Pressure Injury Current Awareness Service

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Aims and Objectives: To compare the reliability and predictive validity of the Braden and Jackson/Cubbin PI risk assessment scales in intensive care unit patients; Background: Risk assessment with a standardised tool is the usual intervention for preventing pressure injury Therefore, tools used to assess pressure injury risk should be valid and reliable for the designated patient population; Design: A prospective and cross-sectional study adheres to the STARD guideline; Methods: This study was conducted between November 2017-April 2018 in the intensive care units of a tertiary level university hospital in Turkey The study sample consisted of 176 patients admitted to three intensive care units Risk assessment was performed once daily with the Braden scale, followed immediately with the Jackson/Cubbin scale Risk assessment was terminated on the day of pressure injury development or upon patient discharge from the intensive care unit Each patient's final risk assessment was considered in the data analysis; Results: The Cronbach's alpha coefficient of the Jackson/Cubbin and Braden scales was 78 and 85, respectively The predictive validity of the Jackson/Cubbin scale was confirmed by a sensitivity of 87, specificity of 84, positive predictive value of 47 and negative predictive value of 97 These values for the Braden scale were 95, 75, 38 and 99, respectively; Conclusion: Both the Jackson/Cubbin and Braden scales are reliable and valid scales for pressure injury risk assessment in intensive care unit patients However, the predictive ability to determine patients at risk and not at risk for pressure injury was better for the Jackson/Cubbin scale than for the Braden scale; Relevance To Clinical Practice: Both scales are reliable and valid scales for pressure injury risk assessment Jackson/Cubbin scale's discriminative ability (between the patients at pressure injury risk and not at pressure injury risk) was better; © 2019 John Wiley & Sons Ltd

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Pressure injuries are a common kind of skin lesion that may be difficult to treat The objective of this study was to analyze the effect of hydrogel enriched with alginate, fatty acids, and vitamins A and E in the treatment of pressure injuries This case series with 12-week follow-up included applying daily dressings with hydrogel, maintaining a photographic record, using planimetry to calculate the lesion area, and classifying the healing process using the Pressure Ulcer Scale for Healing (PUSH) In addition, exudate collection from the ulcers was performed in the beginning and after 12 weeks of treatment to determine the dosage of metalloproteinase 9 (MMP9) and tissue inhibitor of metalloproteinase 1 (TIMP1) Of the 13 patients included in the study, 2 died and 11 were monitored for 12 weeks Only 1 patient showed full wound healing, but all patients showed a significant 1219% (p 023) reduction in the lesion area The PUSH score was also significantly reduced from 159 to 1054 (p 0052) Relative to the dosage of metalloproteinase and its inhibitor, there was a reduction in the level of MMP9 and there was no change in the level of TIMP1 This study showed that hydrogel enriched with alginate, fatty acids, and vitamins A and E provided promising results for the treatment of pressure injuries by reducing the lesion area, the general PUSH score, and the amount of MMP9 in the wounds' microenvironment

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Objective: This study aimed to examine the superiority of peroxidase detection of macroscopic observations using rat wounds, and to test the external validity of the peroxidase analysis in pressure ulcers (PU) in humans Method: In the animal study, rat wounds were analysed A crosssectional study analysed, by wound blotting, exudate samples from full-thickness PUs Peroxidase activity was divided into two groups (ring and non-ring signals) Scores in the 'inflammation/infection' and 'necrotic tissue' components of DESIGN, a classification tool of PUs, were compared between the groups Results: In the animal study, 20 rat wounds were assessed and in the clinical study, 62 samples were collected from 26 full-thickness PUs of 21 patients aged ≥ 65 years In the animal study, five of six wounds with clinical inflammation signs showed
ring signal (defined as a signal on the wound edge and no signal on the wound bed). While the tissue sections of three wounds with a ring signal showed inflammatory features, they showed no clinical signs of 'inflammation/infection'. In the clinical study, which analysed 630 ring and 32 non-ring signals, 13 samples in the ring signal group and five in the non-ring signal group had 'inflammation/infection'; scores of ≥ 21 (p<0.001). Despite having no clinical signs, 17 samples showed the ring signal. Conclusion: This study revealed the external validity of the wound blotting analysis of peroxidase and demonstrated its use to detect subclinical inflammation.

Declaration of interest: The authors have no conflicts of interest.

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Implementing evidence-based strategies for the prevention and treatment of pressure injuries (PIs, also called pressure ulcers) that include the use of dressings, positioners, and turning and positioning systems can deliver optimal, cost-effective care to at-risk patients. This meeting report summarises the proceedings of an expert panel-led symposium at the European Wound Management Association (EWMA) Conference, Gothenburg, Sweden, in June 2019, during which the findings of recently undertaken research relating to technologies for PI prevention and treatment were presented.

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Caitano de Sousa, R and A Mathes Faustino (2019) "Nurses' understanding about the pressure injury prevention and care" Revista de Pesquisa: Cuidado e Fundamental 11(4): 992-997

Objective: This study's purpose has been to identify the nurses' understanding of Pressure Injury (PI) prevention and care in medical and surgical clinics from a university hospital in Brasília city, Federal District, Brazil. Methods: It is a descriptive and cross-sectional study with a quantitative approach. Data were collected with an instrument containing information about the nurses' understanding of and training in PI. Results: The research sample was composed of 38 nurses, from which 78.9% scored between 70 and 89% of the instrument's items, and only two nurses (52%) scored 90% or higher. The lowest accuracy items are related to the use of devices such as water gloves (23.6%), cushions (23.6%), and items about positioning and repositioning, and bony prominence massage. Conclusion: It is concluded that the nursing team lacks understanding of PI, which may directly compromise the care towards the patient at risk of PI.

