature and timing of inflammatory upregulation is still unknown in the early stages of skin damage. This study aimed to explore the inflammatory profile during different timepoints after NIV treatment.

Methods: Patients (n=11) from a thoracic intensive care unit that underwent routine NIV treatment with oronasal face masks was included. Inflammatory proteins were collected from the nasal bridge, using an adhesive tape (3). Six different timepoints after removal of the facemask was used (0 min, 20 min, 40 min, 60 min, 120 min & 180 min). An electrochemiluminescent detection method was used to analyse the concentrations of 71 inflammatory proteins. The proteomic data set was analysed by a multivariate data analysis. For protein-protein association network the bioinformatic tool STRING (Search Tool for Retrieval of Interacting Genes/Proteins) was used.

Results: 11 proteins were excluded from further analyse since they were below the lowest limit of detection in more than 50%. The multivariate analyse showed the changes of protein expression in clusters of three groups according to the timepoints after removal of the facemask (Group 1= 0+20 min, group 2= 40+60 min, group 3= 120+ 180 min). This model was significant, (CV ANOVA p-value= <0.001), and 17 proteins contributed most to the separation to clusters. There were differences within the groups, especially in the early timepoints, which may be caused by the individual vulnerability.

Conclusions: Using a multiplex immunoassay technology with a broad panel of 71 inflammatory proteins, this study adds new insights to the timing of inflammatory upregulation and tissue recovery after NIV treatment. This study revealed the expression and interaction of inflammatory biomarkers at six different timepoints, were 17 proteins contributed most to the separation between the groups.

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COI: Funded by The Swedish Research Council and ALF Grants, Region Östergötland.

10.4

IMPACT OF LOCALISED SKIN COOLING AT THE SACRUM ON MICROVASCULAR RESPONSES TO SUSTAINED PRESSURE-INDUCED ISCHEMIA

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Introduction: Pressure ulcers (PUs) constitute localised damage to the skin from prolonged periods of pressure and shear forces, and cost ~£8.3 billion p.a. in the UK to treat(1,2). Improving mechanistic understanding of mechanical loading on human skin tolerance could help develop cost-effective, personalised solutions to prevent these wounds and improve patient care and quality of life. Early animal research showed reduced skin temperature minimises the risk of PU formation through altered microvascular responses and the potential therapeutic role of skin cooling for protecting tissue health(3). However, the mechanisms by which cooling enhances skin tolerance to pressure remain poorly understood in humans. This study aimed to examine how different levels of localised cooling alter the skin's microvascular responses to sustained pressure.

Methods: Eleven healthy participants (7M/4F; 24±5y; 73±10Kg; 175±10cm) completed 3 experimental sessions separated by a minimum of 24hrs in a randomised cross-over design. Participants underwent a 75-min protocol to cause pressure-induced ischemia and post-occlusive hyperaemia at the sacrum, involving: i) a 10-minute baseline stabilisation with minimal pressure [17.5mmHg (2.3kPa)], ii) 45-minute loading phase [60mmHg (7.9kPa)], and iii) a 20-minute minimal pressure phase [17.5mmHg (2.3kPa)]. The sacrum was mechanically loaded and unloaded with a custom-built thermal probe, set to either 38°C, 24°C, or 16°C. Skin blood flow (SkBF) at the loading site was measured continuously via Laser Doppler Flowmetry and then normalised to the baseline and expressed as a percentage change. Peak SkBF (P-SkBF) was defined as the maximum value after unloading occurred. Data were analysed using a one-way repeated measures ANOVA.

Results: Baseline SkBF did not differ between thermal conditions (P=0.390; 16°C, mean 14.5, 95%CI [12.1, 17.0], 24°C, mean 16.4, 95%CI [10.4, 22.3], 38°C, mean 13.3, 95%CI [11.0, 15.6]). There was a significant main effect of temperature (P<0.001) on normalised P-SkBF (Figure 1). Compared to 38°C, both 24°C (mean difference -226.2%, 95%CI [-316.9%, -135.6%], P<0.001) and 16°C conditions (mean difference -250.0%, 95%CI [-368.3%, -131.6%], P<0.001) showed decreased P-SkBF following pressured-induced ischemia. No statistically significant differences were observed between 24°C and 16°C (mean difference 23.5%, 95%CI [-73.2%, 25.9%], P=0.602).

Conclusions: Localised cooling at the sacrum reduces the P-SkBF response following pressure induced ischemia, potentially offering a protective effect on the underlying tissues. The use of localised cooling could offer novel therapeutic benefits in the prevention and management of PUs.

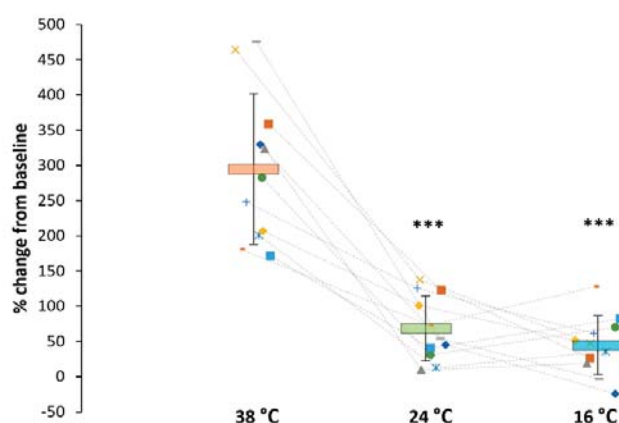


Figure 1. Normalised P-SkBF at the sacrum under three temperature conditions. Data are presented as individual responses (n=11). Horizontal bars indicate group mean values with SD. Significant differences from 38°C-condition are denoted by ***P<0.001.

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10.5

RISK FACTORS RELATED TO THE DEVELOPMENT OF FULL-THICKNESS PRESSURE INJURIES IN HOSPITALIZED PEDIATRIC PATIENTS

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Introduction: Current pediatric pressure injury (PI) prevention measures are based on risk factors related to PI development in adults¹. Children offer a unique concern for PI development as their bodies are in the process of developing and their skin responds differently to external pressure. This retrospective, observational, correlational design research explored risk factors for the development of full-thickness PIs in children aged ≤28 weeks gestation to 21 years.

Methods: The sample consisted of 799 hospitalized children that developed a PI. The pediatric and adult PI risk factors utilized in the study were identified from the International Guideline for the prevention and treatment of pressure injuries. A stepwise multivariate logistic regression model was utilized.

Results: Multivariate analyses findings revealed that risk factors for predicting a full-thickness PI by age included: 1) children aged 38 weeks to 12 months: tissue perfusion and oxygenation: generalized edema, being in the operating room (OR) and nutritional deficits, 2) 1 – 7 years: fragile skin status, 3) 8 – 21 years: tissue perfusion and oxygenation: decreased oxygenation and extracorporeal membrane oxygenation (ECMO) 4) total sample: ECMO, tissue perfusion & oxygenation: decreased oxygenation and malnutrition.

Conclusions: Full-thickness PI risk factors differ among the ages of pediatric patients.

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COI: Funding was not received for this sentinel research

A.1

THE APPLICATION OF DESIGN THINKING TO THE PREVENTION AND MANAGEMENT OF LOWER LIMB PRESSURE ULCERS

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Introduction: Recent research into the biomechanics of pressure ulcer formation includes emerging themes around load tolerance, capillary closing pressures and tissue metabolic demand. These are widely recognised parameters to measure the effectiveness of heel pressure ulcer prevention and management devices (Gefen et al. 2021). However, what is yet to be considered is how limited current devices are at addressing the individual risk factors of the diverse range of patients within this population who are currently managed with generic off-the-shelf devices.

Methods: The first phase was to complete a literature review to provide evidence-based device parameters to guide the design of a novel pressure relieving device. An umbrella review of the literature has provided a comprehensive overview and examination of existing systematic reviews focused on heel pressure ulcers.

Results: Three relevant review papers were found. Dube et al. (2022) outlines the key patient risk factors that contribute to heel pressure ulcer development in adults. Greenwood et al. (2022) looked at the overall effectiveness of current devices in the prevention of heel pressure ulcers. McGinnis & Stubbs (2014) set out to review a variety of devices (heel specific and non-heel specific) but were unable to draw conclusions due to the lack of relevant robust research in this area. Since McGinnis & Stubbs review (2014) is dated, a subsequent search was undertaken to look for more recent research into Heel PU management with heel-specific devices. No further robust papers were found after 2014.

Conclusions: Recruiting sufficient patients to PU studies can be difficult as many participants have complex physical and cognitive problems. Also, high mortality rates are likely to be a challenge in trial planning. From this literature review, a novel device will be tested in a small-scale study using a factorial design approach with healthy volunteer. It will explore individual patient risk factors and their impact on the design specifications of a new and innovative pressure-relieving device, with consideration of the device user experience and broader context. The findings will be analysed and synthesised to inform the product a design specification that will then be refined for clinical use.

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COI: No industry sponsorship has been received.

A.2

AN OBSERVATIONAL STUDY: EVALUATING THE SAFETY AND PERFORMANCE OF A POWERED GEL SUPPORT SURFACE SYSTEM IN REDUCTION OF HOSPITAL ACQUIRED PRESSURE ULCERS IN THE ACUTE CARE SETTING

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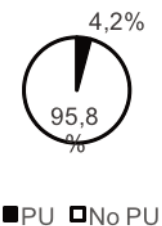
Introduction: Pressure ulcers (also known as pressure injuries, pressure sores, decubitus ulcers and bed sores) are localised injuries to the skin or underlying soft tissue, or both, caused by unrelieved pressure, shear or friction. Powered support surfaces are a key interventional strategy implemented and recommended to be part of the overall care and patient management program for reduction of hospital acquired pressure ulcers in the acute care setting.

Methods: We conducted a retrospective statistically designed high quality clinical survey study to assess the safety and performance of the powered gel support surface and pump, IsoTour System. The IsoTour system is a gel based powered pressure redistributing support surface with the low air less feature to manage skin moisture and TruTurn for automated cycles of turning of patients.

Results: We studied 313 patients globally to assess the ability of the IsoTour system to reduce the incidence of new pressure ulcers and help in reducing severity of community acquired pressure ulcers in the acute care setting. The study was conducted in line with recommendations from the NPIAP/EPUAP/PPIAP 2019 guideline. At end of their length of stay on the support surface system, 95.8% of the patients did not develop any new pressure ulcers. Of the total number of the patients who had Stage 3+ community acquired pressure ulcers, 42% of them experienced a reduction in severity.

Conclusions: When implemented as part of an overall patient risk management program such as turning of patients at 2 hourly intervals, avoidance of incontinence and a comprehensive tissue viability assessment, the IsoTour System acts as a differentiator in helping HCP's achieve enhanced pressure ulcer mitigation outcomes for their patients.

Incidence of New PU



■ PU □ No PU

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COI: Please declare any funding of the research by industry here.

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A.3

WHAT IS THE IMPACT OF CARE BUNDLES ON THE PREVALENCE OR INCIDENCE OF PRESSURE ULCERS AMONG AT RISK ADULTS IN THE ACUTE CARE SETTING? A SYSTEMATIC REVIEW

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Introduction: A pressure ulcer is an injury to the skin and underlying tissues caused by pressure, shear or a combination of the two. In Europe, the mean prevalence rate of pressure ulcer is 10.8%, in Ireland it is less than 12%. Care bundles are associated with a reduction in pressure ulcer rates. Pressure ulcer prevention is an essential value for the overall safety of patients in acute care.

Methods: Using systematic review methodology, original research studies written in English were included employing pre and post studies, quality improvement initiatives or projects, RCTs and experimental studies. Data were extracted using a pre-designed data extraction tool and quality appraisal was undertaken using the Evidence-based librarianship (EBL) tool, where appropriate, meta-analysis was undertaken using RevMan. The study protocol was pre-registered with the International Prospective Register of Systematic Reviews (PROSPERO CRD42023442711).

Results: Following the search, 528 records were returned, of which 12 met the inclusion criteria. The studies were conducted in a variety of acute healthcare settings. Three studies present data on prevalence, two studies present data on prevalence and incidence, and eleven studies present data on the incidence of pressure ulcers post-implementation of a care bundle or protocol. Meta-analysis of 5 studies identified an OR of PU development of 0.59 (95% CI 0.48-0.74; $p=0.00001$). This indicates a statistically significant 41% reduction in the odds of PU development among those cared for using a specific PU prevention care plan, with the true population parameter indicating a 52% reduction to a 26% reduction. Using Glynn's EBL critical appraisal checklist, the mean overall score was 75.9%. This suggests that, on average, the studies were considered valid in terms of methodological approach.

Conclusions: A variety of care bundle elements were found in the studies. Although results indicate the use of a care bundle is advantageous in preventing a pressure ulcer in the acute care setting, it is unclear which of these elements are most effective. Further research would be beneficial to elucidate practice and continue to prevent such adverse events.

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COI: The RCSI Strategic Academic Recruitment (StAR) Programme.

A.4

PRESSURE ULCERS PREVENTION RELATED TO SURGICAL PROCEDURES - WHAT IS IMPORTANT MONITOR.

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Introduction: The risk of pressure ulcers (PUs) during surgery is notably elevated among a specific subset of patients, particularly the elderly and those with multiple comorbidities undergoing prolonged surgery. The occurrence of PUs represents a significant challenge, potentially impacting surgical outcomes and leading to complications such as wound infection, delayed healing, and extended recovery periods, ultimately prolonging hospital stays.^{1,2} Hence, it is imperative to implement preventative measures before and during surgery and to diligently monitor and evaluate patients postoperatively.

Methods: A prospective observational study was conducted, focusing on postoperative patients in surgical intensive care units, with an emphasis on preventing PUs during the perioperative and postoperative phases. The risk of PUs development was evaluated on the day of surgery and the subsequent postoperative day using the Norton scale (most common scale used in the Czech Republic) and Braden scale. Various risk factors (age, gender, duration, and type of surgery, as well as patient positioning during surgery) were monitored. Statistical analyses were performed at a significance level of 0.05 using T-tests and ANOVA.

Results: The total sample consisted of 67 patients undergoing surgery and hospitalized for more than 2 days in the intensive care unit (63% were women (n=42) and 37% were men (n=25)). On postoperative day zero, 29 PUs occurred in 26 patients. A combination of two PUs was present in three patients. On the first postoperative day, 5 PUs were present in four patients. All PUs on both postoperative days 0 and 1 fell into the first category - non-blanchable/erythema. According to both the Norton scale and Braden scale, the risk of PUs on postoperative day 1 significantly decreases with early mobilization and verticalization. The Braden scale adequately predicts the incidence of PUs (p=0.0106) in contrast to the Norton scale (0.9554) where a patient with no risk of PUs have been suffered with PUs occurrence.

Men, older people, and people with a higher BMI are more at risk of PUs. Patients undergoing abdominal surgery, long-lasting surgery, supine position, and unplanned surgery had a higher risk. However, none of these findings are significant given the sample size.

Conclusions: The study demonstrated the importance of perioperative and early postoperative preventive interventions. Although PUs cases were noted, they remained confined to category 1 without deterioration. Early verticalization of the patient and regular skin care, including individualised preventative measures, are important factors influencing the reduced incidence of PUs in the early postoperative phase.

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COI: none

A.5

USING A TURNING PLATFORM SYSTEM TO PREVENT PRESSURE DAMAGE: A SMALL SCALE EVALUATION OF TWO DIFFERENT SYSTEMS, ONE TURNING 30 DEGREES V ONE TURNING 22 DEGREES

Heather Hodgson¹

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Introduction: Immobile patients are at the highest risk of developing pressure ulcers. Keeping patients moving is just one aspect of a person centred care plan to prevent pressure damage.

Lateral turning systems have been designed to keep patients moving by automatically turning them at regular intervals day and night. They work on the principle of one side slowly, gently and evenly inflating to a specific angle fully supporting patients from head to toe and then deflating in the same manner whilst the opposite side inflates. Thus providing constant repositioning in a 24 hour period.

These systems effectively redistribute pressure away from 'at risk' areas without the requirement of manual handling.

There are numerous benefits to these turning systems including:

- Pressure ulcer prevention
- Wound progression
- Staff well-being relating to reduced musculoskeletal demands
- Improved sleep
- Nursing time saved as need for repositioning not required (35 hours per week per patient)
- Assurance that very vulnerable 'at risk' patients are being repositioned to prevent pressure damage
- Suitable for a range of patients including end of life and cognitively impaired

Methods: A comparison of two different turning systems was undertaken over a four week period: one turning to 22 degrees and one turning to 30 degrees per cycle. The comparison was undertaken on a busy, medical ward with a high percentage of dependent, immobile patients at risk of pressure damage. Feedback was obtained from patients, senior nurses, junior nurses, students and health care support workers.

An initial time and motion study was undertaken to determine if any nursing time would be saved.

Patient feedback obtained from patients who had been nursed on either or both units

Staff focus groups to discuss both systems in terms of: Ease of use, clinical outcomes, patient care

Pressure ulcer incidence compared pre and post use of turning platforms

Wound progression charted by examining wound assessment charts

Results: Patient feedback indicated that the turning platform to 22 degrees was more comfortable and better tolerated.

Patients preferred the 22 degree unit

Staff preferred the 22 degree unit

Time and motion calculations concluded 35 hours of nursing time could be saved per week per unit.

Wound progression noted for both units.

Pressure ulcer incidence reduced with both units.

Both units easy to use, although the 30 degree unit easier to understand

Conclusions: Turning platforms should be considered as a technology for the prevention and healing of pressure damage and any other existing wound.

They have a role to play in the reduction of manual handling and can save nursing time.

Consideration should be taken regarding the purchase of any turning platform as it would appear that patients better tolerated the systems that turned them 22 degrees instead of 30 degrees.

COI: The turn assist platforms from both companies were provided free of charge for evaluation.

A.6

THE UNEXPECTED OUTCOMES OF USING A SUB-EPIDERMAL MOISTURE (SEM) DEVICE: REDUCTION IN PRESSURE DAMAGE, REDUCTION IN MOISTURE DAMAGE, INCREASED NURSES' KNOWLEDGE ON PRESSURE ULCER GRADING, PREVENTION AND MANAGEMENT AND REDUCED WORKLOAD.

Veronica Pollard¹

¹ NHS Greater Glasgow and Clyde, Tissue Viability Department, United Kingdom

Introduction: My aim was to reduce incidence of pressure damage by identifying early signs of pressure damage by measuring sub epidermal moisture levels daily on pressure areas of a high risk group of patients.

Methods: Evaluated a device which measures sub epidermal moisture levels on the skin at pressure areas, the higher the score on the device, the higher the risk of pressure damage. The device is found to identify pressure damage 5 days before it is visible. Evaluation carried out over 1 month in a 20 patient older adult ward who had a high incidence rate of hospital acquired pressure damage, despite the patients being deemed at risk and having a ritualistic practice of 2 hourly positional changes for all patients.

- All patients scanned daily at sacrum and heels
- Scan results recorded daily on data recording sheets and PU Data recorded
- If high scoring (>0.6) at sacrum, positional changes increased from 4 to 2 hourly, if at heels, off-loading footwear applied.
- Staff questionnaires

Results:

- 46 patients in study, 1382 readings in total
- 45% of readings of >0.6 with no visible pressure damage
- Patient repositioning reduced by 55%, equating to time saving of 7.15 hours /day.
- Pressure ulcer rate per 1000 occupied days reduced from 5.77 to 0.0
- Moisture damage reduced by 100%
- 100% increase in staff knowledge.

Conclusions: Using this device reduced the number of positional changes staff were required to carry out by 55%, the ward noticed a reduction in moisture damage, nursing staff were able to differentiate between moisture and pressure more effectively. Staff described it as their "Crystal ball" being able to identify truly high risk patients.

References:

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COI: Arjo Provizio sponsored the evaluation and provided 2 devices to the ward for 1 month. The company also provided staff training for all ward staff.

A.7**PRESSURE INJURY PREVENTION WITH A UNIQUE MULTI-LAYER FOAM DRESSING: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS.****Lloyd Atkinson¹, Ben Costa¹**¹ *Smith and Nephew, United Kingdom*

Introduction: Pressure injury (PI) is a major burden to both patients and healthcare systems, leading to morbidity and excess cost. The aim of this study was to determine if the inclusion of a uniquely designed five-layer hydrocellular polyurethane foam dressing (HPFD)* as part of standard PI prevention (PIP) can significantly reduce the incidence of sacral PI development compared to standard of care (SOC) PIP protocols.

Methods: A systematic literature review (SLR) was performed in October 2023 to capture studies reporting on sacral PI incidence in at-risk patients using the HPFD (with standard protocol) compared to SOC PIP protocol alone. To be included, studies had to be randomized controlled trials (RCTs). Binary meta-analysis of sacral PI incidence was performed and summarized with odds ratios.

Results: Five RCTs containing a total of 2819 participants (1657 HPFD vs 1162 SOC) were included in the SLR. Three RCTs were included for final meta-analysis, demonstrating a 66% reduction in the odds of PI incidence compared to SOC PIP protocol (odds ratio 0.34 [0.22-0.54], p=0.0016).

Conclusions: Use of a unique HPFD in multiple settings in at-risk patients significantly reduces the odds of PI incidence compared to SOC alone. Findings from this study may inform healthcare professionals as to the appropriate dressing in their PIP protocols.

COI: The authors are employees of Smith and Nephew.

**ALLEVYN™ LIFE (Smith and Nephew, Hull, UK)*

A.8

LOCAL TREATMENT OF PRESSURE ULCERS AT RISK OR WITH CLINICAL SIGNS OF LOCAL INFECTION WITH TLC-AG DRESSINGS - EVIDENCE FROM A PROSPECTIVE, MULTICENTRE REAL-LIFE STUDY

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Introduction: Pressure ulcers (PU) are prone to local infection and delayed healing. This clinical evaluation aimed to assess the performance of TLC-Ag dressings in the local treatment of PUs at risk or with clinical signs of local infection in an unselected cohort of patients under real-life conditions.

Methods: A large, prospective, multicentre observational study in patients with a wound at risk or with clinical signs of local infection treated with two TLC-Ag dressings* was conducted in 39 centres across Germany, between May 2020 and May 2021. Main outcomes included a description of the treated patients and their wound management, the changes in wound infection and wound healing outcomes over a maximum period of four weeks of treatment, as well as the overall clinical assessment of the local tolerance and acceptability of dressings. This report will focus on the results achieved in patients with PU.

Results: Among the 728 patients included in this clinical study, 32 patients (age 29-94 years old, 56% women, with multiple comorbidities) had a PU (EPUAP stages 2 to 4, or unstageable). At the initial visit, risks of wound infection were present in 97%, clinical signs of wound infection in 81% and a wound infection was established in 72%, while antibiotic therapy was prescribed to 25%. PUs were most often recent, located on the sacrum region, exudative and painful, with a median surface area of 13.2 cm² and impaired periwound skin condition. Throughout the study period, the parameters of wound infection continuously decreased, the most rapidly diminished being wound deterioration/enlargement, presence of pus and clinical signs related to wound exudate, resulting at the final visit in a reduction by 61% of local wound infections and by 70% of the presence of the different signs on average. Concurrently, in terms of healing process, 91% of the wounds healed or improved, and 6% stabilized (data missing for 3%). During the study, one serious adverse event, unrelated to the dressings was reported. Overall, the two dressings were 'well tolerated' and 'well accepted' by most patients and were assessed by the physicians useful in the majority of the cases with a 'very good' or 'good' efficacy in terms of antimicrobial activity and promotion of the wound healing process.

Conclusion: These results are consistent with previous clinical evidence on TLC-Ag dressings. They support the good efficacy, good tolerability and usefulness of these antimicrobial dressings in the management of patients with PUs at risk or with clinical signs of local infection, in association with appropriate standard of care.

References:

*UrgoTul Ag, UrgoTul Ag Lite Border, Laboratoires URGO, France

COI: This work was funded by Laboratoires Urgo

A.9**WOUND HEALING IN PATIENTS WITH PRESSURE ULCERS TREATED WITH TLC-NOSF DRESSINGS - EVIDENCE FROM A POOLED ANALYSIS OF TWO PROSPECTIVE, MULTICENTRE REAL-LIFE STUDIES****Maurice Moelleken¹**¹ *Universitätsklinikum Essen, Universitätsklinikum Essen-Klinik und Poliklinik für Dermatologie, Venerologie und Allergologie, Germany*

Introduction: Clinical research on pressure ulcer (PU) local treatments remains scarce in the literature. This clinical evaluation aimed to assess the performance of TLC-NOSF dressings in the local treatment of PUs in an unselected cohort of patients under real-life conditions.

