

Why you should read this article:

- To enhance your understanding of the role of the emergency nurse in preventing pressure ulcers
- To familiarise yourself with strategies for preventing pressure ulcers in the emergency department (ED)
- To learn about embedding pressure ulcer prevention into the ED workflow

Preventing pressure ulcers in emergency departments: four simple and effective nurse-led changes

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Abstract

Patients can develop pressure ulcers within a few hours of entering an emergency department (ED). However, despite the critical role of EDs in reducing the incidence of pressure ulcers, few have protocols in place for prevention. This article describes the prevention emergency project (PEP), a quality improvement project undertaken in the ED at Karolinska University Hospital in Sweden to reduce the incidence of pressure ulcers. The article demonstrates how four simple nurse-led changes – early risk assessment, pressure-relieving equipment, intentional rounding, and using prophylactic dressings and incontinence pads – can reduce the incidence of pressure ulcers significantly when integrated into ED workflow.

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Keywords

accident and emergency, clinical, dressings, equipment, pressure area care, pressure ulcers, skin, skin assessment, wound care

Introduction

Pressure ulcers are a serious challenge for healthcare services. Variation in standards of care means that they are a significant cause of unnecessary patient suffering and mortality, avoidable hospital admissions and onerous costs for health services (Padula and Pronovost 2018). A growing body of evidence demonstrates the critical role of emergency departments (EDs) in preventing pressure ulcers (Denby and Rowlands 2010, Bjorklund et al 2011, Faulkner et al 2015), yet it appears that few EDs have prevention protocols in place (Gefen 2008, Gamston 2019).

Pressure ulcers are a result of damage to an area of skin and underlying tissue caused by pressure that impedes blood supply. They occur most commonly in people who are confined

through illness to a bed or chair, although all patients are at risk of developing a pressure ulcer, particularly those with impaired mobility or nutrition, neurological conditions, poor posture or deformity (National Institute for Health and Care Excellence 2014). Strategies for preventing pressure ulcers include documented risk assessment using validated scales such as Braden, Waterlow or Norton, skin assessment of people at high risk, frequent repositioning, pressure-redistributing devices, for example high-specification foam mattresses, and application of barrier creams (National Pressure Ulcer Advisory Panel et al 2014).

Despite widespread implementation of these strategies, pressure ulcers remain a significant challenge for healthcare services. For example, in 2013 a Swedish national pressure ulcer

prevalence survey found that despite extensive prevention efforts, 16.6% of hospital patients developed a pressure ulcer (Gunningberg et al 2013). More recently, a systematic review of studies of pressure ulcer prevalence in acute care settings published between January 2000 and December 2015 found a likely worldwide prevalence of between 6% and 18.5% (Tubaishat et al 2018).

Not only does such a high prevalence of pressure ulcers cause extensive suffering, it is also extremely costly. The US experiences more than 2.5 million pressure ulcers a year and over 60,000 associated deaths, costing the health system between \$9 and \$11 billion (Lyder and Ayello 2008). In England, NHS Improvement (2018) calculated that between April 2015 and March 2016, just under 25,000 patients developed a new pressure ulcer and their treatment cost more than £3.8 million a day.

This article describes a change in practice in the ED at Karolinska University Hospital (KUH) in Huddinge, Sweden, during its pressure emergency project (PEP), which aimed to reduce the incidence of pressure ulcers. The article discusses how the project team ensured that ED nurses were engaged in planning the change and that the improvements were sustained.

Role of emergency departments in pressure ulcer prevention

EDs play a crucial yet frequently overlooked role in the prevention of pressure ulcers. Fulbrook et al (2019) investigated the incidence of pressure ulcers in adults in the EDs of two Australian tertiary hospitals. The researchers conducted full skin inspection and pressure injury risk assessment using Braden and Waterlow scores within one hour of the patient being triaged ($n=212$) and found that 11 patients (5.2%) had pre-existing pressure ulcers and that these patients tended to be those who had a longer ambulance journey or spent longer on an ambulance stretcher. In a French study, Dugaret et al (2014) observed that of the 602 patients admitted to an ED over 15 days, 77 (12.7%) had pressure ulcers on admission and 115 (19.1%) had pressure ulcers on discharge, showing that 38 (6.3%) patients had developed new pressure ulcers during their time in the ED.