Objetivo: Identificar el conocimiento de los enfermeros asistenciales en cuanto a la prevención y cuidados con lesiones por presión (LPP) en unidades de clínica médica y quirúrgica de un hospital universitario de Brasilia. Métodos: Se trata de un estudio descriptivo, transversal con análisis cuantitativo. Los datos fueron recolectados por medio de la aplicación de un instrumento con informaciones acerca de la formación y conocimiento del enfermero acerca de la LPP. Resultados: La muestra fue de 38 enfermeros, donde 78.9%, acertaron entre 70 a 89% del instrumento, y solamente 2 enfermeros (5.2%) obtuvieron nota igual o mayor al 90% de acierto. Los elementos de menor acierto están relacionados al uso de dispositivos, como guante de agua (23.6%), cojines (23.6%), y en relación al posicionamiento y reposicionamiento, además del masaje en prominencia ósea. Conclusión: Se concluye que hay un déficit del conocimiento del equipo de enfermería de este hospital, lo que puede comprometer directamente en la asistencia principalmente del paciente en riesgo para LPP.

Objetivo: Identificar el conocimiento de los enfermeros asistenciales en cuanto a la prevención y cuidados con lesiones por presión (LPP) en unidades de clínica médica y quirúrgica de un hospital universitario de Brasilia. Métodos: Trata-se de um estudo descritivo, transversal com análise quantitativa. Os dados foram coletados por meio da aplicação de um instrumento com informações acerca da formação e conhecimento do enfermeiro acerca da LPP. Resultados: A amostra foi de 38 enfermeiros, na qual 78.9%, acertaram entre 70 a 89% do instrumento, e somente dois enfermeiros (5.2%) obtiveram nota igual ou maior a 90% de acerto. Os itens de menor acerto estão relacionados ao uso de dispositivos, como luva d'água (23.6%), almofadas (23.6%), e em relação ao posicionamento e reposicionamento, além da massagem em proeminências ósseas. Conclusão: Conclui-se que há um déficit do conhecimento da equipe de enfermagem deste...

Objectives: To systematically assess the incidence and prevalence of pressure injuries in adult ICU patients and the most frequently occurring pressure injury sites.

Data Sources: MEDLINE, Embase, the Cochrane Library, and Cumulative Index to Nursing and Allied Health Literature.

Study Selection: Observational studies reporting incidence rates, cumulative incidence, and prevalence of pressure injuries.

Data Extraction: Two reviewers independently screened studies, extracted data, and assessed the risk of bias. Meta-analyses of pooled weighted estimates were calculated using random effect models with 95% CIs.

The 95% CI of cumulative incidence and prevalence were 100-259% and 169-238% in studies that used skin inspection to identify a pressure injury, studies at low risk of bias, and studies that excluded stage 1 and each stage of pressure injury. Data Synthesis: Twenty-two studies, 10 reporting cumulative incidence of pressure injury irrespective of stage, one reporting incidence rate (198/1,000 hospital-days), and 12 reporting prevalence were included. The 95% CI of cumulative incidence and prevalence were 100-259% and 169-238% in studies that used skin inspection to identify pressure injuries, the 95% CI of cumulative incidence was 94-275%; all prevalence studies used skin inspection therefore the results were unchanged. In studies assessed as low risk of bias, the 95% CI of cumulative incidence and prevalence were 66-368% and 122-245%. Excluding stage 1, the 95% CI of cumulative incidence and prevalence were 0-238% and 124-155%. Five studies totalling 406 patients reported usable data on location; 95% CI of frequencies of PUs were as follows: sacrum 269-480%, buttocks 41-464%, heel 185-389%, hips 109-157%, ears 43-197%, and shoulders 0-402%. Conclusions: Although well-designed studies are needed to ensure the scope of the problem of pressure injuries is better understood, it is clear prevention strategies are also required.

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Background: Reducing hospital-acquired pressure ulcers (PUs) in intensive care units (ICUs) has emerged as an important quality metric for health systems internationally. Limited work has been done to characterize the profile of PUs in the ICU using observational data from the electronic health record (EHR). Consequently, there are limited EHR-based prognostic tools for determining a patient's risk of PU development, with most institutions relying on nurse-calculated risk scores such as the Braden score to identify high-risk patients.

Methods and Results: Using EHR data from 50,851 admissions in a tertiary ICU (MIMIC-III), we show that the prevalence of PUs at stage 2 or above is 78 percent. For the 1,690 admissions where a PU was recorded on day 2 or beyond, we evaluated the prognostic value of the Braden score measured within the first 24 hours. A high-risk Braden score (<12) had precision 009 and recall 050 for the future development of a PU. We trained a range of machine learning algorithms using demographic parameters, diagnosis codes, laboratory values and vitals available from the EHR within the first 24 hours. A weighted linear regression model showed precision 009 and recall 071 for future PU development. Classifier performance was not improved by integrating Braden score elements into the model. Conclusion: We demonstrate that an EHR-based model can outperform the Braden score as a screening tool for PUs. This may be a useful tool for automatic risk stratification early in an admission, helping to guide quality protocols in the ICU, including the allocation and timing of prophylactic interventions.

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Evaluation of photobiomodulation therapy (PBMT) in the treatment of pressure ulcers in adults and the elderly.

Method: Systematic review, based on the recommendations of the Handbook, proposed by Cochrane. The search was carried out in databases, records of randomized clinical trials, list of references cited in the selected articles, as well as a manual search in meetings and specialized journals.

Results: 1342 studies were identified, 18 were pre-selected and 5 were included in this review. Clinical heterogeneity of the participants was observed, in addition to variation in the laser parameters and predominance of studies of
low methodological quality PBMT with the use of laser (658nm; 4J/cm2; 50mW) showed complete wound healing (p<0.001) when compared to lasers (990nm and 808nm). However, there was no statistically significant difference in relation to time to complete wound healing and in area reduction compared to standard care. Conclusion: PBMT in the infrared wavelength showed efficacy in the healing of the pressure ulcer, similar to the standard care presented in the different studies PBMT (658nm) was effective in promoting healing when compared to standard care. Laser can be a therapy of choice in the treatment of pressure ulcers, since no evidence has been found to refute its clinical application; © 2019 American Society for Photobiology