Methods: Data were pooled from two large, prospective, multicentric observational studies conducted among general practitioners, internists, and dermatologists in Germany, between 2017 and 2020. A total of 2101 patients with a chronic wound treated with different TLC-NOSF poly-absorbent dressings* were followed up for 12 weeks, with a maximum of four documented visits. The main endpoints included wound healing rate, tolerability and acceptability of the dressings. This work will focus on patients with PU.

Results: A total of 208 patients with PU (mean age 77.4 years old, 54.8% women, with multiple comorbidities) were treated with the evaluated dressings. At the initial visit, PUs (67.3% lasting \leq 1 month) had a median surface area of 9.4 cm² covered by 43% sloughy tissue, and most often with high or moderate level of exudate. By the final visit, 47.1% of ulcers were healed (median healing time: 50 days, interquartile range 31-71), 48.6% improved, 2.9% stabilized, and 1.0% worsened (0.5% missing). The median relative wound area reduction was 98.7% (interquartile range 65.6%-100%). The proportion of wounds with moderate/high level of exudate decreased from 63.9% to 11.5%. Maceration and malodour were reduced by 78.6% and 87.4%, respectively, and perilesional skin condition was improved in 76.4% of patients. Optimal healing results were achieved when the dressings evaluated were used as first-line treatment, i.e. in PUs lasting \leq 1 month, with 54.3% of wound healing in 43 days (compared with 31.8% of wound healing in 85 days in PU lasting $>$ 1 month). During the study period, antibiotic therapy was prescribed in 16.8% of patients, and wound infection documented in 9.1%, without discontinuation of the local treatment with the dressings evaluated. No adverse events related to the dressing were reported in patients with PU. The dressings were 'very well' tolerated (86.5%) and 'very well' accepted (80.3%) by most patients, with painless dressing changes reported in 70.4% of cases. Participating physicians assessed the dressings as 'extremely useful' for 81.7% of patients treated. Similar results were reported regardless of the dressing of the range evaluated.

Conclusions: These results show the good performance of these dressings in rapidly improving wound healing in patients with PU treated in real-life settings. They are consistent with previous clinical evidence on TLC-NOSF dressings, supporting their use as a first-line treatment in the local treatment of PUs, in association with appropriate standards of care.

References:

**UrgoStart Plus Pad, UrgoStart Plus Absorb and UrgoStart Plus Border, Laboratoires URGO, France*

COI: This work was funded by Laboratoires Urgo

A.10

COST-BENEFIT COMPARISON OF THREE DIFFERENT TREATMENTS FOR INCONTINENCE-ASSOCIATED DERMATITIS IN ITALY

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Introduction: Among the highest expenditure items for Nursing Homes there are certainly the products for prevention, both of pressure injuries and maceration skin lesions (Moisture-Associated Skin Damage - MASD) [1]. With this work we wanted to compare three different treatments in terms of cost-benefit, especially focusing the attention to a technological topical product versus the two most common treatments for IAD (Incontinence-Associated Dermatitis) used in Italy [2].

Methods: We enrolled, in a two-years study, 150 elderly patients, divided into three groups of 50 each, all suffering from IAD. Group A patients have been treated with zinc oxide paste*, Group B patients with hyaluronate and colloidal silver spray powder** and Group C patients with stable ozonides-based barrier cream***. Products have been applied to each diaper change, after a correct hygiene with specific non-aggressive cleansing products. We have evaluated healing times and costs. Patients with neoplasm or cachexia or using immunosuppressive drugs or with a low life expectancy have been excluded.

Results: All patients achieved the complete healing, but the healing times were so much different [3]: the mean time of resolution were 132.1 days in Group A patients, 87.3 days in Group B patients and 29.7 days in Group C patients. The mean cost for every treatment was €173.20 (£148.10) for zinc oxide paste, €190.75 (£163.11) for hyaluronate and colloidal silver spray powder and €103.45 (£88.46) for stable ozonides-based barrier cream.

Conclusions: This work demonstrated that the reduction in treatment times using stable ozonides-based barrier cream is highly significant and the cost-benefit ratio between the three groups is in any case in favor of this technological treatment. Although the daily cost of this treatment is higher than the others, the difference in healing time is strongly significant and sufficient to obtain the decision to prefer the stable ozonides-based barrier cream.

*Bioderm (Farmoderm) **Farmactive (Farmac-Zabban) ***Rigenoma Barrier Cream (Erbagil)

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A.11

VALIDITY AND RELIABILITY OF BARAKAT-JOHNSON
INCONTINENCE-ASSOCIATED DERMATITIS KNOWLEDGE TOOL

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Introduction: Incontinence-associated dermatitis is an important problem frequently encountered in hospitalized patients because of exposure to urine or feces. It is important for nurses, who are the primary caregivers, to have adequate and accurate information about IAD, which has a high prevalence and incidence, to obtain accurate diagnosis, quality of care and positive patient outcomes. This research was conducted to determine the validity and reliability of the Turkish version of The Barakat-Johnson Incontinence-Associated Dermatitis Knowledge Tool.

Methods: The methodological study was conducted between May and December 2023. Data were collected from a sample of 128 nurses caring for patients with incontinence through the online version of the tool. For linguistic validity, an expert panel of six academics was formed, and the Turkish version was finalized according to their suggestions. Confirmatory factor analyses were conducted for construct validity.

Results: The stratified alpha coefficient for the test is 0.62. Test-retest stability coefficients are between 0.92 and 0.94. It can be argued that 10 of the 18 items of the scale have negative item difficulty coefficients, items 1 and 18 are answered correctly by almost everyone and items 2, 7 and 17 were the most difficult items in the test.

Conclusions: As a result, it was determined that improvement studies are required for the adaptation of the Turkish version of the 'IAD-KT' for utilization within the Turkish community.

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COI: This study was not funded.

A.12

A FIRST IN HUMAN EVALUATION OF CONCURRENT OPTICAL AND MAGNETIC STIMULATION IN SEVERE HARD-TO-HEAL PRESSURE ULCERS

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Introduction: Chronic pressure ulcers are a major health concern, particularly in the Middle East. Factors such as an aging population, cultural practices that may prolong bedridden states, and a rising incidence of diabetes heighten the risks. One of the leading long-term care centers for complex medical cases in this region faces significant challenges with the prevalent issue of pressure ulcers. This research explores the potential of concurrent optical and magnetic stimulation therapy, a novel approach for pressure ulcers, to enhance tissue regeneration.

Methods: Patients initially received standard care for stage IV pressure ulcers (including NPWT and ultrasound debridement) over four weeks. Following this initial phase, the treatment protocol transitioned to the therapy under review, administered twice weekly. To evaluate the treatment's effectiveness, wound imaging coupled with comprehensive clinical observations formed the basis for analyzing its performance in healing advanced-staged pressure ulcers.

Results: To date, 19 pressure ulcers in a total of 15 patients were completed. The majority (79%) of the ulcers were older than one year. These hard-to-heal ulcers were treated with the therapy under review twice weekly for 5 to 40 weeks (exemplary ulcer in Figure 1). All patients were bedfast and more than half (53%) required ventilation. All patients demonstrated a Wound Surface Area Reduction (WSAR) during the investigational treatment as seen in Figure 2. The average WSAR after treatment was 77% from pre-therapy baseline measurements, with complete wound closure being achieved in 42.1% of the treated ulcers. This novel therapeutic approach achieved 2.8 times the closure rate reported for standard care treatment of pressure ulcers by Carter et al. ¹, highlighting its potential as a promising treatment option.

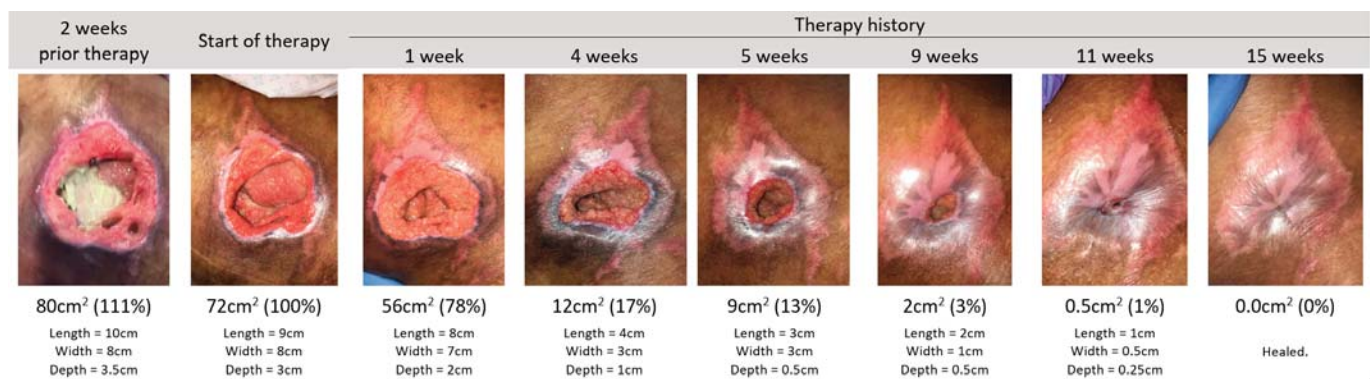


FIGURE 1: EXEMPLARY CASE OF SUBSCAPULAR STAGE 4 PRESSURE ULCER WOUND HEALING INFORMATION

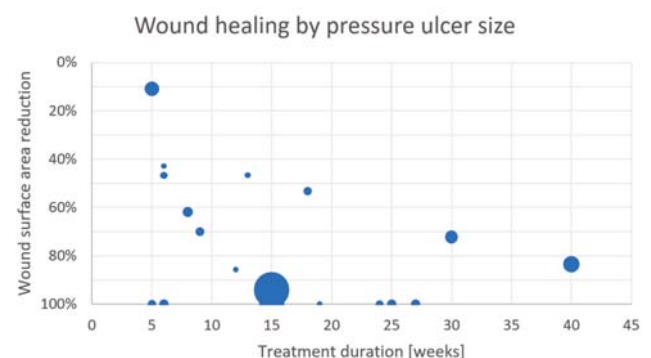
FIGURE 2: WOUND HEALING CHART ILLUSTRATING THE WSAR AT END OF TREATMENT PERIOD IN RELATION TO THE THERAPY DURATION WITH ULCER SIZE DEPENDENT POINTS (ULCER SIZE AT START) FOR EACH EVALUATED ULCER

Conclusions: In this case series of 15 patients with 19 hard-to-heal stage IV pressure ulcers, concurrent optical and magnetic stimulation therapy in combination with standard wound care, achieved clinically significant rates of wound area reduction and wound closure. This therapy may provide a breakthrough treatment option for these complex and costly ulcers that disproportionately burden the healthcare system.

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COI: The therapy material was provided by the manufacturer for this study. The author declares no other COI.



A.13

CLINICAL EVALUATION OF POLYABSORBENT FIBRE DRESSING WITH TECHNOLOGY LIPIDO COLLOID AND SILVER IN PATIENTS WITH PRESSURE ULCERS

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Introduction: Treating Pressure Ulcers (PU) is challenging, and the inclusion of evidence-based dressings as part of a standard of care is imperative to achieve improvement and healing¹. Polyabsorbent fibre dressing with technology lipido colloid and silver dressing (TLC-Ag) incorporates a combination of continuous cleaning, antimicrobial and action, backed by both in vitro and in vivo studies².

Aim: Evaluate the TLC-Ag dressing in the management of challenging PIs real-life setting.

Methods: Case series discussing the management of PU:

- A 93-year-old female, bedridden for around 7 years, with a Stage 4 PU that had been regressing for 3 months
- A 78-year-old female, who had been bedridden for 3 years referred with two 2-month-old Stage 4 PIs, one over the sacral region and one on the left trochanteric region
- A 75-year-old female was referred for management of a 20-day-old, 5 x 4cm sacral unstageable pressure injury with high levels of exudate, previously untreated
- A 74-year-old male referred for a seven-day old Stage 3 untreated pressure injury in the sacral region, measuring 12 x 8cm, almost completely covered with slough and producing high levels of exudate
- A 98-year-old female referred for management of a 3-week-old, highly exudative Stage 4 PI in the sacral region, which had previously been managed with gauze soaked in povidone iodine
- A 79-year-old male patient referred for the management of a 3-month old unstageable PI in the sacral region, measuring 20 x 20cm, and producing low exudate.

Results: Results showed effective and rapid improvement in all cases with elimination of non-viable tissue and wound area reduction .

Conclusions: These results are also in line with previously clinical studies conducted, supporting that TLC-Ag is an effective dressing in the management of chronic wounds, including PU.

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COI: Please declare any funding of the research by industry here

A.14

SEAMLESS - CO-PRODUCTION AND PATIENT AND PUBLIC INVOLVEMENT AND ENGAGEMENT OF A NEW SENSING TECHNOLOGY FOR COMMUNITY USE.

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Introduction: The research team have been using pressure monitors to help understand how to prevent pressure ulcers in individuals' homes. This research involves the development of a sensing system and display unit specifically designed for home use. This will be achieved through co-production, working together with patients and the public, service providers and industry partners on a fit for purpose solution. The original conception of the proposed technology was derived from patient need, liaising with specialist clinicians and care providers to highlight where technologies are currently lacking.

Methods: The patient and public involvement (PPIE) lead and co-applicant supported the design of the study and identified how PPIE can be embedded into the project. A PPIE group was recruited at the start of the research design process via local Trusts and research networks. On discussion with the PPIE group we included a user led design phase, prior to further evaluation.

The group consists of lay members; people who have had pressure ulcers, have had family members with pressure ulcers and clinicians with experience in caring for patients with pressure ulcers.

Research Design -The PPIE group reviewed the ethics documents, patient facing information sheets and consent forms and lay summaries of the research, observations guides, interview and focus groups questions, website content and test and refinement of Programme theories.

Literature review – review of papers identified by the research team with the intention that PPIE members will co-author.

Results: lay member comments: "Since I have been involved with Seamless not only have, but I also felt a member of the team working on a common goal for the greater good in healthcare, I have been given the opportunity to learn and develop in PPIE. Being fairly new to PPIE this has being hugely beneficial in helping me build confidence, there has been opportunities to being involved all the way through the research and I have never felt left behind. The communication has been second to none. Seamless was one of the first PPIE projects I have been on and has helped me to see that my opinions and experiences are valued and beneficial to research"

Chair of the PPIE Group – "Over the last 18 months, our diverse group has developed and grown together. Following some initial hiccups in the early days, I think that we have now become a very mature group. We have established a positive way of working, collaborated effectively, and achieved synergy in a way that is now fostering mutual growth and understanding".

Conclusions: PPIE has been embedded into our project from its conception. The PPIE chair and co-investigator has lived experience of pressure ulcers, leading many aspects of the equality and diversity agenda, as someone with great experience in the disability sector. The group has a range of individuals with different professional backgrounds, who feel empowered to influence and shape the research. This partnership has greatly enriched the research process.

COI: I have no conflicts of interest to declare.

A.15

IMPACT OF WOUND HYGIENE INCORPORATING AN ANTIBIOFILM GELLING FIBER DRESSING ON HARD-TO-HEAL PRESSURE ULCER/INJURIES

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Introduction: Biofilm is strongly implicated in hard-to-heal wounds and can protect microorganisms from antibiotics, antiseptics, and host immune responses.¹ The Wound Hygiene protocol-of-care (WHP) is a 4-step (cleanse, debride, refashion, and dress) standardized, repetitive approach to biofilm management and wound care developed by an international panel of wound care specialists.²⁻⁴ We evaluated the impact of WHP on hard-to-heal pressure ulcers/injuries.

Methods: A subgroup analysis of patients with pressure ulcers/injuries in a prospective, real-world study of hard-to-heal wounds managed with the WHP (incorporating an antibiofilm gelling fiber dressing*) for approximately 4 weeks, or as clinically appropriate, was performed. The primary endpoint was change in wound volume from baseline to the final assessment.

Results: 110 patients had pressure ulcers/injuries (37% were static, 24% were deteriorating) and were included in this analysis (median treatment duration 33 days). Of 88 patients with baseline and final wound volume assessments, 31 (35%) had complete wound closure (100% volume reduction). Mean wound volume reduced from 143.1 cm³ at baseline to 37.4 cm³ (77% reduction) at final assessment. Exudate levels changed from predominantly moderate/high (75%) at baseline to predominantly low/none (56%) at the final assessment. Signs of clinical infection were present in 52% at baseline, which had reduced to 5% at final assessment. Suspected biofilm was 78% at baseline and 15% at final assessment. At final assessment, 20% of pressure ulcers/injuries had healed and 75% had improved.

Conclusions: Management with the WHP resulted in healing or improvement in nearly all hard-to-heal pressure ulcers/injuries (95%), and notable decreases in wound volume, exudate level, suspected biofilm, and local infection. Our findings suggest that the WHP incorporating an antibiofilm dressing is an effective treatment strategy for pressure ulcers/injuries.

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COI: This study was funded by Convatec Ltd.

*Aquacel® Ag+ Extra™ (Aquacel Ag Advantage in the United States).

A.16**ARTIFICIAL INTELLIGENCE AND NEW TECHNOLOGIES FOR ASSESSMENT, MEASUREMENTS AND "CORRECT INTERPRETATION" OF PRESSURE ULCERS****Roberto Cassino¹**¹ *Heliopolis Residences Korian Nursing Home, Geriatrics - Long Term Care, Binasco*

Introduction: Measuring wounds is very important because indicates its evolution and suggests us the therapeutic strategy. Many systems have been used to calculate area and volume, but often the measurements were very approximate, especially regarding the volume. A device that, in addition to measuring in real time and with high precision, can also give informations on the tissue composition and the ulcer clinical state [1], it's certainly very useful. The aim of this work is to demonstrate that the instrumental evaluation of the wound is much more precise than the manual one, also in terms of interpretative correctness.

Methods: We are using an Artificial Intelligence (AI) device* that developed an automatic, accurate and non-invasive wound assessment system using a combination of novel stereoscopic, thermal images and machine learning algorithms that run entirely on a normal smartphone [2]. It can allow 3D dimension measurement (length, width and depth of the wound), tissue assessment (identification of tissues on the wound bed) and wound complication detection (detection of infection and undermining in wounds). All these data are converted into binary language and can be sent online and displayed by remote (Telemedicine). After the AI assessment we compare the results with the manual assessment previously performed.

Results: In all cases analyzed the manual evaluation showed to be much less accurate than the instrumental one, especially in the tissue identification. There are no statistically significant differences in wound size measurement, but in tissue classification only in 22% of cases the manual assessment proved to be quite similar to that of the device, while in the remaining cases the margin of error in the tissue evaluation was greater than 40%. The clinical evaluation underestimated the infection in over 35% of cases.

Conclusions: A wrong evaluation of the wound conditions, especially in terms of infection, is absolutely dangerous from both clinical and legal points of view. This work demonstrated that AI and technological devices can really help the assessment and the treatment strategies in wound care.

*KroniKare (METI Biosolutions, Italy)

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COI: None

A.17

COMBINED THERAPY WITH HYALURONATE AND AMINO ACIDS (INJECTABLE, TOPICAL AND ORAL) IN THE TREATMENT OF COMPLEX PRESSURE INJURIES

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Introduction: In addition to tissue loss, pressure injuries cause large losses of water, energy and proteins; the tissue most subjected to depletion is the muscular one. This is why we need to save time to achieve complete healing: to avoid excessive losses, especially in frail people, the elderly, very often suffering from wide and complex wounds. Hyaluronate and amino acids (HA+AA) have already shown significant effectiveness in wound care, especially in the treatment of pressure injuries [1], even more significant if there is a contemporary general support with oral amino acids [2]. The injectable formulation of HA+AA also proved that the granulation tissue promoting can be extremely faster [3]. The aim of this work is to demonstrate that it is possible to obtain very good and rapid results by organizing a combined therapeutic protocol.

Methods: The study is still ongoing. We are enrolling 15 elderly patients with wide and complex wounds; the target is 15. The treatment protocol, after a good debridement (if needed), is the following: daily oral amino acids support*; intra/subdermal injection of HA+AA** under the wound edge once a week for two weeks and then twice a week for six weeks; primary dressing with HA+AA powder and/or cream*** three times a week (fill the wound with alginate in case of large tissue loss); moist gauze as secondary dressing. Wound Area Reduction (WAR) and Depth Reduction (DR) are evaluated after eight weeks of treatment. Patients with neoplasm or cachexia or using immunosuppressant drugs are excluded.

Results: Five patients have completed the study, all with significant results. The mean WAR was 78.6%; the mean DR was 92.7%. Area and depth reductions are already extremely evident after the first two weeks of treatment; the results within the observation time are more significant in comparison with any other "non-surgical" treatment. In one case complete healing has been achieved.

Conclusions: This combined therapy (injectable, topical and oral) demonstrated to be really effective in terms of speed of healing; this is very important because we need to save time to achieve complete healing to avoid excessive losses, especially in frail and elderly people.

*Aminother Pro **Vulnamin Inj ***Vulnamin PWD/Cream (Professional Dietetics - Italy)

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COI: None

A.18

WHAT ARE THE PSYCHOMETRIC PROPERTIES OF THE TOOLS MEASURING OUTCOMES OF EDUCATIONAL INTERVENTION ON PRESSURE ULCER EDUCATION? SYSTEMATIC REVIEW

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¹ Royal College of Surgeons in Ireland (RCSI), Ireland

Introduction: Given the significant prevalence and incidence of pressure ulcers (PU) and their detrimental effects, the implementation of PU prevention education is fundamental for all involved in the care of the at "risk" patient population. To assess the outcome of the educational programmes and determine their impact, the use of a validated tool is required to assess outcomes such as knowledge, attitudes and behaviors towards PU prevention. An increased focus in health care on the development of instruments and psychometric testing, has allowed both researchers and educators to assess and measure the challenges in a valid and reliable way.

The aim of the systematic review (SR) was to examine the psychometric properties in current tools/instruments used to measure outcomes of educational interventions on PU prevention.

Methods: Systematic review

The search was conducted in August 2023 using, Cochrane, Ovid Medline, EMBASE,

EBSCO CINAHL Plus, Scopus and Google scholar.

The search provided a result of 117 records, with 16 of those included in the review.

Results: The psychometric properties of the tools were investigated by testing validity and reliability scores. 4 tests were identified throughout the review. All 16 tools included, measured various constructs and some measuring multiple within a single tool. 9 constructs were identified throughout the review, with Knowledge being the most popular. All tools showed acceptable psychometric properties that can be used in measuring outcomes in future PU prevention education, practice and research.

Conclusions: To assess PU prevention educational programmes a validated tool such as those included in the review are essential to measure the proposed outcomes. The variation of tests, tools items/phases and sample size does not allow for a precise or clear evidence or comparison. None the less these findings serve as a platform for future research to support the need for standardisation of psychometric testing and can potentially optimise PU prevention education. The variation in constructs measured in each tool included in the SR highlights the need for further research to develop a core outcome set for PU education research for health care professionals.

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COI: No conflicts of interest to declare.

A.19

COST-EFFECTIVENESS OF SUB-EPIDERMAL MOISTURE MEASUREMENT: A SYSTEMATIC LITERATURE REVIEW

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Introduction: Measurement of sub-epidermal moisture (SEM) is a biomarker for the presence of early-stage pressure damage. We carried out a systematic review of studies evaluating the cost-effectiveness of SEM measurement as part of a pressure ulcer (PU) prevention protocol compared with current standard of care (SOC).

Methods: The protocol was registered in PROSPERO and searches were carried out in November/December 2023¹. Economic studies comparing SEM measurement with SOC were eligible.