Despite the findings of these studies, and research demonstrating that malnourished patients can develop pressure ulcers within a few hours of entering an ED (Cereda et al 2017), evidence suggests that few EDs and even fewer ambulance services have pressure

ulcer prevention protocols and that this is a global issue (Gefen 2008, Gamston 2019). Too often, patients who wait in an ED for several hours may not receive a pressure ulcer prevention protocol until admission to an inpatient unit, by which time a pressure injury may have already occurred (Denby and Rowlands 2010). In many US hospitals, failure to assess and document pressure risk and ulcers effectively at the time of admission, combined with a strong desire to avoid payment penalties from medical insurance companies, has resulted in long-term care facilities and other community care settings being unfairly blamed for pressure ulcers that are highly likely to have developed in an ED (Squitieri et al 2018).

Prevention emergency project

KUH delivers care across two sites, Solna and Huddinge, in Stockholm County, Sweden. As in most hospitals, the ED at Huddinge, which is one of the largest in Europe, is the gateway through which almost all non-elective patients are admitted to the hospital, many of whom are at risk of pressure ulcers.

In 2014, the Swedish Association of Local Authorities and Regions launched a national patient safety initiative that aimed to raise awareness of pressure ulcer prevention practice among nurses (Ridelberg et al 2016). This initiative resulted in an increase in the number of documented prevention activities taking place at Huddinge, measured through local audit. However, in 2017, a hospital-wide audit revealed that pressure ulcer incidence was 10.1%, which was concerning. Despite many patients having to stay for up to 24 hours in the hospital's ED before admission due to a lack of inpatient beds, the ED did not have a strategy for identifying those at risk of pressure ulcers and consequently was not implementing preventive measures routinely. Because it was not uncommon for patients to remain in the Huddinge ED following a decision to admit them, senior emergency nurses believed there was a need for more progressive nursing practice in the ED. This led to the launch of the prevention emergency project (PEP).

Initiating the prevention emergency project

Informal discussions between nursing leaders about the need for action on pressure ulcers in the ED began in 2015 and the situation was monitored carefully during 2016 and 2017. By the spring of 2018, it was clear that the ED would benefit from direct intervention, therefore ED nursing leaders and the head

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of innovation at KUH collaborated with Mölnlycke Health Care AB of Sweden, a manufacturer of protective bed surfaces, to plan, launch and implement a new model of care capable of preventing pressure ulcers, improving patients' experiences and enhancing staff satisfaction.

The PEP started with a literature review of best practice related to pressure ulcer prevention in EDs, a consultation with an external expert on pressure injury prevention and wound healing, study visits to progressive US hospitals, and extensive interviews and workshops with ED nurses to understand the challenges and realities of workflow in the department.

The review demonstrated that the four main elements of best practice in pressure ulcer prevention in EDs were:

- » Adaptation and routine use of a pressure injury risk assessment tool for every patient.
- » Use of preventive bed surfaces, such as dynamic air mattresses or pressure-relieving equipment to redistribute pressure from sensitive tissue areas for at-risk patients.
- » Intentional rounding of at-risk patients at regular intervals.
- » Easy access to prophylactic dressings such as heel and sacral covers, and incontinence pads.

Pressure injury risk assessment

The Norton pressure ulcer risk assessment scale was being used at KUH (Norton et al 1962); however, most ED nurses found it too long and time-consuming to use properly and consistently. Therefore, the scale was abridged to include minimal criteria for assessment of risk of pressure ulcer development (Box 1). Posters showing these criteria were displayed prominently at the entrance to the ED alongside a digital screen showing a 45-second instructional video designed to educate and remind paramedics that when handing over patients to the triage nurses,

Box 1. Prevention emergency project pressure ulcer risk assessment criteria

- » Patients with suspected hip fracture
- » Patients aged over 75 years for whom the answer to any of the following questions is yes:
 - Has the patient reduced their intake of nutrients and/or fluids, and do they have reduced mobility?
 - If the patient has reduced mobility, is it difficult for them to change position without help?
 - Does the patient have reduced general health (for example, fever, malaise)?

(Adapted from Norton et al 1962)

they must communicate clearly if patients met the inclusion criteria and should be identified as at-risk. The triage nurse would then record this information in the patient's electronic medical record (EMR), which would trigger fields and alarms prompting the nurse to undertake an initial skin assessment, ensure a turning and positioning system was in place, and ensure that prophylactic dressings were available.

