Pressure Injury Current Awareness Service

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(2019) "Reexamining the Literature on Terminal Ulcers, SCALE, Skin Failure, and Unavoidable Pressure Injuries" Advances In Skin & Wound Care 32(3): E1-E1
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(2019) "Using Nursing Information and Data Mining to Explore the Factors That Predict Pressure Injuries for Patients at the End of Life" Computers, Informatics, Nursing: CiN 37(3): 178-179
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The effect of diabetes on postoperative outcomes following surgical management of pressure ulcers is poorly defined despite evidence showing that patients with diabetes are at increased risk for developing pressure ulcers, as well as postoperative wound complications including delayed healing and infection. This study aimed to examine the impact of diabetes on postoperative outcomes following surgical management of pressure ulcers using the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database. In this retrospective analysis all CPT codes with ICD-9 diagnoses of pressure ulcers were reviewed. A total of 3,274 patients who underwent surgical management of pressure ulcers were identified, of which 1,040 (31.8%) had diabetes. Overall primary outcomes showed rates of superficial and deep incisional surgical site infection (SSI) were 20 and 42%, respectively, while the rate of wound dehiscence was 21%. Univariate analysis of primary outcomes stratified by diabetes status showed that patients with diabetes had significantly higher rates of superficial incisional SSI (39 vs 23%; \( p < 0.001 \)), deep incisional SSI (52 vs 27%; \( p < 0.001 \)), as well as significantly higher rates of readmission (128 vs 89%; \( p < 0.001 \)). Multivariate analysis for significant outcomes between groups on univariate analysis demonstrated that diabetes was an independent risk factor for superficial incisional SSI (OR 27; 95% CI: 15.9-46.2; \( p < 0.001 \)), deep incisional SSI (OR 185; 95% CI: 126-270; \( p < 0.001 \)), wound dehiscence (OR 40.9; 95% CI: 24.9-674; \( p < 0.001 \)), and readmission within 30 days (OR 138; 95% CI: 105-182; \( p < 0.001 \)). These findings emphasize the importance of preoperative prevention, and vigilant postoperative wound care and monitoring in patients with diabetes to minimize morbidity and optimize outcomes. Future prospective studies are needed to establish causality between diabetes and these outcomes; © 2019 by the Wound Healing Society
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Surgical patients are prone to developing hospital-acquired pressure ulcers (HAPU). Therefore, a better prediction tool is needed to predict risk using preoperative data. This study aimed to determine, from previously published HAPU risk factors, which factors are significant among our surgical population and to develop a prediction tool that identifies pressure ulcer risk before the operation. A literature review was first performed to elicit all the published HAPU risk factors before conducting a retrospective case-control study using medical records. The known HAPU risks were compared between patients with HAPU and without HAPU who underwent operations during the same period (July 2015-December 2016). A total of 80 HAPU cases and 189 controls were analysed. Multivariate logistic regression analyses identified eight significant risk factors: age ≥ 75 years, female gender, American Society of Anaesthesiologists ≥ 3, body mass index < 23, preoperative Braden score ≤ 14, anaemia, respiratory disease, and hypertension. The model had bootstrap-corrected c-statistic 0.78 indicating good discrimination. A cut-off score of ≥6 is strongly predictive,
with a positive predictive value of 732% (confidence interval [CI]: 597%-842%) and a negative predictive value of 807% (CI: 743%-861%) SPURS contributes to the preoperative identification of pressure ulcer risk that could help nurses implement preventive measures earlier.

Amon, B V (2019) "Achieving 1,000 Days with Zero Hospital-Acquired Pressure Injuries on a Medical-Surgical Telemetry Unit" MEDSURG Nursing 28(1): 17-21
The article reveals that the American Nurses Association implemented nursing-sensitive indicators (NSIs) such as hospital-acquired pressure injury (HAPI) prevalence as measures of safety to evaluate the quality of nursing care delivered by healthcare facilities and improve patient outcomes Topics discussed include mortality rate in patients with pressure injuries, excess cost of a hospital stay for each HAPI, and strategies for HAPI prevention.

Introduction Pressure ulcers present significant trauma to patients and are expensive to manage In medical imaging (MI), no study has been conducted to rigorously investigate interface pressure (IP) risk on MI table surfaces IP is defined as the pressure between human body and a supporting surface The aims of this research were to investigate whether IP risks exist on MI table surfaces and to assess pain and comfort when lying on MI table surfaces Methods A calibrated XSENSOR mat was used to measure IP for three jeopardy areas (head, sacrum, and heels) in healthy volunteers on an x-ray table surface with no mattress, an x-ray table surface with a thin radiolucent mattress, and a computed tomography table surface, after which they completed a pain and comfort questionnaire Results The sample consisted of 26 females and 23 males aged 18–59 years (mean 34.6; standard deviation [SD] 10.5) Analysis of variance identified statistically significant differences in the mean IP for the jeopardy areas across the three MI table surfaces (P ≤0.01) Results also indicated high mean IP value for the head (759 mmHg; SD 69) on the x-ray table with no mattress Seventy percent of the volunteers found lying on the x-ray table with no mattress to be very uncomfortable Seventy-seven percent experienced most pain whilst lying on the x-ray table with no mattress and over 81% of the pain occurred at the head Conclusion IP risk exists on x-ray tables with no mattress This could increase the risk of developing pressure ulcers in patients accessing prolonged radiography/radiology procedures.

Résumé Introduction Les plaies de pression (PP) constituent un traumatisme important pour les patients et son difficile à prévenir En imagerie médicale (IM), aucune étude n’a été faite pour étudier de manière rigoureuse le risque de pression d’interface (PI) entre le corps humain et la surface de soutien Cette recherche visait donc à étudier si le risque de PI existe sur les tables d’IM et à évaluer la douleur et le confort ressentis en position couchée sur les tables d’IM Méthodologie Un tapis calibré XSENSOR® a été utilisé pour mesurer la PI sur trois zones à risque (tête, sacrum et talons) chez des volontaires en bonne santé sur une table de radiographie sans matelas, sur une table de radiographie avec un mince matelas perméable aux rayons X et sur une table de TDM, après quoi ils ont rempli un questionnaire Sur la douleur et le confort Résultats L’échantillon comprenait 26 femmes et 23 hommes âgés de 18 à 59 ans (moyenne 34.6; écart type [ET] 10.5) L’analyse de variance a conclu à des différences statistiquement significatives sur les trois surfaces (P ≤0.01) Les résultats indiquent également une valeur de PI moyenne élevée pour la tête (759 mmHg; ET 6.9) sur la table de radiographie sans matelas Soixante-dix pour cent des volontaires ont trouvé très inconfortable d’être couchés sur la table de radiographie sans matelas Soixante-sept pour cent ont ressenti le plus de douleurs lorsqu’ils étaient couchés sur la table de radiographie sans matelas plus de 81% des douleurs ressenties étaient à la tête Conclusion Le risque de PI existe sur les tables de radiographie sans matelas Ceci pourrait augmenter le risque de développer des PP chez les patients qui font l’objet de procédures de radiographie/radiologie prolongées Mots clés: plaies de pression; secteurs à risque; pression d’interface; radiographie; imagerie médicale

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The aim of this study was to identify independent risk factors for pressure ulcer (PU) development in a high-risk nursing home population receiving evidence-based PU prevention. This study was part of a randomised controlled trial examining the (cost-)effectiveness of static air support surfaces compared with alternating pressure air mattresses. The sample consisted of 308 residents at a high risk of PU development (presence of non-blanchable erythema, Braden score ≤ 12 or Braden subscale "mobility" ≤ 2) PU incidence was monitored for 14 days. Demographic variables; functional, physical, and psychological characteristics; and data on skin assessment were collected. Independent risk factors were identified using multiple logistic regression analysis. The overall PU incidence (category II-IV) was 84% (n 26), and 19% (n 6) of the residents developed a deep PU (category III-IV). PUs (category II-IV) were significantly associated with non-blanchable erythema, a lower Braden score, and pressure area-related pain in high-risk residents even if preventive care was provided. These results highlight the need of a systematic risk assessment, including pain assessment and skin observations, in order to determine and tailor preventive care to the needs of high-risk individuals.

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Background: There is a significant focus on pressure injury prevention to promote better patient outcomes and control health care cost; Local Problem: In 2016, the institution's pressure injury quarterly prevalence survey showed that two-thirds of the patients surveyed who developed unit-acquired pressure injury stage 2 and greater were in the adult intensive care units; Methods: The quality improvement project used a pre-and postintervention design; Interventions: The adult medical intensive care unit (MICU) executed a competency-based education project to increase staff implementation of pressure injury prevention; Results: Following initiation of competency-based education, staff documentation of pressure injury prevention implementation increased, and unit-acquired pressure injury stage 2 and greater rates were reduced; Conclusions: The use of a competency-based education program may be effective in increasing pressure injury prevention in the intensive care unit.

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This article is based on an advisory board meeting, which was held in London on 27th June 2018, and sponsored by Integra LifeSciences. The expert group was convened to discuss the use of the Integra LifeSciences product portfolio in the diabetic foot, with a focus on limb salvage and creating an appropriate pathway of care that can guide management and be used in practice.

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Pressure ulcers (PUs) are a serious health care problem for nursing home residents and a key quality metric for regulators. Three initiatives were introduced at a 128-bed facility to improve PU prevention. First, a Quality Assurance and Performance Improvement project and a Root Cause Analysis were conducted to improve the facility's wound care programme. Second, a digital wound care management solution was adopted to track wound management. Third, the role of skin integrity coordinator was created as a central point of accountability for wound care-related activities and related performance metrics. Improvements in PU prevention were tracked using Centers of Medicare and Medicaid data, specifically (a) the percentage of long-stay high-risk residents with PUs and (b) the percentage of short-stay residents with PUs that are new or have worsened PU prevalence for long-stay high-risk residents was 1299% (Q4 2016), and upon implementation of these initiatives, the facility saw continued reductions in PU prevalence to 29% (Q4 2017), while PUs for short-stay residents were maintained at zero throughout this period. This study highlights the power of effective management combined with real-time data analytics, as enabled by digital wound care management, to make significant improvements in health care delivery.

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PURPOSE: The purpose of this study was to determine nurses' knowledge and practices regarding pressure injury and identify relationships between these factors and professional nurse characteristics DESIGN: Cross-sectional, descriptive study SETTING AND SUBJECTS: The sample comprised 347 nurses attending the 2013 and 2015 Wound Management Congresses The meetings were organized by the Wound Management Association located in Antalya, Turkey METHODS: A 35-item data collection form was designed for purposes of this study It divided into 2 parts: 8 items queried demographic and professional characteristics of nurse respondents The second part comprised 9 cases describing patients with pressure injury; these cases were associated with 27 items querying pressure injury-related knowledge and practices Demographic and professional characteristics of nurse respondents were summarized via descriptive statistics The Kruskal- Wallis H and Mann-Whitney U tests were used to identify relationships between nurse characteristics and pressure injury knowledge and practices RESULTS: The mean score for the 27 items related to pressure injury knowledge and practices was 5737 ± 1426 out of 100 points Pressure injury knowledge and practices were positively associated with nurses having a bachelor's and/or postgraduate degree (P < 0.012), nurses caring for a higher number of patients with pressure injuries per week (P < 0.042), nurses practicing in intensive care units and wound care clinics (P < 0.011), nurses with specific education in pressure injury (P < 0.000), and those indicating adequate skills and knowledge in pressure injury (P < 0.005) CONCLUSIONS: Nurses' knowledge and practices regarding pressure injuries were lower than anticipated in this sample We recommend additional education and training activities to increase nurses' knowledge and practices related to pressure injury

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Nurses should be highly knowledgeable about and have a positive attitude toward pressure ulcer (PU) prevention; Purpose: This descriptive study was conducted among intensive care unit (ICU) nurses in 6 hospitals in Turkey to identify their PU prevention knowledge, attitudes, and perceptions of barriers to care; Methods: The study was conducted between January 1, 2017, and April 30, 2017, using supervised self-reporting, among nurses working in the ICUs of 3 education and research hospitals, 2 university hospitals, and a private hospital in Ankara, Turkey Three (3) data collection instruments were used: a participant sociodemographic data collection form, the Pressure Ulcer Prevention Knowledge Assessment Instrument (range 0-26, where higher scores indicate more knowledge), and the Attitude Towards Pressure Ulcer Prevention Instrument (range 13-52; a higher score implies a more positive attitude) Frequencies, t tests, analysis of variance, Pearson correlation analysis, and multiple regression analysis were used to analyze the data; Results: Participants (N = 390) were mostly women (339; 869%) who had a bachelor's degree (283; 726%) The mean knowledge score was 1154 ± 291, and the mean attitude score was 4296 ± 406 The most commonly cited barriers to PU prevention were insufficient staff levels (856%) and pressure redistribution materials and equipment (826%) Regression analysis of attitude scores showed the following variables affected nurses' attitude toward PU prevention: self-sufficiency in PU risk assessment (β = 0.28), willingness to learn more about preventing PU (β = -0.15), gender (β = 0.15), and knowledge score (β = 0.14); Conclusion: ICU nurses were found to have a low levels of knowledge but positive attitudes toward PU prevention Policies and procedures should be developed to increase ICU nurse knowledge levels and remove barriers to optimal PU prevention practices;

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Ayello, E A, J M Levine et al (2019) "Reexamining the Literature on Terminal Ulcers, SCALE, Skin Failure, and Unavoidable Pressure Injuries" Advances In Skin & Wound Care 32(3): 109-121
General Purpose: To synthesize the literature regarding skin injuries that are found in patients at the end of life and to clarify the terms used to describe these conditions; Target Audience: This continuing education activity is intended for physicians, physician assistants, nurse practitioners, and nurses with an interest in skin and wound care; Learning Objectives/outcomes: After completing this continuing education activity, you should be better able to:1 Define the terms used to describe pressure injuries and skin changes at the end of life2 Discuss the concept of skin failure as applied to end-of-life skin injuries and implications for practice;
Abstract: This article synthesizes the literature regarding the concepts of "terminal" skin injuries that are found in patients at the end of life, including Kennedy terminal ulcers, Skin Changes At Life's End, Trombley-Brennan terminal tissue injuries, and skin failure. Also included is a discussion of avoidable and unavoidable pressure injuries as defined and differentiated by the Centers for Medicare & Medicaid Services and the National Pressure Ulcer Advisory Panel. To help clarify the controversy among these terms, a unifying concept of "skin failure" that may occur with an acute illness, chronic illness, or as part of the dying process is proposed. This proposed concept of skin failure is etiologically different than a pressure injury, although pressure injury and skin failure can occur concomitantly. These proposed concepts require further research and validated diagnostic criteria. Consensus around appropriate terminology is essential to reduce confusion among stakeholders and ensure appropriate patient care.

Ayello, E A and R G Sibbald (2019) "From Decubitus and Pressure Ulcers to Pressure Injuries" Advances In Skin & Wound Care 32(3): 101-101


This pilot study aimed to evaluate the clinical efficacy and feasibility of a fluidised positioning device to reduce occipital pressure injuries (PIs). A post-test design with a historical control group was used in a 54-bed intensive care unit between September 2017 and August 2018. Patients who were receiving either extracorporeal membrane oxygenation, were mechanically ventilated, or had raised intracranial pressure (≥20) were recruited. The intervention consisted of a fluidised positioning device under the patient's head, and a skin assessment every 8 h. Outcome measures included the occurrence of occipital PIs and registered nurses' perspectives of the intervention. Data collected from patients in the intervention group were compared with data obtained from the historical control group between May 2016 and April 2017. Sixty-four patients were recruited in the intervention phase and 63 were in the historical control group. Results showed a statistically significant reduction in occipital PIs by 87.7% (16/63; 254% historical control vs 2/64; 313% interventional group). Bedside RNs provided positive evaluation of the fluidised positioning device. The findings demonstrate that the fluidised positioning device is a feasible and effective intervention in reducing the risk of occipital PIs in intensive care patients, which merits the continuation of use and further evaluation through a larger-scale study.


Background: Considerable evidence exists on how to prevent hospital-acquired pressure injuries (HAPIs). However, processes employed to implement evidence play a significant role in influencing outcomes. Problem: One Australian health district experienced a substantial increase in HAPIs over a 5-year period (by almost 60%) that required a systemwide practice change. Approach: This article reports on the people, processes, and learnings from using the Promoting Action on Research Implementation in Health Services (PARIHS) framework taking into account the evidence, context, and facilitation to address HAPIs. Outcomes: Applying this approach resulted in a significant decrease in pressure injuries and positive practice change, leading to improved patient outcomes in a shorter time frame than previous strategies. Conclusion: Processes guided by the PARIHS enhanced the effectiveness of translating evidence into practice and positively assisted clinicians to promote optimal patient care. This approach is transferrable to other health care settings.


Background: Hospital-acquired pressure injuries are a quality indicator in healthcare, including nursing care. Successful implementation of interventions to prevent pressure injuries can be impeded by factors beyond the control of nursing staff. Limited research exists on nurses' experiences of providing pressure injury prevention and management in a hospital setting. Aim: To gain an in-depth understanding of nurses' experiences concerning pressure injury prevention and management in a hospital setting. Methods: A
qualitative study design was employed. The purposive sample consisted of twenty nurses working in units with a high incidence of pressure injuries across a local health district in Sydney, Australia. Participants were interviewed between May and September 2016, either individually or as a group using semi-structured interviews. Findings: Four themes were identified that captured the experiences of nurses providing pressure injury prevention and management in a hospital setting: "managing competing demands in complex clinical settings"; "the importance of knowledge and skill"; "clarifying organisational expectations, purpose and successes"; and "feeling ethically challenged when unable to provide quality patient care". Discussion: Participants were aware of the importance of pressure injury prevention and management but found it difficult to provide quality care due to competing priorities and challenges faced at both an organisational and patient level. Conclusion: Pressure injury prevention and management is just one aspect of patient care and should not be considered on its own to change existing practice. Participants wanted to implement preventative strategies and provide optimal pressure injury care, however, complexities associated with a hospital setting hindered this process. Hospitals need to put measures in place that support and enable nurses to deliver the quality care required to prevent and manage pressure injuries.


Objectives: The aims of this study were to determine the costs of hospital-acquired pressure injuries (HAPIs) in one local health district in Australia and compare the costs and consequences of an intervention-based program with current practice to reduce HAPI incidence and prevalence.

Methods: A retrospective cost-consequence analysis was conducted using HAPI incidence rate per occupied bed days, point prevalence rates, Australian Refined-Diagnosis Related Group (AR-DRG) costs and the costs of the program to reduce the HAPI rate. Data were analysed for two phases: preprogram implementation (1 June 2015-1 June 2016) and postprogram implementation (1 August 2016-31 July 2017). Results: The HAPI intervention-based program resulted in a 514% reduction in the incidence of HAPI (from 146 per occupied bed day in 2014 to 071 per occupied bed day in 2017) and a 716% reduction in the prevalence of HAPI (from 67% in 2014 to 19% in 2017). The occurrence of HAPI added an average cost of A$3332 per episode, such that the overall program, including implementation, reduced costs by A$837387. The greatest cost reduction was due to the cessation of washable and disposable underpads. The largest contributor to the cost of HAPI prevention was for education and training regarding HAPI prevention initiatives.