Results: Four original studies were reported in nine documents. One study evaluated the cost-effectiveness of SEM measurement compared with SOC in a population of patients admitted to acute care facilities in the United States². Adding SEM assessments to a standard prevention protocol was estimated to lead to a reduction in PU incidence and a cost saving of US\$2,700 per patient at 2018 prices. Three studies were conducted from the perspective of the UK National Health Service. One modelling study found that the introduction of SEM measurement led to an expected reduction of up to 68.9% in the incidence of hospital-acquired PUs³. An independent review revised some of the underlying model assumptions estimating a reduction in the incidence of category ≥ 2 ulcers of 27%. A further UK modelling study⁴ evaluated the cost-effectiveness of SEM measurement over a one-year horizon; the addition of SEM to SOC was predicted to lead to a reduction of 21.1% in the incidence of hospital-acquired PUs and a cost reduction of £8.98 per patient. In a probabilistic sensitivity analysis, the probability that adjunctive scanning would improve patient outcomes was 91.4%.

Conclusions: Literature describes SEM measurement as a dominant strategy. The main benefits of SEM measurement are an opportunity to prevent patients developing a PU and reduce costs to the healthcare system. These benefits follow from the early detection and greater accuracy of SEM measurement in detecting pressure-induced tissue damage; higher sensitivity and specificity compared with visual skin assessment (50.6% and 60.1%)⁴. The higher sensitivity (true positive rate) means that more cases where pressure damage is present are detected. Assuming prevention measures are successful, higher sensitivity results in, a) an increase in the number of early-stage ulcers which are prevented from becoming more severe, b) a saving in the costs of PU treatment, and c) fewer patients being placed unnecessarily on more intensive prevention protocols.

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COI: This research was funded by an unrestricted grant from Bruin Biometrics, LLC.

A.20

DISRUPTING THE PRESSURE ULCER (PU) DAMAGE CYCLE AND PREVENTING PUS VIA SUB-EPIDERMAL MOISTURE ASSESSMENT TECHNOLOGY- AN UPDATE TO THE SCIENCE

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Introduction: In diagnosing stage 1 PUs reported sensitivity and specificity of skin-tissue- assessments (STAs) and clinical judgement (without the aid of any technology assessments) are 50.6% and 60.1%, respectively¹. This accuracy is random, akin to a coin toss, even lower in dark-skin- tone patients, resulting in higher incidences of later stage PUs. A clinical course correction is required for objective detection and subsequent treatment of pressure-induced tissue damage. Deformation-induced cell-death occurs early in the PU damage cascade resulting in non-visible localised oedema (step 4 in Figure 1); if left untreated, causes further tissue damage and tissue death (step 7). Sub-epidermal moisture (SEM) or localised oedema detected and measured via SEM assessment technology, is the earliest sign of cell-death before it manifests on the skin surface.

Methods: A series of skin modelling and reliability studies validated the ability of SEM assessment technology to measure and detect localised oedema. Multi-center clinical trials established the utility of SEM assessments in differentiating human subjects with confirmed healthy tissue versus subjects with confirmed pressure-damaged tissue. A longitudinal blinded study established the time-duration in detecting non-visible localised oedema prior to clinical judgement.

Results: Porcine skin studies described the sensitivity and specificity of detecting localised oedema via SEM technology at 100%, and 97.5% respectively. Inter-rater reliability exceeded an intraclass correlation coefficient (ICC) of >0.80 (good reliability). Sensitivity and specificity in comparing known healthy tissue (not shown on Figure 1) to known pressure-damaged tissue (Step 7) (n=175), ranged from 82–87% and 51–88%, at an SEM delta (✓) ≥0.63. Diagnostic accuracy area under the curve (AUC) ranged from 78.09% to 91.8% (p<0.0001). SEM assessments detected non-visible damage 5 days prior to confirmed diagnosis of PUs via STAs and clinical judgement. AUC statistic was 67.13% (95%-CI 0.5969-0.7457, p<0.001)³.

Conclusions: SEM or localized oedema is pathological to PUs and deep tissue injuries. Measurement and detection of localised oedema via SEM assessments was accurate, reliable, with diagnostic accuracies exceeding clinical judgement in all clinical trials. Objective measurement and detection of localised oedema prior to tissue damage manifesting on the skins' surface is critically meaningful for patients and healthcare providers. It provides a window of opportunity for treatment interventions to effectively disrupt the PU damage cycle allowing patients' skin to be rescued; this is the time difference between localised edema (Step 4) to tissue death (step 7). Treating localised oedema detected via SEM assessments therefore results in preventing later stage broken skin PUs.

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COI: Authors are employees of Bruin Biometrics, LLC

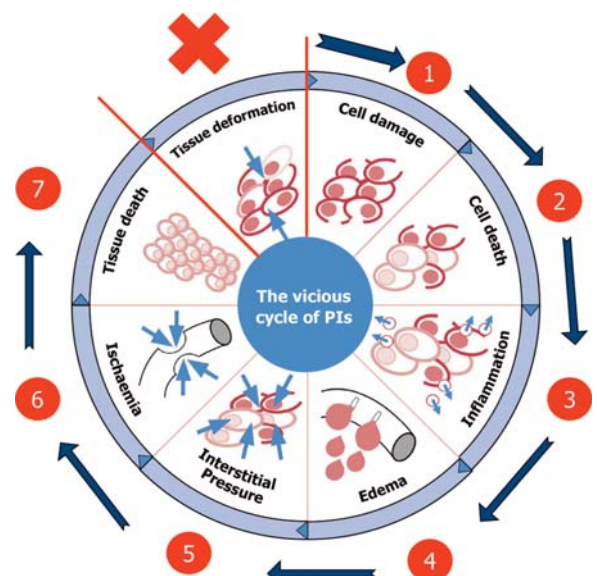


Figure 1: Cycle of Pressure Ulcers: Adapted from Gefen, A., et al. (2020). Update to device-related pressure ulcers: SECURE prevention. COVID-19, face masks and skin damage. (*Journal of Wound Care* Vol 29, NO 5, May 2020. Figure reproduced by permission of MA Healthcare Ltd.)

A.21

SUBEPIDERMAL MOISTURE: A TOOL TO CONSIDER IN THE PREVENTION OF PRESSURE ULCERS IN AN INTENSIVE CARE UNIT- PRELIMINARY DATA

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Introduction: The use of innovative methodologies that allow the early identification of patients at risk of developing pressure ulcers will allow allocating more resources and care time in their prevention, partly avoiding these lesions, allowing to reduce their incidence and consequent improvement of anticipatory care. **Objectives:** To evaluate the predictability of risk of developing PU comparing the subepidermal moisture and the Braden scale, monitor the risk factors for developing PU and the clinical characteristics of patients associated with each level of risk.

Methods: Correlational study, analyzing patients admitted to an intensive care unit in the north of Portugal. As exclusion criteria, it was considered the presentation of a Braden Score greater than 16; presence of PU in the sacrum and calcaneus, clinical presentation of the patient against indication for mobilization; patients with arterial insufficiency in the lower limbs.

A data collection instrument was created, where clinical variables are collected on the day of admission and every 5 days until the date of discharge. Based on the results and clinical characteristics, an intervention plan associated with the level of risk assessed by subepidermal moisture will be defined in a second phase. Data analysis will be descriptive and correlational. All ethical aspects were safeguarded with the users / family members and those responsible for the institution

Results: In the first 4 months, 277 patients were admitted, of which 9 had PU on admission and 23 developed PU in the ICU – incidence of 8.3%. The 1st PU was developed on average in 10.26 days, mostly in the sacrum region (26%). Of the 51 existing PU, 23.5% were Category I. Of the admitted patients, subepidermal moisture was evaluated in 33 patients. Although the risk score assessed by the SEM was higher accordingly to the Braden Scale, there is no statistically significant difference between the two assessments ($p=0.265$). Of the clinical characteristics verified, albumin values ($p<0.05$) demonstrate a statistically significant relation with the development of PU. The administration of norepinephrine has also been shown to potentiate the development of this type of lesions ($p<0.05$).

Conclusions: Although there is accord between increased risk through the Braden scale and SEM assessment, we still do not have statistically significant data to demonstrate this association. There are clinical characteristics and therapies associated with the critically ill that enhance the development of PU: albumin and norepinephrine.

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COI: No conflict of interests of any of the authors

A.22

TRENDS IN PRESSURE ULCER MANAGEMENT IN PORTUGUESE INTENSIVE CARE UNITS

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Introduction: Pressure ulcers (PUs) are a major concern in Intensive Care Units (ICUs), impacting patient outcomes and healthcare resources. They are indicators of care quality, influencing mortality, morbidity, and hospitalization duration, thus affecting patient well-being (1). Preventive and therapeutic strategies for PUs, focusing on risk prediction, are pivotal in nursing care, with multi-faceted programs showing effectiveness in incidence reduction (2). These include risk assessments, skin care, repositioning, and nutrition. Variability in implementation among nurses, influenced by time constraints, workload, and knowledge gaps, highlights the importance of consistent and informed intervention application (1,3,4).

Methods: This retrospective study examined ICU patient records from January 2017 to June 2023 to identify trends in PU prevalence and incidence. Utilizing a non-random convenience sample, patients with ICU stays over 24 hours and documented PU cases were included, while those with insufficient data were excluded. Ethical standards and necessary approvals were adhered to.

Results: Analysis of the 6.5-year period revealed 345 PUs, with an average prevalence of 6.81%, with the lowest prevalence recorded in 2022, at 3.48%, and the highest in 2020, at 11.0%. The average incidence was 3.76%, with a progressive reduction observed from 2017 to 2019 (4.39%, 4.64%, and 3.57%, respectively), a peak incidence in 2020 (5.71%), followed by a progressive decline from 2021 (2.80%, 2.69%, and 2.54%, respectively). On average, 72.2% of patients developed only one PU, with the lowest proportion recorded in 2023 (55.6%, n=5), and the highest in 2020 (92.9%, n=26). Risk assessment and pressure control were consistently implemented measures.

Conclusions: The fluctuating PU rates in the Portuguese ICU correlate with structural changes, particularly bed number increases in 2020, impacting workload and care complexity. Adherence to Directorate-General of Health (DGS) guidelines, including the Braden scale for risk assessment and enhanced skin care, has been central. Since 2021, the adoption of specialized intensive care mattresses has likely contributed to reduced PU occurrences. This study underscores the impact of structural adjustments, preventive measures, and evolving care practices on PU management in ICUs.

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COI: No funding

A.23**PRESSURE ULCER PREVENTION IN TERMINALLY ILL GERIATRIC PATIENTS UTILIZING SOFT SILICONE MULTI LAYERED DRESSINGS: A TWO CASE STUDY AT MAYAPADA HOSPITAL JAKARTA SELATAN, INDONESIA****Bramastha Rosadi¹, Shinta Hutajulu², Ika Dhanudibroto³**¹ Mayapada Hospital, Surgery, Jakarta Selatan, Indonesia² Mayapada Hospital, Intensive Care, Jakarta Selatan, Indonesia³ Mayapada Hospital, Cardiology, Jakarta Selatan, Indonesia

Introduction: Pressure ulcers remain a critical challenge in the care of terminally ill geriatric patients, contributing significantly to patient morbidity and healthcare costs. This report explores the use of soft silicone multi-layered dressings for pressure ulcer prevention through two detailed case studies conducted at Mayapada Hospital Jakarta Selatan, Indonesia.

Methods: A 93-year-old female patient with history of minimally consciousness state post hypoxic ischemic encephalopathy, history of non convulsive status epileptics, history of mix apnea and sepsis survivor. The second case, a 97-year-old female patient with terminal chronic obstructive pulmonary disease (COPD) and congestive heart failure with history of non hemorrhage cerebral vascular disease. Both patients were bedridden, with limited mobility and significant weight loss, placing them at high risk for pressure ulcers. A soft silicone multi-layered dressing was applied to their sacral areas, heels, and elbows. Despite being on a specialized mattress and receiving regular repositioning, these areas were identified as high-risk zones.

Result: Over a period of 6 months, the patient was closely monitored for signs of pressure ulcer development. The dressings were changed every seven to ten days or as needed based on their condition. No pressure ulcers developed during monitoring. The dressings were well tolerated, and no adverse reactions were noted. The patient's family and her caregivers reported that the dressings provided additional comfort and protection.

Discussion: The application of soft silicone multi-layered dressings in these two cases demonstrates their potential efficacy in preventing pressure ulcers in high-risk, terminally ill geriatric patients. These dressings provide a cushioning effect, redistribute pressure, and protect the skin from shear forces, which are critical in immobile patients. The positive outcomes in these cases align with existing literature, suggesting that these dressings can play a significant role in pressure ulcer prevention protocols.

Conclusion: Soft silicone multi-layered dressings appear to be an effective intervention for the prevention of pressure ulcers in terminally ill geriatric patients, as demonstrated by the positive outcomes in these two cases at Mayapada Hospital, Jakarta. These findings suggest that incorporating these dressings into routine care for high-risk patients may enhance patient comfort and reduce the incidence of pressure ulcers. Further research with larger sample sizes is warranted to confirm these benefits and to explore the cost-effectiveness of this intervention.

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A.24

SNOWED BODY MAPPING: CLINICALLY USEFUL OR AN EXPENSIVE NOVELTY?

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Introduction: Body maps are a commonly used recording system within the healthcare field. In particular, healthcare professionals (HCPs) are often reliant on body maps to record and monitor wounds such as pressure ulcers. NHS trusts commonly rely on paper body maps in order to record these wounds. We theorised that the use of paper body maps may limit linked-up care between different HCPs due to inaccuracies and ambiguity related to the current body map processes, and sub-optimal transfer of patient records related to pressure damage and ulcers. We proposed that the development of a digital record system for pressure ulcer monitoring with capabilities such as a SNOMED body mapping functionality would better enable a joined-up approach to pressure damage and ulcers.

Methods: In order to investigate this, we conducted a focus group with HCPs from NHS Wales, with a digital questionnaire and group interview session. The questionnaire focused on ascertaining the current methods used to record and monitor pressure ulcers, HCPs' opinions on how the current processes could be improved, and what functionalities should be included within a digital system. Questionnaire responses were anonymous.

Results: Eight respondents completed the digital questionnaire. A consistent theme within responses was the need for improvement specifically related to body mapping. Respondents reported a variety of "main problems" in the current system to record pressure ulcers, commenting on: the inconsistency due to different processes being used to record pressure ulcers dependent on the HCP; paper notes being "misfiled or not continued" resulting in inconsistency of care; and difficulties in recording "multiple pressure ulcers on the same location" on the same body map. A consistent theme was the need for improvement within the body mapping processes, specifically mentioning the need for "data standardisation such as SNOMED" and "structured data and body mapping". One respondent commented that previous attempts to introduce improvements or technology advances have been unsuccessful as "body maps are horrific".

Conclusion: The responses obtained confirmed a need for improvement in pressure ulcer monitoring processes, particularly within body mapping. HCPs expressed a need for better data standardisation and consistent processes. Our findings indicate that HCPs believe that digital body maps may provide improved pressure ulcer monitoring. These findings call for the development of standardised digitalised body maps, which may be achieved by integrating SNOMED CT to ensure precise and standardised clinical vocabulary and data. We aim to use these results to continue to develop a standardised digital body mapping system, which has scope for use within pressure ulcer monitoring, as well as within a widespread wound care setting.

A.25**PRESSURE ULCER MONITORING APPLICATIONS: INNOVATION, INTRODUCTION AND IMPLEMENTATION.**

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Pressure Ulcer Monitoring Applications: Innovation, Introduction and implementation.

Introduction: A criminal report, released in July 2015, highlighted gross negligence of geriatric patients with particular mention of the development of pressure ulcers (1). An estimated 90% of pressure ulcers are deemed preventable, yet they remain a widespread issue. It's estimated that just under half a million people in the UK will develop at least 1 pressure ulcer in any given year, and around 1 in 20 people who are admitted to hospital with a sudden illness will develop a pressure ulcer (2). Pressure ulcers in older patients are associated with a fivefold increase in mortality. Pressure ulcers in older patients are associated with a fivefold increase in mortality. As well as severe health implications for patients, pressure ulcers also are a significant financial burden to the NHS. Pressure damage costs the NHS more than £3.8 million every day (3). Poor monitoring of these pressure ulcers leads to the aforementioned issues and a rigorous and accurate way to document, monitor and alert clinicians should be introduced as the gold standard.

Methods: Hospitals in our institution document pressure ulcers using paper. If the pressure ulcer reaches grade 3 or above they will ask the medical photographer to take a picture and the next available opportunity. We introduced a novel monitoring application into wards in these hospitals

In the geriatric wards where this was introduced, over a six-month period we measured the number of pressure ulcers, grade of those pressure ulcers, clinician time on pressure ulcers, resources used on the pressure ulcers, litigation costs against the hospital and extra days spent in hospital due to the pressure ulcer.

These results were compared to previous known values for the hospital before the imaging software was introduced.

Results: At the time of writing these results are still being collected.

Preliminary findings are that the introduction of an electronic imaging software to map the ulcers reduces their progression through the stages, reduces the amount of clinician time overall spent treating PUs and increases patient satisfaction of their care.

Statistical analysis of this data will be completed in time for EPUAP 2024.

Conclusions: The introduction of an electronic imaging software onto nurses' handheld devices act as a beneficial tool for the monitoring and therefore the overall care of pressure ulcers. The focus of the industry is mainly aimed at wound surface area, time to complete closure and moisture levels within the wound however, these measures become irrelevant if HCPs miss pressure ulcers or poorly monitor them. This is the most crucial step and monitoring to the necessary gold standard if the pinnacle of PU care that must be upheld.

COI: £75,000 Fast start Innovate UK grant

£17,500 Innovation award Bristol University.

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A.26

WE CAN DO IT BETTER! HOW FOUR MEDICAL STUDENTS TOOK ON MULTI-MILLION POUND COMPANIES TO DELIVER A NOVEL PRESSURE ULCER MONITORING APPLICATION

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We can do it better! How a group of medical students beat multi-million pound companies to deliver a novel Pressure Ulcer Monitoring application.

Introduction: A group of medical students who were placed on geriatric wards found themselves saddened and confused by the treatment and monitoring of the pressure ulcers (PUs) their patients were suffering. They saw PUs missed, poorly documented and incorrectly treated. In their hospitals paper documentation was used to document these PUs and this led to mistakes, confusing handovers and missed PUs.

In the digital age there is no excuse to still be using pen and paper especially when it is leading to poorer outcomes for patients. Myself and three other medical students set about to design, create and implement a digital pressure ulcer monitoring tool to solve this problem.

Methods: We held focus groups with both clinical and non-clinical staff to understand why a solution to this hadn't been implemented before and what would need to be done for an application to be successful. We also spoke with industry leaders from across the globe for their insight.

Once satisfied we had the best solution. We then applied for Government led funding schemes and began commercial talks with large trusts.

Results: We have now built a PU monitoring tool which incorporates SNOMED body mapping, diameter and grade documentation tools, daily photos of the PUs and ability to 'scroll' back through previous images. It also alerts clinicians to PUs which are deteriorating.

We have won a total of £75,000 from both Government and University funding. Our company is a member of the NHS's renowned entrepreneur accelerator programme. We are now in commercial discussion with multiple trusts within the NHS.

Conclusion: To our knowledge this is the largest amount of funding ever received by a solely medical student owned company and it is the largest amount of funding secured by students to develop a tool for pressure ulcers. This stands us out as market and medical leaders in the pressure ulcer community.

It has shown that no matter who you are in the MDT, if you see a problem in the hospital, you can collaborate and work hard enough to design and implement the solution. We worked with all aspects of the hospital team to make sure that both the clinical team on the ground as well as the business leaders of the hospital would be happy with our solution which has given us a unique business and medical expertise and perspective.

We are proud of what we as medical students produced for the PU community and we hope to continue to strive for excellence in the care of those with PUs.

COI: £50,000 from Innovate UK

£17,500 from Bristol University

£15,000 from Innovate UK (Clinical trial pending loan)

A.27

REMOVING THE COMPLEXITIES ASSOCIATED WITH TRADITIONAL NEGATIVE PRESSURE WOUND THERAPY WHEN USING A BRIDGING TECHNIQUE

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Introduction: Traditional Negative Pressure Wound Therapy (tNPWT) is one of the most effective and widely used interventions for challenging wounds, across multiple indications [1], [2], [3]. In certain circumstances its application may require a technique termed 'bridging' [4], to prevent ulcerations caused by the NPWT delivery ports and tubing when positioning the device [4]. The primary objective of this survey was to explore health care professionals (HCP) opinions on two types of delivery ports ('hard port' and 'flexible port') which are used when applying tNPWT using a technique known as 'bridging'.

Methods: An anonymised survey of 200 HCPs in the United States was undertaken. All HCPs were identified as experienced in utilizing tNPWT and bridging. Questions focused on the need for bridging, alleviation of complexity in application and reducing concerns relating to medical device-related pressure injury (MDRPI), when applied to awkward anatomical areas.

Results: 75% (n=150) of HCPs agreed that the bridging technique makes tNPWT application slightly more challenging. Reasons included: additional time taken to apply (74%; n=148), increased dressing resource (67%; n=134) and additional staff required (50%; n=100). Over half (53%; n=106) agreed that the 'flexible port' can eliminate the need for bridging. Wound Specialists were significantly less likely to favour a 'hard port' (58%; n=116).

Conclusions: Overall HCPs preferred the 'flexible port' when using tNPWT. Further potential benefits of using a tNPWT 'flexible port' identified by HCPs included a risk associated with pain/pressure when applying a 'hard port' over a smaller wound size (29%; n=58) and certain anatomical areas which pose a risk of medical device related pressure injuries (MDRPI) and/or kinked/twisted tubing (31%; n=62) which may impact the delivery of NPWT.

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'Flexible port' RENASYS™ Soft Port, Smith and Nephew, Hull, UK

'Hard Port' SensaT.R.A.C.™ Pad, 3M, San Antonio, US

COI: Funded by Smith and Nephew

A.28

REVALIDATION OF A PERIOPERATIVE SKIN BUNDLE

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Introduction: The Operating Room (OR) is a high-risk environment for hospital-acquired pressure injuries (HAPI) due to patients' prolonged immobility and positioning on a relatively hard surface.^{1,2} In 2019, 38% of all HAPI at a 500+ bed teaching hospital were contributed to the OR. The 2019 Guidelines recommend considering expected surgical time and patient position in HAPI risk assessment and using soft silicone multi-layered foam dressings to protect high pressure areas.³

The purpose of this analysis was to test whether OR-related HAPIs could be reduced with perioperative HAPI risk screening tool which triggers an OR skin prevention bundle and soft silicone multi-layered foam dressings for at-risk surgical patients.

Methods: A pre/post-test design was used. The baseline period was 10/2019-9/2020 and the intervention period was 10/2020-9/2021. The Acero – Kurtz Perioperative Skin Bundle was implemented for all surgeries under general anesthesia. The bundle includes standard prevention measures and the application of a soft silicone multi-layered foam dressing. The bundle consists of six risk indicators requiring a yes/no response. Any 1 "yes" answer triggers OR standard prevention measures which include pre-surgical skin assessment, safe patient handling and use of positioning devices. Any 2 "yes" answers or 1 "yes" which is "repeated OR/surgery" during the same admission is a stand-alone criterion identifies the patient as high risk and triggered the use of a soft silicone multi-layered foam dressing in addition to the OR standard prevention measures. OR staff and nursing leadership were educated about the screening tool and HAPI prevention protocol. Statistical significance of pressure injury outcomes was determined using Fisher's Exact Test.

Results: 100% staff education attendance was achieved. Thirty-five surgical patients met the modified PRAMS criteria for high-risk and received OR skin bundle and prophylactic dressing. OR-related HAPI incidence was 0% compared to 1.9% in the baseline (p=.0001).

Conclusions: HAPI can be reduced with staff education and preventative care including prophylactic soft silicone multi-layered foam dressings triggered by an OR-specific risk screening process.

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COI: Lilibeth Acero is a paid consultant for Smith and Nephew and Mandy Spitzer is an employee of Smith and Nephew.