Tortoise Turning and Positioning System

Before implementation of the PEP, it could take hours for patients to be transferred from a hard ED trolley to a more comfortable and protective bed surface. Introducing earlier risk assessment and involving paramedics meant that patients who met the inclusion criteria would be transferred immediately to an ED trolley on which a Tortoise Turning and Positioning System supplied by Mölnlycke Health Care AB of Sweden, was installed. The system redistributes pressure using positive air displacement, enabling the patient to be enveloped by the system, thereby protecting sensitive tissue areas and assisting in the prevention of pressure ulcers.

A work environment survey of 60 ED nurses undertaken by the authors both before and after the implementation of the PEP showed that the Tortoise Turning and Positioning System made it easier for ED nurses to reposition patients safely with less physical exertion and without having to wait for colleagues to assist them, which could take several hours if the ED was busy.

The short video on the digital screen at the entrance to the ED showed a comparison of an ordinary ED trolley with a trolley equipped with the Tortoise Turning and Positioning System and explained how to use it to position and secure patients. A different instructional video was distributed to the five ambulance services in Stockholm County to enable them to provide appropriate training to their paramedics.

Intentional rounding

Only 20% of admissions to the Huddinge ED were trauma patients and many of the remainder were older people. However, early in the project, informal discussions with nursing leaders and focus groups with ED nurses enabled the PEP team to appreciate that the pressures of working in a busy ED sometimes resulted in nurses becoming, as they described it, 'adrenaline junkies' who delivered care 'in the moment' and considered themselves too 'cool' to undertake some

of the more task-oriented processes that person-centred care requires. To address this, intentional rounding – also called care or comfort rounds – was introduced to improve the quality of nursing care. Intentional rounding is a structured process in which nurses undertake regular checks of individual patients at set intervals, typically hourly. It is associated with reduced pressure ulcer development, reduced falls, and increased patient and staff satisfaction (Fitzsimons et al 2011, Ryan et al 2019).

The EMR for patients who met the PEP inclusion criteria was flagged, so that an alarm board prompted nurses every two hours to conduct a comfort round focusing on providing basic nursing care. The rounds ensured that patients' positioning, personal hygiene and skin integrity were checked carefully and that nurses attended to patients' need for food, drink, pain management, toileting, and general comfort and reassurance. Patients were given a short information brochure on admission to reinforce the message that nurses were there to take care of them and that they should not hesitate to ask for assistance if they were in pain or discomfort.

Prophylactic dressings and incontinence pads

Evidence shows that the prophylactic use of soft-silicone dressings is effective in preventing sacral and heel pressure ulcers (Santamaria et al 2015). However, during workshops with ED nurses early in the PEP, concerns were raised about the availability of heel and sacral covers, and of incontinence pads, which were sometimes necessary to protect patients' skin from urine, faeces and other fluids. These concerns were addressed by

creating 'PEP toolboxes' which contain multi-layer heel and sacrum dressings.

Incontinence pads were also added to the toolbox. Although there is growing evidence that dry incontinence pads provide some protection to the load-bearing areas of patients' skin, moist pads significantly increase trans-epidermal water loss and inflammatory biomarkers (Bostan et al 2019), as well as substantially reducing the effectiveness of pressure-redistributing mattresses (Fader et al 2004). Therefore, when used inappropriately incontinence pads can accelerate the development of pressure ulcers and must only be used as part of a strategy that includes regular checking and replacement of pads during intentional rounding.