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Objective: To replicate previous research that found four independent and significant predictors of heel pressure injuries (HPIs) in hospitalized patients using a larger and more diverse patient population; Methods: Researchers conducted a retrospective, case-control study with a main and a validation analysis (N = 1,937). The main analysis had 1,697 patients: 323 patients who had HPIs and 1,374 who did not. The validation analysis had 240 patients: 80 patients who developed HPIs and 160 who did not. Researchers used a series of diagnosis codes to define variables associated with an HPI. Data were extracted from the New York Statewide Planning and Research Cooperative System for January 2014 to June 2015. Study authors conducted a series of forward stepwise logistic regression analyses for both samples to select the variables that were significantly and independently associated with the development of an HPI in a multivariable setting. Researchers generated a receiver operating characteristic curve using the final model to assess the regression model’s ability to predict HPI development. Results: Seven variables were significant and independent predictors associated with HPIs: diabetes mellitus, vascular disease, perfusion issues, impaired nutrition, age, mechanical ventilation, and surgery. The receiver operating characteristic curve demonstrated predictive accuracy of the model. Conclusions: Beyond a risk assessment scale, providers should consider other factors, such as comorbidities, which can predispose patients to HPI development.

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This non-inferiority, multicentre, randomised, controlled, and double-blinded clinical trial compared the therapeutic effectiveness of the topical application of an olive oil solution with that of a hyperoxygenated fatty acid compound for the prevention of pressure ulcers in at-risk nursing home residents. The study population comprised 571 residents of 23 nursing homes with pressure ulcer risk, randomly assigned to a hyperoxygenated fatty acid group (n = 288) or olive oil solution group (n = 283). Both solutions were applied at-risk skin areas every 12 hours for 30 days or until pressure ulcer onset. The main outcome variable was the absolute risk difference was estimated (with 95% CI) using Kaplan-Meier survival and Cox regression curves. The groups did not significantly differ in any study variable at baseline. The pressure ulcer incidence was 418% in the olive oil group vs 657% in the control group, with an incidence difference of -239% (95% CI -640 to 156%), which is within the pre-established non-inferiority margin of ±7%, thus supporting the study hypothesis. We present the first evidence of the effectiveness and safety of the topical application of olive oil to prevent pressure ulcers in the institutionalised elderly; © 2019 Medicalhelplines.com Inc and John Wiley & Sons Ltd

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Background: This study aims to systematically assess the effectiveness of high frequency ultrasound (HFUS) on pressure ulcer (PU); Methods: In this study, PubMed, EMBASE, Cochrane Library, Web of Science, Chinese Biomedical Literature Database, and China National Knowledge Infrastructure will be searched
from inception to the present without any language limitations. The primary outcomes include change in ulcer area, and time complete healing. The secondary outcomes consist of proportion of ulcers healed within trial period, quality of life, pain intensity, and adverse events. Cochrane risk of bias tool will be used to assess methodological quality. RevMan 5 software (London, UK) will be used to analyze the data.

Results: This study will analyze change in ulcer area, time complete healing, proportion of ulcers healed within study period, quality of life, pain intensity, and adverse events on HFUS in patients with PU.

Conclusion: This study will provide most recent evidence for the effectiveness and safety of HFUS for patients with PU; Prospero Registration Number: PROSPERO CRD42019138177;


Objective: To identify the incidence of category II or higher hospital-acquired pressure ulcers (HAPU) and significantly associated factors in older patients with hip fractures. PUs are a frequent complication in hip fracture patients, negatively impacting patients' quality of life, the health-care system and society. Method: A prospective cohort study was conducted. A consecutive sample of patients with pterochanteric, femoral neck or subtrochanteric fractures requiring surgical treatment, were included. A stepwise, multiple regression was performed to identify factors associated with PU development. Results: A total of 761 patients aged ≥65 years were sampled. The incidence of category II or higher PUs was 12%. The study identified five factors that were significantly, independently associated with category II or higher PU development, including a higher preoperative Braden score (Hazard Ratio [HR]: 0.884; 95% confidence interval [CI]: 0.806-0.969), surgical procedure with osteosynthesis (HR 1.876; 95%CI: 1.183-2.975), a higher percentage of days with the presence of foam valve before surgery (HR: 1.010; 95%CI: 1.010-1.023) and a urinary catheter (HR: 1.013; 95%CI: 1.006-1.019) and diaper (HR: 1.007; 95% CI 1.001-1.013) in the postoperative period; Conclusion: Attention should be given by clinical staff to avoiding the use of foam valves, to limiting the use of diapers and to early removal of urinary catheters;


Pressure ulcers (PrUs) affect approximately 25 million patients and account for 60,000 deaths annually. They are associated with an additional annual cost of $43,000 per related hospital stay and a total cost to the US health care system as high as $25 billion. Despite the implementation of national and international PrU prevention guidelines and toolkits, rates of facility-acquired PrUs and PrUs in people with spinal cord injury are still high. A new paradigm is needed that distinguishes between prevention and treatment research methods and includes not only the causative factors of pressure and tissue deformation but also patient-specific anatomical differences and the concomitant biological cellular processes, including reperfusion injury, toxic metabolites, ischemia, cell distortion, impaired lymphatic drainage, and impaired interstitial fluid flow that compound existing tissue damage. The purpose of this article is to summarize the highlights from the first annual Pressure Ulcer Summit held February 9–10, 2018 in Atlanta, Georgia (sponsored by the Association for the Advancement of Wound Care in partnership with multiple professional organizations). This international, interdisciplinary summit brought together key stakeholders in wound care and PrU prevention and management to highlight advances in pathophysiology of pressure-induced tissue damage; explore challenges in current terminologies, documentation, and data collection; describe innovations in clinical care; and identify research opportunities to advance the science of PrU prevention and management.

