

## Clinical experience series

Independent quality improvement publication

### Deal with heels: a pressure ulcer prevention initiative

#### About this publication

This publication presents an independently authored quality improvement article describing how Dorset Healthcare University NHS Foundation Trust addressed the occurrence of heel pressure ulcers within adult inpatient settings.

Following a root-cause analysis, the organisation implemented a multidisciplinary pressure injury prevention initiative focused on education, standardized clinical practice, regular skin inspection, pain management, timely heel offloading and improved access to appropriate heel-suspension devices.

The Maxxcare Heel Pro Evolution boot is mentioned in the article as one of several examples of heel-suspension devices available to support individual patient care. The publication is not a product-specific or comparative evaluation of the Maxxcare Heel Pro Evolution.

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#### Publication details

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Seven physical health wards and four older people's mental health wards within Dorset Healthcare University NHS Foundation Trust, United Kingdom

##### Project type

Independent quality improvement and clinical practice article

##### Reporting period

2016/17 - 2018/19

#### Disclaimer

The statements, experiences, outcomes and clinical observations presented in this publication originate from an independent healthcare professional and reflect the experience and conclusions of the original author and healthcare organisation.

This publication is shared by Maxxcare B.V. with permission from the copyright holder. The reported reduction in heel pressure ulcers followed a multifaceted quality improvement initiative involving education, standardization of practice, skin inspection, pain management, offloading guidance and the availability of different heel-suspension devices.

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# Deal with heels: a pressure ulcer prevention initiative

## Abstract

Pressure ulcers/injuries are well known for being a common problem in healthcare and are a key indicator of the quality and experience of patient care. This article discusses how one NHS trust reduced the incidence of heel pressure ulcers within adult inpatient settings. In 2016/17, the trust identified 14 avoidable category 3 and above pressure ulcers/injuries in inpatient settings, of which 10 had developed on the heels. Through root cause analysis, the organisation identified themes, which prompted action, and a quality improvement project 'Deal with heels' was planned and implemented. Changes were

introduced through a collaborative and structured approach; the key stakeholders included the tissue viability team, procurement, medical devices, patient safety, managers, matrons, ward sisters and tissue viability link advisors, who worked together to reduce heel ulcer prevalence through education and standardised practice. As a result of improved organisational awareness and some changes, the number of heel pressure ulcers/injuries reduced to two over a 3-year period, which also helped reduce the total number of avoidable pressure ulcers/injuries.

■ Pressure ulcer ■ Prevention ■ Patient safety ■ Heels ■ Offloading ■ SSKIN bundle

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Pressure ulcers are a common healthcare problem and are a key indicator of the quality and experience of patient care (NHS, 2016). It is estimated that up to 50% of the most serious pressure ulcers/injuries are preventable or avoidable (Downie et al, 2013). An avoidable pressure ulcer is defined as follows:

*'Avoidable' means that the person receiving care developed a pressure ulcer and the provider of care did not do one of the following: evaluate the person's clinical condition and pressure ulcer risk factors; plan and implement interventions that are consistent with the person's needs and goals, and recognised standards of practice; monitor and evaluate the impact of the interventions; or revise the interventions as appropriate. (Tissue Viability Society, 2012)*

However, preventing these injuries this does require the timely implementation of strategies. Where prevention strategies are not employed, there is a need to collect and understand data on why, in order to drive quality-improvement approaches (NHS Improvement, 2018). The root-cause analysis (RCA) process for pressure ulcers is used to look at how, when and why these wounds develop, in order to help organisations identify the trends and themes, which guide action. To implement change effectively, it is important to understand contextual issues in practice (Young, 2018). The RCA process is used for category 3 and above pressure ulcers/injuries that have developed on admission to the service.

The heel has been recognised as the second most common site for pressure ulcer/injury, and it is estimated to account for up to 25% of all pressure ulcers (Ousey et al, 2019). One American study found that the incidence of heel pressure ulcers/injuries was as high as 41%, compared to the 19% on the sacrum (VanGilder et al, 2017). The anatomy and shape of the heel contributes to making this area vulnerable. The calcaneus (heel bone) is the largest bone in the foot but with the smallest surface area, and the heavy weight of the foot over this small contact area results in higher-than-normal pressures. Further, the area is protected with very little adipose tissue and little to no muscle, and is covered with only a thin layer of skin, making the tissue highly susceptible to damage while sustaining high-intensity pressures even