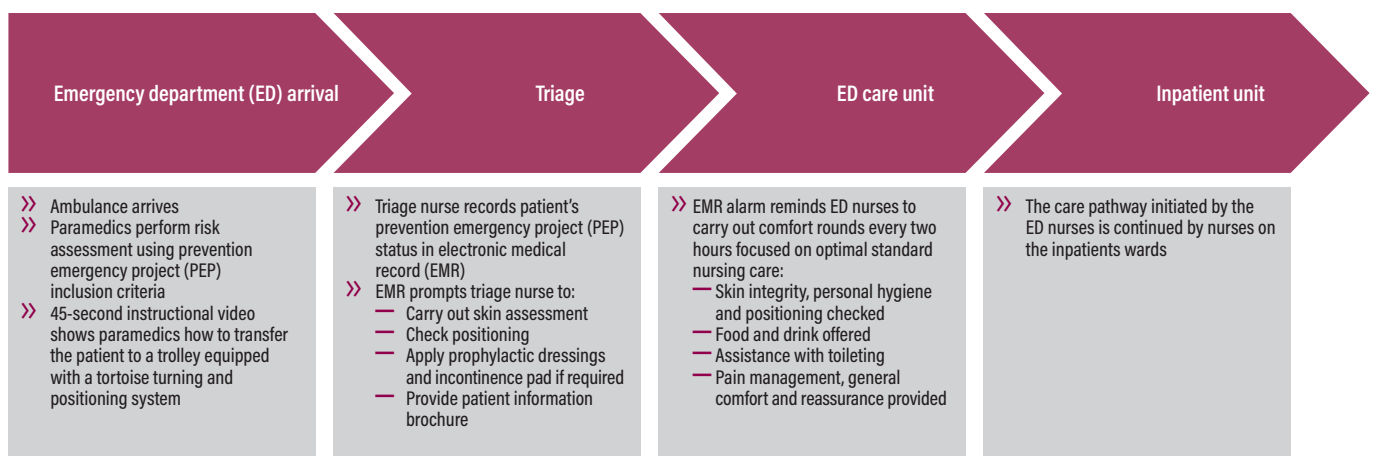
Engaging staff and sustaining improvement

Many innovations that are tested during healthcare improvement projects fail to gain the user acceptance necessary to become embedded and sustained in clinical practice, even if they deliver measurably improved patient outcomes (Robert et al 2020). The PEP team, therefore, was mindful of the need to engage with ED nurses in such a way that two important outcomes were achieved. First, the team wanted to develop a deeper understanding of the daily challenges and frustrations faced by ED nurses as well as their current practice and behaviours. To achieve this, an extensive programme of interviews and workshops was conducted before the changes in practice were designed. These revealed that for PEP to become permanent, the best practice on which it was based would have to be integrated into nurses' workflow as smoothly and seamlessly as possible (Figure 1).

Key points

- A small but significant minority of patients develop preventable pressure ulcers during their stay in emergency departments (EDs), therefore pressure injury risk assessment must take place as soon as patients arrive
- Patients at risk of developing pressure ulcers must be placed on a protective bed surface immediately on arrival at an ED
- Intentional rounding that focuses on patient positioning, comfort, nutrition and hydration should occur at least every two hours, while prophylactic dressings and incontinence pads should be available as close as possible to the point of care
- Nurses must be engaged in the design of changes in practice in EDs to ensure they are embedded smoothly into the existing workflow

Figure 1. Integrating best practice for pressure ulcer prevention into the emergency department workflow



One of the actions taken to accomplish this was to work with the supplier of Huddinge's EMR to integrate a PEP checklist into the software to trigger alarms and reminders for staff to carry out activities such as intentional rounding.

Second, the team wanted the project to resolve some of the ED nurses' recurring issues, for example back pain and injuries commonly associated with repositioning patients without the assistance of colleagues during busy shifts. Introducing ergonomic systems for repositioning patients improved nurses' occupational health, which enabled the PEP team to address staff satisfaction and in turn minimise resistance to change and make it easier for nurses to re-engage with their role as compassionate, person-centred caregivers.

Other techniques used by the PEP team to embed and sustain practice improvements are shown in Box 2.

Effect of prevention emergency project on nursing practice

Huddinge's data analytics team undertakes annual audits of pressure ulcer care by reviewing a random sample of 600 inpatient medical records from across the hospital and checking for documented evidence of prevention activities. As Figure 2 shows, baseline data for audits performed before introduction of the PEP found that pressure ulcer prevention activities were undertaken in only 30% of patients in 2013 and 2014.

A national awareness campaign in 2014 increased pressure ulcer prevention activities to around 46% of patients by 2015, which was sustained for another two years. The PEP delivered further measurable improvements in documented pressure ulcer prevention activities. In 2018, audit data showed there was documented evidence of pressure ulcer prevention activities performed for 61% of patients and by 2019 this had increased to 66% of patients across the hospital.

Responses from 60 ED nurses to a work environment survey conducted before and after implementation of the PEP found that pre-implementation only 12% ($n=7$) agreed they were 'always' or 'often' able to provide appropriate pressure ulcer prevention care, while after implementation 58% ($n=35$) believed they 'always' or 'often' provided appropriate preventive care.