A.29

THE ROLE OF VALUE ANALYSIS IN PRESSURE INJURY PREVENTION: A QUALITY IMPROVEMENT PROJECT

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²

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Introduction: Global pressure injury statistics reveal that hospital-acquired pressure injuries (HAPIs) remain a substantial burden, with over one in ten hospitalized adults being affected.¹ PI are defined as an injury to the skin resulting from intense and/or prolonged pressure, or due to a combination of pressure and shear.²

The purpose of this analysis is to describe how the consistent collection, analysis, and use of data allows hospitals to validate their clinical and economic outcomes, and to adjust pressure injury prevention (PIP) strategies accordingly. This work recognizes the important role of Value Analysis Teams, which consider a variety of factors including clinical outcomes, product quality and comparisons, financial analysis, and education.³

Methods: HAPI incidence data for acute care patients at a 280-bed regional community hospital in West Virginia was collected during the time period evaluated. Soft silicone multi-layered foam dressings from three manufacturers were used between the time period of January 2012 – July 2023 and the outcomes evaluated. Average annual HAPI incidence was calculated retrospectively to allow comparison of outcomes during the time periods that various soft silicone multi-layered foam manufacturers were used. The data presented here demonstrates real-world evidence of HAPI incidence while utilizing various soft silicone multi-layered foam dressings as part of a PIP protocol.

Results: Annual averages show that the use of Dressing 1 resulted in 10.4 HAPI per year, Dressing 2 an average of 5.56 HAPI per year, and Dressing 3 an average of 26.29 HAPI per year. Additionally, an estimated sum of \$451,233 was saved when using Dressing 2 compared to Dressing 3, and \$105,449 saved during the use of Dressing 2 as compared to Dressing 1.

Conclusions: Monitoring data over time can validate product selection decisions to ensure they are advantageous to both costs and the delivery of quality care. Sharing of the data has led to hospital leadership and VAT support for investments in soft silicone multi-layered foam dressings as part of the broader PIP protocol.

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A.30

ENSURING COMPLIANCE: AUTOMATED EVIDENCE OF REPOSITIONING ON ACTIVE MATTRESS

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Introduction: Pressure injuries result from prolonged pressure on the skin, leading to reduced blood flow and subsequent tissue damage (1). Active mattresses, which help redistribute pressure and improve circulation, are commonly used to prevent these injuries (2). However, their effectiveness depends on regular patient repositioning (3,4,5,6). Despite recommendations from health organizations such as the National Institute for Health and Care Excellence (NICE) (4), the European Pressure Ulcer Advisory Panel (EPUAP) (1), and NHS England (6), consistent repositioning remains a challenge due to caregiver workload and compliance issues. This study investigates the use of history of use (HUS) reports from a novel active mattress (2), to monitor and ensure compliance with autofirm repositioning protocols, aiming to improve pressure injury prevention (6).

Methods: A case study approach was used involving a 75 kg mannequin placed on an active mattress. The autofirm repositioning mode (Figure 1) was activated every two hours with significant gaps during the night and weekends. The HUS report (Figure 2) logged a detailed record of compliance and non-compliance. The primary data source was the HUS report, which was analyzed to identify any gaps in care and areas for improvement in adherence to repositioning schedules.

Results: The results indicated that the HUS report effectively documented every instance where the autofirm repositioning mode was activated. Significant care gaps were also identified when the autofirm mode was not used, highlighting a deviation in care that could lead to pressure injuries (1,4,5,6).

Conclusions: The history of use (HUS) report is a valuable tool for monitoring and ensuring compliance with repositioning protocols on a novel active mattress. By providing a detailed log of repositioning activities, HUS reports help identify compliance issues and care gaps that can lead to pressure injuries. Regular review of these reports can enhance patient care by ensuring consistent repositioning, thereby preventing pressure injuries and improving overall outcomes in healthcare settings.

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COI: This research was undertaken as a case study by an Operations Director of a medical device manufacture. The study did not receive any additional funding from external sources, and there are no conflicts of interest to declare related to this research.

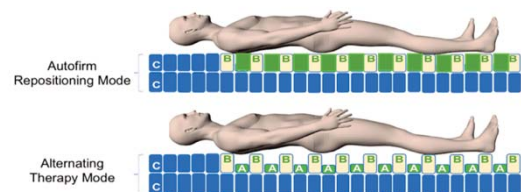


Figure 1. Autofirm (static) mode stabilizes the mattress making patient repositioning safer.

Figure 2. Green shading indicates adherence to the autofirm repositioning protocol every two hours. Yellow shading highlights deviations from the protocol for several hours.

History Of Use		
PUMP MODEL		8955A
PUMP SERIAL NUMBER		24A29287P P0372
DATE OF DOWNLOAD		13/06/2024
Event No	Event	Date & Time(UK GMT)
53	Power On	7/6/2024 11:4 38
54	Control Panel-Locked	7/6/2024 11:5 43
55	Alternating Mode-On	7/6/2024 11:31 11
56	Level 1	7/6/2024 11:31 11
57	Ready For Use	7/6/2024 11:31 11
58	Level 2	7/6/2024 12:34 32
59	Ready For Use	7/6/2024 12:34 32
60	Alternating Mode-On	7/6/2024 12:34 32
61	Control Panel-Unlocked	10/6/2024 7 46
62	Control Panel-Locked	10/6/2024 7 52
63	Control Panel-Locked	10/6/2024 7 52
64	Control Panel-Unlocked	10/6/2024 7:17 51
65	Alternating Mode-On	10/6/2024 7:17 53
66	Control Panel-Locked	10/6/2024 7:18 53
67	Control Panel-Unlocked	10/6/2024 9 6 53
68	Control Panel-Locked	10/6/2024 9 6 10
69	Control Panel-Locked	10/6/2024 9 8 10
70	Control Panel-Unlocked	10/6/2024 9:17 49
71	Alternating Mode-On	10/6/2024 9:17 51
72	Control Panel-Locked	10/6/2024 9:18 50
73	Control Panel-Unlocked	10/6/2024 11 8 45
74	Control Panel-Locked	10/6/2024 11 8 45
75	Control Panel-Locked	10/6/2024 11 8 46
76	Control Panel-Unlocked	10/6/2024 11:17 46
77	Alternating Mode-On	10/6/2024 11:17 47
78	Control Panel-Locked	10/6/2024 11:18 46
79	Control Panel-Unlocked	10/6/2024 13 7 26
80	Control Panel-Locked	10/6/2024 13 7 26
81	Control Panel-Locked	10/6/2024 13 8 27
82	Control Panel-Unlocked	10/6/2024 13:18 16
83	Alternating Mode-On	10/6/2024 13:18 17
84	Control Panel-Locked	10/6/2024 13:19 16
85	Control Panel-Unlocked	10/6/2024 15 12 52
86	Control Panel-Locked	10/6/2024 15 12 52
87	Control Panel-Locked	10/6/2024 15:13 53
88	Control Panel-Unlocked	10/6/2024 15:23 16
89	Alternating Mode-On	10/6/2024 15:23 16
90	Control Panel-Locked	10/6/2024 15:24 15
91	Control Panel-Unlocked	10/6/2024 17 7 47
92	Control Panel-Locked	10/6/2024 17 7 47
93	Control Panel-Locked	10/6/2024 17 8 48
94	Control Panel-Unlocked	10/6/2024 17:17 46
95	Alternating Mode-On	10/6/2024 17:17 47
96	Control Panel-Locked	10/6/2024 17:18 46
97	Control Panel-Unlocked	11/6/2024 7 58
98	Control Panel-Locked	11/6/2024 7 8 38
99	Control Panel-Unlocked	11/6/2024 7 8 40
100	Control Panel-Locked	11/6/2024 7 8 40
101	Control Panel-Locked	11/6/2024 7 10 56
102	Autofirm Mode-Auto Off	11/6/2024 7:30 0
103	Alternating Mode-On	11/6/2024 7:30 0
104	Control Panel-Unlocked	11/6/2024 9 7 55
105	Control Panel-Locked	11/6/2024 9 7 55
106	Control Panel-Locked	11/6/2024 9 7 55
107	Autofirm Mode-Auto Off	11/6/2024 9 8 56
108	Alternating Mode-On	11/6/2024 9 8 28 29
109	Control Panel-Unlocked	11/6/2024 11 7 37
110	Control Panel-Locked	11/6/2024 11 7 37
111	Control Panel-Locked	11/6/2024 11 8 37
112	Autofirm Mode-Auto Off	11/6/2024 11:28 12
113	Alternating Mode-On	11/6/2024 11:28 12
114	Control Panel-Unlocked	11/6/2024 13 7 5
115	Control Panel-Locked	11/6/2024 13 7 5
116	Control Panel-Locked	11/6/2024 13 8 6
117	Alternating Mode-On	11/6/2024 13:27 31
118	Autofirm Mode-Auto Off	11/6/2024 13:27 31
119	Control Panel-Unlocked	11/6/2024 15 7 57
120	Control Panel-Locked	11/6/2024 15 7 57
121	Control Panel-Locked	11/6/2024 15 9 6
122	Autofirm Mode-Auto Off	11/6/2024 15:28 23
123	Alternating Mode-On	11/6/2024 15:28 23
124	Control Panel-Unlocked	11/6/2024 17 7 22
125	Control Panel-Locked	11/6/2024 17 7 22
126	Control Panel-Locked	11/6/2024 17 8 22
127	Autofirm Mode-Auto Off	11/6/2024 17:27 47
128	Alternating Mode-On	11/6/2024 17:27 47
129	Control Panel-Unlocked	13/6/2024 10 2 11
130	Control Panel-Locked	13/6/2024 10 2 11
131	Control Panel-Locked	13/6/2024 10 3 12

A.31

ACTIVE MATTRESS USE SIGNIFICANTLY ENHANCES, ENDOTHELIAL FUNCTION AND RESTING BLOOD FLOW TO THE SKIN.

Gary Baker¹, Saul Bloxham¹

¹ Marjon Sport & Health Centre, Sport & Health Sciences, Plymouth, United Kingdom

Introduction: Endothelial dysfunction, a significant contributor to cardiovascular conditions, plays a critical role in the development of pressure injuries (1,2,3,4). Studies indicate that endothelial function is significantly worse in individuals with a history of pressure injuries (2). This study aims to investigate whether eight weeks of active mattress use, which has been shown to reduce the incidence of pressure injuries, can improve endothelial function.

Methods: Participants resting blood flow (RBF), and endothelial function (measured using post-occlusive reactive hyperemia - PORH) (Fig 1), were assessed at:

- Baseline (Week 0)
- After 8 weeks of active mattress use
- After an 8-week washout period (Week 16)

The study included 10 healthy individuals (4 males, age 52.7±8.5 years; 6 females, age 51.8±17.5 years).

Results:

- Resting Blood Flow (RBF): Increased by 336% (24.3±38.3 to 106.0±100.3 perfusion units, $p=0.021$) (Fig 2).
- Endothelial Function (PORH): Improved by 197% (13,456±10,225 to 40,252±23,995 perfusion units x seconds, $p=0.003$).

Conclusions: Eight weeks of active mattress use significantly improved endothelial function and resting blood flow in the skin, demonstrating notable enhancements in skin function and health and highlighting their potential in reducing pressure injuries. Future research should explore the additional benefits of active mattresses in managing endothelial dysfunction and related disorders.

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COI: Gary Baker, was paid to go to University of St Mark & St John Plymouth, by his employer Squirrel Medical, however the research was published by the University of St Mark & St John. <https://marjon.repository.guldh.ac.uk/id/eprint/1749>

Fig 1. Participant during post-occlusive reactive hyperaemia (PORH) testing, showing combined laser Doppler skin blood flow and temperature (LD/T) probes (A and B), pressure cuff (C), and the Laser Doppler monitor and pressure cuff controller (D), Laptop PC (E) for control of D, data acquisition and PORH analysis.

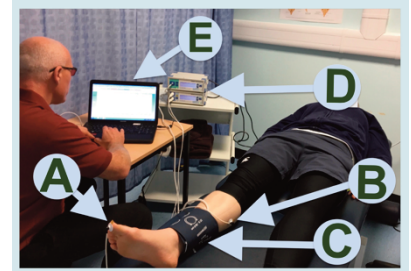
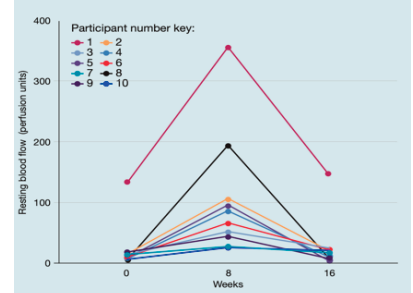


Fig 2. Schematic description of the analysis resting blood flow (perfusion units). All participants experienced an increase in resting blood flow following the use of the active mattress ($p=0.021$) and returned to near baseline (p -value was non-significant)



A.32

WOUND CARE PATIENTS' SATISFACTION ON E-HEALTH

Abdulaziz Binkanan¹¹ Ministry of Health, Saudi Arabia

Introduction: E-health has a vital role in the healthcare system generally. Implementing E-health in wound care to facilitate and ease the process to services accessibility especially when it comes to patient needs and satisfaction.

Methods: The aim is assessing wound care patients' satisfaction on E-health. This prospective multi-center study has 2775 patients who agreed to participate. All participants have one or more wounds limited to pressure ulcer/injury (PU/PI), diabetic foot ulcer (DFU) and surgical site infection (SSI). Participants received full wound care services through E-health including but not limited to dressing materials requests, appointments scheduling, wound pain related issues and requesting dressing changing.

Results: E-health is used widely in the current era and it's crucial to meet patient expectation needs. 88% of the patients were totally satisfied and comfortable with e-health service in wound care while 8% were totally unsatisfied. Moreover, 64% believed e-health should be used more widely in healthcare facilities.

Conclusions: Patients satisfaction is a major component of every facility. E-health proof that patient satisfaction can be reached in wound care and a positive outcome can be noticed.

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COI: No conflict of interest

A.33

ASSESSMENT OF ORGANISATIONAL COMMITMENT AND TURNOVER INTENTION AMONG WOUND CARE STAFF

Abdulaziz Binkanan¹¹ Ministry of Health, Saudi Arabia

Introduction: The global strategy on human resources for the health workforce projected a global shortage of 18 million health workers by 2030. A major contributing factor to the shortages seen in the health workforce is employee turnover. The turnover of healthcare staff, including wound care professionals, is a critical concern in global healthcare sector. This study aimed to assess organizational commitment and turnover intention among wound care professionals.

Methods: A descriptive cross-sectional survey was conducted among wound care professionals using an online self-administered questionnaire and a total of 133 responses were returned and analysed.

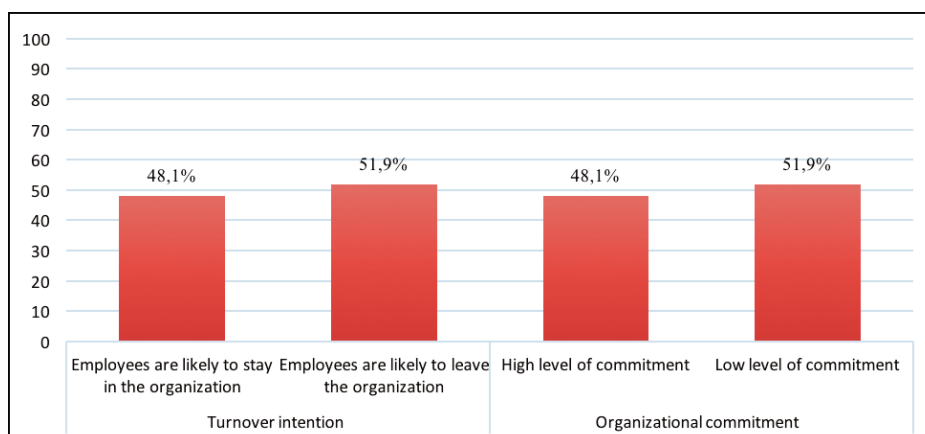
Results: The mean score of the organizational commitment was 50 ± 7.2 with more than half of the study candidates having a low level of commitment (51.9%-n=69). The mean total score of the turnover intention scale among the participants was 18.7 ± 3.3 , with more than half of the participants indicating a likelihood of leaving the organization. Further, 13.5% of the participants had always considered leaving their jobs, and 29.3% had always dreamed about getting another job that would better suit their needs. Sociodemographic factors such as gender, profession, and nationality emerged as significant predictors of both organizational commitment and turnover intention.

Conclusions: While participants demonstrate a moderate level of commitment to their organizations, the high prevalence of turnover intention signals potential challenges in retaining skilled wound care professionals. These findings emphasize the importance of understanding employee attitudes, intention and concerns in healthcare settings to foster a supportive work environment and promote staff retention. By understanding that, healthcare organizations can create a more resilient workforce and ensure the delivery of high-quality patient care.

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COI: No conflict of interest



A.34

A SYSTEMATIC REVIEW OF THE IMPACT OF CARE BUNDLES ON THE INCIDENCE OF PRESSURE ULCER AMONG AT RISK OLDER ADULTS

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Introduction: Care bundles augment clinical outcomes when used regularly with reliable interventions that define a standard of care, which leads to adequate and efficient treatment, and control of infections (Lavallée et al., 2017).

Methods: A systematic review was conducted including the following databases: Cochrane Central Register of Controlled Trials (CENTRAL) (The Cochrane Library) (latest issue), Ovid MEDLINE (1946 to August 2023), Ovid EMBASE (1974 to August 2023), EBSCO CINAHL Plus (1937 to search August 2023), PubMed, Scopus.

Two reviewers out the searching, screening, and extraction of data, excluding all possible biases and including an evidence-based high-quality appraisal and synthesis of all data extracted.

Results: The search strategy identified 1642 citations of which six met the set inclusion and exclusion criteria. Four studies were carried out in America and two in Sweden in a variety of settings. Six of the included studies identified that there was a direct relationship between the use of care bundles and the reduction in the incidence of pressure ulcers in older adults in all studies.

Conclusions: This systematic review highlights the connection between care bundles and the reduction of the number of pressure ulcers in the older adult population (≥ 65 years). Further studies are justified given that care bundles can reduce the incidence of pressure ulcers which can occur easily in older adults due to the nature of their frail skin, increased age, and medical status.

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COI: This project received financial support from the Royal College of Surgeons in Ireland Strategic Academic Recruitment (StAR) programme.

A.35

THE IMPACT OF CHEMOTHERAPY ON PRESSURE INJURY HEALING IN SPINAL CORD INJURY PATIENTS

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Introduction: Pressure injuries significantly impact the quality of life and rehabilitation outcomes for spinal cord injury (SCI) patients. Cancer treatment, especially chemotherapy, can cause various side effects that further reduce patients' quality of life. This study analyzes the pressure injury healing process in a SCI patient who underwent chemotherapy following a breast cancer diagnosis.

Methods: A 49-year-old female was diagnosed with spinal cord injury (SCI, AIS-B) following a traffic accident in June 2018. She developed stage 4 sacral and stage 3 bilateral ischial pressure injuries due to prolonged sitting, and began treatment in April 2020. In April 2021, she was diagnosed with stage 3 left breast cancer and started neoadjuvant chemotherapy while continuing pressure injury treatment. The chemotherapy regimen included Adriamycin, Cyclophosphamide, and Docetaxel, administered over eight sessions in six months. To prevent the worsening of the pressure injuries, the support surfaces were changed, sitting time was reduced, and negative pressure wound therapy (NPWT) was applied to the pressure injuries.

Results: Despite proactive pressure injury prevention efforts, chemotherapy delayed wound healing. The size of the pressure injuries did not change during the chemotherapy period. Chemotherapeutic agents such as Adriamycin and Cyclophosphamide significantly impact wound healing due to their cytotoxic effects on rapidly dividing cells like fibroblasts and keratinocytes. Adriamycin inhibits keratinocyte mitosis and reduces collagen synthesis, while Cyclophosphamide hinders vasodilation and neovascularization during the proliferative phase of wound healing. Twenty-two months after the completion of chemotherapy, the sacral pressure injury had completely healed, but the bilateral ischial pressure injuries showed repeated cycles of improvement and deterioration.

Conclusions: This study demonstrates the impact of chemotherapy on the healing process of pressure injuries in SCI patients. Chemotherapy acted as a major factor in delaying wound healing. While the sacral pressure injury fully healed 22 months after the completion of chemotherapy, the bilateral ischial pressure injuries continued to show variability. These findings indicate that chemotherapy can negatively affect pressure injury healing, emphasizing the need for heightened attention to pressure injury management and prevention in SCI patients undergoing chemotherapy. Further research is needed to analyze the factors and challenges that hinder pressure injury healing in these patients.

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COI: Please declare any funding of the research by industry here

A.36**THE ROLE OF THE SPECIALIST NURSE THROUGH THE USE OF SPECIAL DRESSINGS, IN THE MANAGEMENT AND TREATMENT OF PRESSURE WOUNDS. THE IMPORTANCE OF BLOODLESS DEBRIDEMENT****Marios Vasileiou¹**¹ Cyprus Wound Management Society, Nursing, Frenaros, Cyprus

Introduction: The management and treatment of pressure wounds is an imperative in the health field. The expertise of health professionals in this field, especially nurses, is of great importance in reducing the effects of these wounds. The participation of the nurse as a member of the interdisciplinary team is an important factor in the adequate treatment of wounds.

Methods: The aim is to present the importance of managing wound exudate and complications, through the use of appropriate dressings and bloodless surgical debridement, by the specialist nurse. Case studies will be presented through photos and videos of various types of wounds.

Results: Rehabilitation and complete healing of the wounds of the cases that will be presented, where the specialized nurse with the correct evaluation of the viability of the tissues and with the use of special dressings contributes to the healing of the wounds.

Conclusions: People who develop pressure ulcers or other types of wounds suffer physically, psychologically and financially. Health professionals, and especially specialized nurses, can reduce these effects through correct clinical practice and their participation as a member of the multidisciplinary team.

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COI: NO

A.37

EVALUATING THE IMPACT OF A TRUE FULLY AUTOMATIC DYNAMIC SUPPORT SURFACE ON PRESSURE ULCER MANAGEMENT WITHIN LONG TERM CARE SETTING

Ross Joannides¹

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A 4 week study involving 8 residents with multiple complex health profiles, including incontinence, immobility, and a history of pressure ulcers. Over a four-week period, the research assessed outcomes related to pressure ulcer healing rates, incidence of new ulcer formation, and resident-reported comfort levels due to ongoing compliancy issues with residents using dynamic air support services.

The comfort settings were set to resident's needs. Throughout the four-week period, the support surface remained in alternating mode, with comfort settings adjusted as needed. This was verified by the systems unique tracking download system which provided evidence of how long the mattresses were in alternating mode over the four week period.

Eight residents, including three with pre-existing pressure ulcers, participated. Weekly assessments using standard grading scales tracked pressure ulcer status. Feedback from residents and caregivers on comfort, ease of use, and well-being improvements were collected. The study monitored any new pressure ulcers, changes in existing conditions, providing valuable insights into resident outcomes

Results:

- Pressure Ulcer Healing: 75% (6 out of 8 residents) showed improvement or remained stable. Specifically, among the subgroup with existing pressure ulcers, 66% (2 out of 3 residents) exhibited healing.
- A minimal incidence (12.5%) of new ulcers was reported, with only (1 resident) experiencing deterioration.
- Comfort : All residents rated the support surface 9 out of 10, with unanimous approval for the pumps, quiet operation.
- Clinician Feedback: unanimously found the pump easy to use, easy to maintain. Reported that amongst those able to exit the bed, all found it easier to do so.
- The low profile cell design met the IEC 60601-2-52 bed standard. The system ensured that 22cm(220mm) above the support surface of the mattress delivered compliance and more importantly resident safety compared to the traditional deep cell dynamic air cells.

Conclusions: Traditionally, active support surfaces required manual adjustments by clinicians based on the resident's weight.

The automatic support surface addresses these challenges with an automatic adjustment algorithm, ensuring optimal pressure distribution and comfort without manual intervention. This small study further confirms the support surface's effectiveness in managing pressure ulcers and enhancing resident comfort.

In this study, the automatic dynamic air support surface showed promising results in managing pressure ulcers and enhancing resident comfort in complex long term care settings. With 75% of residents exhibiting healing or stable conditions and minimal incidence of new ulcer formation (12.5%), the support surface proved effective in preventing further deterioration whilst ensuring compliancy with the IEC60601-2-52 regulations. Additionally, residents rated the support surface highly for comfort, highlighting its positive impact on well-being.

A.38

USE OF FINITE ELEMENT ANALYSIS MODELLING TO ASSESS TISSUE STRAINS ASSOCIATED WITH TWO DIFFERENT NASOGASTRIC TUBE SECUREMENT DEVICES.