### Box 1. Patient risk factors for heel pressure ulceration/injury

|                                                                                            |
|--------------------------------------------------------------------------------------------|
| ■ Previous or current healed pressure ulcer/injury, indicative of reduced tissue tolerance |
| ■ Diabetes and peripheral neuropathy                                                       |
| ■ Stroke or cerebrovascular condition restricting the patient's ability to move            |
| ■ Paralysis                                                                                |
| ■ Hip fracture                                                                             |
| ■ Dragging injuries resulting from knee replacements                                       |
| ■ Dementia and cognitive impairment                                                        |
| ■ Leg spasms, which increase shearing forces                                               |
| ■ Peripheral arterial disease, which reduces tolerance to mechanical forces                |
| ■ Parkinson's disease or tremors causing heel rubbing or agitated heels                    |
| ■ Leg oedema, which may compromise capillary flow and reduce tissue tolerance              |
| ■ Frequent sliding on beds or chairs                                                       |

Source: Ousey et al, 2018

when a pressure-redistributing surface is in place (National Pressure Ulcer Advisory Panel (NPUAP) et al, 2019). Heels are also susceptible to mechanical forces in addition to direct pressure, specifically shear stress and friction forces (National Institute for Health and Care Excellence (NICE), 2014). When patients have additional physical or/and health complications, for example, immobility and/or diabetes, the heels become a very high risk area for pressure ulcers/injuries to develop (Box 1).

### Deal with heels project

At a community-based NHS trust serving the physical and mental health needs of adults in community and inpatient settings, a high proportion of avoidable pressure ulcers/injury had developed on patients' heels (14 heel pressure ulcers among 10 patients). This project included seven physical health wards with a total number of 213 beds and four older people's mental health wards (serving those over 65 years old) with a total number of 62 beds.

After identifying key themes via a root-cause analysis, a collaborative action plan was initiated to help reduce heel pressure ulcer prevalence. The proportion of pressure ulcers/injuries that had developed on the heel was higher than that on any other anatomical location (79% vs. 21%). All 10 patients identified with heel pressure ulcers/injuries between 2016 and 2017 had been admitted to a community hospital for rehabilitation, whereby their mobility

had reduced. This was identified as the main risk factor. Establishing other key themes was imperative to identifying an approach to influence change in practice and improve patient safety. Other themes and root causes identified, which will be explored later in this article, included:

1. Poor pressure offloading: three patients had fractured pubic rami and one had a fractured hip with poor pain management, which made it difficult for them to offload pressure by elevating the leg on a pillow
2. Poor skin inspection: three patients had not had their bandages removed and one patient had not had their anti-embolism stockings removed for regular skin inspection as prescribed on the SSKIN bundle.

The wards involved in this project all provided rehabilitation care for older people. Four of the 10 patients with heel pressure ulcers had been admitted following surgery to fix a fracture of the pelvis or hip sustained after a fall. The heel ulceration/injury developed on the affected side. Poor pain management was identified as being a common theme among these patients, with pain impacting on their tolerance to withstand the limb being moved or the heel being offloaded. Patients' pain is now assessed and recorded at every medication round, and this process is supported by advanced nurse practitioners, should a change to analgesia be needed.

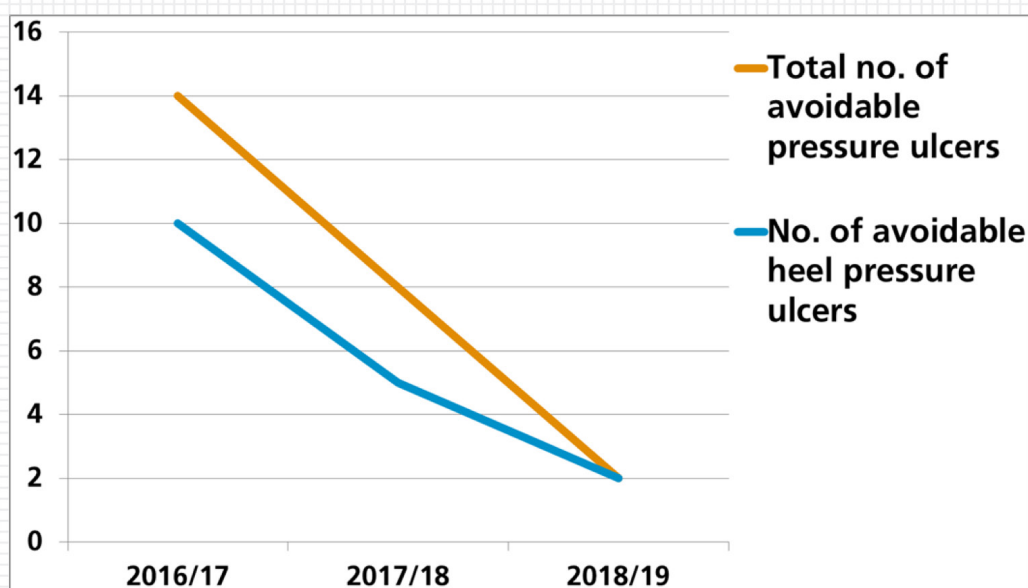
Each ward was commenced on a support program. A member of the tissue viability team spent time working alongside ward staff; this has been a valuable experience for both the tissue viability nurse and the clinical staff involved. Not only has it helped with cascading learning but it has also helped to understand the challenges and the educational needs pertinent to that individual ward. Engagement with front-line staff and understanding their issues can underlie successful implementation of organisational changes (Sustainable Practice Research Group, 2017).