Conclusions: The HAPI intervention-based program halved the incidence and substantially reduced the prevalence of HAPI, with a 231% cost saving compared with the previous approach to preventing HAPIs. What is known about the topic? HAPIs are costly to the individual, the organisation and health system. The prevention of HAPIs is a priority in Australia. There is limited research on the economic effect of HAPIs and the costs and consequences for hospitals of implementation strategies to reduce their incidence. What does this paper add? This paper informs health policy and decision makers about the costs and consequences for a local health district of a program to reduce and prevent HAPIs. This paper reports the economic effect of HAPIs, including hospital episode costs per HAPI and length of stay, on one local health district. What are the implications for practitioners? This cost-consequence analysis has shown that the program to reduce HAPIs resulted in a reduction in expenditure and positive patient outcomes. Such a program is potentially transferable to other healthcare settings.


Studies suggest that sedentary lifestyles are increasing with the average adult spending 50-60% of the day sitting. This change in lifestyle activities poses a risk not just to a person's general health but also for the development of a pressure ulcer, particularly in people who are forced to sit for extended periods of time due to illness or disability. The purpose of this article is to define and categorise pressure ulcers. To explore how and where pressure ulcers develop in the seated individual, the risk factors from direct and indirect forces when seated and the evidence base to explain why pressure ulcers develop when sitting.

The Bates-Jensen Wound Assessment Tool (BWAT) is used to assess wound healing in clinical practice. The purpose of this study was to evaluate BWAT use among nursing home residents with pressure injury. Findings and reliability estimates from the BWAT related to pressure injury characteristics (stage, anatomic location) and natural history (resolved, persisted) among 142 ethnically and racially diverse residents are reported. In this prospective 16-week study, 305 pressure injuries among 142 participants (34% prevalence) are described by stage, anatomic location, and BWAT scores. Visual and subepidermal moisture assessments were obtained from sacrum, buttock, ischial, and heel ulcers. Weekly Participants were 14% Asian, 28% Black, 18% Hispanic, 40% White with a mean age of 78 ± 14 years, and were 62% female; 80% functionally dependent (bed mobility extensive/total assistance) and at risk (Braden Scale score 14 ± 27). The reliability coefficient for BWAT score (all participants, all anatomic locations) was high (r 0.90; p < 0.0001; n 1,161 observations). Weighted Kappas for characteristics ranging from 046 (skin color surrounding wound) to 079 (undermining) were consistent for all participants. BWAT scores showed strongest agreement coefficients for stage 4 pressure injury (r 0.69), pressure injuries among Asian and White ethnicity/racial groups (r 0.89, and r 0.91, respectively), and sacrum anatomic location (r 0.92) indicating scores are better correlated to fair skin tones. Lower agreement coefficients were demonstrated for stage 2 pressure injury (r 0.38) and pressure injuries among African American and Hispanic ethnicity/racial groups (r 0.88 and 0.87, respectively). BWAT scores were significantly different by pressure injury stage (F 4967, df 6, p < 0.0001) and anatomic location (F 3376, df 8, p < 0.0001). BWAT score correlated with pressure injury natural history (ulcer resolved 184 ± 74, ulcer persisted 249 ± 100; F 7011, df 2, p < 0.0001), but not with comorbidities. The BWAT provides reliable, objective data for assessing pressure injury healing progress. © 2019 by the Wound Healing Society

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Benskin, L L (2018) "Evidence for Polymeric Membrane Dressings as a Unique Dressing Subcategory, Using Pressure Ulcers as an Example" Advances In Wound Care 7(12): 419-426

Objective: Wound management recommendations usually group dressings by base substrate material or reimbursement codes, even when functional differences are vast (eg, honey-containing alginates, superabsorbent hydrogels). Polymeric membrane dressings (PMDs) diverge dramatically from conventional foam dressings in functional attributes, indications, and patient results, providing an opportunity to demonstrate the evidence for categorizing dressings based upon functional differences. Approach: A search of all published literature describing the use of PMDs, with no date or language limits, was conducted. Documents simply listing a PMD brand name (eg, PolyMem) as one of many "foam" dressings were eliminated. The subset of evidence evaluating PMDs for tissue damage resulting from pressure (pressure ulcers, pressure injuries, henceforth: PUs) was summarized. Results: Studies of PMDs, primarily from independent clinician-researchers, have accumulated into a significant evidence base over the past 30 years. PMDs actively cleanse and debride wounds, balance moisture, relieve pain, and limit inflammation; all functions not shared by conventional foams. Innovation: This article supports a paradigm shift for wound management guidelines to embrace a more evidence-based, patient-centered method of classifying products. The results presented here, using PMDs for PUs as an example, show that functional attributes, indications, and patient results are not always dictated by dressing substrates. Rather than being comparable with conventional foam dressings, PMDs have substantially enhanced functions and results. Conclusion: These results strongly support the author's assertion that evidence-based wound management requires guidelines and recommendations that categorize advanced dressings based upon how they function in real-life settings, rather than upon their base substrate.

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Pressure ulcers (PUs) are a common problem with serious health care implications. Purpose: This study was conducted to assess PU prevalence, incidence, clinical features, nursing care measures, and patient variables and outcomes among inpatients admitted to 13 internal medicine departments at a university hospital in Turkey between 2010 and 2014. Methods: Using a cross-sectional, retrospective design,
Background: Non-invasive ventilation (NIV) is a valuable treatment in the management of acute hypercapnic respiratory failure. NIV is not without risks. One such adverse effect is the development of pressure ulcers over the nasal bridge, which have an incidence of up to 20% of patients requiring NIV in this setting. The role of medical devices in the development of hospital-acquired pressure ulcers has been increasingly recognised with 10-35% of all hospital-acquired ulcers attributed to medical devices. Guidelines on acute NIV use suggest good skin care strategies. However, data on the magnitude of the problem of nasal bridge pressure ulceration and the effect of proactive preventative steps remains scant.

Method: A quality improvement project was designed to reduce the incidence of nasal bridge pressure ulcers during acute NIV. Hydrocolloid dressings were placed over the nasal bridge in all patients requiring NIV between 30th October 2015 and the 29th October 2016. Tissue viability was assessed daily with new pressure ulceration defining as grade 2 or above. Rates of nasal bridge pressure ulcers were compared to all patients requiring NIV in the 12-month period prior to intervention.

Results: In Group 1, there were 161 admissions and 9 pressure ulcers from 666 NIV bed-days. In Group 2 there were 134 admissions and 0 pressure ulcers from 718 NIV bed-days. There was a statistically significant reduction in grade 2 pressure ulceration rates (p < 0.0013) in Group 2 compared to Group 1. Conclusion: Application of an early prophylactic pressure-relieving hydrocolloid nasal dressing reduces the risk of developing grade 2 pressure ulcers in patients in patients requiring acute NIV.

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The article examines whether there is a sustainable way to influence staff culture, implement pressure injury prevention techniques and attain the zero hospital-acquired pressure injuries (HAPIs) goal of the US Centers for Medicare & Medicaid Services (CMS). Topics discussed include training of skin care resource nurses during the first quarter of 2016 to become proficient with skin and wound care guidelines and protocols, and key factors needed for the sustainability of the CMS project.

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Introduction: Low-level laser therapy is used in managing chronic wounds including pressure ulcers. Less is known about its impact on the healing process if an inhibitive agent, e.g., bacterial infection takes place. Modulating non-specific immunity processes might eliminate bacteria if laser therapy is applied. Aim: To investigate the impact of low-level laser therapy on pressure ulcer dynamics considering an infectious agent and cathelicidin LL-37 concentration; Material and methods: The study comprised 6 patients with pressure ulcers ranging from stage II to III in Torrance classification and 12 patients without pressure ulcers. Venous blood sample and decubitus wound swab were taken - in study groups A at baseline and after 2 weeks; in
control group B once - at a specific point of time The swabs served for species identification Drug susceptibility of isolated pathogens and cathelicidin LL-37 in serum concentration were measured; Results: In study group A, the following bacteria predominantly occurred: S aureus, E faecalis, P mirabilis, P aeruginosa, while in control group B, excluding one MRSA case, S hominis, S epidermidis, D nishinomiyaensis, A haemolyticus (physiological flora) were present HLR resistance mechanisms were detected when analyzing drug susceptibility panels Study group A findings demonstrated a statistically significant difference between the levels of cathelicidin LL-37 concentration at baseline and at the end; Conclusions: There is insufficient information to accurately determine the effect of LLLT on pressure ulcer dynamics considering an infectious agent These effects may occur if innate immunity processes are modulated so that laser therapy might eliminate bacteria indirectly;

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NHS Resolution manages the Clinical Negligence Scheme for Trusts, and aims to reduce the cost of litigation in terms of clinical negligence claims To achieve this, potential clinical negligence claims are screened to assess whether to defend the claim or to provide an out-of-court settlement Nurse experts from all nursing specialties are engaged to review all documentation and patient records to offer an opinion on the viability of a claim This article describes the processes involved in assessing tissue viability clinical negligence claims, providing examples of evidence that guided decisions and advice on how nurses can protect their organisation from costly litigation

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Aim The purpose of the study was to evaluate clinical safety and effectiveness of Oasis® Wound Matrix as a treatment for full-thickness pressure ulcers and compare it to Standard Care Methods A total of 130 adults with Stage III or Stage IV pressure ulcers were randomly assigned, received either multiple topical treatments of SIS plus standard care (n  67), or standard care alone (n  63), and were subsequently evaluated Ulcer size was determined at enrollment and weekly throughout treatment Healing was assessed at each visit for a period of up to 12 weeks, with incidence of complete healing and 90% reduction in ulcer area being the primary outcome measures Results The proportion of complete healing in the SIS group was 40% as compared to 29% in the standard of care group (p  0111); the percentage of patients having a 90% reduction in ulcer surface area was 55% in the SIS group versus 38% in the standard of care group (p  0037) Conclusions The results of this study suggest that within the setting of a comprehensive wound care program, weekly treatment of chronic pressure ulcers with SIS wound matrix increases the incidence of 90% reduction in wound size versus standard of care alone Highlights • An extracellular (small intestinal submucosa, SIS) wound matrix made from porcine collagen is described • The SIS wound matrix was compared to Standard of Care for treating full-thickness pressure ulcers • The proportion of complete healing in the SIS wound matrix group was higher than the Standard of Care group

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Purpose: To analyze whether a viscoelastic mattress support surface can reduce the incidence of stage 2 pressure injuries compared to a standard hospital mattress with pyramidal overlay in critically ill patients; Method: A randomized clinical trial with intention-to-treat analysis was carried out recruiting patients with Braden scale ≤14 on intensive care unit admission from April 2016 to April 2017 Patients were allocated into two groups: intervention group (viscoelastic mattress) and control group (standard mattress with pyramidal overlay) The level of significance adopted was 5%; Results: A total of 62 patients were included in the study There was a predominance of males (53%) and the mean age was 679 (SD 188) years There were no differences in clinical or severity characteristics between the patients in the control group and the intervention group Pressure injuries occurred in 35 patients, with a median time of 7 days (IQR 4-10) from admission The frequency of pressure injuries was higher in the control group (806%) compared to the intervention group
Use of a hydrocolloid dressing (HCD) is generally recommended to help prevent pressure ulcers (PUs) in high-risk patients, including ulcers caused by noninvasive ventilation (NIV); Purpose: The study was conducted to compare the effect of preventive use of HCD to other methods in the rate of facial PUs caused by NIV; Methods: PubMed, Web of Science, China National Knowledge Infrastructure, and Wanfang Data were searched from date of index inception to August 2018 without language restrictions to identify randomized controlled trials (RCTs) that compared HCD use to other NIV-related PU prevention measures Publications were systematically reviewed, data were extracted, and study quality was assessed using the Jadad scale Odds ratio (OR) with 95% confidence intervals (CIs) for PU incidence in patients using HCD versus patients managed with gauze or standard skin care procedures (control) were calculated using a fixed-effects model; Results: The search yielded 80 publications; 40 met the study criteria for full-text and 22 met the meta-analysis inclusion criteria (total study participants 2519) Patients who used a HCD (n 1260) had a significantly decreased incidence of PU (OR 0.15; 95% CI: 0.01-0.20) compared with control group patients (n 1259) Subgroup analysis by age showed a lower incidence in children (OR 0.09; 95% CI: 0.01-0.081) and adults (OR 0.16; 95% CI: 0.02-0.22) in the HCD group than in the control group PU incidence using HCD was lower compared to gauze (OR 0.17; 95% CI: 0.01-0.028) and regular skin care (OR 0.13; 95% CI: 0.009-0.019) Funnel plot diagrams suggested a risk of bias Sensitivity analysis using a random-effects model did not change the result of the main meta-analysis; Conclusion: Using a HCD significantly decreased the incidence of facial PUs caused by NIV Additional high-quality, prospective research to confirm the effectiveness of HCD in preventing NIV-related PUs is warranted;
Evidence suggests that inaccurate and incomplete pressure injury (PI) documentation threatens the validity of treatment and undermines policy and quality improvement. This quality improvement project sought to identify barriers and facilitators when conducting and documenting the daily comprehensive skin assessment in 31 Department of Veterans Affairs (VA) facilities. Evaluators in this 1-year, cross-sectional quality improvement project, using a qualitative approach, interviewed nurses of medical-surgical and critical care units. Participants (N = 62) from 12 high reassessment units (HRUs) and 13 low reassessment units (LRUs) were interviewed using telephone focus groups. Staff from HRUs reported 9 activities that ensured consistency in clinical practices, in validating data, and in correcting inaccuracies. The LRU staff tended to report performing only 2 of the 9 activities. The main barriers to accurate documentation were lack of knowledge, poor templates, and staffing issues such as understaffing and turnover, and main facilitators were an internal data validation process and a documentation template to local practices. Findings from this project led to increased VA leadership engagement, development of 3 innovative, award-winning VA mobile PI prevention and management applications, updated policies and directives on PI prevention, and upgrading of the national VA HAPI workgroup to an advisory committee and improved collaboration between the PI advisory committee and nursing informatics.

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Objective: The development of in-hospital acquired pressure ulcers (PUs) is of great concern for both patients and professionals in health care. Based on the hypothesis that identification of patients who are prone to develop PU will enhance preventive measures in this group of patients, we investigated a new tool, Qscale, for in-hospital prediction of PU Approach: A total of 383 patients were recruited from three departments. The investigations were performed in two steps: 252 patients were used to train the algorithm, and 131 patients were used in the validation. The new scale combines observational and on-site available information regarding patient mobility. Results: The validation data yielded an area under the curve (AUC) of 0.82. The Qscale had a significantly higher AUC compared with that of the Braden Scale with an AUC of 0.76 (p < 0.05). When comparing the performance at specific thresholds, a sensitivity of 47% and a specificity of 94% were observed. This was significantly (p < 0.05) better than the Braden score with a sensitivity of 20% and a specificity of 94%. Innovation: Our study showed promising results on both the training and validation data of the Qscale in comparison with the Braden Scale. Conclusion: The new scale has a potential benefit in the prevention of PU in a hospital setting.

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Objective: Scientific literature suggests pressure ulcer (PU) risk increases as immobility increases, indicating that more extensive paralysis confers a greater risk of PU. Yet the specific level of paralysis (ie, hemiplegia vs paraplegia vs quadriplegia), apart from neurodegenerative diagnoses, has never been examined in the long-term care (LTC) population. This study examined the prevalence of PU among LTC residents with different paralysis levels. Methods: The authors conducted a secondary data analysis of the 2012 US Minimum Data Set of LTC facilities (n = 51,664 residents) Measures included PU stage, level of paralysis, functional impairments, comorbidities, and sociodemographic factors. After removing residents with neurodegenerative disease, comatose patients, and those with hip fractures from the analysis, logistic regressions were used to examine the association of risk factors and sociodemographic characteristics with the presence of PU. Main Results: The sample included 7,540 patients with quadriplegia, 11,614 patients with paraplegia, and 32,510 patients with hemiplegia in LTC facilities. The PU prevalence in the sample (stages 2, 3, and 4; suspected deep-tissue injury; and unstageable PUs) was 339% for patients with quadriplegia, 474% for patients with paraplegia, and 96% for patients with hemiplegia. Conclusions: Within paralysis groups (quadriplegic, paraplegic, hemiplegic), risk factors for PU differed in type and magnitude. The PU rates associated with quadriplegia and paraplegia are much higher than LTC residents without paralysis, and PU prevalence for hemiplegia is similar to the rate in LTC residents without paralysis.
When the risk factor of paraplegia versus quadriplegia was isolated, PU prevalence for patients with paraplegia was significantly higher;


This quality improvement project used the Model for Improvement including the Plan-Do-Study-Act cycle of change framework to educate pediatric intensive care unit (PICU) nurses on risk factors for pediatric pressure injuries and prevention strategies, improve turning compliance for PICU patients, and implement an electronic trigger to order nutrition consultations on all patients with a Braden Q score less than 16 The quality improvement project decreased preventable patient harm to PICU patients by decreasing the pressure injury incidence rate from 8% to 3% in the 6-week time period; Copyright © 2018 Elsevier Inc All rights reserved


The article provides information on the Turn Team Program (TTP), a project aimed at empowering nurses with direct responsibility for hospital-acquired pressure injuries (HAPI) prevention Topics discussed include estimated number of patients affected by HAPIs each year in the US, negative impact of HAPIs, and cost of TTP


Pressure injuries/ulcers are a global health issue, and there is a need for clinicians from many countries and continents to express their opinions on the terminology change (pressure ulcer to injury) and revised staging definitions A convenience, opinion survey sample of clinicians from the Western Asia Gulf Region enrolled in a yearlong wound care course participated by expressing their opinion about these changes Results reveal support for the pressure injury terminology and the revised staging definitions;


BACKGROUND: Selective use of pressure-redistributing support surfaces is considered an essential component of a pressure injury prevention bundle Critically ill children who are too big for an islolette but too little for a bed are usually placed in critical care cribs that have unique features such as moveable side rails and a built-in scale for weighing the patient, but they do not have a mattress designed to redistribute pressure The primary aim of this quality improvement project was to evaluate a pressure redistribution mattress designed for use in critical care cribs CASES: We retrospectively reviewed 22 charts of critically ill pediatric patients who participated in a product trial completed over a 12-week period in a stand-alone children's hospital in the Western United States We reviewed demographic data, skin assessments, Braden Q Scale score, and support surface use Our review revealed no pressure injury occurrences over the 12-week data collection period CONCLUSIONS: Findings from this quality improvement project suggest that the
pressure-redistributing mattress, when used as part of an intervention bundle, prevents pressure injuries in critically ill pediatric patients

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The present study, drawn from a larger mixed-methods case study, provides insights into the health literacy of community-based patients with pressure injuries, and their carers, and critically analyzes the patient information resources available; crucial because health literacy is associated with patient care and outcomes for patients. Two datasets were used to better understand patient literacy in relation to pressure injury: (i) narratives from patients and carers; and (ii) analysis of patient education resources. Narratives were subject to content analysis and patient education resources available to the patients were analyzed drawing on the Simplified Measure of Gobbledygook, the National Health Service Toolkit for Producing Patient Resources, and compared to an internationally-advocated pressure injury leaflet. The study findings indicated that despite leaflets broadly meeting required production and content guidelines, patients appeared to poorly engage with these materials and demonstrated limited health literacy in relation to pressure injury. Although improvements in leaflet production and readability might be advantageous, emphasis should remain on quality patient–health-care professional relationships to enable tailored patient education that can enhance awareness and engagement with treatment and prevention interventions.