Conclusion

EDs are at the frontline of care delivery for patients who require unscheduled hospital care. Despite the daily pressures they face, staff in EDs must also be at the frontline of pressure injury prevention. The PEP at KUH demonstrated that emergency nurses can improve pressure ulcer care through practices such as providing early patient risk assessments, protective bed surfaces and pressure-relieving equipment, intentional rounding, prophylactic dressings, and incontinence pads.

Involving ED nurses in the design of changes in practice, and ensuring that any changes were responsive to the nurse's needs as well as to those of their patients, substantially improved the culture and working environment of the ED. It also ensured that pressure injury risk was documented more accurately and consistently, and that care was person-centred and responsive. A firm foundation has been laid on which future changes that improve the quality of nursing care in the Huddinge ED can be tested and, if successful, embedded in the flow of care.

Box 2. Techniques to embed and sustain practice improvements

Role-models

» Six emergency department (ED) nurses were recruited as project ambassadors and supported the prevention emergency project (PEP) by acting as role models for improved nursing practice. They also coached colleagues in the new skills and behaviours required. Another 20 ambassadors were recruited from inpatient units that receive ED patients, creating opportunities for ED nurses to understand how the quality of care delivered in their department affected later patient outcomes and contributed to patients' experience overall

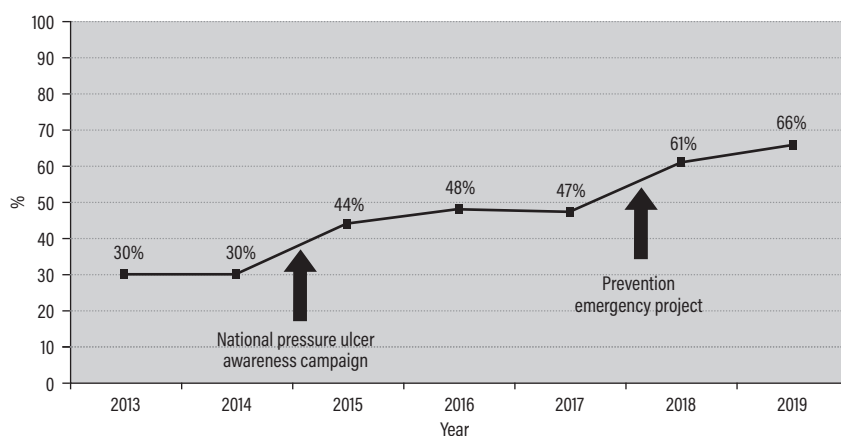
Training ED staff in the flow of work

» Training on pressure injury prevention and the changes required to implement PEP took place in Huddinge ED and across the ambulance services that feed into it. Pressure ulcer prevention became a standard part of induction training for new ED nurses and short training videos were played during start-up huddles at the beginning of each nursing shift to remind staff of best practice

Minimising documentation

» Wherever possible, the PEP avoided bombarding nurses with written information by using short videos presented by Huddinge ED nurses themselves, putting a friendly, familiar face on communications

Figure 2. Percentage of patients at Huddinge hospital with documented evidence of pressure ulcer prevention activities