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Herr, M (2019) "Pressure-induced deep tissue injuries noted in updated FY2020 coding guidelines" Homecare Direction 27(9): 3-4
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We investigated the water contents in commercial semi-solid preparations used for pressure ulcer (PU) treatment using near-IR spectroscopy (NIRS) and compared the results with those measured using the Karl Fischer (KF) method. The aim of this study was to determine a standard method and select the appropriate topical preparation with the optimal moisture for PU treatment. The water absorption properties of bases and formulations were evaluated with a time-dependent factor using Transwell as the model membrane. KF and NIRS were applicable as measurement methods of the water content in semi-solid formulations. NIRS was shown to be a useful, simple, nondestructive tool that is more advantageous than the KF method. The water absorption characteristics tested using Transwell revealed that the rate of and capacity for water absorption are determined not only by the absorption ability of the polymer base but also by other factors, such as the osmotic pressure exerted by additives and NIR measurements can be used to choose external skin preparations to control the amount of water in PU treatment;
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Objective: To determine if meaningful patient characteristics pertaining to pressure ulcers (PU) can be derived from routinely collected community health data; Methods: A retrospective cohort analysis of records was carried out. To provide a detailed dataset on PU for the community of interest, demographic, general medical and PU data were extracted from mandatory incident reports and audit of electronic and paper medical records. This study is reported in accordance with the RECORD Guidelines from the Equator Network. Adult patients were enrolled from a district nursing service in the target region (n=1085) during 2015. The target region was based on a geographical region bounded by a single postcode district (target region) consisting of 62,000 people of whom approximately 50,000 were adults, 3000 of whom were aged >75 years; Results: The total number of recorded PUs was n=137 in 103 individuals. Data from mandatory incident reports was obtained for nearly all variables. Electronic and paper medical records were less reliable due to missing data; Conclusion: Detailed characteristics of community-dwelling PU patients can be derived from routinely collected data, and provides various forms and levels of information which could feed into different projects. The use of mandatory reporting fields increases the level of reporting and reduces missing data. Data enriched with information from electronic and paper records could inform the addition of variables to mandatory forms to improve characterisation of community dwellers with PUs;
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Pressure injury development results in significant morbidity and costs. Despite well-defined guidelines, nurses are frequently faced with subtle and overt patient resistance when implementing prevention strategies. Case
law and hospital policies guide decision making when confronted with refusal of medical care; however, there are limited recommendations that guide competent patient refusal of nursing care This article presents findings of an integrative literature review and idea-generating forum about competent patient refusal of nursing care Emerging topics from the literature review were mirrored in responses generated during the innovation forum; responses from the forum confirmed the clinical relevance of the issue and the lack of resources to guide care in this area for approach

Healthcare communities are rapidly embracing Health Level 7's Fast Healthcare Interoperability Resources standard as the next-generation messaging protocol to facilitate data interoperability Implementation-friendly formats for data representation and compliance to widely adopted industry standards are among the strengths of Fast Healthcare Interoperability Resources that are accelerating its wide adoption Research confirms the advantages of Fast Healthcare Interoperability Resources in increasing data interoperability in mortality reporting, genetic test sharing, and patient-generated data However, few studies have investigated the application of Fast Healthcare Interoperability Resources in increasing data interoperability in mortality reporting, genetic test sharing, and patient-generated data Overall, Fast Healthcare Interoperability Resources effectively represented the majority of the data included in the use case scenario A few challenges that could potentially cause information loss were noted such as the lack of standardized concept codes for value encoding and the difficulty directly connecting an observation to a related condition Continuous evaluations in diverse nursing domains are needed in order to gain a more thorough insight on potential challenges that Fast Healthcare Interoperability Resources holds in representing nursing data;

Hospital-acquired pressure injuries are a patient safety concern and can be costly for health care organizations A multidisciplinary team of senior leaders, managers, nurses, and educators from departments that care for perioperative patients created an evidence-based perioperative pressure injury prevention bundle that includes skin and risk assessments, visual and electronic health record cues, prophylactic protection of at-risk skin, communication among providers and leaders regarding patient risk and injury throughout hospitalization, staff member education, compliance audits, root cause analyses, and wound care team follow-up The prevention bundle resulted in a 50% reduction in perioperative pressure injuries the first year period This article discusses hospital-acquired pressure injuries related to the perioperative setting and outlines the full perioperative pressure injury prevention bundle; © AORN, Inc, 2019

The article presents case study of a 78-year-old man who was diagnosed with Pressure Ulcer as Cellulitis Mimic It mentions that blood examination returned sterile and the patient's condition did not improve despite antibiotics, prompting dermatology consultation and skin biopsy It states that deeper layers of soft tissue are susceptible to pressure-induced injury than superficial layers

Lee, K-H, Y-E Kwon, et al (2019) "Active Body Pressure Relief System with Time-of-Flight Optical Pressure Sensors for Pressure Ulcer Prevention" Sensors (Basel, Switzerland) 19(18) A body pressure relief system was newly developed with optical pressure sensors for pressure ulcer prevention Unlike a conventional alternating pressure air mattress (APAM), this system automatically regulates air flow into a body supporting mattress with
adaptive inflation (or deflation) duration in response to the pressure level in order to reduce skin stress due to prolonged high pressures. The system continuously quantifies the body pressure distribution using time-of-flight (ToF) optical sensors. The proposed pressure sensor, a ToF optical sensor in the air-filled cell, measures changes in surface height of mattress when pressed under body weight, thereby indirectly indicating the interface pressure. Non-contact measurement of optical sensor usually improves the durability and repeatability of the system. The pressure sensor was successfully identified the 4 different-predefined postures, and quantitatively measured the body pressure distribution of them. Duty cycle of switches in solenoid valves was adjusted to 0-50% for pressure relief, which shows that the interface pressure was lower than 32 mmHg for pressure ulcer prevention;

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Yunnan Baiyao (YB) as a kind of famous Chinese herbal medicine, possessed hemostatic, invigorating the circulation of blood, and anti-inflammatory effects. Identifying strategies to protect patients at risk for hospital-acquired pressure ulcers (HAPU) is essential. Herein, our results showed that YB treatment can effectively reduce the acute wound area and improve efficacy in a comparative study of 60 cases HAPU patients with S. aureus positive of acute wound pathogens. Furthermore, YB inhibited Hla expression and suppressed accessory gene regulator (agr) system controlled by regulatory RNA II and RNA III molecule using pALC1740, pALC1742 and pALC1743. S. aureus strain linked to gfpuvr reporter gene. Moreover, YB downregulated cao mRNA expression and inhibited coagulase activity by RT-PCR, slide and tube coagulase test. Additionally, YB downregulated seb, sec, sed, and tsst-1 mRNA expression to suppress enterotoxin and tsst-1 secretion and adhesion function related genes sarA, icaA, and cidA mRNA expression. Taken together, the data suggest that YB may reduce HAPU via suppressing virulence gene expression and biofilm formation of S. aureus;