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Pressure injuries are costly to the healthcare system and mostly preventable, yet incidence rates remain high. Recommendations for improved care and prevention of pressure injuries from the Joint Commission revolve around continuous monitoring of prevention protocols and prompts for the care team. The E-scale is a bed weight monitoring system with load cells placed under the legs of a bed. This study investigated the feasibility of the E-scale system for detecting and classifying movements in bed, which are relevant for pressure injury risk assessment using a threshold-based detection algorithm and a K-nearest neighbor classification approach. The E-scale was able to detect and classify four types of movements (rolls, turns in place, extremity movements, and assisted turns) with >94% accuracy. This analysis showed that the E-scale could be used to monitor movements in bed, which could be used to prompt the care team when interventions are needed and support research investigating the effectiveness of care plans.

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An introduction is presented in which the editor discusses various reports within the issue on topics including the experience of lesbian, gay, bisexual, and transgender (LGBT) patients in Great Britain, managing pressure ulcers, and claims against the National Health Service (NHS).

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ABSTRACT Heel ulcers have a significant impact on lower extremity morbidity and confer a high risk for major amputations. Although there are many conservative treatment options, once calcaneal osteomyelitis occurs or a heel ulcer becomes chronic or recalcitrant, more invasive management is required. The partial calcanectomy is a surgical solution that can address both pathologies—the ulceration and the infected bone. The conventional partial calcanectomy, however, does not ensure complete soft tissue closure. Often, closure under tension is required for primary closure of the soft tissue deficit or the wound must be closed by secondary intention. This process occurs, in part, when the proportion of bone resected is insufficient in relation to the size of the wound. Closure under tension increases the possibility of dehiscence and subsequent postoperative surgical site complications that lead to the same risks for major amputation as the index heel ulcer. This article introduces and describes a novel modification to the conventional partial calcanectomy and addresses these aforementioned concerns. The vertical contour calcanectomy...
incorporates improvements to an already accepted limb salvage technique The purpose of this article was to describe the indications, contraindications, intraoperative technique and postoperative management of the vertical contour calcanectomy for patients who present with heel ulcers in the limb salvage setting

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Background: Bedsore is a common problem in patients with stroke, causing an increased number of hospitalizations, increased healthcare costs, and mortality of these patients Typically, due to their numerous problems, these patients are not able to take care of themselves and thus their care providers play an important role in providing care at their home Objectives: The present study was conducted with the aim of investigating home-based training on the incidence of bedsore in patients with stroke, during year 2017 Methods: In the present clinical trial study, 70 family caregivers of stroke patients that had referred to Ali Ebne Abitaleb Hospital, Zahedan, Iran, were chosen through available sampling and then randomly assigned to control and intervention groups In the intervention group, explanations were provided for the family caregivers about stroke, its resulting problems, bedsore, methods for preventing and caring for bedsore at home The explanations were provided at the place of residence of the patient at the time of discharge as well as two and three weeks after discharge at home, and on the patient's bedside In the control group, on the other hand, routine trainings of the ward were given After 12 weeks, both groups were evaluated in terms of incidence of bedsore, based on scoring presented by the National Pressure Ulcer Advisory Panel (NPUAP) Data analysis was performed by chi-square and t-test, using SPSS 21

Results: The number of individuals in each group was 35 Frequency of incidence of bedsore after the intervention in the intervention and control groups was 257 and 486%, respectively The statistical results indicated that there was a significant difference between the two groups in terms of frequency of bedsore (P 0046) Conclusions: Home-based training is a practical and inexpensive method for participation of family members in providing care for patients with stroke and reducing incidence of bedsore in these patients

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Purpose: Medically underserved adults with spinal cord injury (SCI) remain at high risk of incurring medically serious pressure injuries even after receiving education in prevention techniques The purpose of this research is to identify circumstances leading to medically serious pressure injury development in medically underserved adults with SCI during a lifestyle-based pressure injury prevention program, and provide recommendations for future rehabilitation approaches and intervention design; Methods: This study entailed a qualitative secondary case analysis of treatment notes from a randomized controlled trial Participants were 25 community-dwelling, medically underserved adults with SCI who developed medically serious pressure injuries during the course of the intervention of the RCT Results and Conclusions: Among the 25 participants, 40 unique medically serious pressure injuries were detected The six themes related to medically serious pressure injury development were: (1) lack of rudimentary knowledge pertaining to wound care; (2) equipment and supply issues; (3) comorbidities; (4) non-adherence to prescribed bed rest; (5) inactivity; and (6) circumstances beyond the intervention's reach Together, these factors may have undermined the effectiveness of the intervention program Modifications, such as assessing health literacy levels of patients prior to providing care, providing tailored wound care education, and focusing on equipment needs, have potential for altering future rehabilitation programs and improving health outcomes Implications for rehabilitation To provide patients with spinal cord injury with the necessary information to prevent medically serious pressure injury development, health care providers need to understand their patient's unique personal contexts, including socio-economic status, language skills, and mental/cognitive functioning When providing wound care information to patients with spinal cord injury who have developed a medically serious pressure injury, practitioners should take into account the level of health literacy of their patient in order to provide education that is appropriate and understandable Practitioners should be aware of how to help their patient advocate for outside services and care that address their equipment needs, such as finding funding or grants to pay for expensive medical equipment;

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The article discusses a case study on the diagnosis of pressure wound due to subcutaneous drain after breast reconstruction. Topics include the complications due to exposure of breast implants and tissue expander, patient developing skin thinning and erythema in the breast, and the methods to avoid tissue expander exposure.

A pressure ulcer prevalence of 173% at Odense University Hospital in Denmark in 2010 prompted action and a quality improvement project was planned. This had two aims: to reduce pressure ulcers at the hospital by 50% and to have no pressure ulcers at or above category 3. An project was established with a steering committee, a pressure ulcer specialist nurse, local dedicated nurses and nurse assistants to implement a pressure ulcer bundle in clinical practice at all departments at the hospital. Six years later the pressure ulcer prevalence was down to approximately 2% and in 2018 only one stage 3 pressure ulcer occurred in the hospital. Pressure ulcer prevention is now incorporated into clinical practice in all departments at the hospital.

PURPOSE: The aim of this study was to assess nurses' knowledge of pressure injuries in order to gather benchmark data, identify knowledge gaps, and based on results, implement educational strategies to improve practice.

DESIGN: Cross-sectional survey.

SUBJECTS AND SETTING: The study setting was a large Australian tertiary general hospital employing approximately 2500 nurses in both full-time and part-time roles. A proportional sample (25%) stratified by experience, preparation, and facility-generated categories (nursing grade) was generated. The sample included nursing students and nursing assistants. Three hundred six participants completing the survey.

INSTRUMENT: The Pieper-Zulkowski Pressure Ulcer Knowledge Test (PZPUKT) version 2, comprising 72 statements, with 3 subscales (prevention/risk, staging, and wound description) was used to measure pressure injury knowledge. Item responses are "True," "False," and "Don't know." For the purpose of analyses, correct responses were scored 1, and incorrect or "don't know" responses were scored 0. Generally accepted ranges of scoring for the original PZPUKT specify less than 70% as unsatisfactory, 70% to 799% as satisfactory, 80% to 899% as good, and 90% and greater as very good knowledge of pressure injury prevention.

METHODS: The survey was advertised throughout the hospital by strategically placed posters, computer screen savers within the hospital, and e-mails. Respondents completed paper-based questionnaires and data were manually entered online. Data were collected between September 2015 and October 2016. Descriptive and nonparametric inferential statistical tests (Mann-Whitney U, Kruskal-Wallis H) were used to analyze within sample differences in scores.

RESULTS: The overall mean knowledge score was 65%; approximately two-thirds of the sample (68%) scored 60% and greater, reflecting an unsatisfactory knowledge level of pressure injury prevention according to the original PZPUKT scores. The lowest mean scores were found in the "wound description" subscale. Participants who sought pressure injury information via the Internet had read pressure injury guidelines scored significantly higher than those who did not (P < 001 and P < 001, respectively). Seventeen items were answered incorrectly by over half of participants, identifying important knowledge deficits, particularly within the wound description subscale.

CONCLUSIONS: When compared with results from studies using the PZPUKT, we contend that a cutoff score of 60% and greater (instead of >70%) should be used to indicate an overall satisfactory score. Our results identified deficits in pressure injury knowledge related to seating support and seated individuals and wound dressings as areas where nurses would benefit from focused education strategies.

Background: Pressure ulcers represent an important worldwide public health problem, which substantially decrease the quality of life of those affected. Yet, few studies to date have analyzed the perceptions regarding home care for pressure ulcers. Aims: To explore the conceptualizations regarding home care of pressure ulcers from the perspective of affected patients and their caregivers. Methods: A qualitative study design based on Grounded Theory. In-depth interviews were conducted on a theoretical sample of 10 people currently suffering from a pressure ulcer, or who had experienced one in the past, and 15 caregivers of patients who had suffered from this pathology, all of whom came from the four health districts of Puertollano (Ciudad Real, Spain). Findings: Two categories emerged to explain the conceptualizations regarding pressure ulcers: (a) Cause of the pressure ulcer with three subcategories (unavoidable injuries, caregiver’s lack of knowledge and painful wounds) and (b) Preferences regarding caring for pressure ulcers with two subcategories (home care as the best approach to treatment and noninstitutionalization). Conclusions: This research provides a novel perspective on the specific problems surrounding home care for pressure ulcers, including the perceptions of both patients and their caregivers. It is important to give a voice to patients and their caregivers as this will help understand their needs and improve the care provided. Further studies are required to improve current treatment protocols and clinical practice guidelines for the prevention and treatment of this pathology; © 2019 Nordic College of Caring Science

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Prevention of pressure ulcers (PUs) is becoming the focus of acute and chronic care facilities for a variety of reasons beyond human suffering. The literature demonstrates that pressure ulcer prevention (PUP) reduces hospital stays, leads to less aggressive medical procedures, yields substantial cost-benefit and lowers the risk for litigation. Infrared thermography (IRT) is a noninvasive quantitative method for mapping skin temperatures, which makes it effective and powerful in assessing the microclimate conditions associated with a risk for PUs. This article reviews current and potential future roles of IRT in mechanobiological and clinical research of PUP and pressure ulcer treatment (PUT), and presents relevant examples from studies by the authors’ group that are currently under way with focus on measurements of skin microclimate conditions caused by medical devices associated with device-related PUs and assessment of polymeric membrane dressings and the microclimate conditions developing in their PUP application. The authors further discuss the potential for future use of IRT in PUP and PUT, and the strengths and limitations of IRT in these applications in view of present global PUP efforts.

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Gefen, A, N Santamaria, et al (2019) "Patient safety may be compromised if study conclusions are generalized to products that make similar claims but have no equivalent research evidence" Journal of Patient Safety & Risk Management 24(1): 37-45
This paper addresses a fundamentally important issue in health care, namely how to make informed decisions on product selection when two products, from different manufacturers, appear to be similar and have medical claims that sound comparable. In such cases, manufacturers of competing products often use each other’s evidence. They argue that the published evidence is generally applicable even if the original bioengineering tests and clinical trials were performed on a specific product, and no equivalence was obtained for their product that has similar medical claims. In this work, we use prophylactic dressings for pressure injury prevention as a good demonstrative example on how patient safety may be compromised if study conclusions are generally projected to such unstudied products. The medical device industry is regulated differently than the pharmaceutical industry, and consequently, voids in current medical device regulation are sometimes used to promote commercial interests. This paper analyzes gaps and potential pitfalls that occur where guiding documentations (e.g., guidelines, standards) do not cope well with medical technology. We explain how that can eventually lead to potential compromises to the well-being of patients, primarily if nurses are unaware of the aforementioned pitfalls. We conclude that currently, there is no alternative to rigorosity: Clinicians and decision-makers need to scrutinize up-to-date literature, decide which products have the best portfolio of bioengineering and clinical research to support the claims made, and which products have the best cost–benefit models. This is fundamentally different from simply buying the least expensive product because of appealing sale arguments.

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The authors present the surgical strategy in the treatment of a morbidly obese paraplegic patient with a massive sacral pressure ulcer as well as bilateral trochanteric ulcers in a 1-step leg-sacrificing procedure utilizing the "spare-part" concept. It is the intention of the authors to reinforce the use of fillet flaps as a last resort option in paraplegic patients with pressure sores; Check for full text

Background: Processed microvascular tissue (PMVT), a human structural allograft, is derived from lyophilized human tissue containing microcirculatory cellular components. Since PMVT serves as a source of extracellular matrix (ECM), growth factors, cytokines, and chemokines modulating angiogenesis, inflammation, apoptosis, and endogenous cell recruitment, we hypothesized its application would accelerate wound regeneration in a validated pressure ulcer (PU) model developed in C57BL/6 mice using two 24-hour cycles of skin ischemia/reperfusion created by placement and removal of external magnets.
Methods: Two identical PU injuries (n  50 female mice) were treated with (a) topical particulate PMVT, (b) injected rehydrated PMVT, or (c) saline control injection, and assessed daily for closure rates, scab formation/removal, and temperature. A baseline control cohort (n  5) was euthanized at day 0 and treatment group cohorts (n  5) were killed at 3, 7, or 14 days postinjury. The PU injuries were collagenase-digested for flow cytometric analysis of inflammatory, reparative, and stem cell frequencies and analyzed by hematoxylin and eosin (H&E) histology and immunofluorescence. Results: PMVT-accelerated wound closure, most notably, topical PMVT significantly increased mean closure from d5 (13% versus 9%) through d13 (92% versus 38%) compared with phosphate-buffered saline (PBS) controls (P < 005). PMVT also hastened scab formation/removal, significantly accelerated disappearance of inflammatory myeloid (CD11b+) cells while upregulating α-smooth muscle actin, vascular endothelial growth factor A, and placental growth factor and raised skin temperature surrounding the PU site, consistent with increased blood flow. Conclusions: These results indicate that PMVT has potential as an advanced treatment for restoring normal tissue function in ischemic wounds and merits clinical study; Check for full text

Introduction: Surgical closure of late-stage pressure ulcers (PUs) poses challenges in the immobilized population due to the high rate of complications, including infection, dehiscence, and recurrence. Muscle flap closure is the standard treatment for chronic, late-stage (stage 4) PUs, characterized by the European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel as full-thickness tissue loss with exposure of bone, tendon, or muscle. Objective: The aim of this study is to evaluate the outcomes associated with the use of a cryopreserved placental membrane containing viable cells (vCPM) graft for the augmentation of surgical flap closure in nonhealing perineal ulcers; Materials and Methods: Four paraplegic patients (2 men, 2 women; average age, 61 years; range, 44-77 years) with stage IV PUs (ischial, gluteal, and sacral areas) with a mean duration of 4 years (range, 05-10 years) received muscle flap closure augmented with vCPM. Following surgical debridement, vCPM was placed between the wound bed and muscle flap closure prior to skin closure. Patients were kept offloaded in fluid-air beds for 6 weeks followed by a gradual return to mobilization. Results: All 4 patients achieved complete wound closure in an average of 7 weeks (range, 6-8 weeks) without complications or recurrence. All patients demonstrated complete take of the muscle flap and maintained their closed wounds for an average follow-up of 12 months. Conclusions: Preliminary clinical results indicate vCPM supports surgical wound closure of chronic perineal PUs in immobile, high-risk patients. In an effort to decrease postoperative recovery time and reduce complications, vCPM may be beneficial for patients undergoing perineal muscle flap closure; Check for full text

Pressure ulcers (PUs) are highly frequent in hip fractured elderly patients. This issue has a direct impact in quality of life, mortality as well as healthcare costs. Handgrip strength (HGS) is an efficient, low-cost and straightforward method to measure functional capacity, as well as the global muscle strength of elderly patients. In this research, we are aiming to analyze if low HGS is associated with higher incidence of pressure ulcers within a population of elderly patients with hip fracture from a tertiary hospital from Monterrey, Mexico. This research, designed as an observational-longitudinal cohort, included 462 patients admitted at the Hip and Pelvic Surgery Department of the Hospital of Traumatology and Orthopedics No 21, of the Mexican Institute of the Social Security (IMSS), in Monterrey, Mexico. HGS measurement was performed by a trained physician, using a Jamar® Hydraulic Hand Dynamometer. Patients were grouped into tertiles according to their grip strength measurement and sex. Every patient was evaluated for presence or absence of PUs during hospital admission and followed until discharge. The general incidence of PUs was 25.7%. The incidence was higher in the weaker subjects (Tertile one 33%, Tertile two 30%, and Tertile three 15%, P<0.001). Pre-fracture Barthel's index, and Mini Nutritional Assessment Scores were lower among participants with PUs. After multivariate analysis, only HGS remained associated with PUs incidence. Low handgrip strength is associated with a higher incidence of pressure ulcers;


Critically ill patients are at risk for developing pressure injuries during operative and other invasive procedures. The purpose of this secondary analysis was to explore the relationship of OR time to sacral pressure injuries in critically ill patients using high frequency ultrasound as a method of assessment. The 41 participants examined in this study had both time in the OR and up to eight days of pressure injury data. The multivariable model containing OR bed time, body mass index, and Braden Scale score produced the best prediction of pressure injury (area under the curve 0.859). A higher body mass index (P<0.09), shorter OR bed time (P<0.01), and lower Braden Scale score (P<0.05) were associated with a greater chance of pressure injury. These results suggest that use of high frequency ultrasound may identify tissue changes before observable skin changes, leading to earlier pressure injury prevention strategies; © AORN, Inc, 2019


Aim: To examine the frequency, preventability, and consequences of hospital acquired pressure injuries in acute care hospitals over a 4-year period. Method: A retrospective record review was performed using the Swedish version of the Global Trigger Tool (GTT). A total of 64,917 hospital admissions were reviewed. Data were collected between 2013 and 2016 from all 63 Swedish acute care hospitals. Results: The
prevalence of pressure injuries (category 2-4) was 1% Older patients, “satellite patients”, and patients with acute admissions had more pressure injuries Most pressure injuries (91%) were determined to be preventable The mean extended length of hospital stay was 158 days for patients who developed pressure injuries during hospitalization Conclusion: The GTT provides a useful and complementary national perspective on hospital acquired pressure injuries across hospitals, informing health care providers on safety priorities to reduce patient harm Clinical leaders can use information on the preventability and the consequences of pressure injuries, as well as evidence-based arguments for improving the health care organization