References

- Bjorklund L, Basch A, Borregard B et al (2011) The pressure is on! An innovative approach to address pressure ulcers in the ED setting. *Journal of Emergency Nursing*. 38, 2, 159-164. doi: 10.1016/j.jen.2010.12.013
- Bostan LE, Worsley PR, Abbas S et al (2019) The influence of incontinence pads moisture at the loaded skin interface. *Journal of Tissue Viability*. 28, 3, 125-132. doi: 10.1016/j.jtv.2019.05.002
- Cereda E, Neyens JC, Caccialanza J et al (2017) Efficacy of a disease-specific nutritional support for pressure ulcer healing: a systematic review and meta-analysis. *The Journal of Nutrition, Health and Aging*. 21, 6, 655-661. doi:10.1007/s12603-016-0822-y
- Denby A, Rowlands A (2010) Stop them at the door: should a pressure ulcer prevention protocol be implemented in the emergency department? *Journal of Wound Ostomy and Continence Nursing*. 37, 1, 35-38. doi: 10.1097/WON.0b013e3181c68b4b
- Dugaret E, Videau MN, Faure I et al (2014) Prevalence and incidence rates of pressure ulcers in an emergency department. *International Wound Journal*. 11, 4, 386-391. doi: 10.1111/j.1742-481X.2012.01103.x
- Fader M, Bain D, Cottenden A (2004) Effects of absorbent incontinence pads on pressure management mattresses. *Journal of Advanced Nursing*. 48, 6, 569-574. doi: 10.1111/j.1365-2648.2004.03245.x
- Faulkner S, Dowse C, Pope H (2015) The emergency department's response to pressure ulcer crisis. *Wounds UK*. 11, 2, 20-25.
- Fitzsimons B, Bartley A, Cornwell J (2011) Intentional rounding: its role in supporting essential care. *Nursing Times*. 107, 27, 18-21.
- Fulbrook P, Miles S, Coyer F (2019) Prevalence of pressure injury in adults presenting to the emergency department by ambulance. *Australian Critical Care*. 32, 6, 509-514. doi: 10.1016/j.aucc.2018.10.002
- Gamston J (2019) Pressure induced skin and soft tissue injury in the emergency department. *Emergency Medicine Journal*. 36, 10, 631-634. doi: 10.1136/emered-2018-207807
- Gefen A (2008) How much time does it take to get a pressure ulcer? Integrated evidence from human, animal and in-vitro studies. *Ostomy Wound Management*. 54, 10, 26-28.
- Gunningberg L, Hommel A, Bååth C et al (2013) The first national pressure ulcer prevalence survey in county council and municipality settings in Sweden. *Journal of Evaluation in Clinical Practice*. 19, 5, 862-867. doi: 10.1111/j.1365-2753.2012.01865.x
- Lyder CH, Ayello EA (2008) Pressure ulcers: a patient safety issue. In Hughes RG (Ed) *Patient Safety and Quality: An Evidence-based Handbook for Nurses*. Agency for Healthcare Research and Quality, Rockville, MD, 267-299.
- National Institute for Health and Care Excellence (2014) *Pressure Ulcers: Prevention and Management*. Clinical guideline No. 179. NICE, London.
- National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel, Pan Pacific Pressure Injury Alliance (2014) *Prevention and Treatment of Pressure Ulcers: Quick Reference Guide*. epuap.org/wp-content/uploads/2016/10/quick-reference-guide-digital-npuap-epuap-pppia-jan2016.pdf (Last accessed: 6 October 2021.)
- NHS Improvement (2018) *Pressure Ulcers: Revised Definition and Measurement-Summary and Recommendations (CG 73/18)*. NHS Improvement, London.
- Norton D, McLaren R, Exton-Smith AN (1962) *An Investigation of Geriatric Nursing Problems in Hospital*. Churchill Livingstone, London.
- Padula WV, Pronovost PJ (2018) Addressing the multisectoral impact of pressure ulcers in the USA, UK and abroad. *BMJ Quality and Safety*. 27, 3, 171-173. doi: 10.1136/bmjqs-2017-007021
- Ridelberg M, Roback K, Nilsen M et al (2016) Patient safety work in Sweden: quantitative and qualitative analysis of annual patient safety reports. *BMC Health Services Research*. 16, 1, 1-9. doi:10.1186/s12913-016-1350-5
- Robert G, Sarre S, Maben J et al (2020) Exploring the sustainability of quality improvement interventions in healthcare organisations: a multiple methods study of the 10-year impact of the 'Productive Ward: Releasing Time to Care' programme in English acute hospitals. *BMJ Quality and Safety*. 29, 1, 31-40. doi:10.1136/bmjqs-2019-009457
- Ryan L, Jackson D, Woods C et al (2019) Intentional rounding – an integrative literature review. *Journal of Advanced Nursing*. 75, 6, 1151-1161. doi: 10.1111/jan.13897
- Santamaria N, Gerditz M, Liu W et al (2015) Clinical effectiveness of a silicone foam dressing for the prevention of heel pressure ulcers in critically ill patients: Border II Trial. *Journal of Wound Care*. 24, 8, 340-345. doi: 10.12968/jowc.2015.24.8.340
- Squitieri L, Ganz DA, Mangione CM et al (2018) Consistency of pressure injury documentation across interfacility transfers. *BMJ Quality and Safety*. 27, 3, 182-189. doi: 10.1136/bmjqs-2017-006726
- Tubaihat A, Papanikolaou P, Anthony D et al (2018) Pressure ulcers prevalence in the acute care setting: a systematic review, 2000-2015. *Clinical Nursing Research*. 27, 6, 643-659. doi: 10.1177/1054773817705541