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PURPOSE: The purpose of this study was to measure the incidence and identify risk factors of pressure injury development during the perioperative period in patients undergoing spinal surgery requiring intraoperative positioning in the prone position. DESIGN: Review of medical records. SUBJECTS AND SETTING: The sample comprised 3834 patients; 522% (n=2006) were male and 655% (n=2516) were older than 60 years. Most patients underwent surgery of the lumbosacral spinal segments (43.4%, n=1667) followed by cervical (32.6%, n=1241) and thoracic spinal segments (24.2%, n=932). The study setting was the First Affiliated Hospital of Nanchang University, Jiang Xi Province in southeastern China. METHODS: We reviewed charts of patients who underwent spinal surgery requiring intraoperative positioning in the prone position from November 2013 to July 2016. Demographic data, Braden Scale for Pressure Sore Risk cumulative score (measured before preoperative transport), body mass index (BMI), duration of surgery, preoperative time (time between preoperative transport from the inpatient unit to when the operation began), postoperative time (time between when the operation was over and postoperative transport to the inpatient unit), and development of any pressure injury were collected using a standardized form. Factors associated with an increased or decreased likelihood of pressure injury were initially evaluated with χ2 and independent t tests. Logistic regression was then used to identify potential risk factors for perioperative pressure injury in patients undergoing open spinal surgery requiring placement in the supine position during surgery. RESULTS: One hundred eighty-four of 3840 patients (47%) developed pressure injuries. Multivariate analysis indicated that factors associated with intraoperative pressure injury development were older than 60 years (odds ratio [OR] 105, 95% confidence interval [CI] 102-217), BMI under 18 kg/m² (OR 245, 95% CI 405-521), cumulative Braden Scale score 13 or less (OR 659, CI 223-398), prolonged preoperative time (OR 599, 95% CI 321-612), and prolonged postoperative time (OR 1423, 95% CI 1023-2119). CONCLUSIONS: Based on these findings, we recommend extending preventive interventions for pressure injury to incorporate the time from preoperative transport to the surgical suite to inpatient care unit following surgery.

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Background: Validated perioperative pressure injury (PI) risk assessment measures are few and often cumbersome to complete, leading to missed opportunities to identify and target prevention interventions to those patients at increased risk for developing a postsurgical PI. Objective: Previous validation of a six-item perioperative risk assessment measure for skin (PRAMS) was conducted in our community hospital with positive findings. The purpose of this study was to increase generalizability by revalidating the PRAMS in a larger sample. Methods: This was a retrospective chart review of all surgical patients aged ≥18 years positioned in the supine or lateral position in a Midwest quaternary care, multispecialty, 1,500-bed hospital during a 6-month period (n = 1,526). The intent of the study was to revalidate the PRAMS. The main outcome of interest was the development of PI after surgery. Risk indicators of interest included diabetes, age, surgical time, Braden score, previous surgery, and preexisting PI. The diagnostic ability of any of the risk indicators on the development of a postsurgical PI was evaluated using sensitivity, specificity, and predictive values. Results: Postsurgical PI occurred in 121 patients. Comparing current to previous study results, the PRAMS was effective in identifying surgical patients at risk for PI (sensitivity 98%). Those patients with a postsurgical PI had a lower mean Braden score, were more likely to have a preexisting PI, and were more likely to have a previous surgery during the same admission (p < 0.01 for all risk indicators), comparing favorably to the original study. Patients without risk indicators were unlikely to develop a postsurgical PI (negative predictive value 98%). Discussion: Results of this validation study demonstrate that the PRAMS is effective in identifying patients who developed a postsurgical PI using information readily available to the perioperative staff.

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A biofilm plays a crucial role in delaying wound healing. Sharp debridement, a possible effective method for eliminating biofilms, can only be applied to the wound with visible necrotic tissue; thus, no option has been available for eliminating biofilms that are not accompanied by necrotic tissue. Wound blotting was recently developed to visualize biofilm noninvasively and quickly, and ultrasonic debridement is available for biofilm removal. Therefore, the purpose of this study was to investigate the efficacy of "biofilm-based wound care system (BWCS)," a combination of wound blotting as a point-of-care testing and ultrasonic debridement, for promoting wound healing. Firstly, the cross-sectional study was conducted to examine the proportion of biofilm removal by ultrasonic debridement in pressure ulcers [Study 1]. Subsequently, the retrospective cohort study was conducted to examine the effectiveness of BWCS for healing of chronic wounds [Study 2]. The proportions of wound healing between wounds treated with BWCS and those with standard care in the home-visiting clinic were compared by Kaplan–Meier curve, and the Cox proportional hazard modeling was used to assess the effect of BWCS on wound healing. In Study 1, the median of biofilm removal proportion was 389% (interquartile range, 129–680%) for pressure ulcers treated with standard care and 652% (411–788%) for those treated with ultrasonic debridement (p = 0.009). In Study 2, the proportion of wound healing within 90 days was significantly higher in wounds treated with BWCS than in those treated with standard care (p = 0.001). The adjusted hazard ratio of BWCS for wound healing was 4.5 (95% confidence interval, 13–150; p = 0.015). In conclusion, we demonstrated that our novel approach, BWCS, can be a promising therapeutic strategy for visualizing biofilms that are not accompanied by necrotic tissue and promoting healing in chronic wounds.