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Background: Intraoperative pressure injury is still a major problem of perioperative nursing Reducing the peak interface pressure is a valid clinical intervention for reducing the incidence of intraoperative pressure injuries However, studies of repositioning and pressure-distributing for surgical patients are still lacking In this context we aimed to evaluate the effect of a curvilinear supine position on incidence of pressure injury with surgical patients in a hospital setting; Methods: This was a prospective, randomized, controlled study, carried out from May to December 2016, included 104 surgical patients from a university hospital in China (experimental group, n 52; control group, n 52) Incidence of pressure injury, interface pressure, comfort and satisfaction scores from surgeons, anesthesiologists, OR nurses were recorded Mann-Whitney U Chi-square test was used for difference of pressure injury’s incidence and mixed linear model was used for interface pressure: Results: Overall the intervention group had significant fewer intraoperative pressure injuries than the control group (0 patients [0%] vs 9 patients [1765%], p <0.0002) Compared with control group, the experimental group had significantly lower interface pressures in the sacrum and heel regions (F 2381, p < 0001; F 6071, p < 0001) The subjects felt comfortable in two groups were 40(80%) vs 3(588%) (experimental group vs control group), respectively (p < 0001); Conclusions: Curvilinear supine position could significantly decrease the incidence of perioperative pressure injuries in surgical patients with surgery duration more than three hours Considering these results, we recommend that curvilinear supine position use as effective interventions to inform perioperative care delivery, reducing perioperative pressure injuries These findings may serve to guide the application of pressure redistribution in the surgical positioning of patients during prolonged surgery;

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Evidence-based pressure ulcer (PU) prevention guidelines were developed for a Southern California regional medical centre following what were concerning 1-day prevalence survey results A previous focus had been placed on treatment of PUs with little education and policy related to prevention After familiarising staff with the new guidelines and providing education, the results of the follow-up 1-day prevalence study were significantly improved in most areas of interest

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The purpose of this Quality improvement project was to develop a multimedia hospital-acquired pressure injury (HAPI) prevention education program The project setting was 3 adult critical care units plus a step-down unit located in the Mid-Atlantic region of the United States A multimedia educational intervention was developed, which comprised 4 modules designed to improve nursing knowledge and competency in HAPI prevention A posteducation program staff survey was also administered to evaluate nurse satisfaction with the program Nurse knowledge of HAPI prevention was measured before and following implementation of the educational intervention One hundred twenty-nine participants completed the education program, and 117 completed the satisfaction survey Analysis revealed a statistically significant increase in knowledge after the education course (P < 05) Findings also indicated participants were satisfied that the program met stated aims

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Objective: To review observational studies reporting medical device-related pressure injuries and to identify the medical devices commonly associated with pressure injuries; Design: A systematic review of primary research was undertaken, according to the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines; Data Sources: A comprehensive electronic literature search of AMED, CINAHL, MEDLINE, PsycINFO, Web of Science, British Nursing Database and Google Scholar was conducted from inception to 31st December 2018 Studies that reported the prevalence or incidence of medical device-related pressure injuries and published in English language were included in the review; Review Methods: The eligibility of studies was evaluated independently by three of the four authors and audited by an independent researcher The titles and abstracts of all studies were screened to identify studies that met the inclusion criteria Full-text articles of the remaining studies were obtained and screened against the inclusion criteria Risk of bias was assessed using the Newcastle-Ottawa scale Meta-analysis was conducted using the ‘metaprop’ routine, with estimates of medical device-related pressure injuries from the included studies pooled using DerSimonian-Laird random-effects model Meta-regression analysis was also conducted to examine between-study heterogeneity; Results: Twenty-nine studies (17 cross-sectional studies; 12 cohort studies) comprising data on 126,150 patients were eligible for inclusion in this review The mean ages for patients were approximately 362 years (adults) and 59 years (children) The estimated pooled incidence and prevalence of medical device-related pressure injuries were 12% (95% CI 8-18) and 10% (95% CI 6-16) respectively These results should be interpreted with caution given the high levels of heterogeneity observed between included studies The commonly identified medical devices associated with the risk of developing medical device-related pressure injuries include respiratory devices, cervical collars, tubing devices, splints, and intravenous catheters; Conclusions: Medical device-related
pressure injuries are among key indicators of patient safety and nursing quality in healthcare facilities. This systematic review and meta-analysis provide up-to-date estimates of the extent and nature of medical device-related pressure injuries, and the findings suggest that device-related pressure injuries are a public health issue of significance, especially as these injuries affect patients' wellbeing and increase the cost of care for both patients and providers. Further research is required to inform strategies for increasing the reporting and risk assessment of medical device-related pressure injuries.


The aim of this study was to identify and characterise the association between the prevalence of pressure ulcers, spasticity levels, and advanced dementia in disable elderly patients. Data were obtained from the patient medical files. Patients were hospitalised in the geriatric skilled nursing department. A total of 40 frail elderly patients, bedbound and suffering from advanced chronic diseases, advanced dementia, and high-grade pressure ulcers, were examined. Pressure ulcer grades and spasticity in advanced dementia versus non-dementia patients were evaluated. Logistic regression indicated that only advanced dementia and spasticity were significantly associated with the development of pressure ulcers versus those without dementia or without spasticity. Patients with advanced dementia displayed a significantly higher prevalence of severe spasticity. In multivariate logistic regression analyses, spasticity was significantly associated with pressure ulcers. The strong association of spasticity with the onset of pressure ulcers in advanced dementia should encourage clinicians to implement preventative measures to delay the onset of pressure ulcers.


BACKGROUND: Soft tissue injuries recognized at birth are a common occurrence and well described in the medical literature. Despite this, there has been no discussion of congenital pressure injuries. In this Clinical Challenges article, I describe 3 cases in which congenital skin injuries have occurred, all of which meet the National Pressure Ulcer Advisory Panel definition for a pressure injury and are demonstrably not the result of other etiologies. CASES: Over a 6-month period, in a 44-bed level 111-1V neonatal intensive care unit, 3 patients were identified and diagnosed with congenital pressure injuries. All were born to mothers who presented with significantly diminished or a near-absence of amniotic fluid. The amniotic fluid provides essential cushioning for the developing fetus. A number of well-described conditions result from alterations in the character and volume of the amniotic fluid during gestation. Among these is a correlation between severely diminished fluid volume and congenital contractures resulting from immobility of the fetus as it is compressed against the uterine wall. Therefore, it is not unreasonable to speculate that this immobility and pressure could be the very same mechanism that created our congenital pressure injuries noted in these patients. The stages of the congenital pressure injuries noted were a stage 1, a stage 2, and also a deep tissue pressure injury. One infant succumbed to conditions related to extreme prematurity prior to healing, while the other 2 patients' injuries healed without complication or apparent long-term sequelae. CONCLUSIONS: Despite their absence in the medical literature, I assert that congenital pressure injuries occur and are clinically relevant. This lack of recognition and description risks unnecessary diagnostic procedures and inappropriate or delayed treatment.


Pressure injuries are a significant problem among hospitalized patients. Many people, including those with multiple sclerosis (MS), are at a high risk of pressure injury development in health-care settings due to suboptimal oral intake and decreased mobility, which can result in increased pressure over bony prominences. Vitamin C, zinc, and arginine have been studied with regard to their impact on pressure injury healing, and available evidence does not support routine supplementation with these nutrients. A case study of a patient...
with stage IV pressure injuries and MS is presented with an emphasis on evidence-based guidelines for nutrition interventions related to pressure injury healing

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PURPOSE: The purpose of this study was to evaluate the effect of a low-profile alternating pressure (AP) overlay system on hospital-acquired pressure injuries (HAPIs) DESIGN: Prospective case series with historical controls SUBJECTS AND SETTING: The study setting was the operating room and critical care unit of an urban quaternary care hospital in the Midwestern United States One hundred neurosurgery patients undergoing surgery for 2 hours or longer in supine position were included in the study (AP group) The outcomes for the AP group were compared to a historical control group of 292 patients METHODS: A group of 100 patients were prospectively placed on the AP overlay during surgery Participants were enrolled preoperatively and tracked by the research team during their hospital stay Demographic data, details of the operation, and pressure injury risk factors were recorded Following surgery, AP group patients were evaluated daily and continued on standard protocol for pressure injury prevention The primary study outcome was HAPI rate during the perioperative period (up to 5 days postsurgery) for the AP group (plus standard of care) compared to the standard of care alone (historical control) Control group data were extracted from electronic health records for the prior 2 years A written questionnaire was given to the care team that used the AP technology; items queried the degree of acceptance of the overlay by surgeons and the operating room and intensive care unit (ICU) staff RESULTS: None of the patients in the AP group developed perioperative pressure injuries Review of historical control group revealed a 6% perioperative pressure injury incidence (18 pressure injuries in a group of 292 patients) Responses on the written questionnaire indicated that the AP technology was well accepted by surgeons and the operating room and ICU staff There were no adverse events CONCLUSIONS: Study findings suggest that AP overlay system can safely and reliably be used during neurological surgeries Further studies are underway to evaluate the use of this AP overlay system beyond the operating room for more comprehensive care

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Objectives To define the prevalence of dysphagia and its associated factors and to investigate the influence of dysphagia and nutritional therapies performed in dysphagic subjects on clinical outcomes, including nutritional status, pressure ulcers, hospitalization, and mortality Design A prospective observational study Setting and participants Thirty-one Italian nursing homes participating in the ULISSE project and 1490 long-stay nursing home residents, older than 65 years, assessed at baseline and reassessed after 6 and 12 months Measures All participants underwent a standardized comprehensive assessment using the Italian version of the nursing home Minimum Data Set The activities of daily living Long-Form scale was used to evaluate functional status Health care professionals assessed dysphagia by means of clinical evaluation Nutritional status was assessed using the information on weight loss Results The prevalence of dysphagia was 128%, and 16% of the subjects were treated with artificial nutrition The mortality rate in subjects with dysphagia was significantly higher compared with that of nondysphagic subjects (277% vs 168%; P 0001) The prevalence of weight loss and pressure ulcers was also higher in dysphagic subjects At variance, dysphagia was not associated with a higher hospitalization risk Conclusion/Implications Dysphagia is common in nursing home residents, and it is associated with higher mortality Therefore, early diagnosis and optimal management of dysphagia should become a priority issue in nursing homes

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Objectives: Mechanical ventilation increases the risk of hospital-acquired conditions (HACs) such as ventilator-associated pneumonia (VAP) and pressure injury (Prl) Beds with continuous lateral rotation therapy (CLRT) are shown to reduce HAC incidence, but the value of switching to CLRT beds is presently unknown
We compared the cost-effectiveness of CLRT beds with standard care in intensive care units; Methods: A cost-effectiveness analysis from the healthcare sector and societal perspectives was conducted A Markov model was constructed to predict health state transitions from time of ventilation through 28 days for the healthcare sector perspective and 1 year for the US societal perspective Value of information was calculated to determine whether parameter uncertainty warranted further research; Results: Our analysis suggested that CLRT beds dominate standard care from both perspectives From the healthcare sector perspective, expected cost for CLRT was US $47,165/patient compared with a higher cost of US $49,258/patient for standard care The expected effectiveness of CLRT is 0.0418 quality-adjusted life years/patient compared with 0.0416 quality-adjusted life years/patient for standard care Continuous lateral rotation therapy dominated standard care in approximately 93% of Monte Carlo simulations from both perspectives Value of information analysis suggests that additional research is potentially cost-effective; Conclusions: Continuous lateral rotation therapy is highly cost-effective compared with standard care by preventing HACs that seriously harm patients in the intensive care unit;

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Purpose: This study examined the incidence of oral mucosa pressure ulcers (PUs) in intensive care unit (ICU) patients and the relationship between biomechanical and physiological variables in onset of PUs Methods: A prospective observational descriptive study design was used We recruited patients over 18 years of age with endotracheal tube (ETT) insertion in three ICUs in a tertiary hospital in Korea We analysed 113 patient-days of data Patient assessments and medical record reviews were conducted to gather biomechanical and physiological data Fisher's exact tests and χ2 test and Spearman's rank correlations were used to compare data Results: The highest incidence of oral mucosa PUs occurred in lower oral mucosa (363%) There was a significant relationship between lower oral mucosa PU stage and bite-block or airway use (r = 0.20, p = 0.036), commercial ETT holder use (r = 0.19, p = 0.048), sedative use (r = −0.22, p = 0.022), and plasma protein (r = 0.20, p = 0.033) Upper oral mucosa PU stage was related to commercial ETT holder use (r = 0.19, p = 0.044), haemoglobin (r = 0.24, p = 0.011), haematocrit (r = 0.27, p = 0.004), and serum albumin (r = −0.24, p = 0.012) Stage was related to commercial ETT holder use in both sites (r = 0.28, p = 0.028), haematocrit (r = 0.19, p = 0.039), and serum albumin (r = −0.23, p = 0.015) Conclusion: Oral mucosa PUs developed more frequently and healed more quickly than general skin PUs Taken together, these data indicate that biomechanical and haematological variables are risk factors associated with PU incidence should be considered in intensive care patients Highlights • Oral mucosa PUs occur more frequently at multiple sites, and they may develop and heal repeatedly and overlap • This study has shown the necessity of oral mucosa PU classification by stages to estimate more precise incidence rates • Biomechanical factors, such as non-commercial and commercial ETT holders; and physiological variables, such as sedative use, haemoglobin, haematocrit, and serum albumin, are associated with oral mucosa PU incidence

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This study aimed to investigate the prevalence pattern of pressure injuries (PIs), or 'sores', in South Korea and investigate the factors affecting its development We estimated the annual prevalence of PIs using the National Inpatient Sample (NIS) data extracted from the Health Insurance Review and Assessment Service (HIRA) database from 2009 to 2015 Multivariable logistic regression was performed to examine the association between hospitalization and socio-demographic characteristics, such as sex, age, type of health insurance, Charlson Comorbidity Index (CCI), and plegia comorbidity We found that inpatients with PIs make up to 0.86% of the total population in South Korea in 2015, which had shown a steady increase from the previous years And male, old age, low socioeconomic status (SES), and the patients’ severity such as high CCI and the plegia comorbidity were strongly associated with hospitalization due to PI Based on our results, it would be anticipated that the medical cost for treatment and management of PIs will increase in the future, and it will be accelerated due to the rapidly aging society In addition, patients in low SES and patients with severe comorbidities would be relatively more burdensome, threatening their household economy and further reducing the quality of life Therefore, PIs should not be overlooked as the responsibility of just the nursing care professionals but should be recognized as one of the serious societal
problems. The establishment of an intense medical care system is needed not only to reduce the prevalence of PIIs but also to increase the awareness in people with PI patients;
nurses must recognize PU care's importance and take responsibility for improving their own performance. At the institutional level, systematic evidence-based guidelines and support systems, such as activating wound specialists, must be implemented. The academic society can support these initiatives by updating continuously the national guideline on PU prevention and management for ease of use by nurses or institutions; © 2019 Sigma Theta Tau International


This study aimed to investigate Korean nurses' level of knowledge, attitude, and performance of pressure ulcer prevention in long-term care facilities. A descriptive study was performed. Convenience sampling was used, and registered nurses were recruited from the attendees of a continuing education programme for nurses in long-term care facilities. A total of 282 participants (RN) completed the questionnaire. Data were collected from September to December 2015. Nurses participating in this study demonstrated a moderate level of knowledge of pressure ulcer prevention (60.1%) and exhibited positive attitudes towards pressure ulcer prevention (3380 ± 248). Nurses regularly assessed the risk factors of pressure ulcers during the hospitalisation period for all patients in the hospital when performing pressure ulcer prevention care. However, the plan for preventive nursing care was not properly reviewed. It was also found that nurses did not consider changes in the patient's condition as important to why they had to change their nursing plans to prevent pressure ulcer. Therefore, this study suggested that appropriate guidelines, education programmes, and an environment that makes it possible to provide continuing education should be created for nurses to prevent pressure ulcers in Korea's long-term care facilities.


The incidence rate of patients developing pressure ulcers associated with medical device use is underreported in Korea. This study aims to determine clinical nurses' perceived importance and performance towards medical device-related pressure injury prevention. A total of 620 nurses from seven hospitals attending continuing education programmes in Korea responded to self-administered questionnaires. Data were collected from March to December 2017 on a 4-point-Likert scale on nurses' perceived importance and performance for prevention of medical device-related pressure ulcer (MDRPU). Secondary data analysis was performed through reported pressure injury incidence, and questionnaire data were analysed using descriptive statistics, t-test, and ANOVA. The overall rates of hospital-acquired pressure ulcers and MDRPU were 16.9% and 0.8%, respectively. The proportion of MDRPU was 50.2%. Its perceived importance (356 ± 0.48) was also higher than prevention performance (313 ± 0.90) among nurses. Education level and participation in pressure injury management training was found to enhance performance by nurses. Therefore, informational and educational programmes based on clinical practice are necessary for clinical nurses to focus on perceived importance and performance towards prevention of medical device-related pressure injury and pressure ulcer care.


Hospital-acquired pressure ulcers/injuries (HAPU/I) have been a major focus of research, but information about community-acquired pressure ulcer/injuries (CAPU/I) is limited. Purpose: The aim of this study was to compare HAPU/I and CAPU/I in a 620-bed academic medical center in the western United States. Methods: This descriptive study involved prospective/retrospective data collected from the National Data for Nursing Quality Indicators, including pressure ulcer stage (January 1, 2015, through December 31, 2017; the hospital's incident reporting system (January 1, 2017, through December 31, 2017); electronic medical records (EMR) as needed for verification; and the hospital's pressure ulcer registry (January 1, 2012, through December 31, 2017), developed by both EMR and manual extraction. Data regarding point prevalence, length of stay (LOS), source of admission, ulcer stage, and frequency of hospital encounters from patients at least 18 years of age with a pressure ulcer/injury documented in their records were abstracted. Data from pregnant or incarcerated persons and persons with missing or incomplete information
on staging or origin of admission were excluded Variables were analyzed using descriptive statistics;

Results: The number of patients with data reviewed for point prevalence was 1787 for 2015, 1989 for 2016, and 1917 for 2017 For 2015, the average CAPU/I and HAPU/I point prevalence was 66% and 08%, respectively; for 2016, 60% and 15%, respectively; and for 2017, 69% and 09%, respectively The average LOS for patients analyzed for 2017 admitted with a CAPU/I or HAPU/I was 105 days and 389 days, respectively Hospital encounters were more frequent in the CAPU/I than in the HAPU/I group, with 821 CAPU/encounters compared to 45 HAPU/I encounters The majority of patients with a HAPU/I (80%) or CAPU/I (65%) were admitted from home; Conclusion: In this study, CAPU/I were more prevalent than HAPU/I and most patient encounters originated from home More descriptive research that includes staging and source of admission is needed to document the rate of CAPU/I and characteristics of HAPU/I compared to CAPU/I in order to optimize pressure ulcer/injury practices across the continuum of care;
Further changes in the parameters were observed. Skin and soft tissue displacement does not depend on mattress hardness, but rather on its shape. Furthermore, mattress inclination increases skin surface displacement.

**Highlights**
- Compression of the skin and soft tissue depends on the mattress hardness.
- A threshold value for hardness exists in this compression, above which no further changes are observed.
- Displacement of the skin and soft tissue depends on the mattress shape.