Amy McNulty¹, Robert Wilkes², Kimberly Schommer², James Sieracki²

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2 Solventum (previously 3m), medical affairs, Minneapolis, United States

Introduction: Medical device-related pressure injuries are recognized as a significant clinical problem and have been described by Pitman and Gillespie in 2020.¹ Nasogastric tube (NG Tube) usage can lead to significant pressure injury. Some NG tube securement devices (NGTS) on the market are bulky and composed of hard plastic components. Recently a new device without hard components believed to reduce the risk of pressure injury became available. The current study assessed the differences in strain profiles for two NGTS using a finite element analysis (FEA) to measure strain and deformation occurring at the NG Tube - tissue interface.

Methods: Two different NGTS with hard components,* or without hard components,† were modelled. FEA models of the devices were based on device mechanical test data as well as clinically relevant placements and wear of the devices. Peak strain values were determined by modelling of different scenarios whereby the tubing is moved during wear.

Results: The FEA modelling showed peak strains ranging from 51 – 529% for the 2 NGTS depending on how the tubing was situated. The peak strain was always higher for the hard plastic device. For example, when the tube was hanging from the devices, the weight of the NG tube was associated with 51 and 529% peak tissue strain for the soft vs device with hard plastic, respectively. If the NG Tube was tugged to the right, the peak tissue strain for the soft vs device with hard plastic was 55 vs 337%, respectively.

Conclusions: NGTS may, in certain instances, be related to pressure injury. Therefore, it is important to choose the best product for the intended job while providing the least potential damage to the tissue. The NGTS without any hard components may provide an important option for the reduction of pressure injury during normal usage.

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*Hollister Feeding Tube Attachment Device, †3M™ Nasogastric Securement Device

A.39

DIMINUTION DU TAUX D'ESCARRES, UNE DÉMARCHE PROACTIVE!

Mendes Fernando¹, **Hamonic Gwenaëlle**¹, Scascighini Matteo¹, Sechet Véronique¹, Bariatti Léa¹

¹ Centre Hospitalier Universitaire Vaudois, Switzerland

Introduction : Malgré le programme institutionnel de prévention des escarres, un audit réalisé en novembre 2022 dans un service de traumatologie d'un hôpital universitaire suisse a révélé une prévalence élevée de 25%. Patientèle âgée de plus de 65 ans issue de la filière ortho-gériatrique, ainsi que des polytraumatisés présentant des comorbidités, le risque de développer des escarres est élevé. La rotation élevée du personnel post-pandémie de COVID et le manque de spécialistes dans la gestion des escarres ont privé le service de ressources clés pour une prise en soins efficace de cette complication. Les délais d'attente opératoire exposent les patients à des périodes d'immobilisation prolongées, aggravées par des mobilisations préventives douloureuses et une gestion sous-optimale de la douleur. Ces facteurs, combinés à d'autres contraintes opérationnelles, contribuent à maintenir un taux élevé d'escarres dans le service.

Methods : Face à cette situation préoccupante, l'équipe d'encadrement (EE) des soins a mis en œuvre un plan d'action visant à identifier les facteurs de risque identifiés et à améliorer la prévention et la gestion des escarres. Une analyse systémique a été entreprise sur le modèle du London Protocole, suivie du développement d'un plan d'action pluridisciplinaire. Des experts ont été sollicités, des référents qualifiés et du matériel de soins ont été réintroduits pour renforcer l'intégration du programme institutionnel basé sur les recommandations internationales. Des supervisions et formations basées sur des données probantes ont été mises en place pour assurer une gestion efficace et pérenne de ce risque.

Results : Des audits ont été réalisés tous les 2 mois en 2023, puis 4 fois par année dès 2024, se focalisant sur l'évaluation clinique, la perception de l'infirmière sur le risque et la documentation dans le dossier informatisé. En juillet 2023, le taux d'escarres nosocomiales a diminué à 13%, puis à 8,7% en septembre 2023. Une légère augmentation a été observée en novembre 2023 et mars 2024 avec respectivement 9,8% et 10,5% de prévalence d'escarre.

Conclusions : Malgré les mesures mises en place et les résultats encourageants, des défis persistent, notamment la collaboration en termes de dépistage, suivi et traitement avec les urgences et les chirurgiens. Cette démarche nécessite une approche holistique, tenant compte de l'ensemble du parcours de soins du patient. Une régularité dans les audits et un rappel des bonnes pratiques sont essentielles pour assurer une évaluation rigoureuse des pratiques et une adaptation continue du programme. La collaboration avec toutes les parties prenantes, y compris les patients, est indispensable pour améliorer la prévention et la gestion des escarres. En adoptant une approche collaborative intégrant toutes les dimensions du parcours de soins, le personnel soignant sera mieux armé pour surmonter les défis persistants.

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B.1

EVALUATING THE PREDICTIVE VALIDITY OF A PRESSURE ULCER RISK ASSESSMENT SCALE FOR ELDERLY INPATIENTS IN TERTIARY HOSPITALS.

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Introduction: The purpose of this study was to evaluate the predictive validity of the Braden scale for pressure ulcer risk assessment in elderly inpatients at tertiary general hospitals and to identify an optimal cut-off point.

Methods: This study enrolled 151 subjects selected from elderly inpatients aged 65 or older who were hospitalized from January 1, 2021 to December 31, 2021 in a tertiary hospital without pressure ulcers on admission and who stayed in the intensive care unit (ICU) during hospitalization.

Results:

1. Eight of 151 subjects developed a pressure ulcer, leading to a pressure ulcer incidence of 5.3%.
2. There were significant differences in the general characteristics of groups with and without pressure ulcers as follows: average BMI and diabetes. Among the treatment-related characteristics of subjects, there was also a significant difference in length of ICU stay and length of hospital stay. Even though there was no difference between the two groups in the total Braden scale score on admission, there was a significant difference in activity subscale score. There was a significant difference between the two groups in the last total Braden scale score obtained before pressure ulcers, and there were also significant differences in the subscales: activity, mobility, and friction/shear.
3. Braden scale score AUC was .713 (95% CI: .527 to .899) on admission and .849 (95% CI: .720 to .978) on last score obtained before pressure ulcer. Thus, the predictive validity of the Braden scale was moderate in terms of accuracy. In order to determine the optimal cut-off point, the sensitivity and negative predictive value were compared for each cut-off point. When the cut-off point for last Braden scale score obtained before pressure ulcer was set to 17 points, the sensitivity, negative predictive value, and Youden index were computed to be .75, .98, and .56, respectively, which were highest.

Conclusions: The predictive validity of the Braden scale was identified to be moderate in terms of accuracy. When the cut-off point was set to 17 points, the sensitivity, negative predictive value, and Youden index were .75, .98, and .56, respectively, which were highest.

It is expected that the accuracy of selection of patients at high risk of pressure ulcer would be improved by applying the Braden scale and cut-off point validated in this study to elderly inpatients without pressure ulcers on admission to tertiary general hospitals who stayed in the ICU during hospitalization.

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B.2

AN EVALUATION OF COVID-19 ISOLATION EFFECTS ON PRESSURE SORE IN A TERTIARY HOSPITAL

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Introduction: The management of pressure sores can have various environmental effects. COVID-19 infection requiring hospitalization in the intensive care unit for long time in some cases. Its high pandemic characteristics, special required protective equipment make physician difficult to wound management. In this study, we compared the pressure ulcer characteristics in COVID-19-isolated patients with non-COVID-19 patients and evaluated the actual effect of isolation on pressure sore.

Methods: From November 2022 to February 2023, patients who had pressure sores were included and medical chart was reviewed retrospectively. The experimental group denoted patients who confirmed COVID-19 infection and received clinical treatment in isolated unit. Characteristic of wound in each group and risk factor were analyzed.

Results: Fifty-four COVID-19 isolation patients and 58 control patients were included. There was no significant difference in Braden Scale score and Korea patient classification system-1 between two groups. However, Grade I pressure sore in COVID-19 isolation group showed significantly lower than control ($p < 0.001$). Also, the number of lesions was significantly higher than the control group ($p = 0.034$). The mortality rate of the COVID-19 isolation group was higher than control ($p = 0.008$), and more patients were discharged with unhealed wounds ($p = 0.004$).

TABLE 4 Comparative analysis of risk of pressure sore between two groups.

		COVID-19 isolation		Total	p-Value
		Yes	No		
Activity, N (%)	Bed restoration	39 (72.2)	31 (53.4)	70 (62.5)	0.062
	Walk occasionally	5 (9.3)	17 (29.3)	22 (19.6)	
	Walk frequently	1 (1.9)	1 (1.7)	2 (1.8)	
	Chair restoration	9 (16.7)	9 (15.5)	18 (16.1)	
Nutrition, N (%)	Poor	19 (35.2)	22 (37.9)	41 (36.6)	0.763
	Adequate	35 (64.8)	36 (62.1)	71 (63.4)	
	Excellent	0 (0.0)	0 (0.0)	0 (0.0)	
Wound moisture, N (%)	Humid	14 (25.9)	15 (25.9)	29 (25.9)	0.993
	Occasionally humid	35 (64.8)	38 (65.5)	73 (65.2)	
	Rarely humid	5 (9.3)	5 (8.6)	10 (8.9)	
Perception, N (%)	Very limited	27 (50.0)	24 (41.4)	51 (45.5)	0.485
	Slightly limited	20 (37.0)	22 (37.9)	42 (37.5)	
	No impairment	7 (13.0)	12 (20.7)	19 (17.0)	

	COVID-19 isolation		Total	p-Value
	Yes	No		
Healed, N (%)	19 (35.2)	34 (58.6)	53 (47.3)	0.013
Discharge, N (%)	20 (37.0)	16 (27.6)	36 (32.1)	0.285
In care, N (%)	0 (0.0)	3 (5.2)	3 (2.7)	0.244
Expire, N (%)	15 (27.8)	5 (8.6)	20 (17.9)	0.008*

* $p < 0.05$.

TABLE 5 Comparative analysis of results of management between two groups.

Conclusions: In our comparative COVID-19 isolation and control group pressure sore study, there was no significant difference of disease severity score between the two groups. However, in the COVID-19 isolation group, the grade of pressure sore that was first detected was higher than control group and the number of lesions is more than control group.

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B.3

EFFECT OF A TEAM APPROACH TO PRESSURE INJURY MANAGEMENT OVER 5 YEARS IN A TERTIARY HOSPITAL

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Introduction: The authors' facility established a novel integrated wound care team (IWCT), which included the implementation of a strict treatment algorithm by the patients' attending providers and a specialized wound care team led by a plastic surgeon. Investigators then retrospectively analyzed clinical outcomes of pressure injury (PI) management by the IWCT over 5 years.

Methods: The authors performed a retrospective chart review and periodic statistical analysis of the data for all patients with PI referred to the IWCT in the authors' center from May 2015 to April 2019. Data including patients' demographic information, first and last consultation dates, referring department, PI stage, site of PI, and Braden Scale scores were collected and analyzed.

Results: Patients (N = 15,556) did not differ significantly in age, sex, or Braden Scale score. A preimplementation/postimplementation analysis of PI data before and after establishing the IWCT showed that the incidence of stage 3 or 4 PIs had significantly decreased during the study period (19.1% vs 15.2%, $P < .05$). Conversely, the incidence of stage 1 PIs significantly increased in the same period (38.0% vs 57.4%, $P < .05$). The proportion of completely healed PIs also increased, and the median treatment period was significantly shortened ($P < .05$).

Conclusions: This novel IWCT implemented in a tertiary hospital setting demonstrated significantly positive effects on the PI management and outcomes. An increase in early-stage PI detection and a decrease in rate of serious, late-stage wounds suggest a powerful impact on affected patients. Early specialized consultation and preemptive treatment planning may increase overall wound healing and shorten PI healing intervals.

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Figure 1. CONSORTIUM OF NEW INTEGRATED WOUND CARE TEAM

Three main provider types collaborate in this approach: the patient's attending providers, the wound care nurse, and the department of plastic surgery.

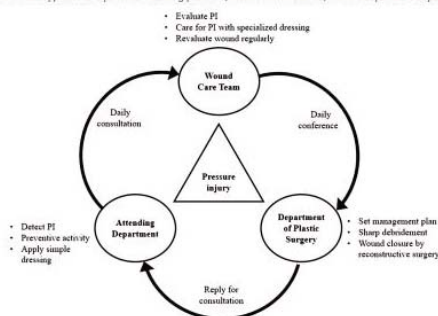
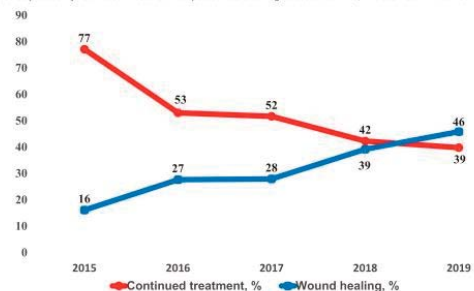


Figure 5. ANNUAL TREND OF WOUND HEALING

Proportion of completely healed pressure injuries and continued treatment period. Wound healing increased over time, whereas the continued treatment period decreased.



B.4

THE CHALLENGES WHEN INTRODUCING A NEW MATTRESS SYSTEM INTO A LARGE MULTI-SITE ACUTE HOSPITAL TRUST

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Introduction: With the aim of standardising practice, reducing the incidence of Pressure Ulcers (PU's) whilst also enabling cost effective care it was decided to implement a "Hybrid" led approach. Following a successful implementation at one of the hospital sites the rollout across the two remaining locations was possible.

Hybrid support surfaces combine foam and air to maximise the benefits offered by both static and alternating surfaces. As discussed by Ellis (2016), they simplify choice, and are more suitable across a much broader range of patients.

At the start of the process concerns were raised with an identified resistance to change to the new mattress; inspections also showed some user errors and training needs.

Resistance to change can occur due to fears about adapting to and coping with new methods. As demonstrated by Lumbers (2018), this is where change models and leadership are important.

Methods: To ensure the mattress was used effectively and appropriately, the tissue viability service and supplier utilised a collaborative approach. The issues and concerns were assessed and a robust plan put into place.

This included:

- Vision and benefits were frequently communicated with engaging and inspiring messages.
- Training and support was provided with a structured and meaningful basis, these were regularly reassessed and adapted as appropriate.
- Resources were reviewed, updated and disseminated, these included:
 - Information brochures.
 - Patient scenarios / training tools.
 - Trouble shooting / hints and tips guides.
 - A self-assessment competency tool
 - Staff questionnaire.

Results: During the implementation preprogramme it was imperative to identify the causes of resistance or concern. By understanding the reasons behind the resistance, it was possible to tailor the communication and intervention accordingly.

One of the most important steps in overcoming resistance and achieving effective outcomes was communicating the vision and benefits of change clearly and consistently. By monitoring and evaluating the change, it was possible to assess its effectiveness and value, and make any necessary adjustments or corrections.

Conclusions: As demonstrated by NHS England, (2018), managing and implementing changes within the NHS is not easy. Change management requires well-developed leadership and management skills (Marquis and Huston 2000).

The introduction of the new mattress system, had its challenges but by working collaboratively with the supplier the issues and concerns were effectively managed to enable an effective outcome. By reassessing educational approaches used to support staff in learning new skills, and recognising the impact of change on behaviours, effective use of, and confidence in the mattress system improved.

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COI: Support was provided by DHG with the development and printing of the guidelines

B.5

THE IMPACT OF THE SPECIALIZED WOUND CARE NURSING TEAM ON PRESSURE INJURY-RELATED STRESS AND BURDEN AMONG WARD NURSES

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Introduction: Ward nurses suffer from workload and burden when caring for patients with Pressure Injury or those at risk of Pressure Injury. This is because pressure injury dressing or preventive care takes a long time, and ward nurses experience stress as patients can develop or worsen pressure injuries. A team was formed to effectively manage and prevent Pressure Injury patients and reduce nurses' workload. A total of four nurses, including one certified wound care nurse and three others, formed a team specializing in wound care to treat and prevent pressure injuries in inpatients on both weekdays and weekends. Therefore, the purpose of this study was to investigate the effect of the specialized wound care nursing team on the pressure injury-related stress and burden among ward nurses.

Methods: In a single institution, a total of 130 nurses from 12 wards were surveyed and compared through questionnaires in August 2021 and three months later, before the specialized wound care nursing team began operating. (A total of 20 questions, with 10 related to stress and 10 related to workload)

Results: After the specialized wound care nursing team began operating, ward nurses' work stress related to pressure injuries decreased by approximately 14.6%, and workload related to Pressure injuries decreased by about 18.6%.

Conclusions: Ward nurses' work stress and workload related to pressure injuries decreased significantly. Therefore, the specialized wound care nursing team not only reduces the burden of nurses' work related to pressure injuries but also efficiently manages pressure injury patients.

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COI: No of any relevant conflicts of interest.

B.6

EFFSCAR.1 EFFECTIVENESS AND CONTEXT OF USE OF AUTOMATED LATERALIZATION DEVICES IN PRESSURE ULCER CARE : A TIME-MOTION STUDY

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Introduction: One of the main predictors of pressure injuries is exposure to pressure and shear forces due to immobilization (1). Consequently, professionals aim to reduce the intensity and duration of exposure to these forces by regularly mobilising the person and distributing their support (2).

As part of pressure ulcer care, professionals can use automated lateralization devices. They are used to support preventive and curative care, and are intended to replace manual position changes performed by caregivers. The effectiveness and usability of these devices need to be reviewed in the context of their use in ecological environments (3).

Methods: EFFSCAR.1 is an observational, comparative, and controlled study. Its main objective is to compare the context of use of two automated lateralization devices with manual position changes in 18 centres (6 for each device and 6 for controlled centres) between April and July 2024. We will follow the TDABC methodology (6).

Interviews of people in charge of pressure sore care (steps 1 to 3 of TDABC) will be conducted to identify and compare the care context and the decision-making process behind the implementation of the devices. To determine the time spent on position changes and to differentiate theoretical practices from care in real-life conditions (step 4 of TDABC), we will carry out 21 hours of observations per centre. Finally, the financial costs of each care condition will be compared (steps 5 to 7).

PU-QOL-P scale will be used to obtain feedback from care recipients, while interviews will be conducted with professionals in the field to determine the usability and acceptability of different care conditions. Usability will be recontextualized according to CanMOP (5).

Validation by the ethics committee is awaited.

Results: All the data collected will be used to determine the time spent on position changes and the cost of this care for each care. They will also enable us to identify the match between actual mobilization frequencies and the theoretical needs of beneficiaries in terms of position changes in ecological conditions.

Conclusions: EFFSCAR.1 will clarify multiple aspects of device usability. The results will help to improve professional practices and, consequently, the quality of support provided to beneficiaries.

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B.7

CUSTOMIZED SUPPORT SURFACE: CONNECTING CLINITIAN AND MEDICAL DEVICE FACTORY

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Introduction: In spring 2023 the Emergency Room (ER) needs a support surface that fits with the new ER environment. In collaboration with an Italian factory, a new model of support surface was created and provided. The new support surface is designed to match the emergency room stretchers perfectly. The Customized Support Surface (CSS) is a Dynamic alternating pressure, with a 1-to-1 cycle. The set pressure ensures an adequate degree of immersion and improves the distribution of the patient's weight (contact pressures below POC 32mmHg). The CCS has 11 cm high cells, differentiated cells per anatomical seat, and a polyurethane foam base, the cover ensures proper management of the microclimate. After one year of use, we can provide data from a survey that highlighted the number of customized support surfaces used each day and the staff's level of satisfaction due to CSS.

Methods: A survey conducted between the end of 2023 and the beginning of 2024 (6 month), collected those data:

- customer satisfaction: a survey was created to explore Emergency Room staff experience with the use of CSS (surface ease of use, surface comfort both for staff and patients)
- number of CSS activations per day (patient turns over each support surface)
- data about population with a support surface in the ER: age, comorbidities, presence and stage of existing pressure ulcer

Results: 60% of ER staff answered the survey and gave a good response in terms of ease of use, patient management, comfort, and environmental management. The high level of satisfaction was reached in the 50% of the survey. All surfaces were used continuously, taking full advantage of the technology. 120 patients have the customized support surface during their ER observation. Patients are 75 years old on average, with diabetes and high blood pressure. 8% of patient present a PU at admission, only 3% stage III o IV.

Conclusions: Pressure Ulcer prevention guidelines promote the use of patient-centered recommendations and the best technologies. To implement guidelines, clinicians must have the best technologies applied to the environment in which they assist patients. At the beginning of this project was the need for a PU relief surface that could fit with ER furniture. An Italian Factory provided a new customized device. PU prevention strategy doesn't stop at this step, Survey is an important part of PU prevention. The data collection, emerging from the survey, reveals ER staff satisfaction in terms of ease of use and patient comfort. This project achieves the connection between the clinician and the medical device factory.

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COI: x

B.8

IMPLEMENTATION OF SKIN TONE ASSESSMENT IN PRESSURE ULCER PREVENTION

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Title: Implementation of skin tone assessment in pressure ulcer prevention

Introduction: Pressure ulcers (PU) associated with dark skin tones are more common due to inaccurate assessment and late diagnosis (Oozageer et al., 2017). The signs and symptoms clinicians are trained to look for may present differently depending on the patient's skin tone, as dark skin rarely shows the blanching response clinicians are trained to look for. Addressing these biases can significantly improve patient outcomes and contribute to more equitable healthcare (Limb, 2021).

Methods: Training was implemented using the Best Practice Statement: Addressing skin tone bias in wound care (Wounds UK 2021) The goal of the training was to reinforce the need to incorporate and document skin tone assessment within the SSKIN bundle and PU risk assessment tool (PURPOSE-T). Staff were asked to identify the baseline skin tone using the below skin tone guide. Any altered skin tone, on the SSKIN bundle, triggers a repeat Purpose T pressure risk assessment.

A survey was devised to assess nurses' skin tone understanding before and after the training.

Results: The survey results showed that 96% of clinicians had not received previous training on skin tone assessment, with over half (54%) unaware of the issue of skin tone bias in healthcare. After training, as part of a holistic assessment, 95% of staff assessed baseline skin tone as part of the skin assessment and documented it.

Conclusions: Assessing the skin tone of every patient, irrespective of skin tone tackles potential inequality in healthcare and addresses patient safety during healthcare provision. All clinicians are responsible for ensuring all patients with different skin tones receive equitable assessment and care.

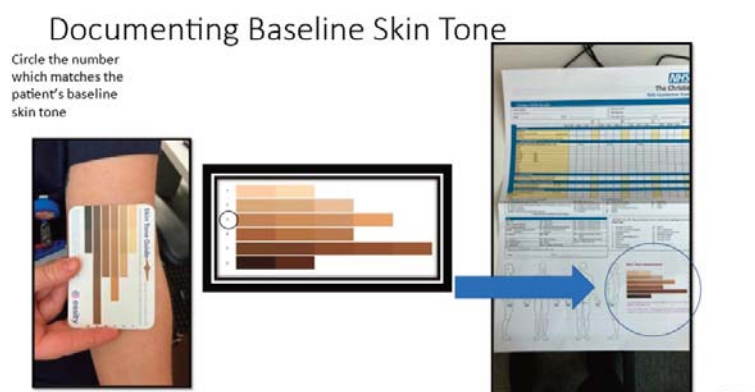
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Wounds UK (2021) Best Practice Statement: Addressing skin tone bias in wound care: assessing signs and symptoms in people with dark skin tones. Wounds UK, London. Available to download from: www.wounds-uk.com

COI: Please declare any funding of the research by industry here



B.9

ARE PRESSURE ULCER CATEGORISATION SYSTEMS "FIT FOR PURPOSE"?

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Numerical pressure ulcer categorisation systems are widely used across the world, although there is a wealth of literature which identifies that, in general, clinicians are unable to reach agreement when viewing a pressure ulcer on which category it is, and there is little published that considers what the purpose / benefit of allocation of a numerical category may be for the patient, clinician or healthcare provider / system.

The frequently used descriptors of categories are not relevant to many areas of the body as they do not accurately describe the tissue types present, this includes:

- areas of mucosa
- areas that do not have epidermis, dermis fat, muscle, bone, e.g. scalp, ears, elbows or heels

resulting in clinicians making local decisions about which categories to apply. A 2024 short survey identified that ears could be categorized as a 2, 3 or 4.