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Background: Pressure ulcers (PUs) are a burden to patients, carers and health-care providers. Specialist mattresses minimise the intensity and duration of pressure on vulnerable skin sites in at-risk patients. Primary Objective: Time to developing a new PU of category ≥2 in patients using an alternating pressure mattress (APM) compared with a high-specification foam mattress (HSFM). Design: A multicentre, Phase III, open, prospective, planned as an adaptive double-triangular group sequential, parallel-group, randomised controlled trial with an a priori sample size of 2954 participants. Randomisation used minimisation (incorporating a random element). Setting: The trial was set in 42 secondary and community hospitals.
inpatient facilities in the UK; Participants: Adult inpatients with evidence of acute illness and at a high risk of PU development; Interventions and Follow-up: APM or HSFM - the treatment phase lasted a maximum of 60 days; the final 30 days were post-treatment follow-up; Main Outcome Measures: Time to event; Results: From August 2013 to November 2016, 2029 participants were randomised to receive either APM (n 1016) or HSFM (n 1013) Primary end point - 30-day final follow-up: of the 2029 participants in the intention-to-treat population, 160 (79%) developed a new PU of category ≥ 2 There was insufficient evidence of a difference between groups for time to new PU of category ≥ 2 [Fine and Gray model HR 0.76, 95% confidence interval (CI) 0.56 to 1.04; exact p-value of 0.0089 and 2% absolute difference] Treatment phase sensitivity analysis: 132 (65%) participants developed a new PU of category ≥ 2 between randomisation and end of treatment phase There was a statistically significant difference in the treatment phase time-to-event sensitivity analysis (Fine and Gray model HR 0.66, 95% CI 0.46 to 0.93; p 0.0176 and 26% absolute difference) Secondary end points - 30-day final follow-up: new PUs of category ≥ 1 developed in 350 (172%) participants, with no evidence of a difference between mattress groups in time to PU development. (Fine and Gray model HR 0.83, 95% CI 0.67 to 1.02; p-value 0.0733 and absolute difference 31%) New PUs of category ≥ 3 developed in 32 (16%) participants with insufficient evidence of a difference between mattress groups in time to PU development (Fine and Gray model HR 0.81, 95% CI 0.40 to 1.62; p 0.5530 and absolute difference 04%) Of the 145 pre-existing PUs of category 2, 89 (61%) healed - there was insufficient evidence of a difference in time to healing (Fine and Gray model HR 1.12, 95% CI 0.74 to 1.68; p 0.6122 and absolute difference 29%) Health economics - the within-trial and long-term analysis showed APM to be cost-effective compared with HSFM; however, the difference in costs models are small and the quality-adjusted life-year gains are very small There were no safety concerns Blinded photography substudy - the reliability of central blinded review compared with clinical assessment for PUs of category ≥ 2 was 'very good' (kappa statistic 0.82, prevalence- and bias-adjusted kappa 0.82) Quality-of-life substudy - the Pressure Ulcer Quality of Life - Prevention (PU-QoL-P) instrument meets the established criteria for reliability, construct validity and responsiveness; Limitations: A lower than anticipated event rate; Conclusions: In acutely ill inpatients who are bedfast/chairfast and/or have a category 1 PU and/or localised skin pain, APMs confer a small treatment phase benefit that is diminished over time Overall, the APM patient compliance, very low PU incidence rate observed and small differences between mattresses indicate the need for improved indicators for targeting of APMs and individualised decision-making Decisions should take into account skin status, patient preferences (movement ability and rehabilitation needs) and the presence of factors that may be potentially modifiable through APM allocation, including being completely immobile, having nutritional deficits, lacking capacity and/or having altered skin/category 1 PU; Future Work: Explore the relationship between mental capacity, levels of independent movement, repositioning and PU development Explore 'what works for whom and in what circumstances'; Trial Registration: Current Controlled Trials ISRCTN01151335; Funding: This project was funded by the National Institute for Health Research Health Technology Assessment programme and will be published in full in Health Technology Assessment; Vol 23, No 52 See the NIHR Journals Library website for further project information;
Spinal epidural abscess is a neurologic emergency with a potential complication to the spinal cord such as paralysis. Frequently, it has a nonspecific initial presentation such as neck or back pain, and hence there is a delay in diagnosis. We present the case of a 60-year-old Caucasian male who presented to emergency room with one week of numbness and weakness of all four extremities. Neurological examination showed variable quadripareisis. Urgent MRI of spine with contrast revealed epidural abscess in the cervical region C4-C6 with resultant cord compression. The underlying etiology for hematogenous spread of infection being pressure ulcer associated with testicular prosthesis. Urgent neurosurgical intervention was done to achieve spinal cord decompression. Both blood and pus cultures were positive for Streptococcus intermedius, requiring prolonged administration of intravenous antibiotics. Clinical outcome was encouraging with progressive gain in motor and sensory function. Spinal epidural abscess is a rare diagnosis; hence, clinicians should have a high index of suspicion for timely diagnosis.

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**Objective:** To investigate potential linkages between pressure injury (PrI) recurrence following spinal cord injury (SCI) and muscle-based and circulatory biomarkers, specifically fatty metabolites and inflammatory cytokines.

**Design:** Observational study

**Setting:** Tertiary Care Center

**Participants:** 30 individuals with complete or incomplete SCI

**Interventions:** Not applicable

**Outcome Measures:** Gluteal muscle histology, immunohistochemistry, muscle-based and circulatory fatty metabolites and inflammatory cytokines.

**Results:** Gluteal intramuscular adipose tissue (IMAT) was greater than 15% in most Group II (83%) individuals. Muscle tissue histology confirmed intramuscular structural differences. Fatty acid binding protein 4 (FABP4) and fatty acid binding protein 3 (FABP3) were reliably detected in muscle and blood and significantly correlated with IMAT (P < 0.001), and varus/valgus foot deformities (p < 0.0001) and brace use (0.32 risk difference, p = 0.01), but not with standing foot position, deformity rigidity, body mass index, spina bifida type, lesion level, ambulatory level or comorbidities. Most common sites were the heel (21/96, 22%), lateral malleolus (12/96, 13%), and plantar 5th metatarsal head (11/96, 12%).