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Pressure ulcers can be painful and negatively affect health-related quality of life and healthcare costs. Many people living in nursing homes are at risk of developing a pressure ulcer. Nursing home staff, tissue viability nurses, and researchers have co-designed the first theory and evidence-informed care bundle specifically for nursing homes, which consists of three prevention practices (skin inspection, support surfaces, repositioning) and a range of behaviour change techniques to promote these practices. We conducted a mixed methods feasibility study of the use of this care bundle in one nursing home in the North of England using an uncontrolled, before-and-after study design. We collected quantitative data on pressure ulcer prevention behaviours of the nursing home staff and pressure ulcer incidence rates for 5 weeks prior to implementing the bundle. Data collection continued for a further 9 weeks during the bundle implementation phase. We explored adherence to the bundle and participants’ experiences of using it. The Conceptual Framework for Implementation Fidelity and the Theoretical Domains Framework informed the semi-structured interviews. Quantitative and qualitative data were analysed using descriptive statistics and deductive framework analysis respectively. We collected data for 462 resident bed days prior to implementing the bundle; five new pressure ulcers were recorded and repositioning was the only documented pressure ulcer prevention behaviour. We collected data for 1,181 resident bed days during the intervention phase; no new pressure ulcers developed and the documented prevention behaviours included repositioning, skin inspection and checking support surfaces. Participants reported that the bundle enhanced the care they delivered and offered suggestions for future improvements. Our findings have highlighted a number of feasibility issues surrounding recruitment and retention, collecting data and implementation fidelity. A pressure ulcer prevention bundle specifically designed for nursing homes was acceptable. The feasibility work has highlighted the potential for the intervention and the areas that require development and refinement; © 2019 The Authors Health and Social Care in the Community Published by John Wiley & Sons Ltd


Pressure ulcers result in financial losses, including the cost of unnecessary medical expenses because of extended hospital stays, treatment, and examination. This was a retrospective, observational, methodological study to develop quality indicators related to pressure ulcer development and validate risk adjustment factors for pressure ulcer development. We performed a literature review to develop risk adjustment factors, and an expert group performed a content validity test. To validate risk adjustment factors for pressure ulcer development using electronic medical records, 127 patients admitted to a long-term care hospital in South Korea from June to September 2015 were enrolled in the study. Pressure ulcer risk factors were peripheral vascular disease, end-stage disease, past pressure ulcer history, high risk group for pressure ulcer development, fever, haemoglobin, and albumin (all P < 0.05); only albumin (odds ratio: 0.210, P < 0.0001) was significantly associated with pressure ulcer development as an independent risk factor. Further research with a large sample size is needed for the validation of risk adjustment factors. Risk-adjusted quality
indicators for pressure ulcer development can be used to evaluate the quality of nursing care and compare outcomes after preventive pressure ulcer care activities or between long-term care hospitals.


The aim of this study was to compare the pressure injury risk predictability between the individual Braden subscales and the total Braden scale in adult inpatients in Singapore A retrospective 1:1 case-control design was used from a sample of 199 patient medical records Clinical data were collected from a local university hospital's medical records database The results showed that, among the six subscales, the activity subscale was the most sensitive and specific in predicting pressure injury (PI) However, the overall results showed that the Braden scale remained the most predictive of PI development in comparison with the individual subscales The study also found that, among the Singaporean patients, the Braden cut-off score for PI risk was 17 compared with the current cut-off score of 18 Therefore, it may be relevant for local tertiary hospitals to review their respective Braden cut-off scores as the study results indicate an over-prediction of PI risk, which leads to unnecessary utilisation of resources The hospital may also consider developing a PI prevention bundle comprising commonly used preventive interventions when at least one Braden subscale reflects a suboptimal score; © 2019 Medicalhelplinescom Inc and John Wiley & Sons Ltd


The aim of this study was to assess the prevalence, incidence, and the associated factors of pressure injuries (PIs) among immobile hospitalised patients in China Being immobile during hospitalisation put these patients at a higher risk of PIs There is little literature about pressure injury (PI) prevalence or PI incidence in immobile hospitalised patients in hospitals in China This was a multicentre, cross-sectional, exploratory descriptive study A total of 23 985 immobile patients were recruited from 25 general hospitals in six provinces of China from November 1, 2015 to March 18, 2016 Information was collected on demographic characteristics, physical assessment information, and treatment and nursing care measures The PI period prevalence was 338%, and the PI cumulative incidence was 123% Most PIs (8403%) were Stage 1 or Stage 2 A total of 4822% of PIs occurred in the sacrum or heel region In the multivariate analysis, the following factors were associated with higher PI prevalence: age, gender, length of immobility, type of hospital, modified Braden Scale score, urinary incontinence, faecal incontinence, low serum albumin, the usage of fixation or restraint devices, and patient's discharge diagnosis (lower limb fracture, malnutrition, and spinal cord injury) PI prevalence for immobile hospitalised patients in the study was lower than those reported in literature However, because of the large population in China, the number of patients who suffer with PIs can be very high The relating factors of higher PI prevalence identified in this study were consistent with current literature Patients with a higher number of these associated factors should be monitored more closely, and preventative measures should be taken to prevent PI occurrence in high-risk populations; © 2019 Medicalhelplinescom Inc and John Wiley & Sons Ltd


Pressure ulcers (PUs) are a complex and serious clinical problem Deep tissue injury (DTI) is either the outcome or the trigger of deep PUs However, the cellular and molecular mechanisms that contribute to the pathogenesis of deep PUs remain unclear In this study, the degeneration characteristics and increased autophagy and apoptosis were observed in deep PU muscle tissues Muscular proteome of deep PU revealed that a total of 520 proteins were differentially expressed, particularly, JAK2 was down-regulated Intriguingly, expression of JAK2 in C2C12 myoblasts exposed to oxygen-glucose deprivation and reoxygenation (OGD/R) insult was also distinctly reduced Ex vivo, we transfected C2C12 myoblasts with...
lentivirus carrying the JAK2 plasmid and found that JAK2-overexpressed myoblasts exhibited a decrease in autophagy and apoptosis after OGD/R treatment, as well as less cell death. Finally, Western blot analysis determined that p-JAK2, p-AKT, p-mTOR and p-ERK1/2 levels were significantly elevated, accompanied by JAK2 overexpression but without p-STAT3. and inhibition of the AKT and ERK1/2 pathway resulted in elevated apoptosis and/or autophagy. These results demonstrated that JAK2 may play an important protective role in muscular ischemia and reperfusion injury during DI development by inhibition of autophagy and apoptosis through the AKT and ERK1/2 pathways.


Mepilex Border Sacrum and Heel dressings are self-adherent, multilayer foam dressings designed for use on the heel and sacrum aiming to prevent pressure ulcers. The dressings are used in addition to standard care protocols for pressure ulcer prevention. The National Institute for Health and Care Excellence (NICE) selected Mepilex Border Sacrum and Heel dressings for evaluation. The External Assessment Centre (EAC) critiqued the company's submission. Thirteen studies (four randomised controlled trials and nine nonrandomised comparative studies) were included. The majority of studies compared Mepilex Border Sacrum dressings (plus standard care) with standard care alone. Comparative evidence for Mepilex Border Heel dressings was limited. A meta-analysis indicated a non-statistically significant difference in favour of Mepilex Border Sacrum dressings for pressure ulcer incidence (RR 0.51 (95% CI 0.22-1.18)). The company produced a de novo cost model, which was critiqued by the EAC. After the EAC updated input parameters, cost savings of £19 per patient compared with standard care alone for pressure ulcer prevention were estimated with Mepilex Border dressings predicted to be cost saving in 57% of iterations. The Medical Technologies Advisory Committee reviewed the evidence and judged that, although Mepilex Border Heel and Sacrum dressings have potential to prevent pressure ulcers in people who are considered to be at risk in acute care settings, further evidence is required to address uncertainties around the claimed benefits of the dressings and the incidence of pressure ulcers in an NHS acute-care setting. After a public consultation, NICE published this as Medical Technology Guidance 40.

McCoulough, S (2019) "Changing work routines to prevent pressure ulcers" Nursing & Residential Care 21(3): 129-134

Pressure ulcer prevention plans are most effective when all care staff are informed and involved. Siobhan McCoulough explains which training should be provided and what organisational changes are required to make prevention more effective.


Aims and objectives: To explore how the context of care influences the development of community-acquired pressure ulcers from the perspective of nurses working in home healthcare settings, to identify and categorise the factors perceived as contributing to the development of these ulcers using the Model for Examining Safety and Quality Concerns in Home Healthcare, and to explore how these risks are managed in practice. Background: Pressure ulcer reduction is a priority in both hospital and community settings. Evidence suggests the factors affecting safety and performance in community settings are not the same as in hospital. However, research pertaining to pressure ulcer risk management has predominantly been undertaken in hospital settings. Design: The study was framed by a qualitative exploratory design. Methods: Semistructured interviews were conducted with a purposive sample of 19 registered nurses recruited from an independent regional tissue viability network and five community nursing provider organisations in London. Results: The experiences and perceptions of participants mapped onto the components of the...
Model for Examining Safety and Quality Concerns in Home HealthCare: patient characteristics, provider characteristics, nature of home healthcare tasks, social and community environment, medical devices and new technology, physical environment, and external environment. Four strategies to address identified risks were established: behavioural interventions, technical interventions, safeguarding interventions and initiatives to promote better integration between health, local authorities and families. Conclusion: Understanding the complex interplay between people and other elements of the healthcare system is critical to the prevention, management and investigation of pressure ulcers. This study has illuminated these elements from the perspective of nurses working in community settings. Relevance to clinical practice: Further consideration should be given to the importance of place when both developing risk management strategies for pressure ulcer prevention and learning the lessons from failure.


Background Pressure ulcers (PU) usually occur over bony prominences in hospitalized patients. But they may occur due to medical devices referred also as Medical device related pressure ulcers (MDRPU). The United States National advisory panel (NPUAP) recognizes it as an important entity. MDRPU is one of the key quality indicators of hospital care, so far no data is available on MDRPU from the Indian Sub-continent. Aim: The primary objective of the study was to examine prevalence and Risk factors of MDRPU in critically sick patients. Design: A Cross-sectional point prevalence study. Methods: All patients above 18 years of age admitted in Intensive care units (ICU) on the date of the survey were included in the study. It was conducted in medical, cardiothoracic and neurosurgical ICUs. Demographic and MDRPU data were recorded. MDRPU was staged as per National Pressure ulcer advisory panel staging system. Ethics Committee approval was obtained prior to the start of the study. Results: One hundred and forty-six patients were included. The prevalence of PU was 260%. The prevalence of MDRPU was found to be 192%. MDRPUs most commonly occurred with non-invasive ventilation mask (NIV) and nasogastric tube (NGT) (20% and 123% respectively). MDRPUs were associated with a longer ICU stay. Conclusions: MDRPUs pose a significant burden on healthcare. Our study showed significant prevalence rate of MDRPU which is comparable to those seen internationally. There is a compelling need to have continuous audits and structured training programs among healthcare professionals to prevent MDRPUs in critically sick patients. Highlights: Overall Prevalence of MDRPU was 192%. Patients with MDRPUs accounted for 737% of pressure ulcers. MDRPU's were associated with Longer ICU length of stay, NIV Mask, NGT tube were mostly frequent. Patients with postural ulcers were more likely to have MDRPU in ICU.


Though preventable in the vast majority of cases, pressure ulcers continue to pose a major burden to the individual and society, affecting up to 3 million adults annually in the United States alone. Despite increased national attention over the past 20 years, the prevalence of pressure ulcers has largely remained unchanged, while associated costs of care continue to increase. Dermatologists can play a significant role in pressure ulcer prevention by becoming aware of at-risk populations and implementing suitable preventive strategies. Moreover, dermatologists should be able to recognize early changes that occur prior to skin breakdown and to properly identify and stage pressure ulcers so as to prevent delay of appropriate care. The aim of the first part of this continuing medical education article is to discuss the pathophysiology, risk factors, epidemiology, social and economic burden, and clinical presentation of pressure ulcers; Copyright © 2019 Published by Elsevier Inc.


Prevention has been a primary goal of pressure ulcer research. Despite such efforts, pressure ulcers remain common in hospitals and the community. Moreover, pressure ulcers often become chronic wounds that are difficult to treat and tend to recur after healing. Especially given these challenges, dermatologists should have the knowledge and skills to implement pressure ulcer prevention strategies and to effectively treat pressure ulcers in their patients. This continuing medical education article will focus on pressure ulcer...
prevention and management, with a particular emphasis on the evidence for commonly accepted practices;
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The article reports that therapist and wheelchair users are focused on applying data from pressure mapping technologies, to identify the problems and developing strategies for healthy sitting. It mentions that pressure mapping is an important seating toolbox for clinicians, that can be used in different methods.

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Introduction: Hospital-acquired pressure injuries (HAPIs) increase patient mortality and length of stay (LOS). Twenty-eight full-thickness HAPIs occurred in fiscal year 2015 (FY15), and that trend continued into FY16 with 14 injuries on multiple units throughout a tertiary acute care center with 400 beds. To address this trend, a multidisciplinary Pressure Injury Prevention (PIP) team was created. Objective: This report is a description of ongoing, hospital-wide efforts to understand the common factors of HAPI causality and to establish corrective action plans institutionally to prevent similar events in the future. Methods: The team goals were to document the occurrence of HAPIs across all hospital units, reduce preventable full-thickness PIs to zero, and recommend institution-wide changes as those opportunities were recognized. Results: Since the committee's inception in July 2015, an 89% reduction of full-thickness HAPIs, with only 2 full-thickness HAPIs in FY17 and 3 in FY18, has been seen. This effort has been hospital wide with involvement of all inpatient units and perioperative areas (including the operating rooms). Opportunities remain for improvement around the prevention of deep tissue and partial-thickness HAPIs. Conclusions: The data demonstrate that the formation of a multidisciplinary PIP team of engaged clinicians can reduce the number of preventable full-thickness HAPIs.

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Hospital-acquired pressure injuries (HAPIs) are a major source of unintended patient harm and unnecessary costs. The Braden Scale is widely used for risk assessment, yet it lacks specificity and clinical applications. This study used the electronic health record to examine associations between patient-specific factors and pressure injury. Adult patients (age >18) with 3-day length of stay from April 2011 to December 2016 were included. Pressure injuries were identified by ICD-9/ICD-10 codes. Longitudinal multivariate logistic regression was used to evaluate the association between patient-specific factors and HAPIs. This included 57,227 hospital encounters and 241 HAPIs. We observed 2-3 times increased likelihood of acquiring a pressure injury among patients who were malnourished or who had increased intraoperative time. The Braden subscales of nutrition, mobility, and friction showed significant predictive value. Future work is needed to assess the clinical applicability of this work.

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Pressure ulcers (PUs) have a high incidence, especially in hospital units. Randomised clinical trials (RCTs) of therapeutic interventions for PU should include a clear description of the outcomes and results to enhance transparency and replicability. Objectives: The primary objective of this study is to assess the completeness of the descriptions of the outcomes of therapeutic interventions in RCTs in adult patients with PU. The secondary objectives are to evaluate the types of reported primary outcomes, measurement methods or tools used to evaluate the outcomes and the results of reported outcomes. Methods: We will conduct a systematic survey of RCTs published from January 2006 to April 2018. The selection process of the studies will be done in two stages of screening: title and abstract, and full text revision, always by two
International Wound Journal 16(2): 556-558
Sudden-onset immobilisation generates unexpected external forces over bony prominences and is a potential cause of pressure ulcers Here, we report two cases of deep pressure ulcers in patients with acute monoarthritis as a result of calcium pyrophosphate (CPP) crystal deposition (pseudogout) The patients were women in their 80 who could perform activities of daily living by themselves They developed pressure ulcers while living in their own home Because acute CPP crystal arthritis is known to develop in relatively healthy elderly patients, patients and caregivers do not expect sudden-onset immobilisation In addition, larger joints are preferentially involved in acute CPP crystal arthritis, leading to the inability of patients to change positions themselves Therefore, acute CPP crystal arthritis should be recognised as a potential causal disease for pressure ulcers This case report further highlights a new concept of "disease-specific unexpected external force", which is beneficial for the prevention of pressure ulcers

Moore, F (2019) "Role of nutrition in pressure ulcer management" Journal of Community Nursing 33(1): 38-41
A pressure ulcer is localized damage to the skin and/or underlying tissue, usually over a bony prominence (or related to a medical or other device), resulting from sustained pressure (including pressure associated with shear) The damage can be present as intact skin or an open ulcer and may be painful (NHS Improvement, 2018a) The consequences of pressure ulcers are increased length of hospital stays for the patient, estimated at 431 days (National Institute for Health and Care Excellence (NICE), 2005), but also an increase in cost to NHS, which is identified at around £14-21 billion annually (Nutritional Pressure Ulcer Advisory Panel et al, 2014) Poor nutrition has been recognized as one of the risk factors in the development of pressure ulcers Improving nutritional intake of patients is thus paramount in reducing patient harm and unnecessary cost This article looks at the role nutrition plays in the prevention and treatment of pressure ulcers, provides practical advice and signposts readers to the resources produced by the Nutrition and Pressure Ulcer Tasks and Finish Group