Multiple categorisation systems exist with varying numbers from 4 up to potentially 9 options, this variation, lack of applicability in parts of the body and lack of inter rater reliability result in difficulty using published data for comparison between organisations due to inconsistencies.

It is unclear what the purpose of the numerical category is, it does not link to the level of harm to the patient, act as an accurate descriptor of the wound or guide treatment.

In England a huge amount of time is spent on teaching how to categorise, validating categories allocated by clinicians (often by highly paid, highly skilled specialists) and incident reporting these pressure ulcers because of the number. It was proposed in 2017 that categories be limited to 2 options superficial i.e. only involving the skin and deep i.e. the damage has passed through the skin, but this was not agreed.

Many clinicians have a poor understanding of human anatomy being unable to recognise / describe tissue layers involved in the wounds at different anatomical locations. This may link to the consistent use of diagrams which perpetuate the myth of 'epidermis, dermis, subcutis, muscle, bone' as the model they are trying to match their patient's wounds to or may simply be due to overall poor knowledge of anatomy as many are also frequently unable to accurately describe wound locations using appropriate medical terminology.

Kottner et al (2020) in a review of existing categorisation systems stated that "PU/PI classification system are only worth implementing, when the diagnostic information improves clinical decision making leading to improved PU/PI prevention and treatment".

This paper does not propose any answers simply asks the question – are pressure ulcer categorisation systems fit for purpose?

Do they adequately describe the tissues across a range of anatomical locations?

Do they lead to improved PU prevention and or treatment?

Could time used for teaching and validating pressure ulcers be better spent on prevention or improvement work?

Kottner J, Cuddigan J, Carville K et al (2020) Pressure ulcer / injury classification today: An international perspective. Journal of Tissue Viability 29 197 – 203

COI: None

B.10

UNDERSTANDING THE BURDEN OF PRESSURE ULCERS; GETTING TO YES/NO

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Introduction: Data capture to identify the burden of pressure ulcers is challenging with many inconsistencies in reporting including determining:

- the correct category of pressure ulcer
- if the pressure ulcer occurred in your care or was present on admission
- if the pressure ulcer was due to something that did or did not happen within your organisation.

There is a much more fundamental question that needs to be answered prior to any of the above questions, - is the wound actually a pressure ulcer, or something else?

Methods: We were tasked with developing a national pressure ulcer surveillance system to replace a previous audit data collection system that was burdensome for clinicians. Crucial to the development of the system was the principle that data capture be secondary to clinical care, that is, information had to be captured at the point of care.

An existing national dashboard was felt to be the most appropriate system to use to display findings.

Phase 1 focused on acute services (hospitals) and the use of ICD 10 coding. Information that goes into the patient record (paper or via electronic records) is then coded and pulled through into a national data set¹ and can be extracted into a hospital compartment of national dashboard².

The dashboard offered the opportunity to capture many aspects of information about PU, we focused on the crucial data point – is the wound a pressure ulcer Yes/No without which the validity of additional data was questionable.

We worked with a small group of acute hospital organisations pulling together teams of clinicians and clinical coders to understand how we could best improve the data.

Results: Initially the pilot organisations did not recognise their data as accurate but over time, and with small changes to documentation systems, it became possible to see the accuracy improve. The work expanded to a group of fast followers and continues to grow. Key concerns included: staff recording wounds that were not PU as PU and incorrect categorisation of PU. Working with the coders it was possible to find ways of ensuring these challenges were limited.

Conclusions: PU data from the national dataset had previously been ignored as it was 'too inaccurate' and 'too hard' to change, coding relies on good record keeping and clinicians are notoriously poor at record keeping. Bringing together clinicians and coders helped to focus on simple solutions to improve data accuracy and keep the burden of data capture low.

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COI None

B.11**INNOVATIVE APPROACHES TO PREVENTING MEDICAL DEVICE-RELATED PRESSURE ULCERS ON THE HEAD**

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Introduction: The management and prevention of medical device-related pressure ulcers (MDRPU) in the head region is a significant concern within healthcare settings. This study evaluates the efficacy of silicone foam dressings in mitigating the incidence of MDRPUs in Czech healthcare facilities, drawing upon established guidelines and recent research to frame the investigation.

Methods: We conducted a retrospective analysis of MDRPU prevalence in the head region within two healthcare institutions in the Czech Republic for the years 2022 and 2023. The study focused on the utilization of silicone foam dressings and assessed healthcare professionals' perceptions through a survey. The methodology integrates insights from the latest clinical practice guidelines and research findings on MDRPU management and prevention.

Results: The application of silicone foam dressings is associated with a decrease in the prevalence of head region MDRPUs. Feedback from healthcare professionals via surveys highlighted the effectiveness and user-friendliness of the dressings. These results are discussed within the context of the broader scientific literature on MDRPU prevention, demonstrating the practical applicability of recommended strategies in real-world settings.

Conclusions: Silicone foam dressings emerge as a viable intervention for reducing head region MDRPUs, supporting their broader use in clinical practice. The findings underscore the importance of adhering to evidence-based guidelines and employing innovative solutions to address MDRPUs. Future efforts should focus on education, policy development, and the implementation of research-backed interventions to improve patient care and outcomes.

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COI: The authors declare no conflict of interest.

B.12

PRESSURE ULCER MANAGEMENT PRACTICES UPDATE: A POSTER BASED ON EPUAP 2019 RECOMMENDATIONS

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Introduction: Pressure ulcers represent a major challenge in care, including home care, affecting patients' quality of life and generating significant costs. The European Pressure Ulcer Advisory Panel (EPUAP) regularly updates its recommendations to reflect advances in research and clinical practice. The update of the poster aims to disseminate these latest recommendations to the professionals of home care to improve the prevention and management of pressure ulcers.

Methods: We've synthesized the 2019 EPUAP guidelines, focusing on major changes and additions from previous versions. The information has been organized into clear sections to facilitate understanding and practical application. Sections include risk assessment, goals, preventive interventions, and treatment of existing pressure ulcers.

Results: The poster includes attractive visuals and explanatory diagrams to illustrate techniques for preventing and caring for pressure ulcers. It highlights evidence-based practices, including the use of positioning supports, moisture management, and nutritional approaches. Initial feedback from healthcare professionals indicates a better understanding and ease of applying the recommendations in their daily practices.

Conclusions: The poster on good practices for the management of pressure ulcers is an effective tool for the rapid and effective dissemination of the latest EPUAP recommendations. It is essential that home care practitioners adopt these practices to prevent the occurrence of these types of wounds, improve patient care outcomes, and reduce the prevalence of pressure ulcers.

References:

1. European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance. *Prevention and Treatment of Pressure Ulcers/Injuries: Quick Reference Guide*. Emily Haesler (Ed.). EPUAP/NPIAP/PPPIA:2019.
2. Kotter J. & al. (2019), *Prevention and treatment of pressure ulcers/injuries: The protocol for the second update of the international Clinical Practice Guideline 2019*. *Journal of Tissue Viability*

COI: I am not affected by any conflict of interest in this work.

B.13

RISK FACTORS ASSOCIATED WITH PRESSURE INJURIES IN SURGERY PATIENTS

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Introduction: Pressure injuries (or PIs) are painful regions of intact skin or open ulcers that form due to the skin's exposure to intense, prolonged pressure or through a combined effect of shear and pressure. PIs cause considerable discomfort to patients and could develop into a potentially fatal infection, prolonging hospital stay and raising healthcare costs. While past research has explored the epidemiology of patients with PI, risk factors for surgery-associated PIs remain to be uncovered.

Methods: In a new study, a team of researchers from Korea sought to address this gap by identifying predictive risk factors for PIs that occur within 24 hours of surgery. Through a retrospective case-control analysis of electronic medical records, the team identified patients undergoing elective surgery that lasted a minimum of 3 hours and included a postoperative hospital stay of at least a day.

Results: Of the 6,070 participants evaluated in the study, 380 patients developed a surgery-related PI within 24 hours, which largely presented in the coccyx and the trunk. All PIs were classified as stage 1 or 2. The risk of PIs was found to be over twice as much in patients lying in the prone and lithotomy positions compared to those lying in the face-up, or supine, position during surgery. Analysis further showed that the risk of PIs rose progressively with an increase in surgery duration. Other factors that increased PI risk included the need for blood transfusion and ICU admission, which were indicative of intraoperative blood loss and increased disease severity, respectively.

Conclusions: Since these independent risk factors remain non-modifiable, there is an urgent need to formulate preventive measures such as the use of gel/foam cushions and prophylactic dressing to support bony prominences during surgical procedures to curb the incidence of PI.

Overall, the findings of this study could help promote PI prevention programs that account for these risk factors to prevent the occurrence of PIs in patients.

B.14

IMPLEMENTATION OF ASSKING PROTOCOL IN REDUCING HOSPITAL ACQUIRED PRESSURE INJURY

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Introduction: In 2019, our hospital identified 21 hospital-acquired pressure injury (HAPI) incidents, corresponding to an incidence rate of 0.83 per 1000 patient days. However, after the implementation of SSKIN guidelines, the number of HAPI cases decreased by 57% by the end of 2020 and remained less than 0.5 per 1000 patient days throughout 2023. A root cause analysis conducted from January to June 2023 showed that nurses had difficulty in conducting accurate Braden scale assessments, which led to delays in implementing preventive measures. Feedback collected in July 2023 revealed that nurses were confused by Braden scale assessments due to the absence of detailed explanations on the chart. Additionally, there was a need for more clarity on the appropriate interventions based on the overall scoring of patients.

Methods: We have developed a guideline that instructs nurses on when to initiate aSSKING. We also added an addendum that details the Braden scale scoring for each category to enhance nurses' understanding.

Complete Braden Scale within 8 hours of admission

Braden Scale Score	≤15	≥16 but non-ambulating, unable to control body position and requires assistance in moving	≥16
Intervention	Initiate aSSKING		Nil, Continue monitoring
Frequency of Assessment	Every 72hours		Weekly
	when patient's condition deteriorates Development of a new pressure injury Newly admitted		

The aSSKING framework was integrated into the hospital's policy in August 2023. Online training sessions on the aSSKING protocol were conducted in October 2023, followed by structured training programs scheduled quarterly in 2024. These programs aimed to improve nurses' proficiency in preventing and managing pressure injuries. Additional learning sessions between quarters and revisions to the nursing orientation program ensured standardized understanding among all nursing staff.

Results: Since implementing the aSSKING protocol, no HAPI incidents related to the failure to initiate preventive measures have been reported. However, efforts continue to reduce HAPI occurrences to zero percent by the fourth quarter of 2024.

Conclusions: Modifying the Braden scale without understanding its consequences poses a serious issue, potentially leading to incorrect risk assessments and delayed interventions. Implementing the aSSKING protocol has reduced HAPI incidents, but continuous improvement is essential. This would ensure that all nurses consistently and thoroughly understand the aSSKING protocol. A reassessment of the training program based on nurse feedback will guide future improvements. This multifaceted approach reinforces their knowledge and enhances their ability to apply the protocol effectively in patient care settings.

References:

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COI: Nil

B.15

ASSESSMENT OF THE PRESSURE DISTRIBUTION OF STATIC, HYBRID AND ACTIVE HOSPITAL MATTRESSES TO REDUCE PRESSURE ULCER RISK

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Introduction: Pressure ulcers (PUs) are a burden for the bedridden patient and lead to pain, prolonged hospital stay and increased mortality. The support surface is one of the main factors influencing the PU risk. Therefore, we aimed to quantitatively assess the pressure distribution of the current mattresses used within our hospital to investigate and optimize the impact of mattress choice.

Methods: We quantitatively assessed the pressure distribution in supine, semi-fowler and lateral position with a pressure-measuring mat on four different mattresses using eight volunteers.

Results: The pressure distribution significantly varied between mattresses. Peak pressure also differed per person and body position. However, the order from best to worst pressure distribution remained constant for all subjects. In the Semi-fowler position, mean peak pressure was 26.6 mmHg on the Active_FIS, 39.0 mmHg on the Passive_foam, 46.5 mmHg on the Active_air and 58.7 mmHg on the Passive_hybrid mattress. Mean peak pressure was lowest for the most advanced active mattress and highest for the hybrid standard mattress in all positions. The static foam mattress had significantly better pressure distribution qualities than the non-powered hybrid foam mattress and even outperformed the Active_air mattress.

Conclusions: Pressure distributing properties of an active mattress are not necessarily better than a passive mattress. Pressure measurements are an additional objective measure to help in mattress selection for patients at risk of a PU. A better and more cost-effective mattress selection could lead to both a PU incidence reduction and corresponding lower healthcare costs.

COI: Authors declare that they have no competing interests.

B.16

HEALING NEONATAL SKIN DAMAGE, DRESSINGS AND USAGE DIFFERENCES.

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Introduction: Hospitalized neonates are at a higher risk of both medical adhesive removal injuries (MARSIs) and hospital acquired pressure injuries (HAPI), and skin and soft tissue infections (SSTIs) than their pediatric and adult counterparts. This is due to their needs for life sustaining equipment and the fact that their skin is underdeveloped, incorporating only minimal layers of stratum corneum and structurally immature skin layers.

Given these characteristics, the premature neonate can quickly develop skin compromise, occurring as a result of conditions including decreased perfusion, impaired and decreased mobility, underdeveloped and compromised neurological responsiveness, fluid retention (potentially causing edema), and the moist conditions typically surrounding these necessary medical devices.

Strategies for early detection and mitigation of device-related injury are essential to prevent pressure injuries in the NICU. Skin breakdown leads to significant pain and potential infection exposure. Additionally, it can be a major cause of emotional distress for families of babies requiring advanced care.

Methods: A retrospective study was conducted exploring medical records of neonates that contained clinical photographs. The records of patients with photographs were reviewed for information associated with pressure injuries and treatments including products used for cleansing and dressing. This gathered information provided many case studies useful for creating a database of best practice guidelines for patient skin care and standardization of clinical practice. Dressing type and how often to change dressings were of particular assistance in formulation of guidelines in the NICU. The type of dressing is dependent on the gestational age and chronological age of the neonate as well as the type of injury and amount of exudate of the wound.

Results: This project facilitated development of a standardized, evidence-based guideline offering a variety of useful options for clinicians caring for NICU patients. By creating a registry of infant data and corresponding photographs, infections and wounds can be categorized, and best practices for healing can be studied and cataloged to guide providers' care.

Conclusions: Expanding providers' knowledge of how to prevent and treat neonates' pressure injuries in the NICU supports the maintenance of skin integrity, thereby enabling NICU units to achieve lower rates of skin injuries, breakdown and infections. Supplementing evidence-based learning with photos and an algorithm to simplify appropriate treatment measures will help providers optimize outcomes for neonatal patients.

References:

Available upon Request

B.17**POOLED DATA ANALYSIS ON 1,011 PRESSURE ULCERS TREATED WITH TLC-NOSF DRESSINGS IN REAL-LIFE CONDITION****Sylvie Meaume¹**¹ Hôpital Rothschild AP-HP, CCA, Gériatrie Plaies et Cicatrisation, France

Title: Pooled data analysis on 1,011 pressure ulcers treated with TLC-NOSF dressings in real-life condition

Introduction: TLC-NOSF dressings*, composed of lipidocolloid healing matrix with nano-oligosaccharide factor (sucrose octasulfate salt), have been demonstrated in randomised controlled trials to enhance the healing process and reduce healing times in chronic wounds. This work aimed to determine whether evidence from real-life studies supported the benefits of these dressings on time-to-heal and whether there is an optimal time to initiate this treatment in patients with pressure ulcer (PU).

Methods: Observational studies, conducted in France and Germany, evaluating current practices in patients suffering from non-selected chronic wounds treated with TLC-NOSF dressings were identified. Characteristics of the patients and their wounds at initiation of the treatment, and wound healing outcomes were extracted and combined. Due to various follow-up duration between the studies, times-to-heal were estimated using a Kaplan-Meier approach and considering the line of treatment. The findings were compared to the healing outcomes reported in the French SNIIRAM database and in the literature. This report focuses only on patients with PU.

Results: The data from seven prospective, multicentre, observational studies were found eligible for this analysis. A total of 1,011 patients (19-102 years old, 53.1% female, 34.9% diabetes) treated with the evaluated dressings had a PU. The ulcers were most often located on the heel (43.1%) or the pelvis (43.1%) regions and characterized by a mean score of 11 ± 3 on the 17-points severity scale (PUSH, Pressure Ulcer Scale for Healing). Ulcers lasted for less than 2 months in 62.7% of the cases and the TLC-NOSF dressings were used as first-line treatment in 28.6% of the cases. Mean estimate for time-to-heal was 70.2 days (95% CI 62.3 – 78.0) when the dressings were used as first-line treatment and 103.7 days (95% CI 98.7 – 108.7) when used later.

Conclusions: Compared with available data on time to complete closure for pressure ulcers, this real-life evidence supports the use of TLC-NOSF dressings as first-line treatment, in association with good standard of care, in the management of patients with PU.

COI: This work was funded by Laboratoires Urgo

*UrgoStart dressing range (Laboratoires Urgo)

B.18

EVALUATION OF TLC-NOSF DRESSINGS FOR THE MANAGEMENT OF PRESSURE ULCERS: A CASE SERIES IN GERIATRIC DEPARTMENT IN FRANCE

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Evaluation of TLC-NOSF dressings for the management of pressure ulcers: a case series in geriatric department in France

Introduction: Pressure ulcers are common among hospitalized elderly patients and are exacerbated by patients' overall health status and associated comorbidities. These skin lesions contribute to high morbidity and mortality rates, impairing patients' quality of life and often necessitating lengthy and costly treatments that may delay hospital discharge. Treatment typically involves a comprehensive approach addressing the underlying causes, patient mobilization, management of comorbidities and nutritional status, as well as local wound care using dressings aimed at promoting healing and protecting the wound.

Among the available dressings, those impregnated with sucrose-octasulfate (TLC-NOSF)* have demonstrated robust efficacy in the local treatment of chronic wounds such as leg ulcers and diabetic foot ulcers, as evidenced by randomized studies^{1,2} or observational studies^{3,4} in chronic wounds including pressure ulcers.

We aim to evaluate, through an exploratory clinical assessment in hospitalized patients, the effectiveness of these TLC-NOSF dressings prescribed for the management of pressure ulcers, ranging from stage II to IV.

Methods: We propose a prospective case series conducted in a geriatrics department in a French Hospital. The study will include patients with non-infected pressure ulcers (stage II-IV) of any location, without dry necrosis, eligible for local wound care with TLC-NOSF dressings. Eligible patients will be followed for a maximum of 12 weeks, with up to 5 visits: inclusion visit (D0), visits at Weeks 2, 4, and 8, and a final visit at Week 12 (or end-of-evaluation visit in case of wound healing before Week 12 or occurrence of adverse events preventing further evaluation). The primary criterion will be the number (and percentage) of patients achieving complete healing (100% re-epithelialization) at the end of the 12-week treatment period (or last treatment visit). Secondary criteria include:

- Healing time of pressure ulcers treated with this strategy.
- Frequency of dressing changes since the initial visit.
- Overall clinical assessment of healing progression.
- Dressing acceptability and overall performance evaluation (ease of application, manipulation, conformability, pain during dressing change, bleeding upon removal, exudate, maceration, odor, tolerance, effectiveness, and treatment interest).
- Evolution of perilesional skin condition.
- Nature and number of adverse events.

Results: As of the abstract submission, patient recruitment for the study is ongoing, with an anticipated total of approximately twenty cases to be included.

Conclusions: The proposed study aims to provide insights into the clinical effectiveness, tolerability, and acceptability of TLC-NOSF dressings in the management of pressure ulcers (stage II-IV). By evaluating various parameters, we aim to contribute valuable data to support the use of these dressings in real-world clinical settings.

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*UrgoStart Plus® Pad, UrgoStart Plus® Border®, UrgoStart Contact...

COI: We declare that there has been no funding provided by industry for this research.

B.19**PREVENTION OF PRESSURE ULCERS AND SKIN LESIONS WITH A HYPER-OXYGENATED OIL.****Sylvie Meaume¹**

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Introduction: Pressure ulcers (PU) are still a prevalent burden persisting in both healthcare facilities and in the community, negatively affecting the health-related quality of life of patients, as well as contributing to increase in costs of health institutions.

A hyper-oxygenated oil (HO) has been designed and has been shown to help in the prevention of PUs when included in a robust standard of care for prevention, as shown in various publications¹.

Methods: Narrative review of evidence behind the HO in the prevention of PUs

Results: Evidence discussed include: Initial clinical evaluation in patients at risk of PU (Colin et al, 1998); HO and standard of care versus standard of care alone: a RCT in PU prevention (Gallart et al 2001); HO and standard of care including silicone foam dressing versus standard of care including silicone foam dressing alone: a RCT in PU prevention (Huang et al, 2021); The GIPPS study: a large prospective, observational study (Meaume et al, 2005); Prevention of PU induced by prolonged wearing of protective masks or goggles (Maciá, 2021); HO versus blank control in preventing skin lesions related to PPE: a RCT conducted during the COVID-19 pandemic (Song et al, 2020); HO and hydrocolloid versus blank control in preventing nasal and facial PU related to PPE: a RCT conducted during the Covid-19 pandemic (Xia et al, 2020); Real-life survey on the use of HO in the prevention of PU related to protective equipment during the COVID-19 pandemic (Moliner-Llopis et al, 2020).

Conclusions: The evidence reported here shows that HO, in combination with an evidence-based standard of care, can be very effective in reducing PU incidence. The evidence suggests consistent benefits in terms of reduction of PU and improvement of the patient's QoL.

References:

1. Van Thach D, Zhu J, Wang J, Sanmugam K, Zhang S, Quang TX. Prevention of pressure injuries/ulcers and skin lesions using Sanyrene®: a narrative review of the evidence. *Journal Articles*.;6(02).

COI: Please declare any funding of the research by industry here

B.20

LERICHE SYNDROME AND THROMBOSIS OF LUMBAR AORTA AS A CAUSE OF A REVERSIBLE POOR OUTCOME IN EXTENSIVE SACRO-GLUTEAL PRESSURE ULCERS.

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Introduction: thrombosis of lumbar aorta and leriche syndrome are two rare entities that must be ruled out when a sacral pressure looks too big or rather gluteal or when it responds poorly to the best available management.

Methods: retrospective analysis of two sacro-gluteal pressure ulcer cases that did not respond to surgery and best wound care. Both turned to have lumbar aortic thrombosis.

The first case was a cancer patient. She developed huge sacro-gluteal (bilateral) necrosis while under post-operative negative pressure wound therapy. Redo surgery revealed moderately ischemic gluteal muscles. Re-application of vaccum therapy gave a slightly better response, yet unsatisfactory, but no recurrent necrosis was observed. The second case was a recurrence of necrosis affecting the sacral region and extensive bilateral gluteal areas, after initial excision and 2 consecutive debridements by a general surgeon. Angioscan of abdominal aorta showed thrombosis of lumbar and iliac segments.

Results: First patient: Granulation was very poor and the patient died of her cancer with a still wide open sacro-gluteal wound. The family refused vascular intervention in view of the poor prognosis of her cancer.

Second patient: The family did not accept the vascular intervention. Recurrent necrosis extended widely. They discharged the patient against medical advice.

Conclusions: extensive sacro-gluteal (bilateral) pressure ulcers must be promptly suspected to be of vascular origin. Aortic imaging is best performed before initial excision to rule out leriche syndrome or ilio-lumbar aortic thrombosis, so that revascularization is performed first. Excision of the pressure ulcer would give a better outcome especially if followed by vaccum therapy.

If a vascular cause was not initially suspected and if the operative findings are suggestive of ischemic gluteal muscles, then an immediate post-operative vascular evaluation should be made.

The same applies for a poor granulation or recurrent necrosis after proper surgery and high standard wound care. Revascularization improves the outcome in sacro-gluteal pressure ulcers associated with leriche syndrome or ilio-lumbar aortic thrombosis.

References:

sacral pressure ulcer in leriche syndrome: a case report. S ishikawa, plast reconstr surg glob open.2021 nov;9(11):e3971.