**Conclusion:** Foot pressure ulcers occur in nearly 1 in 10 ambulatory children with spina bifida, most often in pre-teens or young teen-agers with foot deformities, who use braces. This information can help direct skin care education and prevention to those most vulnerable. Implications for Rehabilitation: Foot pressure ulcers occur in children and adolescents with spina bifida, most commonly in those aged 11-15 years, with foot deformities and who use braces. Ulcer development was unrelated to stiffness of foot deformity, body mass index, lesion or functional level, or presence of comorbidities such as Arnold-Chiari malformation, syringomyelia or shunted hydrocephalus. Skin care education and preventative measures should be provided to all patients, but with particular emphasis for those with these risk factors.

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**Objective:** To determine prevalence, incidence and risk factors for foot pressure ulcers in ambulatory pediatric patients with spina bifida.

**Method:** Retrospective cohort study of 72 ambulatory children (age range 0-239 years) with spina bifida treated at a pediatric tertiary care facility. Data on foot pressure ulcers were recorded and analyzed to determine prevalence, incidence and predictive factors.

**Results:** Foot pressure ulcers occurred in 50/143 limbs (35%) over 105 ± 35 years. Average incidence was 0.10 foot pressure ulcer incidents per person-year, and prevalence in years with complete follow-up was 88%. Prevalence was related to age (higher for ages 11-15 (17%), than ages 0-10 (5%) and 16+ years (7%), p < 0.0001), and varus/valgus foot deformities (p < 0.0001) and brace use (0.32 risk difference, p = 0.01), but not with standing foot position, deformity rigidity, body mass index, spina bifida type, lesion level, ambulatory level or comorbidities. Most common sites were the heel (21/96, 22%), lateral malleolus (12/96, 13%), and plantar 5th metatarsal head (11/96, 12%).

**Conclusion:** Foot pressure ulcers occur in children in the spine area. Urgent MRI of spine with contrast reveals epidural abscess in the cervical region C4-C6 with resultant cord compression. Clinioutcome was encouraging with progressive gain in motor and sensory function. Spinal epidural abscess is a rare diagnosis; hence, clinicians should have a high index of suspicion for timely diagnosis.

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FABP3 was significantly higher in Group I muscle (P < 0.05). Circulatory FABP3 levels were lower for Group I Inflammatory biomarkers were more reliably detected in blood. Colony-Stimulating Factor-1 was slightly higher in Group II muscle. Circulatory interleukin-13 was significantly higher (P < 0.01) in Group I Vascular endothelial growth factor (VEGF-A) was significantly increased (P < 0.05) in Group I muscle and blood. Conclusion: Identifying individuals with SCI at highest risk for recurrent PrI may impact patient management. IMAT content evaluation illustrates that muscle quality is a key biomarker. Low circulatory inflammatory biomarker expression potentially limits clinical significance for between group differences. Circulatory levels of FABP4 hold great potential as a recurrent PrI risk biomarker.

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The aim of this study was to evaluate the effects of photobiomodulation (PBM) by dual-wavelength low-power lasers on the healing and bacterial bioburden of pressure ulcer (PU) models. Twenty-five male Swiss mice were divided into five equal groups. Ischemia reperfusion cycles were employed to cause PU formation by the external application of magnetic plates. Immediately after wounding, a suspension of Pantoea agglomerans was applied at the base of all the wounds of the infected groups, using a calibrated pipette. PBM (simultaneous emission at 660 and 808 nm, 1428 J/cm², in continuous wave emission mode) was applied to the PUs for 14 sessions. The animals were euthanized 14 days after PU induction, and their tissues were analyzed for wound contraction and reepithelialization, epidermis thickness, bacterial survival, and IL-1β and IL-10 mRNA level evaluations. The PU areas appeared larger in the mice from the infected groups than in those of the laser group 4 days after PU induction. The animals were euthanized 14 days after PU induction. However, the PBM accelerated the wound healing in the infected + laser group compared with the infected group 11 and 14 days following the PU induction. The infected and irradiated PUs exhibited a thinner neo-epidermis than those in the infected group, and the bacterial survival decreased in the laser group; the relative expression IL-1β mRNA levels demonstrated an increasing tendency while the relative expression IL-10 mRNA levels demonstrated a decreasing tendency in the infected + laser and laser groups. These results suggest that PBM improves healing by killing or inhibiting bacteria in PUs as well as by accelerating the wound healing, resulting in tissue repair.

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The exploration of an effective method for preventing and treating pressure ulcers (PUs) is a hot topic in medical research. Recently, disputes about the choice of heat and cold therapies have emerged for the prevention and treatment of clinical PUs. The present study was designed to compare the effect of cool and heat therapies on pyroptosis and apoptosis of early-stage PUs in rats. Sixty SD rats of SPF grade were randomly divided into the sham group, model group, heating group, and cooling group. We established a rat model of early-stage PUs by using an ischemia-reperfusion method. At the end of the experiment, the tissue underneath the compressed region was collected for hematoxylin and eosin staining, transmission electron microscopy, immunohistochemistry, immunofluorescence staining, a TdT-mediated dUTP nick-end labeling assay, a Western blot analysis, and a mitochondrial swelling experiment. Our results suggested that the mitochondrial apoptotic pathway and pyroptosis were involved in the formation of early-stage PUs, and local heating increased the PU injury in rats, while local cooling reduced the PU injury in rats. This study showed that heat therapy might not be suitable for the clinical treatment and care of early-stage PUs, while cold therapy may be more appropriate. © 2019 Wiley Periodicals, Inc

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Background and Purpose: Efforts to establish support for the reliability of quality indicator data are ongoing. Most patients typically receive recommended care, therefore, the high-prevalence of event rates make statistical
This article presents a novel statistical approach recently used to estimate inter-rater agreement for the National Database for Nursing Quality Indicator pressure injury risk and prevention data. Inter-rater agreement was estimated by prevalence-adjusted kappa values. Data modifications were also done to overcome the convergence issue due to sparse cross-tables. Results: Cohen's kappa values suggested low reliability despite high levels of agreement between raters. Conclusion: Prevalence-adjusted kappa values should be presented with Cohen's kappa values in order to evaluate inter-rater agreement when the majority of patients receive recommended care.