Background: Use of pressure ulcer risk assessment tools or scales is a component of the assessment process used to identify individuals at risk of developing a pressure ulcer Use of a risk assessment tool is recommended by many international pressure ulcer prevention guidelines, however it is not known whether using a risk assessment tool makes a difference to patient outcomes We conducted a review to provide a summary of the evidence pertaining to pressure ulcer risk assessment in clinical practice, and this is the third update of this review; Objectives: To assess whether using structured and systematic pressure ulcer risk assessment tools, in any healthcare setting, reduces the incidence of pressure ulcers; Search Methods: In February 2018 we searched the Cochrane Wounds Specialised Register; the Cochrane Central Register of Controlled Trials (CENTRAL); Ovid MEDLINE (including In-Process & Other Non-Indexed Citations); Ovid Embase; and EBSCO CINAHL Plus We also searched clinical trials registries for ongoing and unpublished studies, and scanned reference lists of relevant included studies as well as reviews, meta-analyses and health technology reports to identify additional studies There were no
restrictions with respect to language, date of publication or study setting; Selection Criteria: Randomised controlled trials (RCTs) comparing the use of structured and systematic pressure ulcer risk assessment tools with no structured pressure ulcer risk assessment, or with unaided clinical judgement, or RCTs comparing the use of different structured pressure ulcer risk assessment tools; Data Collection and Analysis: Two review authors independently performed study selection, data extraction, 'Risk of bias' assessment and GRADE assessment of the certainty of evidence; Main Results: We included two studies in this review (1,487 participants) We identified no new trials for this latest updateBoth studies were undertaken in acute-care hospitals In one study, patients were eligible if they had a Braden score of 18 or less In the second study all admitted patients were eligible for inclusion, once they were expected to have a hospital stay of more than three days and they had been in hospital for no more than 24 hours before baseline assessment took place In the first study, most of the participants were medical patients; no information on age or gender distribution was provided In the second study, 503% (619) of the participants were male, with a mean age of 626 years (standard deviation (SD): 193), and 154% (190) were admitted to oncology wardsThe two included studies were three-armed studies In the first study the three groups were: Braden risk assessment tool and training (n  74), clinical judgement and training (n  76) and clinical judgement alone (n  106); follow-up was eight weeks In the second study the three groups were: Waterlow risk assessment tool (n  411), clinical judgement (n  410) and Ramstadius risk assessment tool (n  410); follow-up was four days Both studies reported the primary outcome of pressure ulcer incidence and one study also reported the secondary outcome, severity of new pressure ulcers We are uncertain whether use of the Braden risk assessment tool and training makes any difference to pressure ulcer incidence, compared to risk assessment using clinical judgement and training (risk ratio (RR) 097, 95% confidence interval (CI) 053 to 177; 150 participants), or compared to risk assessment using clinical judgement alone (RR 143, 95% CI 077 to 268; 180 participants) We assessed the certainty of the evidence as very low (downgraded twice for study limitations and twice for imprecision)Risk assessment using the Waterlow tool may make little or no difference to pressure ulcer incidence, or to pressure ulcer severity, when compared to risk assessment using clinical judgement (pressure ulcers of all stages: RR 110, 95% CI 068 to 181; 821 participants; stage 1 pressure ulcers: RR 105, 95% CI 058 to 190; 821 participants; stage 2 pressure ulcers: RR 125, 95% CI 0 0 to 313; 821 participants), or risk assessment using the RamstADIUS tool (pressure ulcers of all stages: RR 141, 95% CI 083 to 239; 821 participants; stage 1 pressure ulcers: RR 116, 95% CI 063 to 215; 821 participants; stage 2 pressure ulcers: RR 249, 95% CI 079 to 789; 821 participants) Similarly, risk assessment using the RamstADIUS tool may make little or no difference to pressure ulcer incidence, or to pressure ulcer severity, when compared to risk assessment using clinical judgement (pressure ulcers of all stages: RR 079, 95% CI 046 to 135; 820 participants; stage 1 pressure ulcers: RR 090, 95% CI 048 to 168; 820 participants; stage 2 pressure ulcers: RR 050, 95% CI 015 to 165; 820 participants) We assessed the certainty of the evidence as low (downgraded once for study limitations and once for imprecision)The studies did not report the secondary outcomes of time to ulcer development, or pressure ulcer prevalence; Authors' Conclusions: We identified two studies which evaluated the effect of risk assessment on pressure ulcer incidence Based on evidence from one study, we are uncertain whether risk assessment using the Braden tool makes any difference to pressure ulcer incidence, compared with training and risk assessment using clinical judgement, or risk assessment using clinical judgement alone Risk assessment using the Waterlow tool, or the RamstADIUS tool may make little or no difference to pressure ulcer incidence, or severity, compared with clinical judgement. The low, or very low certainty of evidence available from the included studies is not reliable enough to suggest that the use of structured and systematic pressure ulcer risk assessment tools reduces the incidence, or severity of pressure ulcers;
and HSP90α; and sample size for prognosis prediction for Category I PUs. Patients aged >65 years underwent skin blotting, scoring for DESIGN-R, and took thermography images of their Category I PU site. Albumin signals were not detected in one out of three participants PAI1, IL-1α, VEGF-C, and HSP90α were detected in 19 participants, among whom 11 participants could be followed up after one week. There was no difference in DESIGN-R score and skin surface temperature between normal and impaired healing groups, and the sample size was calculated as 16. In conclusion, the feasibility of skin blotting was confirmed PAI1, IL-1α, VEGF-C, and HSP90α could be biomarker candidates for prognosis prediction for Category I PU. The combination of VEGF-C and HSP90α could be associated with the prognosis of Category I PU. We need to investigate 842 patients in a future study. Copyright © 2019 Published by Elsevier Ltd.

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Nazarko, L (2019) "Pressure ulcer prevention guide" Nursing & Residential Care 21(3): 127-127

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Nelissen, J L, R Sinkus, et al (2019) "Magnetic resonance elastography of skeletal muscle deep tissue injury" NMR In Biomedicine epub ahead of print: e4087-e4087. The current state-of-the-art diagnosis method for deep tissue injury in muscle, a subcategory of pressure ulcers, is palpation. It is recognized that deep tissue injury is frequently preceded by altered biomechanical properties. A quantitative understanding of the changes in biomechanical properties preceding and during deep tissue injury development is therefore highly desired. In this paper, we quantified the spatial-temporal changes in biomechanical properties upon damage development and recovery in a rat model of deep tissue injury. Deep tissue injury was induced in nine rats by two hours of sustained deformation of the tibialis anterior muscle. Magnetic resonance elastography (MRE), T2-weighted, and T2-mapping measurements were performed before, directly after indentation, and at several timepoints during a 14-day follow-up. The results revealed a local hotspot of elevated shear modulus (from 330 ± 014 kPa before to 422 ± 090 kPa after) near the center of deformation at Day 0, whereas the T2 was elevated in a larger area. During recovery, there was a clear difference in the time course of the shear modulus and T2. Whereas T2 showed a gradual normalization towards baseline, the shear modulus dropped below baseline from Day 3 up to Day 10 (from 329 ± 007 kPa before to 268 ± 023 kPa at Day 10, P < 0001), followed by a normalization at Day 14. In conclusion, we found an initial increase in shear modulus directly after two hours of damage-inducing deformation, which was followed by decreased shear modulus from Day 3 up to Day 10, and subsequent normalization. The lower shear modulus originates from the moderate to severe degeneration of the muscle. MRE stiffness values were affected in a smaller area as compared with T2. Since T2 elevation is related to edema, distributing along the muscle fibers proximally and distally from the injury, we suggest that MRE is more specific than T2 for localization of the actual damaged area; and in nonhealing ulcers and peripheral vascular disease as a last resort, 17 distally based peroneus brevis muscle flaps were elevated in 17 patients with full-thickness heel ulcerations measuring an average defect size of 1411 cm2. All flaps were supplemented with concentrated bone marrow aspirate, negative pressure wound therapy, bilayer wound matrix, and static external fixation for an average time of 103 weeks. Split-thickness skin graft was delayed by an average of 175 days. All procedures were performed on patients diagnosed with diabetes, advanced peripheral arterial disease, and nonhealing heel ulcer present >1 year. All flaps survived at 15 years follow-up. The average time to healing was 103 weeks. No major amputations were performed to date. Partial tip necrosis occurred in 2 patients and healed uneventfully with local wound care. Distally based peroneus brevis muscle flaps in patients with diabetes and peripheral vascular disease offer a reliable alternative to limb salvage for full-thickness heel ulcerations measuring up to 7 × 6 cm. Combinatorial procedures are necessary to improve outcomes in high-risk patients whose alternative is a major amputation.

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Nguyen, T and E R Rodriguez-Collazo (2019) "Healing Heel Ulcers in High-Risk Patients: Distally Based Peroneus Brevis Muscle Flap Case Series" Journal of Foot & Ankle Surgery 58(2): 341-346. The purpose of this study was to demonstrate use of a distally based peroneus brevis muscle flap in high-risk patients with diabetes and peripheral vascular disease for limb salvage of nonhealing heel ulcerations. Seventeen patients were referred for a below-knee amputation because of nonhealing heel ulcerations and peripheral vascular disease. As a last resort, 17 distally based peroneus brevis muscle flaps were elevated in 17 patients with full-thickness heel ulcerations measuring an average defect size of 1411 cm2. All flaps were supplemented with concentrated bone marrow aspirate, negative pressure wound therapy, bilayer wound matrix, and static external fixation for an average time of 103 weeks. Split-thickness skin graft was delayed by an average of 175 days. All procedures were performed on patients diagnosed with diabetes, advanced peripheral arterial disease, and nonhealing heel ulcer present >1 year. All flaps survived at 15 years follow-up. The average time to healing was 103 weeks. No major amputations were performed to date. Partial tip necrosis occurred in 2 patients and healed uneventfully with local wound care. Distally based peroneus brevis muscle flaps in patients with diabetes and peripheral vascular disease offer a reliable alternative to limb salvage for full-thickness heel ulcerations measuring up to 7 × 6 cm. Combinatorial procedures are necessary to improve outcomes in high-risk patients whose alternative is a major amputation.

Background: Limited research has explored the associations between the US Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) ratings data and hospital-acquired pressure ulcer (HAPU) occurrences; Purpose: We examined the associations between the hospital-level patient satisfaction HCAHPS scores with hospital care experience reported by Medicare patients 65 years or older and the occurrence of HAPUs among Medicare patients with stroke; Methods: A matched case-control design was used; Patients with a history of stroke were identified using the 2011 Medicare fee-for-service patient data Medicare Beneficiary Summary and Medicare Provider Analysis and Review files processed by the Chronic Conditions Data Warehouse were analyzed; Conditional logistic regression was used; Results: HAPUs occur less frequently among Medicare patients with stroke who received inpatient care at hospitals with higher patient satisfaction HCAHPS scores for nurses' communication skills and quietness at night for the areas around patient rooms; Conclusions: Using hospital-level patient satisfaction HCAHPS scores to monitor and project HAPU occurrences is recommended;

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Nurses play a vital role in preventing and detecting pressure ulcers within an intensive care unit This study was conducted to investigate the effect of an empowerment program on nurses' ability to visually determine the stage of a pressure ulcer This study was a nonrandomized clinical trial involving an intervention group and a control group Prior to the empowerment program, data indicated that there was a significant deficit in the ability of nurses in both groups to accurately determine the stage of a pressure ulcer Following the empowerment program, the mean scores of nurses in the intervention group were significantly higher than the mean score of nurses in the control group (P < 001) This study indicates that the implementation of an empowerment program can increase the ability of nurses to detect pressure ulcers and to accurately determine staging

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Objective: This paper reports the iterative redesign, feasibility and usability of the Comprehensive Mobile Assessment of Pressure (CMAP) system’s mobile app used by Veterans with SCI; Design: This three-year, multi-staged study used a mixed-methods approach; Setting: Minneapolis VA Health Care System, Minneapolis, Minnesota; Participants: Veterans with spinal cord injury (N = 18); Interventions: Veterans with spinal cord injury engaged in iterative focus groups and personal interviews, sharing their needs and desires for the CMAP app redesign App developers used these data for the redesign The redesigned CMAP app was tested for six-weeks in users’ homes; Outcome Measures: Quantitative (surveys) and qualitative (interviews) methods measured feasibility for self-management of seating pressure Qualitative data were audio recorded, transcribed, anonymized, and coded Survey data were analyzed using summary statistics; Results: After the CMAP system's redesign, the in-home use interview found: (1) any tool that can assist in prevention and monitoring of skin ulcers is important; (2) the desired key features are present in the app; (3) the main barrier to CMAP use was inconsistent functionality; (4) when functioning as expected, the live pressure map was the central feature, with reminders to weight shift also of high importance The survey found: power wheelchair users tended to score closer than manual wheelchair users to the positive response end ranges on two separate surveys; Conclusions: Overall both the power and manual wheelchair users reported that they wanted to use the system, felt confident using the system, and that the functions of the system were well integrated;

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Background: Hospital-acquired pressure injuries (HAPIs) typically develop following critical illness due to immobility and suboptimal perfusion. Vitamin D helps to maintain epithelial cell integrity, particularly at barrier sites such as skin. It is unclear whether vitamin D status is a modifiable risk factor for HAPIs in critically ill patients. Our goal was to investigate the relationship between admission 25-hydroxyvitamin D (25OHD) levels with the development of HAPIs in surgical intensive care unit (ICU) patients.

Methods: We performed a retrospective cohort study of patients admitted to surgical ICUs at a major teaching hospital in Boston, Massachusetts. To investigate the association of 25OHD levels with subsequent development of HAPIs, we performed logistic regression analyses, controlling for body mass index, Nutrition Risk in the Critically Ill score, ICU length of stay, and cumulative ICU caloric or protein deficit. Results: A total of 402 patients comprised our analytic cohort. Each unit increment in 25OHD was associated with 11% decreased odds of HAPIs (odds ratio [OR] 0.89; 95% CI 0.84-0.95) When vitamin D status was dichotomized, patients with 25OHD <20 ng/mL were >2 times as likely to develop HAPIs (OR 2.51; 95% CI 1.06-5.97) compared with patients with 25OHD >20 ng/mL. Conclusion: In our cohort of critically ill surgical patients, vitamin D status at ICU admission was linked to subsequent development of HAPIs. Randomized, controlled trials are needed to assess whether optimizing 25OHD levels in the ICU can reduce the incidence of HAPIs and improve other clinically relevant outcomes in critically ill patients.

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Ousey, K and J Blackburn (2019) "The positive impact of training and education on nurses' competence and confidence" Wounds UK 15(1): 7-8

An editorial is presented on the importance of education and training to competence and confidence of nurses. Topics mentioned include the advantage of knowledge retention to nurses in providing competent healthcare, the relationship between competence and confidence, and the contribution of decision making to nurses in healthcare such as in wound dressing choice.

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The article presents guidelines for the nurses dealing with hospital-acquired pressure injuries (HAPIs) in patients in the hospital. It talks about the importance of risk assessment, skin care and improving nutrition which are managed by the nurses. It tells about the cost of the medical care provided for the HAPIs.

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Our objective was to estimate the US national cost burden of hospital-acquired pressure injury (HAPI) using economic simulation methods. We created a Markov simulation to estimate costs for staged pressure injuries acquired during hospitalisation from the hospital perspective. The model analysed outcomes of hospitalised adults with acute illness in 1-day cycles until all patients were terminated at the point of discharge or death. Simulations that developed a staged pressure injury after 4 days could advance from Stages 1 to 4 and accrue additional costs for Stages 3 and 4. We measured costs in 2016 US dollars representing the total cost of acute care attributable to HAPI incidence at the patient level and for the entire United States. The previously reported epidemiology of pressure injury US HAPI costs could exceed $268 billion. About 59% of these costs are disproportionately attributable to a small rate of Stages 3 and 4 full-thickness wounds, which occupy clinician time and hospital resources. HAPIs remain a concern with regard to hospital quality in addition to being a major source of economic burden on the US health care system. Hospitals should invest more in quality improvement of early detection and care for pressure injury to avoid higher costs; © 2019 Medicalhelplinescom Inc and John Wiley & Sons Ltd

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Papp, A A (2019) "Incisional negative pressure therapy reduces complications and costs in pressure ulcer reconstruction" International Wound Journal 16(2): 394-400

Complications after pressure ulcer reconstruction are common. A complication rate of 21% to 58% and a 27% wound recurrence has been reported. The aim of this study was to decrease postoperative wound-healing...
complications with incisional negative pressure wound therapy (iNPWT) postoperatively. This was a prospective non-randomised trial with a historic control. Surgically treated pressure ulcer patients receiving iNPWT were included in the prospective part of the study (Treatment group) and compared with the historic patient cohort of all consecutive surgically treated pressure ulcer patients during a 2-year period preceding the initiation of iNPWT (Control). There were 24 patients in the Control and 37 in the Treatment groups. The demographics between groups were similar. There was a 74% reduction in in-hospital complications in the Treatment group (108% vs 417%, P < 0.005), 27% reduction in the length of stay (248 vs 338 days, P < 0.005), and a 78% reduction in the number of open wounds at 3 months (54 vs 25%, P = 0.00481). Recurrent wounds and history of previous surgery were risk factors for complications. Incisional negative pressure wound therapy shortens hospital stay, number of postoperative complications, and the number of recurrent open wounds at 3 months after reconstructive pressure ulcer surgery, resulting in significant cost savings.

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Objectives: to evaluate and classify patients according to the Risk Assessment Scale for Perioperative Pressure Injuries; verify the association between sociodemographic and clinical variables and the risk score; and identify the occurrence of pressure injuries due to surgical positioning. Method: observational, longitudinal, prospective and quantitative study carried out in a teaching hospital with 278 patients submitted to elective surgeries. A sociodemographic and clinical characterization questionnaire and the Risk Assessment Scale for Perioperative Pressure Injuries were used. Descriptive, bivariate and logistic regression analyses were applied. Results: the majority of patients (565%) presented a high risk for perioperative pressure injury. Female sex, elderly group, and altered body mass index values were statistically significant (P < 0.005) for a higher risk of pressure injuries. In 77% of the patients, there were perioperative pressure injuries. Conclusion: most of the participants presented a high risk for development of perioperative decubitus ulcers. The female sex, elderly group, and altered body mass index were significant factors for increased risk. The Risk Assessment Scale for Perioperative Pressure Injuries allows the early identification of risk of injury, subsidizing the adoption of preventive strategies to ensure the quality of perioperative care.

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Context: Pressure ulcers are among the main postoperative complications which is associated with an increased length of hospitalization. Determining risk factors of postsurgical pressure ulcers is crucial for developing prevention and treatment strategies. Aims: This study aimed to investigate the incidence rate of pressure ulcer and related risk factors after general surgery. Settings and Design: This descriptive cross-sectional study was carried out in three hospitals in Mazandaran province in 2016. Materials and Methods: The sample size was 191 surgical patients undergoing general surgery by using census method. Data were collected in pre-, intra-, and post-operative period using demographic and clinical questionnaires and also, through the Braden Scale for Predicting Pressure Ulcer Risk. Statistical Analysis Used: Descriptive statistics, t-test, Chi-square, and univariate and multivariate logistic regression were used to analyze the data. Results: The incidence rate of postoperative pressure ulcers in patients was 178% (34 out of 191 patients). Based on the multivariate logistic regression model, significant correlations existed between the incidence of pressure ulcers and the following variables: age over 70 years old (P = 0.003), history of hypertension (P = 0.035), history of heart diseases (P = 0.029), Braden score <15 (P = 0.017), type of surgery (P = 0.003), and type of anesthesia (P = 0.015). Conclusions: Since it is critical to consider the incidence of postoperative pressure ulcers among patients, further measurements are required to identify high-risk people and use preventive protocols by nurses at pre-, intra-, and post-operative levels. Moreover, it requires extra attention in patients over 70 years, those with a history of hypertension and heart diseases, and those undergoing emergency surgery and spinal anesthesia.

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Patient-reported outcomes can be included as end points in pressure ulcer (PU) intervention trials to provide information to inform decision-making and improve the lives of patients. However, the challenge for researchers and clinicians is identifying and choosing an appropriate instrument for each particular application that suits their research questions and clinical context. To provide researchers and clinicians with the information needed to inform choice of patient-reported outcome measures, we compared a generic and disease-specific measures' ability to discriminate between clinical groups known to differ, and determined their responsiveness to change. We performed analyses on a subset of patients recruited to the PRESSURE 2 trial that completed the pressure ulcer quality of life instrument-prevention version (PUQOL-P) and Short Form 12 Questionnaire (SF12) measures at baseline and 30-day posttreatment. Known-group validity and responsiveness-to-change analyses were conducted. The analysis sample consisted of 617 patients that completed both measures at baseline. Known-group validity revealed that some PUQOL-P symptoms and function scales differentiated between people with category 2 PUs and those without PUs. A less meaningful pattern of results was observed for the SF12 scales, suggesting that the PUQOL-P is more sensitive to differences between PU and non-PU populations. Responsiveness analysis revealed that the PUQOL-P was more responsive in detecting disease severity than the SF12. The PUQOL-P provides a standardized method for assessing PU-specific symptoms and functioning outcomes and is suitable for quantifying the benefits of PU interventions from the patient's perspective. Generic measures are useful for group comparisons of global quality of life domains. Choice of measure for each particular application should be determined by the purpose of the measurement and the information required; © 2019 by the Wound Healing Society.

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The emergency department (ED) is at the front line of hospital pressure injury (PI) prevention, yet ED clinicians must balance many competing clinical priorities in the care of seriously ill patients. This paper presents the current biomechanical and clinical evidence and management considerations to assist EDs to continue to develop and implement evidence-based PI prevention protocols for the high-risk emergency/trauma patient. The prevention of hospital-acquired pressure injuries has received significant focus internationally over many years because of the additional burden that these injuries place on the patient, the additional costs and impact to the efficiency of the hospital, and the potential for litigation. The development of a PI is the result of a complex number of biomechanical, physiological, and environmental interactions. Our understanding of the interaction of these factors has improved significantly over the past 10 years. We have demonstrated that large reductions in PI incidence rates can be achieved in critical care and general hospital wards through the application of advanced evidence-based prevention protocols and believe that further improvement can be achieved through the application of these approaches in the ED; © 2019 Medicalhelplinescom Inc and John Wiley & Sons Ltd.