COI: none

B.21

PHYSIOTHERAPY CONSULTATION AT THE DERMATOLOGY WOUND CENTRE

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Introduction: Leg ulcers can be accompanied by poorly controlled edema requiring repeated hospitalizations due to infections, ulcer exacerbation and persistent pain. In order to optimize the management of this health issue, we have developed a physiotherapy outpatient consultation at the dermatology wound centre. Our goal was to promote better ulcer healing through adequate treatment of edema and to reduce the need for hospitalization.

Methods: The multidisciplinary approach of treatment contains a precise medical diagnosis, nursing and physiotherapeutic evaluation, limb hygiene skincare, manual lymphatic drainage, complex wound care, multilayer compression bandaging, therapeutic education with skin and lifestyle hygiene, diet, physical activity, anticipation of complications followed by long-term compression garments after wound healing.

Number of cicatrized ulcers, limb volume reduction (centimetric measurement) and hospitalization rate before and after physiotherapy treatment were evaluated.

Results: From April 2021 to August 2023, 38 patients, mean age 69 (9 14.25) received a treatment during a mean follow-up of 132.5 days (9 167.69). 60 limbs were treated, 38 of whom had ulcers. Our approach allowed ulcer healing in 20 limbs out of 38 (table 1) and edema reduction in 100% of cases at the end of physiotherapy follow-up. We had no dermatological admission reason during the physiotherapy follow-up compared to 15 patients out of 38 which had had 1 or more hospitalizations since 2020 (18 in total) without physiotherapy follow-up (table 2).

During the study time we have observed an evolution of medical approach, we saw a change in the profile of patients referred to physiotherapy. Some patients were referred for complex lymphatic pathologies without ulcers.

Patients and caregiver satisfaction was high.

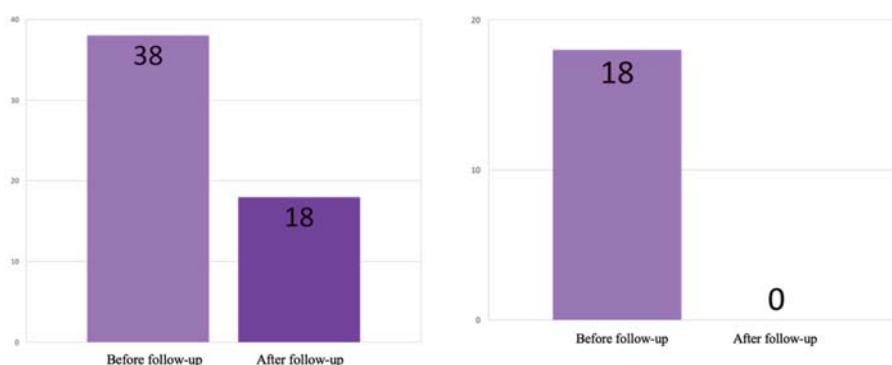


Table 2. Cumulated hospitalizations with dermatological admission reason for 15 out of 38 patients (since 2020)

Conclusions: We concluded in a benefit of outpatient physiotherapy combined with specialized nursing care in edema reduction, ulcer healing and reduced need for hospitalization during follow-up.

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COI: Please declare any funding of the research by industry here

B.22

'DIALLING DOWN THE PRESSURE': THE USE OF AUTOMATIC SUPPORT SURFACES

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Introduction: Guidelines recommend frequent risk assessment and timely intervention as part of an effective Pressure Injury Prevention (PIP) protocol¹. In certain patient risk profiles, one intervention is the introduction of powered support surfaces. Manual technology adds demand on already strained care teams which may present increased risk of operation errors.

Self-Set Technology or SST uses intelligent software to automatically and regularly assess the body mass distribution of the patient on the support surface, to readjust target pressures within the cells to suit the individual patient, removing the need for caregiver intervention.

With the introduction of new methods to measure support surface performance, namely the S3I Immersion & Envelopment apparatus², this work aims to provide a visual representation of how the self-set technology can improve performance under these metrics.

Methods: The S3I Immersion and Envelopment apparatus will be used to measure the change in the following performance metrics over time.

- Immersion Is measured using the indenter as per the SS-1 standard.
- Peak Pressure Using the embedded pressure sensors, the interface pressure at any point across the hemisphere can be measured and tracked over the course of the test. The corresponding support surface cell pressure is also monitored to allow comparison with the resulting interface pressure.

The metrics outlined above will be measured before and after a simulated patient weight change is applied to the support surface. This situation aims to emulate the usage case where two patients of different weights have used the surface, and the system reacts to accommodate the new weight. It also demonstrates the system changes to support surface orientation when repositioning the patient, such as head of bed elevation.

Results: Results recorded for approximately 90 minutes during the weight change. For each of the metrics above, a graphical output of performance is generated, to compare the effect of the system on the test indenter as it adjusts to the new patient weight.

Conclusions: Healthcare professionals implementing new support surface technology require simplicity through automation, whilst having clear and easy to understand evidence that the products selected are performing in the way intended for pressure injury prevention.

References:

1. *European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel, Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: The International Guideline 2019. Emily Haesler (Ed.). 2019.*
2. *ANSI/RESNA SS-1:2019. American National Standard for Support Surfaces – Volume 1: Requirements and Test Methods for Full Body Support Surfaces. Section 6. 2019.*

COI: This poster is industry initiated. The authors are paid employees of Arjo.

B.23

'TOO HOT TO HANDLE?' - COOLING THE MULTIDISCIPLINARY DEBATE

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³ Arjo Inc, Clinical Consultant, Addison, United States

Introduction: Healthcare staff move and reposition patients frequently throughout their daily workflow. Yet the practice of leaving patient handling devices under a patient on a support surface continues to be a hotly debatable issue. A Safe Patient Handling (SPH) program offers solutions including transfer / repositioning devices. Patients may remain on the device for long periods either in bed or during clinical procedures. This practice can reduced the number of required caregivers for the task, their physical exertion and potential caregiver / patient injury, thus supporting a safe / efficient workflow. Historically, leaving devices in place has resulted in a compromise between SPH needs and support surface performance. International guidelines for SPH[1] drive safe and efficient practice, while conversely, Pressure Ulcer Prevention[2] programs may recommend removal of such devices due to potential PU risk and the impact on support surface performance. This work seeks to cool the debated issue within the multidisciplinary healthcare environment in an attempt to highlight best outcomes for all stakeholders. Product performance testing[3] provides a pathway towards integrating the fundamental principles of SPH and PU prevention and management.

Methods: The ANSI/RESNA_SS-1:2019[4] standardized laboratory tests were performed for microclimate, immersion, envelopment and horizontal stiffness along with pressure mapping on widely-used active and reactive support surfaces with / without the addition transfer /repositioning devices to assess the impact on the support surface performance.

Results: Results are shown graphically. Results[5] demonstrate negligible impact on the performance of the example support surface.

Conclusions: This type of performance testing is designed to demonstrate the impact on the support surface performance characteristics (when leaving a transfer device in place underneath the patient) – not the impact of the device directly on individual patients. This testing gives an indication that the transfer device may be suitable for leaving underneath a patient. However, the test results only form part of an individual patient risk assessment, which should be carried out by the responsible clinician when considering leaving devices underneath patients for a period of time between transfers. This should include consideration of the following factors:

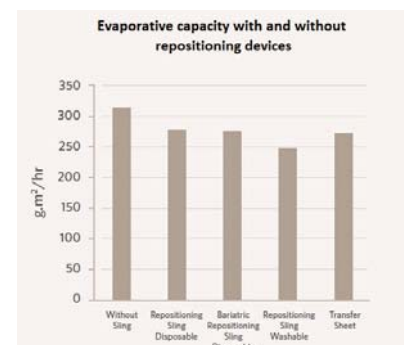
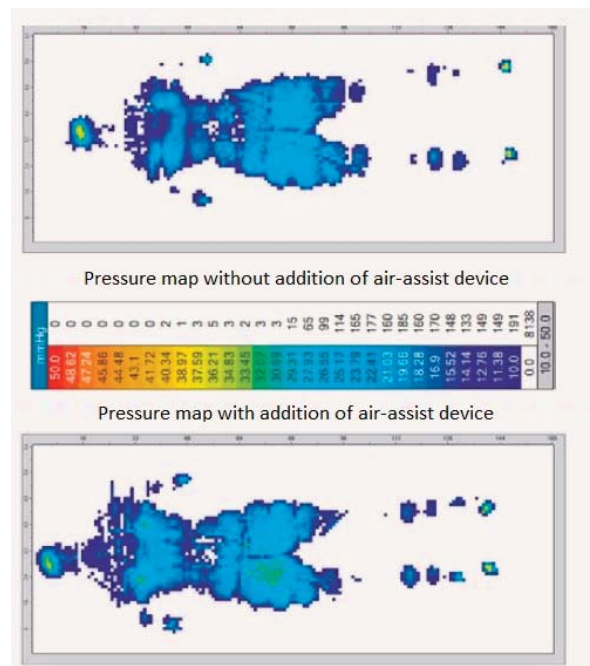
- Individual clinical conditions/needs of the patient
- Support surface efficacy
- Repositioning/patient handling practices
- Other factors influencing the risk of PU development e.g. temperature / microclimate related needs

Ongoing monitoring of the patient is essential once the decision has been made to leave the device in place.

References:

- [1] ISO/TR 12296:2012 Ergonomics — Manual Handling of People in the Healthcare Sector,2012
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- [5] Product performance testing whitepapers,Arjo Inc, Air-Assisted Lateral Patient Transfer device, AA00501.1.0.INT.EN and Repositioning Slings A00492.1.0.INT.EN

COI:This work is funded by industry, the authors are employees of a supplier of support surface and patient handling solutions.



B.24

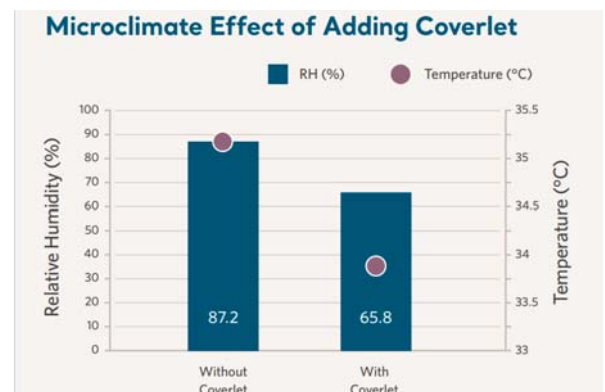
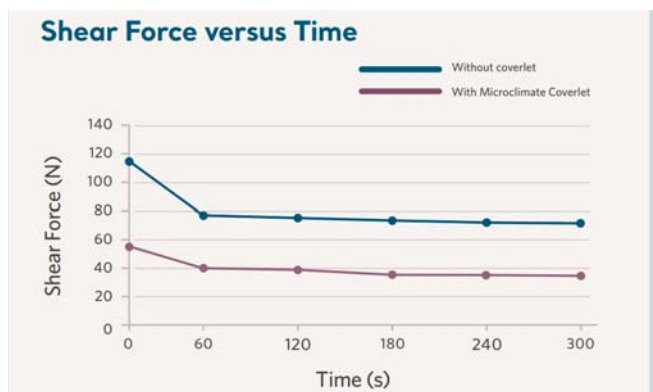
'GETTING STRESSED BY SHEAR?' - THE LINKAGE BETWEEN MICROCLIMATE AND SHEAR

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Introduction: Shear and microclimate are established[1] extrinsic risk factors in the formation of a pressure ulcer (PU), and the effects of microclimate are also well understood and reported clinically[1]. Increased moisture[2] and/or heat[3] are known conditions potentially increasing friction between skin and fabrics/support surfaces. This can be detrimental to tissue tolerance during repositioning, transfers or bed articulation. The interrelationship between microclimate and other PU causal factors has been described via a 'microclimate cascade' model[3]. The present work expands on this model to demonstrate how microclimate can adversely affect support surface performance as a result of increases in heat / moisture at the patient interface which can significantly increase shear forces. Microclimate, therefore, can be considered as a 'force-multiplier' on the effects of shear, hence it is important that shear and microclimate be addressed at the patient-surface interface. This study was designed to investigate the linkage between microclimate and shear on two examples of support surfaces with & without a microclimate accessory coverlet fitted. Laboratory based standardized testing[4] was performed to demonstrate the shear-reducing effects of the coverlet, which is already an established solution to the management of microclimate. The importance of minimizing exposure to sustained tissue deformation (pressure, shear) is well known, particularly in critical tissue conditions involving sensitive anatomical locations (e.g. the sacrum) or in critical situations (e.g. post PU surgery[5]).

Methods: Independent testing of Horizontal Stiffness (analogous to shear) was performed using the US National Standard SS-1:2019[4] Section 4 test on two support surfaces both with and without a shear-reducing microclimate coverlet. The two surfaces utilized different construction methods and operated in different operating modes. One support surface operated in an active mode using an air-based alternating pressure modality, the other surface operated in a reactive mode using a combination hybrid foam/air construction.

Results: Shown graphically below



Conclusions: The effects of shear are important to address in the prevention and treatment of pressure ulcers. The influence of microclimate is particularly important when combined with the deformation effects of mechanical loading. This study demonstrated the addition of a microclimate coverlet significantly improved the interface microclimate conditions and also beneficially reduced shear.

Consequently, by addressing the microclimate needs of the patient it is possible to simultaneously address shear. The microclimate coverlet can provide this benefit when applied to a support surface, hence forming part of a holistic approach to both pressure ulcer prevention and treatment.

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- [4] _Requirements and Test Methods for Full Body Support Surfaces,SS-1:2019,ANSI/RESNA
- [5] _Comparison of Support Surface Performance Characteristics for Flap and Graft applications, Publication reference A000458.1.0.INT.EN and Data on File.

COI: This work is performed by industry, both authors are employees of a company supplying support surface solutions.

B.25**DYNAMICS OF HUMAN KERATINOCYTE STEM CELLS -TO IMPROVE WOUND HEALING FOR ELDERLY PATIENTS-****Kyoichi Matsuzaki¹**¹ *International University of Health and Welfare, Plastic and Reconstructive Surgery, Narita, Japan*

Introduction: Skin regenerative capacity declines with age, but the underlying mechanisms are largely unknown. Here we demonstrate epidermal growth factor receptor (EGFR) signaling on age-associated alteration of keratinocyte in mouse skin wound healing.

Methods: C57BL/6N mice, 12-week-old (n = 3) and 19–25-mo-old (n = 3) male mice, were used as young and old mice in the experiments, respectively. Before wounding, mice were anesthetized using isoflurane, and the absence of a physical and physiological response to a noxious stimulus was verified. A 6-mm-diameter punch biopsy was performed to make a circular full-thickness wound on the dorsal skin. 3 d after wounding, all mice were euthanized, and the wounded area was excised from the skin. An ~2-mm margin of the wound was collected for Western blotting. Rabbit monoclonal antibody against EGFR and rabbit polyclonal antibody against phospho-EGFR were used for Western blotting.

Results: Strong signals of phospho-EGFR were detected in the protein lysate prepared from the wound in the young mice, but the signals were decreased in the lysates from the aged mice. Western blot analysis confirmed these results and also revealed that the level of phosphorylated EGFR was reduced in protein lysates prepared from aged mice, even though the EGFR expression level was maintained.

Conclusions: Wound healing experiments strongly suggested that the decline of EGFR signaling with aging results in an age-associated alteration of keratinocyte migration and reepithelialization. The decreased phosphorylation of EGFR results from the reduced production of EGFR ligands in wounds and/or the dysregulation of EGFR signaling in keratinocytes.

COI: The author has no financial interest to declare in relation to the content of this study.

B.26

PRESSURE REDISTRIBUTION PROPERTIES OF PROPHYLACTIC DRESSINGS USING AN IN VITRO MODEL WITH CLINICALLY RELEVANT PRESSURES AND A NOVEL HEEL INDENTER

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Introduction: Pressure injuries (PIs) have significant deleterious impacts on patients, healthcare professionals, and payors. Recent clinical studies indicate that multilayer foam dressings may be an effective addition in the prevention hospital-acquired PIs^{1,2}. In vitro work has further demonstrated that these dressings can absorb and redistribute forces applied directly to the skin³. The aim of this study was to evaluate pressure distribution properties of commercially available wound dressings used in high-risk body areas when applying clinically relevant interface pressures using a novel heel indenter^{3,4}.

Methods: Five dressings were evaluated: A*, B†, C‡, D§, and E||. A high-resolution pressure mapping system was used to test the pressure redistribution properties of the dressings. The dressing was applied to a 6 mm thick silicone gel⁵ layer (to simulate overlying tissue), and a clinically relevant load (80 mmHg, representing a patient in the supine position or sat in a wheelchair)⁶ was applied for 60 seconds using a novel heel indenter. A control was performed using the same set up without a dressing applied. Contact area and average and peak contact pressures were recorded (6 replicates performed).

Results: All dressings showed a significant reduction in peak and average pressure and an increase in contact area compared with the no dressing control ($p < 0.001$). Dressings A and B showed a statistically significant reduction in both peak and average pressure compared with dressings D and E ($p < 0.001$).

Conclusions: Using an anatomically accurate heel indenter and clinically relevant testing pressure, these findings indicate that dressings A and B provide a significant reduction in interface pressure compared with no dressing, as well as a reduction compared with most other test dressings. These data suggest that these dressings may be considered as a component in the toolkit of pressure injury prevention protocols.

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*ConvaFoam Border Multisite

†ConvaFoam Silicone Multisite

‡ALLEVYN LIFE Heel

§Mepilex Border Heel

||OptiView Multisite

COI: This work was supported by an unrestricted research grant with funding from Convatec.

B.27

PRESSURE REDISTRIBUTION PROPERTIES OF PROPHYLACTIC DRESSINGS USING AN IN VITRO MODEL WITH CLINICALLY RELEVANT PRESSURES AND A NOVEL SACRAL INDENTER

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³ Weber State University, Ogden, United States

Introduction: Pressure injuries (PIs) have significant deleterious impacts on patients, healthcare professionals, and payors. Recent clinical studies indicate that multilayer foam dressings may be an effective addition in the prevention of hospital-acquired PIs^{1,2}. In vitro work has further demonstrated that these dressings can absorb and redistribute forces applied directly to the skin³. The aim of this study was to evaluate pressure distribution properties of commercially available wound dressings used in high-risk body areas when applying clinically relevant interface pressures using a novel sacrum model^{3,4}.

Methods: Five dressings were evaluated: A*, B†, C‡, D§, and E||. A high-resolution pressure mapping system was used to test the pressure redistribution properties of the dressings. The dressing was applied to a 6 mm silicone gel⁵ layer (to simulate the overlying tissue), and a clinically relevant load (30 mmHg) was applied for 60 seconds using a novel sacral indenter. A control was performed using the same construct without a dressing applied. Contact area and average and peak pressures were recorded (6 replicates performed).

Results: All dressings showed a significant reduction in peak and average pressure and increase in contact area compared with the no dressing control ($P \leq 0.001$). Dressing A showed significant reduction in peak pressure compared with dressings D and E, and in average pressure compared with dressing E only ($P < 0.001$). Dressing B showed a reduction in peak and average pressure compared with Dressings D and E; the difference was statistically significant only with Dressing E.

Conclusions: Using an anatomically accurate sacral indenter and clinically relevant testing pressure, these findings indicate that dressings A and B provide a significant reduction in interface pressure compared with no dressing. Dressings A and B also showed comparable or improved pressure reduction compared with most other test dressings. These data suggest that these dressings may be considered as a component in the toolkit of pressure injury prevention protocols.

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2. Santamaria N, et al. *Int Wound J* 2015;12(3):302-8.
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4. Call E, et al. *Int Wound J* 2015;12(4):408-13.
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*ConvaFoam Border Sacral

†ConvaFoam Silicone Sacral

‡ALLEVYN LIFE Sacrum

§Mepilex Border Sacrum

||OptiView Sacral

COI: This work was supported by an unrestricted research grant with funding from Convatec.

B.28

EVALUATING POST-DISCHARGE RECOVERY OF PATIENTS WITH HOSPITAL-ACQUIRED PRESSURE ULCER (HAPU): PROSPECTIVE COHORT STUDY

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Introduction: Pressure ulcers (PUs) occur due to intense and/or prolonged pressure associated with shear force¹. Usually, these ulcers are acquired while the patient is hospitalized and persist until discharge², requiring specific guidance to ensure the continuity of healthcare after leaving the hospital environment. We aimed to evaluate the post-discharge recovery and care provided for adult patients who developed PUs.

Methods: This is a prospective cohort study conducted with patients who developed PUs during their hospitalization and were discharged from a tertiary hospital complex in Brazil. We included adult who developed PUs and were assessed by the Wound Care Committee during hospitalization. Data collection began in January 2022 and ended in January 2023. After participants consent, information was obtained post-discharge using electronic medical records, primary health care and phone calls. The authors developed a checklist instrument for data collection to obtain hospital and post-discharge information on instructions adherence, dressing changes, healthcare services received, overall clinical and PU healing status. Data were collected on days seven (D7), fifteen (D15), thirty (D30), and sixty (D60) post-discharge.

Results: From a total of 113 patients, 55.8% were males aged over 64.6 years (SD = 15.1) and self-identified as white 75.2% (n=85). Hospital stays had a median duration of 40.0 days (IQR: 22.0 – 57.0 days). The primary reasons for hospitalization were external causes (falls and trauma) 22.1% (n=25), followed by diseases of the nervous system 21.2% (n=24). Hospital-acquired infection was common complication, affecting 46.0% (n=52) of patients. A total of 246 PUs were identified. The sacral region was the most affected site, with 37.0% (n=91), stage 2 accounted for 47.6% (n=117) of cases. By D60, 32.7% of patients (n=37) were re-hospitalized, and there were 22.1% (n=25) deaths. Additionally, healing or significant wound improvement was noted in 42.5% (n=48) of participants. The survival curve was calculated and stroke emerged as a statistically significant factor negatively affecting the healing process (p=0.021) (Figure 1).

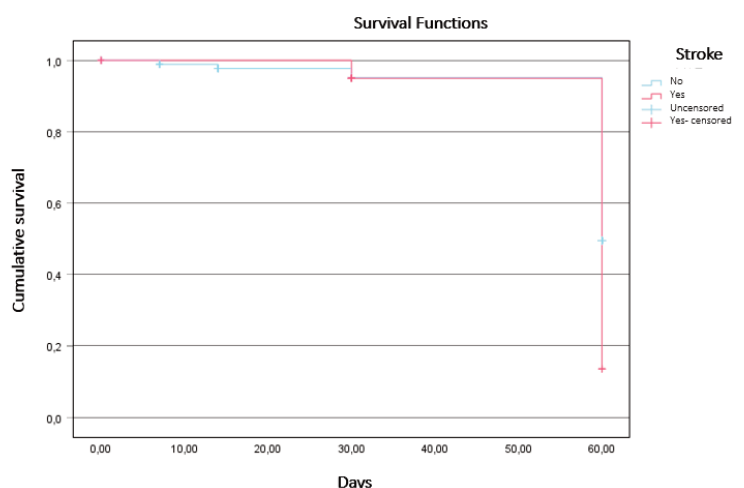
Conclusions: HAPUs remain a prevalent and serious complication, with a significant proportion of patients experiencing sustained or worsening conditions up to 60 days post-discharge. This progression frequently results in detrimental outcomes such as increased mortality, re-hospitalizations, and persistent non-healing wounds. Our findings highlights the urgent need for improved post-discharge follow-up and interventions tailored to optimize recovery and healing processes. Identifying higher risk patients such as those who had a stroke and enhancing preventive strategies is crucial to elevating the quality of care and outcomes for patients with HAPUs, ultimately contributing to more effective management and prevention of these challenging complications.

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COI: None

Figure 1. Survival curve in relation to the healing process of hospital pressure ulcers in patients with stroke.



B.28

PREDICTIVE COMPARISON OF PRESSURE ULCER PREVENTION SCALES IN INTENSIVE CARE

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Introduction: Patients in intensive care units (ICUs) are at a heightened risk of developing pressure ulcers (PUs)¹. Key prevention strategies includes risk assessment via structured tools using predictive scales². Consequently, our goal was to conduct a predictive comparison of PU risk assessment scales within an ICU setting.