Objective: Patients hospitalised in the Burn Intensive Care Unit are at increased risk of pressure ulcers (PU; also known as pressure injuries) While effective methods exist to offload pressure from other areas, offloading the head is difficult, especially with facial or head burns. An increase in occipital PUs prompted a review of practices for offloading the head in the Burn Intensive Care Unit Method: A multidisciplinary team (MDT) of physicians, occupational therapists and nurses evaluated several devices used to prevent occipital PUs using a pressure mapping device. Pressure was measured using the SensorEdge Measure X device. The pressure mapping device provides a real-time graphic representation of pressure to the body area studied, in this case the occiput. In addition, the SensorEdge allows for numeric data to be exported to Excel format. Results: Our data showed that the occipital pressure was observed in our health volunteer using a fluidised gel positioner using pressure mapping. As a result of this we stopped using other pillows and went to exclusive use of the fluidised gel positioner. Reimplementation and consistent use of a fluidised gel positioner resulted in decreasing occipital PUs from nine to zero. Conclusion: The use of a fluidised gel positioner should be considered in other critical care environments to reduce the prevalence of hospital-acquired occipital PUs.

The article presents a debate on the pressure ulceration focuses on pressure ulcers (PUs) and mobility or more precisely and lack of patient mobility. Topics discusses include response of several experts on issue such as Joanna Swan (JS), Lead Tissue Viability Nurse at University Hospitals Birmingham National Health Service (NHS) foundation Trust, Birmingham, England and Mike Clark (MC), Commercial Director Welsh Wound Innovation Centre, Welsh Wound Innovation Centre, Pontyclun, Wales.

In the UK, over 700 000 patients are affected by pressure ulcers each year, and 180 000 of those are newly acquired each year. The occurrence of pressure ulcers costs the National Health Service (NHS) more than £38 million every day. In 2004, pressure ulcers were estimated to cost the NHS £14-£24 billion per year, which was 4% of the total NHS expenditure. The impact on patients can be considerable, due to increased pain, length of hospital stay and decreased quality of life. However, it is acknowledged that a significant number of these are avoidable. In early 2015, it was identified that for the North East and North Cumbria region the incidence of pressure ulcers was higher than the national average. Because of this, a 2-year Pressure Ulcer Collaborative was implemented, involving secondary care, community services, care homes and the ambulance service, with the aim of reducing the percentage of pressure ulcers developed by patients within their care. The Breakthrough Series Collaborative Model from the Institute for Healthcare Improvement provided the framework for this Collaborative. In year 1, pressure ulcers were reduced by 36%, and in year 2 by 33%, demonstrating an estimated cost saving during the lifespan of the Collaborative of £513 000, and a reduction in the number of bed days between 220 and 352;
Objective: Given evidence that malnutrition and immobility increase the risk of pressure injuries (PIs) in nursing home (NH) residents and that body mass index guidelines related to undernutrition may differ between Asian and non-Asian populations, the purpose of this study was to describe differences in overall nutrition, dietary intake, and nonnutrition risk factors for PIs between Asian and non-Asian NH residents; Design and Setting: Secondary data analysis of a 3-week PI prevention randomized controlled trial in seven Canadian NHs; Patients: Asian (n = 97) and non-Asian (n = 408) residents at moderate or high mobility-related risk of PI; Main Outcome Measure: Incident PI by racial subgroups; Main Results: Asian residents (PI = 6) consumed significantly smaller meals and marginally different patterns of daily dietary consumption of protein types, liquid supplements, and snacks; took more frequent tub baths; and had marginally lower body mass index than non-Asian residents (PI = 4); Conclusions: Findings are consistent with earlier research suggesting that nutrition consumption and care patterns may predispose Asian NH residents to develop more PIs than their non-Asian counterparts Future research should focus on the threshold for and types of nutrition support sufficient to improve nutrition status and reduce PI risk;

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Objective: This study focused on assessing the knowledge and attitudes of nurses towards pressure ulcer (PU) prevention in intensive care units Material and Methods: A cross sectional study was performed in eight intensive care units 81 out of 95 nurses completed the questionnaire The response rate of those who completed the questionnaire was 85.3% As the data collection form of the study, "nurse information tool", "tool for PU information" and "attitude toward PU tool (APuP)" were used The participating nurses were fully informed by the researcher about the purpose and method of the study and were asked to complete the tools Results: Approximately half of the nurses (481%) in intensive care units about knowledge of prevention of pressure ulcer is inadequate Moreover, only in less than a quarter (21%) of the nurses have an attitude scores of equal to or greater than 75% A significant negative correlation existed between knowledge levels and attitudes of nurses to prevent pressure ulcer (p<0.05) In other words, the positive attitudes of nurses decrease, as the level of knowledge to prevent pressure ulcer increases Conclusion: In conclusion, nurses' knowledge on prevention of pressure ulcer in intensive care units is inadequate This study also explored that only in less than a quarter of the nurses' attitudes towards pressure ulcer prevention is positive As the knowledge level of the nurses increases, the decrease in their positive attitudes is also thought provoking In this study, it is thought that the individual differences of nurses are more effective on positive attitude than knowledge Strategic plans (regular individual training, prevention policies and management, etc) are necessary to improve both knowledge and positive attitude towards prevention of pressure ulcer

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The article discusses the invasive and non-invasive techniques of assessing the skin and wounds Topics mentioned include wound area measurement from digital photographs, judgement about the health of the skin and underlying tissues based on colour, and the use of a form of ultrasound called high-frequency diagnostic ultrasound

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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
https://search.ahrq.gov/search?q=%22pressure+ulcer*%22+or+%22pressure+injur*%22


Cochrane Wounds Group
https://wounds.cochrane.org/news/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 & Wound Care (Tables of Contents only)
- Eplasty (formerly Journal of Burns & Wounds) (full text)
- EWMA Journal (full text)
- International Wound Journal (Tables of Contents only)
- Journal of the American College of Clinical Wound Specialists (full text)
- Journal of Tissue Viability (full text)
- Journal of Wound Care (full text)
- 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 Management and Prevention (Table of Contents only)
- 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
- 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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