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The objectives of this study were to investigate the prevalence and the characteristics of pressure ulcers (PU) in community-dwelling older adults in Indonesia, including specific characteristics of the PU patients and their use of formal and informal care. A cross-sectional design was used for the study, with 325 participants aged 60 years or older, randomly chosen from the general community. The overall PU prevalence and the PU prevalence excluding category 1 were 108% (95% confidence interval [CI], 58-158) and 52% (95% CI 02-102), respectively. Category 1 PUs were mostly located on the shoulder, sacrum, and hip. The main factors that contributed strongly to PUs among older adults in the community were the degree of physical activity, problems with sensory perception, and having a history of stroke. None of the participants with a PU received wound care or information about PUs from formal caregivers and only 114% received wound care from family caregivers. This study shows that pressure ulcers in community-dwelling older adults in Indonesia are a

The pressure injury environment is characterized by overproduction of reactive oxygen species and exacerbated inflammation, which impair the healing of these lesions Mediterranean-like diet may be a good intervention to improve the healing of pressure injury due to its anti-inflammatory and antioxidant components. So, this study evaluated the hypothesis that olive oil, as a main source of lipid in Mediterranean diet, could improve cutaneous wound healing of pressure injury in mice Male Swiss mice were randomly divided into standard, olive oil or soybean oil plus olive oil groups and fat represented 10% of total calories in all groups. Four weeks after the beginning of diet administration, two cycles of ischemia-reperfusion (IR) by external application of two magnets disks were performed in the dorsal skin to induce pressure injury formation. Fourteen days after the end of the second IR cycle, olive oil based diet reduced neutrophils cells and cyclooxygenase-2 protein expression, increased nitric oxide synthase-2 and protein and lipid oxidation. Olive oil based diet also increased nuclear factor erythroid 2-related factor 2 protein expression and collagen type I precursor protein expression. In addition, olive oil based diet administration promoted wound closure 7, 10 and 14 days after the end of the second IR cycle. These findings support the hypothesis that olive oil based diet improves cutaneous wound healing of pressure injury in mice through the reduction of inflammation and stimulation of redox equilibrium;

Schwartz, D and A Gefen (2019) "The biomechanical protective effects of a treatment dressing on the soft tissues surrounding a non-offloaded sacral pressure ulcer" International Wound Journal epub ahead of print

Patients who are immobile endure prolonged body weight support contact areas that over time may lead to the onset of pressure ulcers (PUs). Approximately, one-third of the common sacral PUs are severe and classified as category 3 or 4. If a PU has occurred, off-loading is the basic, commonly accepted clinical intervention; however, in many situations, complete off-loading of sacral PUs is not possible. Minimising the exposure of wounds and their surroundings to elevated mechanical loads is crucial for healing. Accordingly, in the present study, we aimed to investigate the biomechanical effects of the structural and mechanical properties of different treatment dressings on stresses in soft tissues surrounding a non-offloaded sacral PU in a supine patient. Using a novel three-dimensional anatomically realistic finite element modelling framework, we have compared performances of three dressing designs: (a) The Mepilex Border Sacrum (MBS) multilayer anisotropic silicone foam dressing (Mölnlycke Health Care), (b) an isotropic stiff dressing, and (c) an isotropic flexible dressing. Using our newly developed protective efficacy index (PEI) and aggravation index (AI) for assessing prophylactic and treatment dressings, we identified the anisotropic stiffness feature of the MBS dressing as a key design element; © 2019 Medicalhelplinescom Inc and John Wiley & Sons Ltd


Objective To use the theoretical frameworks of implementation science to implement pressure injury (PI) prevention best practices in spinal cord injury (SCI) rehabilitation Design Quality improvement Setting Six Canadian SCI rehabilitation centers Participants Inpatients (N2371) admitted from 2011 to 2015 Interventions The SCI Knowledge Mobilization Network (SCI KMN) selected and implemented 2 PI prevention best practices at 6 Canadian SCI rehabilitation centers: (1) completing a comprehensive PI risk assessment comprised of a structured risk assessment instrument followed by an individualized, interprofessional risk factor determination and prevention plan; and (2) providing structured and individualized PI prevention patient education Active Implementation Frameworks provided a systematic approach to best practice implementation Main Outcome Measures Implementation indicators (completion rates) and patient outcomes (PI incidence, patient education survey) Results After implementation, risk
assessmen t completion rates improved from 46% to 94% (P <05) Between initial (2012-2013) and full (2014-2015) implementation stages, completion rates improved for both interprofessional risk factor determination (67% to 96%) and prevention plans (67% to 94%) Documentation of patient education also increased to 86% (vs 71% preimplementation) At rehabilitation admission 22% of patients had PUs, with 14% of individuals developing new PUs during rehabilitation The overall PI prevalence was 30% Considering only PUs of stage 2 or greater, prevalence was 21% and incidence 7% There were no statistically significant differences in PI incidence between pre- and postimplementation Patient education surveys indicated that PI education improved patients' knowledge of prevention strategies Conclusions Active Implementation Frameworks supported successful implementation of PI prevention best practices across the 6 participating SCI KMN sites Achieving a reduction in PI incidence will require additional measures, and there is an ongoing need to strengthen the evidence base underpinning PI prevention guidelines

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Introduction: Introduction: Pressure ulcer is one of the most common and painful complications in patients admitted to intensive care units (ICUs) This study aimed to compare the effects of tragacanth gel cushions and foam-filled ones on the prevention of pressure ulcers Methods: This triple-blind, randomized, clinical trial was performed on 94 patients admitted to the ICU of Taleqani Hospital of Mashhad, Iran The participants were divided into two groups of tragacanth gel pad and foam (n47 for each group) Both groups received all the routine care The participants were examined on a daily basis during a ten-day period We considered sacral region as the most affected site, and the patients with erythema were excluded from the study To analyze the data, Chi-squared test, Fisher's exact test, and t-test were run, using Stata version 12 Results: The data showed significant differences in terms of the incidence of skin redness in the tragacanth gel cushions group and foam cushion group, respectively, 684 (158) and 567 (126) days after admission In addition, in the tragacanth gel cushions group 14 patients (297%) did not have skin redness compared with the foam cushion group (851%), which indicated a significant difference Conclusion: This study showed that the use of tragacanth gel cushion is effective in the prevention of pressure ulcers in ICU patients Cushions filled with tragacanth gel also delayed the onset of erythema Considering their cost-effectiveness and naturalness, the use of tragacanth gel cushions is recommended to improve the sacral skin health and prevent pressure ulcers;

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For decades, aged care facility residents at risk of pressure ulcers (PUs) have been repositioned at two-hour intervals, twenty-four-hours-a-day, seven-days-a-week (24/7) Yet, PUs still develop We used a cross-sectional survey of eighty randomly selected medical records of residents aged ≥ 65 years from eight Australian Residential Aged Care Facilities (RACFs) to determine the number of residents at risk of PUs, the use of two-hourly repositioning, and the presence of PUs in the last week of life Despite 91 per cent (73/80) of residents identified as being at risk of PUs and repositioned two-hourly 24/7, 34 per cent (25/73) died with one or more PUs Behaviours of concern were noted in 72 per cent (58/80) of residents of whom 38 per cent (22/58) were restrained Dementia was diagnosed in 70 per cent (56/80) of residents The prevalence of behaviours of concern displayed by residents with dementia was significantly greater than by residents without dementia (82 per cent v 50 per cent, p 0028) The rate of restraining residents with dementia was similar to the rate in residents without dementia Two-hourly repositioning failed to prevent PUs in a third of at-risk residents and may breach the rights of all residents who were repositioned two-hourly Repositioning and restraining may be unlawful Rather than only repositioning residents two-hourly, we recommend every resident be provided with an alternating pressure air mattress;

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Introduction: Trochanteric pressure ulcers (PrUs) are difficult to treat and are often complicated by infection spreading to the hip joint We review three cases from India where proximal femoral resection and pedicled
Tensor Fascia Lata (TFL) flapping was used in the management of infected deep trochanteric ulcers communicating to the hip joint: Case presentation: Three patients had a total of four trochanteric PrUs communicating to the hip joint: Proximal femoral resection along with radical debridement of the pressure ulcer (PrU) was the first step in our surgical protocol. Serial debridements were performed to make the resulting cavity healthier and ready for the subsequent flap surgery. TFL flapping was done to cover the raw area of the PrU and the donor site was closed either primarily or with a split skin graft. All patients were males with AIS A spinal cord injury (SCI) and stage 4 PrUs in the trochanteric region. One patient had bilateral trochanteric ulcers. There was complete healing of all PrUs with improvement in wheelchair mobility, and general health. Discussion: PrUs are a common complication of patients with SCI and are often considered one of the most neglected issues of health care delivery in India. Proximal femoral resection with pedicled TFL muscle flap is a versatile and reliable procedure for the coverage of recalcitrant trochanteric PrU with hip joint involvement. Minimal donor site morbidity occurs;


Pain from pressure ulcers can severely impact a patient's quality of life. Evidence-based treatment of ulcer-related pain typically relies on systemic opioids with limiting side effects. Literature exists on the use of topical ketamine for neuropathic pain, but not for tissue injury in general and for decubitus ulcer pain specifically. Ketamine has a number of actions including blocking of the glutamate NMDA ionophore in the periphery. Preclinical evidence suggests that NMDA receptors located on peripheral sensory afferent terminals may play a role in initiating pain signaling in inflamed tissues. Topical ketamine, therefore, has the potential to provide analgesia when applied to decubitus ulcers. Here, a case is reported of a 54-year-old female with diffuse large B-cell lymphoma who during a critical period in her illness experienced gangrene leading to chronic bilateral stage IV decubitus ulcer. The severe pain reported by the patient was poorly managed using high doses of systemic opioids and resulted in intermittent systemic side effects. Adding a compounded ketamine gel to her wound dressings twice daily over an interval of several months drastically reduced her opioid use and, more important, her pain, with minimal side effects;


Background: Pressure injuries negatively impact quality of life and participation for individuals with spinal cord injury (SCI). Objective: To examine the factors that may protect against the development of medically serious pressure injuries in adults with SCI. Methods: A qualitative analysis was conducted using treatment notes regarding 50 socioeconomically disadvantaged individuals who did not develop medically serious pressure injuries during a 12-month pressure injury prevention intervention program. Results: Eight types of potentially protective factors were identified: meaningful activity, motivation to prevent negative health outcomes, stability/resources, equipment, communication and self-advocacy skills, personal traits, physical factors, and behaviors/activities. Conclusions: Some protective factors (e.g., personal traits) may be inherent to certain individuals and nonmodifiable. However, future interventions for this population may benefit from a focus on acquisition of medical equipment and facilitation of sustainable, health-promoting habits and routines. Substantive policy changes may be necessary to facilitate access to adequate resources, particularly housing and equipment, for socioeconomically disadvantaged individuals with SCI. Further research is needed to understand the complex interplay of risk and protective factors for pressure injuries in adults with SCI, particularly in underserved groups;


Aims and objectives: To evaluate the influence of long-term at-home nursing care (LTHNC) on patient functional status. The specific aims were as follows: (1) to analyse the influence of LTHNC on patient functional status.
in terms of activities of daily living; (2) to evaluate the risk of pressure sores and pressure sore prevention in patients receiving LTHNC. Background: LTHNC is a form of care for chronically ill persons staying at home who do not need hospitalisation, but due to their health problems they require regular nursing care that can be provided at home. Design: A retrospective descriptive study. Methods: A document research method was used. We collected data from the medical records of 1,058 patients receiving LTHNC at the Non-Public Health Care Centre OMNI-MED in Bialystok (Poland) for the years 2005–2012. Results: Detailed analysis of scores on the Barthel Activities of Daily Living Index revealed significant improvement in patient functional status as a result of LTHNC. In patients aged 65–80, the Barthel score increased by 883 points, and in patients aged 64 years and younger, the score increased by 658 points (p < 0.001). In the oldest patients (>80 years), functional status improved the least, gaining a mean of 497 points on the Barthel scale. Overall, the demonstrated improvement of patient functional status and reduced risk of pressure sore development provide evidence that LTHNC is an effective form of care for elderly and chronically ill persons staying at home. Conclusion: The findings of our study represent a positive example of the way good nursing care can benefit patients while promoting the autonomous nature of nursing. Relevance to clinical practice: The results add to our understanding of the functioning of LTHNC by providing relevant scientific evidence which may contribute to the development of community nursing.

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Objective: To evaluate the effect of silicone foam dressings, placed preoperatively, on the incidence of postoperative sacral deep-tissue pressure injuries; Design, Setting, and Patients: An uncontrolled before-and-after quality improvement method was used. Within a single, urban academic medical center, consecutively admitted adult cardiac surgery patients were included in the pre- and postintervention groups; only those receiving elective procedures were included; Intervention: Nurses applied a sacral silicone foam dressing preoperatively. This dressing was maintained on the patient's sacrum intraoperatively and postoperatively for up to 5 days in the intensive care and step-down units; Main Results: This project demonstrated a clinically significant decrease (P < 0.02) in the incidence of postoperative sacral deep-tissue pressure injuries from 23% (preintervention, n = 300) to 0% (postintervention, n = 224). These results were sustained for 24 months after the trial was completed; Conclusions: The use of silicone foam dressings may be an effective prophylactic intervention to reduce the incidence of perioperative deep-tissue pressure injuries among cardiac surgery patients, a high-risk population;

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Aim: To estimate the incidence of pressure injury and its predictors including nursing workload in critical patients Background: There is controversy about the influence of the nursing workload on the occurrence of pressure injury in intensive care units. Methods: A retrospective cohort of 766 patients in nine intensive care units of two university hospitals was studied. The nursing workload was measured using the Nursing Activities Score. The predictors were identified by logistic regression. Results: The pressure injury incidence was 187%. The odds ratio of the development of pressure injury increased 35 times in mechanical ventilation (p < 0.001), 78 times in palliative care (p = 0.004), 23 times in the 60–84 years old group (p = 0.005); it also increased 10% for each day of hospitalization (p < 0.001), and 15% for each registered point of the Nursing Activities Score (p = 0.016). Conclusion: Existing risks for the development of pressure injury have been confirmed and nursing workload identified as a new predictor. Much still needs to be done in the area of prevention, especially in groups at risk. Implications for Nursing Management: Increasing nursing resources in the intensive care unit may assist in reducing the pressure injury rate.

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Timely removal of the urinary catheter is an important strategy for decreasing catheter-associated urinary tract infections (CAUTIs). Data were aggregated from an electronic root cause analysis tool, which is used to collect and guide discussions on patient factors following a CAUTI event at our facility. This identified the Braden Scale score as a possible important predictor of early-onset CAUTI in high-risk patients and could potentially be leveraged for early action in urinary catheter removal.


Background: The main objective was to assess the reduction of the pressure ulcers prevalence which could be obtained if AscalisOptimo® mattresses were made available ad libitum in rehabilitation services (RS) by comparison to prevalence as observed in the national PERSE study (historical control) in similar departments using a variety of prevention aids. Methods: This cross-sectional prevalence study was combined with a prospective study of the incidence of pressure ulcer occurrence in the high-risk target population whose beds were systematically equipped with the studied support. Results: The prevalence study shows that 12 of the 369 patients presented pressure ulcers which occurred during the period when AscalisOptimo® corresponds to a prevalence of 33% [14, 51] which is significantly lower than those recorded in the PERSE study: 118% [108; 128] p <0.0001. The ulcer incidence study was conducted on 71 patients hospitalized on a bed with an AscalisOptimo® support because of their high risk of pressure ulcers. One pressure ulcer occurred in 4 patients, 2 pressure ulcers occurred in one patient and 3 pressure ulcers occurred in another patient, ie 6 out of 71 corresponding to an incidence of 85% [32; 175]. Conclusions: The significant decrease of the prevalence of pressure ulcer in the rehabilitation departments where AscalisOptimo® were available when compared to the current prevalence observed in rehabilitation services as well as results of the study of pressure ulcer incidence in patients bedridden on AscalisOptimo®, shows the benefit provided to patients in terms of pressure ulcers prevention.

Swift, A (2019) "Body sensor providing feedback to bedside staff reduced the prevalence of pressure ulcers in patients with critical illness" Evidence-Based Nursing 22(2): 48-48

Takamura, N, K Tada, et al (2019) "Clinically Infrequent Arcanobacterium haemolyticum Bacteremia Complicated by Foot Decubitus Ulcer: An Educational Reminder for Primary Care Physicians" Internal Medicine (Tokyo, Japan) epub ahead of print

An 81-year-old Japanese man with no history of diabetes mellitus was admitted to our hospital for a fever with a new ulcerative lesion on the left heel. Blood cultures on admission grew Arcanobacterium haemolyticum in aerobic bottles. He was therefore diagnosed with A. haemolyticum bacteremia and osteomyelitis complicated with foot decubitus ulcer. He was successfully treated with intravenous antibiotic therapy and debridement of the left heel. Our case and literature review show that it is important to recognize that A. haemolyticum is a systemic causative pathogen in immunocompetent patients in primary care practice.


It has been shown that pressure ulcer formation in critically ill paediatric patients increases morbidity and mortality. We sought to identify factors associated with pressure ulcer formation in paediatric patients on extracorporeal membrane oxygenation (ECMO). From December 2014 to 2015, we identified patients at our institution who developed a pressure ulcer to create two cohorts: ulcer and no ulcer. Variables of interest included: type of ECMO, ECMO indication, hours on ECMO, location of cannulas, volume of crystalloid and blood products received during the first 7 days or during the length of the ECMO run, albumin and lactate levels on the day of cannulation, and presence of vasopressor support or steroid therapy. Of 43 patients studied, 11 (25.5%) developed a pressure ulcer. Patients that developed ulcers were older (P <0.001) and weighed more (P <0.006). Femoral cannulation was more frequent in the ulcer group (36.4% vs 63%, P = 0.029), and duration of ECMO was longer (P <0.007). Age, weight, duration of ECMO, and femoral cannulation may contribute to the development of pressure ulcers in children who require ECMO.
Further analysis is imperative to identify specific techniques and protocols that will prevent pressure ulcers in this critically ill population.


A pressure ulcer/injury (PU/I) is caused by multiple factors with sustained pressure being the major contributor to its development. This pressure may be measured by a healthcare provider using a pressure mapping device in order to assess pressure distribution properties of surfaces used. This educational article describes a general overview, the value, how to perform, and how to incorporate pressure mapping into clinical practice. Also included is an exemplar of a nurse and a physical therapist using pressure mapping to identify the best surface and position for a wheelchair-bound patient in order to minimize PU/I risk.