Methods: A prospective cohort study was conducted in the ICU of a tertiary hospital in Brazil from March to December 2022. The study included adults hospitalized for at least 24 hours in the ICU with no PUs who consented/assented to participate in the research. Researchers applied the Braden, CALCULATE, EVARUCI, Cubbin & Jackson, and Sunderland scales daily until discharge, death, or completion of 21 consecutive days of data collection through Google Forms. Predictive validity was assessed by the Receiver Operating Characteristic (ROC), Area Under the Curve (AUC), sensitivity, specificity, and internal consistency were also evaluated.

Results: A total of 150 patients underwent 1340 risk assessments. Of these, 26.7% (n=40) developed PU. Regarding predictive validity, the Cubbin & Jackson and Sunderland scales achieved the highest AUC values (0.687 [95% CI: 0.611, 0.763]; 0.687 [95% CI: 0.607, 0.767], respectively (Figure 1). As for reliability, Cubbin & Jackson had the best Cronbach's alpha at 0.725 (Table 1).

Conclusions: Although the Sunderland and Cubbin & Jackson scales showed moderate predictive validity in identifying PU risk, the Cubbin & Jackson scale presented the best reliability, making it a more reliable assessment tool. Providing information on the performance of different scales is crucial. This allows healthcare professionals to select the most suitable tool for their patients' cohort and specific needs, as well as aiding in the clinical judgment of PU risk assessment. Thus, having access to this information enables healthcare professionals to enhance care and outcomes in intensive care patients.

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COI: None

Figure 1. ROC curve of the five pressure ulcer risk assessment scales according to specificity and sensitivity in a sample of 150 patients.

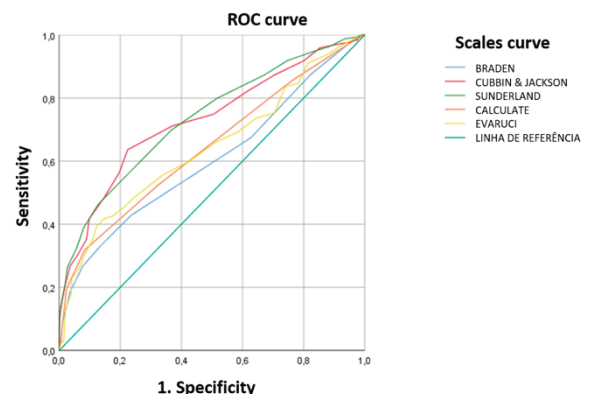


Table 1. Comparison predictive and reliability of the five pressure ulcer risk assessment scales according to specificity and sensitivity in a sample of 150 patients.

Scales	Cut-off ROC	AUC (CI 95%)	SEN/SPE %	Cronbach's alpha (CI 95%)	KR-20
Braden	10.5	0.610 (0.519 - 0.700)	53.6/62.5	0.683 (0.665-0.701)	-
CALCULATE	2.5	0.608 (0.529 - 0.686)	90.0/31.5	-	0.579 (0.549-0.607)
Cubbin & Jackson	33.5	0.687 (0.611 - 0.763)	63.1/67.5	0.725 (0.704 - 0.744)	-
EVARUCI	9.8	0.605 (0.520 - 0.691)	80.0/39.8	0.669 (0.652 - 0.686)	-
Sunderland	32.5	0.687 (0.607 - 0.767)	56.9/70.0	0.598 (0.569 - 0.626)	-

ROC =Receiver Operating Characteristic, SEN= Sensibility, SPE= Specificity, AUC = area under the curve, KR-20 = Kuder-Richardson

B.30

NURSE-LED TELEMONTORING: IDENTIFYING HIGH-RISK PRESSURE ULCER PATIENTS IN NEUROLOGICAL HOME SETTINGS

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Introduction: Telemonitoring led by nurses is anticipated to enhance caregivers' health literacy (HL) and subsequently improve outcomes for patients undergoing neurosurgery, including tissue viability.^(1,2) This study evaluates the postoperative pressure ulcer (PU)-related outcomes associated with nurse-led neurosurgery telemonitoring.

Methods: Following the STROBE guidelines (3) this prospective cohort study was conducted in Brazil over a five-month period, from March 2023 to March 2024. The participants included caregivers of neurosurgical patients with varying levels of dependency, post-discharge. We utilised the European Health Literacy Survey Questionnaire short form (HLS-EU-Q6) (4) and the Katz Index (5) to assess caregivers' literacy and patients' functional status, respectively.

Results: Among the 89 caregivers, 73.0% (n=65) were female, averaging 48 years old (SD = 13.48). Literacy levels were categorized as 6.7% (n=6) inadequate, 61.8% (n=55) problematic, and 31.4% (n=28) sufficient. Patient demographics showed 58.4% (n=52) female, with an average age of 56.5 years (SD = 16.3). A total of 47.2% (n=42) were dependent on all six Katz Index functions. The initial prevalence of pressure ulcers (PU) at discharge was 9.8%, consisting of 13 PUs (eight sacral, two occipital, and three trochanter), categorised as stage II (n=22), I (n=6), III (n=4), and IV (n=1). After 120 days, only five PUs had healed. Alarming, a 7.5% (n=6) incidence of new PUs was noted among the 80 initially PU-free patients during the 30-day home evaluation. From this new cohort of PUs developed at home, the literacy status among caregivers showed that five of them were classified as problematic and one sufficient.

Conclusions: Nurse-led telemonitoring may be an effective strategy to identify neurological patients at higher risk of developing PUs in home settings due to low functional status and low caregivers' literacy.

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COI: None.

B.31**PRESSURE INJURY PREVENTION PROGRAM IN INTENSIVE CARE UNIT -KFCH-JAZAN -KSA****Ali Alibrahim¹**¹ MOH-KFCH-JAZAN, WOUND CARE UNIT, Saudi Arabia

Introduction: Hospital acquired pressure ulcers (HAPIs) remain a significant problem, despite implementation of numerous prevention initiatives. We aimed to assess the relationship between healthcare professionals' (nurses, residents, and attending physicians) perceptions of the importance of HAPU prevention and actual HAPU prevalence. Additionally, we were interested in their perception of the effectiveness of existing prevention initiatives and devices, as well as their satisfaction with the same. We hypothesized that perceptions of the importance of pressure ulcer prevention would be correlated with pressure ulcer prevalence. We also hypothesized that there would be high perceived effectiveness for, and satisfaction with, existing initiatives.

Methods: This is a retrospective comparative study of pressure ulcer prevention Programme (PIPP) at single healthcare facility (ICU). The outcomes of PIPP were tracked for 1 year. The current project location was in King Fahad Central Hospital – Jazan, a tertiary hospital with 450 beds located in Saudi Arabia. The average annual census in 2022 was 30000 patients with 5.2 days average length of patient stay.

Results: Hospital acquired pressure ulcers (HAPIs) remain a significant problem, despite implementation of numerous prevention initiatives. We aimed to assess the relationship between healthcare professionals' (nurses, residents, and attending physicians) perceptions of the importance of HAPI prevention and actual HAPI prevalence. Additionally, we were interested in their perception of the effectiveness of existing prevention initiatives and devices, as well as their satisfaction with the same. We hypothesized that perceptions of the importance of pressure ulcer prevention would be correlated with pressure ulcer prevalence. We also hypothesized that there would be high perceived effectiveness for, and satisfaction with, existing initiatives

Conclusions: Despite an overall positive perception of the importance of pressure ulcer prevention, HAPIs continue to be a major problem. Contrary to our hypothesis, many current initiatives are felt to be effective. There was an effective correlation between perceptions on the importance of prevention and HAPI prevalence, suggesting that prevention methods are effective as thought or they are being used as widely as they should. Further research should take advantage of these positive attitudes by prospectively investigating novel interventions, especially in the ICU setting

References:*Ministry of health in Saudi arabia guidelines**COI: no funding*

B.32

A NEW APPROACH TO PEDIATRIC BURNS: COMPARING STABLE OZONIDES AND SILVER SULPHADIAZINE

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Introduction: Burns represent the most frequent acute wounds in pediatric population aged < 5. The most challenging aspects of children's burn are the Lack of:

- alternatives to silver sulphadiazine (SS) in children aged <12 months, face and mucosal burns.
- child's compliance painful and long dressing changes, requiring immobilization causing child and care givers' distress
- easy reproduceable dressing for home caring.

In our study we compared a new approach to pediatric burns based on stable ozonides (SO) to SS cream.

Methods: Out/inpatients aged 0-18 presenting with I to IIB grade burns despite multiplicity, location, are included in the study. Children treated in monotherapy with SO since the first dressing only are considered eligible. Treatment consisted of:

- cleaning and cleansing with SO spray
 - Non adherent I dressing: Paraffin gauzes or tulle.
 - II dressing: non-woven gauzes or thin polyurethane foam in exudating wounds.
 - Cohesive bandage fixation.
 - Change: 12 or 24 hours depending on burn degree.
 - Caregiver education to SO application was provided
- Results are compared SS approach. At least 6 months follow-up for scarring sequelae is provided.

Results: In 36 months, 80 children aged 4.2+/-2.8 out of 300 presenting with burns have been considered eligible.

Outcomes are summarized on Table 1. No Adverse events, changes in pigmentation occurred. Educated care givers performed dressing change in home-caring reducing the need of child's daily clinic admission. Time to re-epithelization was almost superimposable to SS but related safety issue in children aged <12 months, and above all pain, distress related to the mandatory dry cream debris removal were avoided.

Conclusions: The new protocol based on SO for burns graded from I to IIB is a safe alternative even in neonates, periocular area and on mucosae allowing smooth re-epithelization while lowering scarring sequelae rates.

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COI: No Coi

STABLE-OZONIDES PROTOCOL						
GRADE	Sample size	Days to re-epithelization	Scarring	Superinfection	Mean Dressing duration	Home caring
I	31.25%	5	No	No	10 minutes/5% TBSA	+++
IIA	50%	7-10	No in 72% (6 months follow up not ended)	No	10 minutes/5% TBSA	++
IIB	18.75%	8-16	1, silicone gel	1 Aureus MRSA -	15 minutes/5% TBSA	++
Tot 80	100%					
TRADITIONAL PROTOCOL (SILVER SULPHADIAZINE+ PARAFFINE GAUZES)						
GRADE	Sample size	Days to re-epithelization	Scarring	Superinfection	Dressing duration	Home caring
I	27.7%	5	No	No	15 minutes /5% TBSA	++
IIA	46.92%	6-9	No in 87%	No	20 minutes/5% TBSA	+/-
IIB	25.38%	8-18	Yes 15% sample, silicone gel and sheet	6, S. Aureus, E. faecalis	30 minutes/5% TBSA	--
Tot 130	100%					

Table 1: Outcome of Traditional Vs Stable-ozonides protocol for pediatric burns



B.33

CARER ENGAGEMENT IN HOME HEALTH CARE THROUGH VIRTUAL WOUND CARE SERVICES

Abdulaziz Binkanan¹¹ Ministry of Health, Saudi Arabia

Introduction: Providing pressure ulcer care at home can be challenging for healthcare professional facilities due to variety of factors including but not limited to shortage of staff and continuity of care. In the current era, virtual healthcare services including pressure ulcer provide an outstanding experience and cutting costs which can achieve the reason of home visit and goal.

Methods: This study aim to engage the carer of pressure ulcer in home health care setting through a virtual wound care service. 1294 participants who agreed to participate we included. All the participants are carer or taking care of patient living with pressure ulcer. Engagement included both patient and wound assessment, management, treatment, and treatment options as well as full care plan over 8 weeks.

Results: Virtual pressure ulcer care service solved many issues instead of visiting the patients physically. 79% of the participants were satisfied with the provided service, where 39% of them believe that one home care visit per month in addition to the virtual care could be enough. However, 22% believe that even with the virtual service, a clinician must visit the patient physical at least once a week due to clinician specialty.

Conclusions: Virtual pressure ulcer care service in home health care is playing a major role in carer engagement especially when it affects the patient either positively or negatively.

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COI: No conflict of interest

B.34

THE IMPACT OF APPROPRIATE PRESSURE ULCER/INJURY ASSESSMENT ON CLINICIANS

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Introduction: Pressure Ulcers (PUs) have a negative impact on patient quality of life. They are avoidable yet costly injuries. Collaborative evidence-based assessment enables clinicians to improve health outcomes and reduce demands on over-stretched healthcare resources (Andrade et al, 2016).

Appropriate assessment of PUs is key to limiting further tissue damage and selecting suitable treatment (Engles et al, 2016; Greenwood and McGinnis, 2016). Analysis has revealed that nurses' PU management knowledge and practices have been inadequate (Nuru et al, 2015). Clinicians should assess and document PU risks for every age group (Smith et al, 2016). However, they are more inclined to assess older people, since this group is more likely to have PUs. The patient's physical and mental health need to be considered (Richardson et al, 2017) and barriers to healing be identified during the initial assessment process (Benbow, 2016).

Methods: Literature review

Results: PUs have a major impact on the emotional and psychological health of most patients which, in turn, has a negative effect on their quality of life (Sari et al, 2019). As mentioned in European Pressure Ulcer Advisor Panel (EPUAP) and (NPUAP) guidelines, without an assessment, clinicians cannot advise patients on which activities they need to stop or modify to prevent ulceration or improve wound healing (Guy, 2007; NPUAP et al, 2014).

Fabbruzzo-Cota et al (2016) found that the implementation of evidence-based PU prevention strategies reduced the number of hospital-acquired PUs. This can have a huge impact on both patient wellbeing and healthcare resources. Furthermore, early assessment helps clinicians identify and understand the factors that have caused ulceration and determine the patient's needs. It is important to promptly assess and evaluate PUs because early intervention and addressing major risks or contributing factors such as urinary incontinence or nutritional status could aid the healing process, making it less likely that their wounds will become chronic (NPUAP et al, 2014). Assessment is fundamental to efficient diagnostic practices (Eva et al, 2016). Also, enables clinicians to determine the best treatment options for PUs, produce a treatment plan and effectively advise patients on how to manage their wound at home (Richardson et al, 2017)

Patients should be asked about possible contributory factors during assessment. EPUAP, NPUAP and Pan Pacific Pressure Injury Alliance (2014) assessment guidelines have been associated with practices that should be taken into consideration. While managing PUs. Hospitals are required to strictly follow guidelines because they provide a framework on the basis of which specific strategies can be devised to treat and effectively optimise healing of PUs.

Conclusions: Appropriate assessment helps clinicians to make effective diagnostic, treatment and management choices for the patients with PUs. It also enables clinicians to identify at-risk patients and implement PU prevention strategies.

References: Available

COI: No conflict of interest

B.35

MANUAL LYMPH DRAINAGE IN THE MANAGEMENT OF VENOUS LEG ULCER: A CLINICAL CASE STUDY

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Introduction: Chronic venous leg ulcers (VLU) present a significant clinical challenge, with lymph stasis likely contributing to their persistence (1). While compression therapy and interventional therapies are the cornerstone of VLU treatment, recent findings suggest that manual lymph drainage (MLD), as part of complex decongestive physiotherapy (CDP), may improve healing by enhancing lymph circulation (2,3). This case study shows benefits of comprehensive management, including CDP, within a multidisciplinary management.

Methods: In presence of VLU, in addition to vascular diagnostic workup and interventional treatment of underlying arterio-venous disorders, wound management by specialized nurses is provided. Additionally, CDP, if needed, is initiated, consisting of lower limb MLD associated with wound edge MLD prior to wound care. Two patients underwent a 2-week CDP intensive phase followed by a 2–3-week outpatient management with MLD and multilayer compression bandaging (MCB) and follow-up wound management. Patients are encouraged to remain active.

Results: Patient: 43-year-old woman, BMI 60 kg/m², severe bilateral edema, chronic venous insufficiency (CVI) CEAP stage C6sEpAsPr. History includes bilateral great saphenous vein crosssection and stripping, sclerotherapy of tributary veins around lower limb ulcers, no structural venous outflow obstruction, and recurrent superficial varicose vein thrombosis on long-term anti-vitamin K treatment. Ulcer history: recurrent calf ulcerations during the last 5-years with CDP treatment 3x/week and daily wound care through home-caregivers and 2-times an inpatient treatment. Initial wound surface: 60 cm² (fig.1), after 1-month of CDP treatment: 37.5 cm² (fig.2), leg volume reduction: 3.2 liters, weight loss: 4 kg.



Patient: 60-year-old man, BMI 55 kg/m², CVI stage C6sEpAsPr (left leg) and C4aEpAsPr (right leg), severe lipodermatosclerosis, edema. History includes great saphenous vein reflux ablation, no significant residual varicose veins. Post-traumatic left pretibial ulcer, unhealed for 8 months. Previous treatments: negative pressure device, compression bandages, and wound care 2-3 times/week, with no improvement. Initial wound surface: 42 cm²; after 2 weeks of CDP: 24.75 cm². Leg volume reduced by 850 ml, weight loss of 4 kg. Photos showed a healing process with reduced inflammatory signs.

Conclusions: These clinical cases highlights the potential role of MLD in VLU healing within a comprehensive multidisciplinary management. Additional lymphatic drainage of wound edges, combined with specialized wound care, MCB, and patient engagement in physical activities, appeared to reduce edema and decrease ulcer size. These observations suggest that MLD, alongside established compression and interventional venous therapies, could be a valuable component in VLU treatment strategies, potentially, providing better conditions for ulcer healing. However, further clinical studies are needed to assess its efficacy.

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B.36

THE PHYSIOLOGICAL EFFECTS OF INTERNAL AIR PRESSURE CHANGES IN ADVANCED SUPPORT SURFACE DESIGN

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Introduction: Support surface systems aim to redistribute pressure to minimize the risk of pressure ulcers. Advanced systems also have the capability of alternating pressures (APAM) at the patient interface to periodically offload vulnerable skin sites. There is a need to assess the clinical effect of the discrete technical parameters that go to designing an alternating pressure cycle. This study aims to assess the effects of alternating air pressure gradients within support surfaces and their effect on local tissue physiology

Methods: To test the alternating pressure mattress for its functionality in controlling conditions that can lead to pressure ulcers, three mattress settings were assessed (fast cycle, normal cycle, and slow cycle). Research design for the study was conducted in accordance with institutional ethics approval, following an adapted published protocol (Woodhouse et al, 2015). Participants were asked to lie on the mattress for the duration of the study and adopted three distinct postures - supine lying, lateral lying, and high sitting (randomised order). Each participant underwent two trials in different inflation cycle speeds, which were randomised (fast, normal, and slow) to compare the effect of the inflation and deflation speed. Three parameters were measured to evaluate the effectiveness of the support surface: transcutaneous gas tensions (TcPO₂ and TcPCO₂), interface pressures, and internal mattress pressures.

Results: A total of fifteen participants (age 21-68 years), 7/15 females, BMI range 18.7-31.1 kg/m². Peak pressure values varied between participants and postures, with most peak values occurring in the high sitting position. There was no statistical difference between average pressure values for each air inflation cycle speed setting across the postures. By contrast, a significantly higher value ($p < 0.05$) for high sitting was observed when compared to other postures. Transcutaneous gas tension results were collated for each participant with respect to their mattress setting and posture (Table 1). The data depicts that during lateral lying a high level of perfusion was observed for all participants (category 1, Figure 1B). By contrast, during high sitting, there were three category 3 responses during both fast and normal air inflation cycle speed (Figure 1A).

Table 1. Cross tabulation showing the tissue response categories for transcutaneous gas pressures as defined in Chai and Bader, 2013.

Mattress Setting	Transcutaneous Tissue Response (Percentage of the cohort)								
	Supine			Lateral			High Sitting		
	Cat 1	Cat 2	Cat3	Cat1	Cat2	Cat3	Cat 1	Cat 2	Cat3
Fast	50	50	0	90	10	0	30	60	10
Normal	60	40	0	100	0	0	50	30	20
Slow	100	0	0	100	0	0	60	40	0

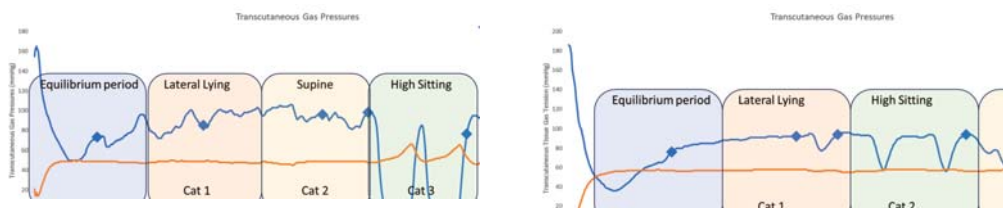


Figure 1. (A) P4 fast air inflation cycle speed demonstrating a category 3 tissue response during high sitting, (B) P5 Normal air inflation cycle speed demonstrating a category 2 tissue response during high sitting and supine.

Conclusions: The study revealed that dynamic surface provided a high level of immersion with peak interface pressures ranging from 50-90mmHg. Sacral perfusion assessed using transcutaneous tissue gas tensions identified cyclic changes in local oxygenation, modulated by the alternating pressure of the mattress. These changes were sensitive to the speed by which air was pumped through the mattress cells, with faster air flow causing greater changes in local tissue physiology. These findings have implications for developing new dynamic mattress systems and optimizing air cell movement to promote tissue perfusion.

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B.37

HARNESSING INTERMITTENT ELECTRICAL STIMULATION (IES) TO PREVENT PRESSURE INJURIES: A NOVEL APPROACH

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Introduction: Pressure injuries pose a significant challenge in healthcare, particularly for individuals with limited mobility or sensation. Intermittent Electrical Stimulation (IES) has emerged as a promising intervention for preventing pressure injuries by targeting the physiological mechanisms responsible for tissue breakdown. This poster provides an overview of the current evidence and practical considerations regarding the application of IES in pressure injury prevention.

Methods: We will present our tissue oxygenation measurement obtained when a thermistor probes are inserted into subcutaneous tissue between two ipsilateral electrodes from IES system. The Licox Thermistor will record tissue oxygenation during two consecutive periods: 30 minutes baseline (IES system turned off) and 60 minutes treatment period (IES system turned on). In addition previously published data will be addressed as well to demonstrate the science behind the IES. First in human safety and feasibility study results will be presented as well as ongoing studies.

Results: IES acts by increasing local blood flow, tissue oxygenation and maintaining muscle contraction enhancing tissue resilience against pressure related damage. Our preliminary results have demonstrated that IES can protect against pressure injuries among at risk populations, including individuals with spinal cord injury or prolonged immobility.

Key aspects of IES application such as mechanism of action, electrode placement, stimulation parameters will be highlighted with the focus on the importance of individual patient's needs. Safety consideration, patient's tolerance will be discussed.

Conclusions: Intermittent Electrical Stimulation holds significant promise for the prevention and treatment of pressure injuries.

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B.38

HOW COULD WE REDUCE INCIDENCE OF PRESSURE INJURY : EXPERIENCE OF ONE HOSPITAL

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Introductions: My hospital is acute patients care facilities. There are many patients with cancer, complex diagnosis and high severity. The incidence of pressure injury had been increasing every year, exceeding target. The nursing department at our hospital formed the Pressure Injury Taskforce Team(TF) to reduce the incidence of pressure injury, prevent pressure injury and early detection.

Methods: TF had composed of one senior manager, unit managers, WOCN and Wound Ostomy Champions(WOC). WOCs submitted 30 hours Wound, Ostomy education and 2 hours practice with WOCN. TF analyzed the incidence of pressure injury, planed project with high incidence rate units or nursing team. WOCN provided small group education that requested depending on the characteristics of the nursing team. Also WOCN provided repositioning simulation, pressure injury stage classification and coaching WOC in a variety of ways including mobile messengers. Nursing department and senior manager selected 'best performance award' and 'best unit of pressure injury prevention' and award them. We focused on raising awareness of pressure injury all around the hospital and nurses. We held SPID(Stop Pressure injury day) festival where all nurses could participate. In festival, we held quiz contest on pressure injury to make interests with pressure injury. Woc in best practice unit presented their practice for pressure injury prevention, benchmarked another units great performance.

Results: Through 2 years of TF and another year, now we achieved a 9.1% reduction in the incidence of pressure injury.

Conclusions: During this period, we raised awareness of pressure injury prevention and provide tailored solution with nursing team or unit. TF were completed successfully.