Pressure-induced deep tissue injury is a form of pressure ulcer which is difficult to detect and diagnose at an early stage, before the wound has severely progressed and becomes visible at the skin surface. At the present time, no such detection technique is available. To test the hypothesis that muscle damage biomarkers can be indicative of the development of deep tissue injury after sustained mechanical loading, an indentation test was performed for 2 hours on the tibialis anterior muscle of rats. Myoglobin and troponin were analysed in blood plasma and urine over a period of 5 days. The damage as detected by the biomarkers was compared to damage as observed with T2 MRI to validate the response. We found that myoglobin and troponin levels in blood increased due to the damage and also increased in urine. The amount of damage observed with MRI immediately after loading had a strong correlation with the maximal biomarker levels: troponin in blood rs 0.94; myoglobin in blood rs 0.75; and myoglobin in urine rs 0.57. This study suggests that muscle damage markers measured in blood and urine could serve as early diagnosis for pressure-induced deep tissue injury; Copyright © 2019 The Authors Published by Elsevier Ltd All rights reserved

Traa, W A, M C van Turnhout, et al (2019) "There is an individual tolerance to mechanical loading in compression induced deep tissue injury" Clinical Biomechanics (Bristol, Avon) 63: 153-160

Background: Deep tissue injury is a type of pressure ulcer which originates subcutaneously due to sustained mechanical loading. The relationship between mechanical compression and damage development has been extensively studied in 2D. However, recent studies have suggested that damage develops beyond the site of indentation. The objective of this study was to compare mechanical loading conditions to the associated damage in 3D. Methods: An indentation test was performed on the tibialis anterior muscle of rats (n=39). Changes in the form of oedema and structural damage were monitored with MRI in an extensive region. The internal deformations were evaluated using MRI based 3D finite element models. Findings: Damage propagates away from the loaded region. The 3D analysis indicates that there is a subject-specific tolerance to compression-induced deep tissue injury. Interpretation: Individual tolerance is an important factor when considering the mechanical loading conditions which induce damage; Copyright © 2019 Elsevier Ltd All rights reserved


The aim of this study was to determine the effectiveness of a pressure injury prevention guide used in a pediatric intensive care unit (PICU) on the occurrence of pressure injuries. The design is a post-intervention with...
a control group and a prospective intervention group. Pressure injuries occurred on 94% of children in the nontreatment group, and in 36% of children in the treatment group. There was a statistically significant difference in the occurrence of pressure injuries between the nontreatment group and the treatment group (p = 0.033). The average Braden Q pressure injury score was 1220 ± 2280 at the beginning of the intensive care hospitalization, and 1373 ± 3312 at discharge in the treatment group (p < 0.001). The results show that the risk of pressure injuries was reduced and pressure injuries occurred later when an evidence-based pressure injury prevention guide was used.


Background: Traditionally, a 30-day postoperative period is used to assess outcomes in surgery. However, it is not clear if this is sufficient. Our study assessed readmissions and their risk factors following the surgical repair of pressure ulcers in a 90-day postoperative period; Methods: Patients with a pressure ulcer to the lower back, hip, and/or buttocks who underwent a pedicled or flap based wound operation were identified in the National Readmissions Database. We then analyzed risk factors for overall 0-90-day readmissions, early readmissions (0-30 days), and late-readmissions (31-90 days); Results: 3329 patients were identified, of which 154 (46%) had surgical wound-related readmissions. A majority of these occurred after 30 days (5389%). 90% of patients with a surgical-wound related readmission were readmitted within 63 days of index procedure; Conclusions: The traditional 30-day outcome period is not enough to properly assess outcomes in pressure ulcer surgery such as readmission. We demonstrate that a period of at least 10 weeks and perhaps the entire global 90-day postoperative period would be more appropriate to evaluate readmissions after ulcer repair; Copyright © 2018 Elsevier Inc. All rights reserved.


Pressure injury is a serious problem and is common in critical care units. Over the last decade, there is new evidence suggesting that the use of multilayered silicone foam dressing as preventive measures can decrease the incidence and prevalence rate of hospital-acquired pressure injury. The purpose of this study was to investigate the clinical efficacy of this dressing in reducing sacral and coccygeal pressure injury incidence rate as compared with standard preventive interventions in critical care settings.


Background: Pressure injuries (PIs) represent a frequent, often preventable, secondary complication of spinal cord injury (SCI) with serious consequences to health, societal participation, and quality of life. Specialized knowledge and service delivery related to treatment and prevention are typically located within major health centers. Introduction: For persons with SCI living at home, it can be challenging to access specialized SCI care. A telehealth approach could help mitigate this challenge. This multisite pilot investigation assessed the feasibility of integrating information technologies within the management of PIs; Materials and Methods: Each study site formed a specialized interdisciplinary care team that identified components of their standard clinical care pathway and examined how they could be integrated with study technologies. A monitoring system was utilized to enable patients and caregivers to exchange clinical information with the care team; Results: Clinician and patient focus groups were completed to identify facilitators and barriers for long-term implementation. Findings demonstrate that this method of service delivery is feasible but requires further development; Discussion: This model of care requires refinement to address technological, regulatory, and clinician acceptance barriers; however, increased access to these services has the potential for improving PI healing or prevention rates in comparison with those not able to access specialized services; Conclusions: This project demonstrates that PI treatment services can be delivered effectively through the internet. Future trials can investigate efficacy and cost-effectiveness of this model of care to inform sustained implementation.
The purpose of this quality improvement project was to determine hospitalists' knowledge, practices, and perspectives related to management of pressure injuries and neuropathic/diabetic foot complications (having a foot ulcer or subsequent development of a foot infection because of a foot ulcer) We also sought to identify resources for and knowledge-based barriers to management of these wounds This quality improvement effort targeted an interdisciplinary group of 55 hospitalists in internal medicine that consisted of 8 nurse practitioners, 10 physician assistants, and 38 physicians The site of this initiative was the Johns Hopkins Bayview Medical Center, a 342-bed academic hospital located in the mid-Atlantic United States (Baltimore Maryland) The first phase of our quality improvement project comprised an online survey to identify hospitalists' knowledge, practices, and opinions on inpatient management of pressure injuries and diabetic foot complications The second phase involved semi-structured focus groups attended by hospitalists to identify resource gaps and barriers inferred by survey results Twenty-nine of 55 (52%) hospitalists responded to the survey; 72% indicated no formal training in wound care Over 90% had little to no confidence in management of pressure injuries and diabetic foot complications In a separate ranking section of the survey, respondents selected lack of knowledge/confidence 12 of 29 (41%) and resources 9 of 29 (31%) as number 1 barriers to wound care Managing patients with obesity was identified as a second major barrier from 10 of 29 selected options (34%) Eighteen of 55 (33%) hospitalists attended focus group sessions acknowledging barriers to wound care that included provider education, information technology, system factors, and interprofessional engagement Attendees welcomed additional educational and ancillary resource support

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Introduction: Ischial pressure ulcers are considered the most difficult type of pressure ulcers (PUs) to treat; Objective: The authors report the use of a pedicled anterolateral thigh (pALT) myocutaneous flap as an alternative for covering an ischial PU; Materials and Methods: The authors retrospectively collected the data of 21 patients with an indurated recurrent ischial ulcer or a fresh ischial ulcer A pALT myocutaneous flap was harvested without intramuscular dissection and skeletonization of the perforators for the ischial defect reconstruction Two modified flap-insetting techniques, an open-route method and a subcutaneous tunnel method, were used for the ischial defect reconstruction The open-route flap-insetting was used for a recurrent ulcer status after other surgical procedures, and the subcutaneous tunnel method was used for fresh ulcers; Results: The mean follow-up period was 10 months (range, 4-14 months) During the postoperative follow-up, all open-route reconstructions resulted in flap take; however, poor healing with seroma was noted in 2 patients who had undergone pALT reconstruction with subcutaneous tunneling after other previous surgical reconstructions; Conclusions: In the authors' experience, because of constant blood supply, sufficient bulk, easy elevation, longer pedicle for the arc of rotation, primary closure of the donor site without morbidity, and a non-weightbearing flap donor site, the pALT myocutaneous flap for ischial ulcer reconstruction can serve as a primary treatment and secondary salvage;

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Objective: To estimate differences in the length of stay and costs for comparable hospitalizations of patients with spina bifida (SB) with and without pressure injuries; Design: Retrospective, cross-sectional, observational study; Setting: Nationwide Inpatient Sample from years 2010-2014; Participants: Hospitalizations of patients with SB (N7776) Hospitalizations among patients with SB and pressure injuries (n3888) were matched to hospitalizations among patients with SB but without pressure injuries (n3888); Interventions: Not applicable; Main Outcome Measures: Differences in length of stay and total costs between the 2 groups; Results: After successful matching, multivariate modeling of costs and length of stay on matched sample showed that hospitalizations with pressure injuries had an increased 12 inpatient days and excess average costs of $1182 in 2014 dollars; Conclusions: The estimated average cost of hospitalization
increased by 10%, and the estimated average length of stay increased by 24% in the presence of pressure injuries among hospitalized patients with SB, compared with their peers without these injuries. These results highlight the substantial morbidity associated with pressure injuries, which are potentially preventable before or during hospitalizations among persons with SB; Published by Elsevier Inc.


Background: Patients undergoing pancreatic resection frequently require rehabilitation facilities after hospital discharge. We evaluated the predictive role of validated markers of frailty on rehabilitation facility placement to identify patients who may require this service. Methods: Single-center retrospective cohort study of patients who underwent pancreatic resection from 2010 to 2015. 90-day morbidity and mortality were calculated. Postoperative validated markers of frailty (Activities of Daily Living scale, Braden scale [assesses pressure ulcer risk, lower scores higher risk] and Morse fall scale) were evaluated via multivariate regression to identify predictors of discharge to rehabilitation facility. Results: 470 patients with complete data were included. Mean age was 62 and 49% were male. Postoperative median length of stay (LOS) was 8 (IQR 7-10) days. 92 (19.66%) patients were discharged to rehabilitation facilities and 138 (29.49%) patients were readmitted within 90 days. On multivariate analysis, age, sex, LOS > 8 days, inpatient Comprehensive Complication Index (CCI) and initial Braden scale were predictive of rehabilitation placement. Conclusion: A marker of frailty routinely collected daily by nursing staff, the Braden scale, is available to help surgeons predict the need for postoperative rehabilitation placement after pancreatic resection. Engaging discharge planning services for at-risk patients may help prevent delayed hospital discharge and should be further evaluated. Copyright © 2018 Published by Elsevier Ltd.


Adipose-derived stem cells (ASCs) possess a well-characterized capacity to enhance cutaneous wound healing. However, many controversies exist regarding ASCs from diabetic patients (dASCs). No report exists on the administration of dASCs for the treatment of pressure ulcers. The aim of this study was to compare properties of dASCs and nondiabetic ASCs (nASCs). In addition, we studied if dASCs enhanced pressure ulcer healing in a rodent pressure ulcer model and investigated underlying mechanisms. We found similar expression of cell surface markers and characteristics in dASCs and nASCs, although dASCs exhibited decreased proliferation and osteogenic differentiation capacity and enhanced adipogenic differentiation capacity. dASCs had beneficial effects on chronic wound healing, though some aspects of their capacity were impaired. The ability of dASCs to promote nerve regeneration was not compromised. dASCs promoted pressure ulcer healing and improved healing by modulating inflammation, promoting angiogenesis and neuroregeneration, enhancing collagen deposition, and increasing re-epithelization. These data may provide a theoretical foundation for further clinical administration of ASCs for chronic wound healing in patients with diabetes.


Aim and objective: To investigate the incidence of intraoperative blanchable erythema and pressure injuries in patients undergoing digestive surgery and to explore potential risk factors. Background: Pressure injuries pose significant economic and healthcare burden to patients and are used as one of the key indicators of nursing in the operation room with high incidence. Design: A retrospective observational study. Methods: Basic information and the results of 3S intraoperative risk assessment scale of pressure injury were obtained from the information system. And the patients with intraoperative blanchable erythema or pressure injuries were followed up for 72 hr by the information system. The clinical data were collected to analyse risk factors for intraoperative blanchable erythema and pressure injuries by univariate analysis and logistic regression analysis. STROBE checklist for cohort studies was applied in the preparation of the paper. Results: Of 5,136 surgical cases, 134 (26.1%) had blanchable erythema, 37 (7.2%) had intraoperative...
pressure injuries, and 8 (016%) had pressure injuries at 72-hr follow-up Preoperative skin under compression, preoperative physical activity, surgical position and extra intraoperative pressure were considered independent risk factors for intraoperative pressure injuries Conclusion: The incidence of pressure injuries in our study was lower than those reported in the previous studies Accessing preoperative skin under compression, preoperative physical activity, surgical position and extra intraoperative pressure was considered to be significant for preventing pressure injuries Relevance to clinical practice: The findings suggest that preoperative skin under compression, preoperative physical activity, surgical position and extra intraoperative pressure are associated with intraoperative pressure injuries in patients undergoing digestive surgery.


Frequent repositioning is important to prevent pressure ulcer (PU) development, by relieving pressure and recovering damages on skin areas induced by repetitive loading Although repositioning is the gold standard to prevent PU, there is currently no strategy for determining tissue condition under preventive approaches In this study, the peak reactive hyperemia (RH) trends and ultrasonographic (US) features are compared with the tissue condition under histopathological examination to determine the potential use of these features in determining the tissue condition noninvasively Twenty-one male Sprague-Dawley rats (seven per group), with body weight of 385-485 g, were categorized into three groups and subjected to different recovery times, each with three repetitive loading cycles at skin tissues above of right trochanter area The first, second, and third groups were subjected to short (3 minutes), moderate (10 minutes), and prolonged (40 minutes) recovery, respectively, while applying fixed loading time and pressure (10 minutes and 50 mmHg, respectively), to provide different degree of recovery and tissue conditions (tissue damage and tissue recovery) Peak RH was measured in the three cycles to determine RH trend (increasing, decreasing, and inconsistent) All rat tissues were evaluated using ultrasound at pre- and post-experiment and rated by two raters to categorize the severity of tissue changes (no, mild, moderate, and severe) The tissue condition was also evaluated using histopathological examination to distinguish between normal and abnormal tissues Most of the samples with increasing RH trend is related to normal tissue (71%); while inconsistent RH trends is more related to normal tissue (82%) There is no relationship between the tissue conditions evaluated under ultrasonographic and histopathological examination Peak RH trend over repetitive loading may serve as a new feature for determining the tissue condition that leading to pressure ulcer; © 2019 by the Wound Healing Society.


Fibroblasts synthesize and secrete dermal collagen, matrix proteins, growth factors, and cytokines These characteristics of fibroblasts provide a potential way for fibroblast therapy to treat skin ulcers more effectively than conventional therapies such as cytokine therapy and negative pressure wound therapy However, the obstacle to the commercialization of fibroblast therapy is the limited supply of cells with consistent quality In this study, we tested whether human embryonic stem cell-derived mesenchymal stem cells (hESC-MSCs) could be differentiated into fibroblasts considering that they have characteristics of high differentiation rates, unlimited proliferation possibility from a single colony, and homogeneity As a result, hESC-MSC-derived fibroblasts (hESC-MSC-Fbs) showed a significant increase in the expression of type I and III collagen, fibronectin, and fibroblast-specific protein-1 (FSP-1) Besides, vessel formation and wound healing were enhanced in hESC-MSC-Fb-treated skin tissues compared to PBS- or hESC-MSC-treated skin tissues, along with decreased IL-6 expression at 4 days after the formation of pressure ulcer wound in a mouse model In view of the limited available cell sources for fibroblast therapy, hESC-MSC-Fbs show a promising potential as a commercial cell therapy source to treat skin ulcers;

Background and Objective: Pressure ulcer (PU) is one of the important and frequent complications of hospitalization, associated with high treatment costs. The present study was conducted to determine the incidence of PU and its direct treatment costs for patients in intensive care unit (ICU) in Iran; Material and Methods: In this retrospective study, medical records of 643 discharged patients from ICU of two selected hospitals were examined. The demographic and clinical data of all patients and data of resources and services usage for patients with PU were extracted through their records. Data analysis was done using logistic regression tests in SPSS 22 software. The cost of PU treatment was calculated for each grade of ulcer; Results: The findings showed that 89% of patients developed PU during their stay in ICU. Muscular paralysis (OR 51), length of stay in ICU (OR 40), diabetes (OR 35), age (OR 29), smoking (OR 21) and trauma (OR 14) were the most important risk factors of PU. The average cost of PU treatment varied from USD 12 for grade I PU to USD 66,834 for grade IV PUs. The total treatment costs for all studied patients with PU was estimated at USD 519,991; Conclusion: The cost of PU treatment is significant. Since the preventive measures are more cost-effective than therapeutic measures, therefore, effective preventive interventions are recommended; Copyright © 2019 Tissue Viability Society Published by Elsevier Ltd. All rights reserved

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Websites


“Risk Assessment and Prevention of Pressure Ulcers: a clinical practice guideline from the American College of Physicians” (2015)
http://annals.org/article.aspx?articleid=2173505


NICE Guideline: “Pressure ulcers: prevention and management of pressure ulcers” (April 2014)
http://www.nice.org.uk/guidance/CG179


The Trans Tasman Dietetic Wound Care Group, Evidence based practice guidelines for the nutritional management of adults with pressure injuries (2011)

Registered Nurses’ Association of Ontario - Risk assessment and prevention of pressure ulcers (2011 revised)

National Guideline Clearinghouse – predefined search
http://guideline.gov/search/search.aspx?term=%22pressure+ulcer*%22+or+%22pressure+injur*%22

European Pressure Ulcer Advisory Panel guidelines
http://www.epuap.org/guidelines/

“Pressure Ulcers Basics : education package” / Victoria. Department of Human Services

Cochrane Wounds Group
http://wounds.cochrane.org/our-reviews
The Cochrane Wounds Group was established in 1995 with the aim of using evidence from trials to conduct systematic reviews to establish the effectiveness of interventions for the prevention and treatment of wounds, and interventions for the prevention and treatment of wound complications.

National Pressure Ulcer Advisory Panel
http://www.npuap.org/
e-Journals

Advances in Skin and Wound Care  (Tables of Contents only)
Eplasty (formerly Journal of Burns & Wounds)  (full text)
EWMA Journal  (full text)
International Wound Journal  (full text with 12-month delay)
Journal of the American College of Clinical Wound Specialists  (full text)
Journal of Tissue Viability  (full text)
Journal of Wound Care  (full text)
Ostomy Wound Management  (full text – internet access required)
World Council of Enterostomal Therapists Journal  (full text 2010 onwards)

World Wide Wounds: the premier online resource for dressing materials and practical wound management information  (full text)
The mission of World Wide Wounds is to be the premier online resource for peer-reviewed information on dressing materials providing practical guidance on all aspects of wound management to health professionals worldwide.

Wound Care Advisor  (full text 2014 onwards)
Wound Practice & Research  (full text)
Wound Repair & Regeneration  (full text with 12-month delay)
Wounds International  (full text 2012 onwards)
Wounds UK Journal  (full text 2011 onwards)

e-Books

Acute and chronic wounds  5th ed, 2016
Australian Standards for wound management  2nd ed. 2010
Fast facts for wound care nursing: practical wound management in a nutshell  2011
Nutrition and wound healing  2007
# Queensland Health Libraries and Contact Numbers

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<td><a href="mailto:loganlib@health.qld.gov.au">loganlib@health.qld.gov.au</a></td>
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<td>hhslibrary.uq.edu.au</td>
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