Over the 3-year period of the project to date, the incidence of pressure ulcers in the seven wards has reduced by 80% (from 14 to 2) (Figure 1).

### Offloading pressure

Offloading pressure from the heels for those who are deemed as being at risk of pressure ulcers/injuries is key for prevention. Ideally, the heels should be free of all pressure from the underlying surface of the bed (NPUAP et al, 2019). This concept is referred to as 'free-floating' heels. There are also recommendations on using certain foam dressings for the prevention of heel pressure ulcers (NICE, 2019) in addition to heel offloading and other prevention strategies. However, foam dressings are not used for this purpose within the author's organisation, as the focus is on regular skin inspection; there is a concern that, if the heel is covered with a dressing, the skin will not be checked as regularly as it should.

Pillows were used as the first-line measure to offload pressure from the heels, despite the patients having different individual risk factors. A heel device was not ordered by staff unless recommended by the tissue viability team, and, in most cases, this was done too late, delaying intervention. There are



**Figure 1.** Graph showing the changes in the incidence of avoidable pressure ulcers and avoidable pressure ulcers on the heels of patients over 3 years of the *Deal with heels* project

a number of reasons why pillows may not always be useful for achieving 'free-floating' heels:

- Being able to find a spare pillow on the ward may lead to a delay in care provision
- Soft pillows do not allow 'free floating', especially in the case of patients with heavy lower limbs and oedema
- Pillows might be positioned under the legs incorrectly
- Pillows may not always be tolerated by patients
- The heels may not stay in the desired place, resulting in them resting on the underlying service despite the use of a pillow.

Because of these issues, complete pressure offloading at all times could not be guaranteed, and this highlighted the need for guidance and alternative devices that could be readily available for adequate offloading. NPUAP et al (2019) supported the use of heel-suspension devices that redistribute the weight of the leg without adding pressure on the Achilles tendon and popliteal vein. Some examples of such devices would include:

- MaxxCare Pro Boot (Invacare)
- heel up (VM Orthotics Ltd)
- Devon positioning products (H&R Healthcare)
- Repose Foot Protector or Wedge (Frontier Medical Group)
- Z Flex Heel Boot (Molnlycke)

With input from procurement and the medical device team at the trust, a working group was formed, including: infection prevention and control, physiotherapy, patient safety and tissue viability. A heel protector specification was developed, which helped guide the selection of some appropriate heel-suspension devices that were on the market. The devices were considered as an additional to the choice of pillows to help meet the needs of patients.

All wards are now expected to keep a stock of the chosen devices to ensure that they are available when a patient at risk of heel pressure ulcers is identified, which can be as soon as

a patient is admitted onto the ward. Which device to choose should primarily be a clinical decision with a consideration to patient choice and the risk of falls. Additional guidance, including a poster demonstrating correct leg positioning using pillows, was also provided, and staff received education for each new device.

## Importance of skin inspection

It is important to frequently complete a holistic, comprehensive skin inspection in order to identify early signs of skin damage and document any changes observed (NPUAP et al, 2019). In this project, four patients were identified for whom the heels had not been checked at regular intervals.

The trust uses SSKIN bundle care plans for patients assessed as being at risk of pressure ulcer/injury, and the risk assessment tool used is the PURPOSE T.

## KEY POINTS

- The heel is the second most likely area to develop a pressure ulcer/injury; the heel is covered with very little adipose tissue
- Four of the 10 patients with heel pressure ulcers had sustained a pelvis or hip fracture, and the pressure ulcer/injury developed on the same affected side as the fracture
- Pillows are not always successful for achieving 'free-floating heels'
- Root cause analysis is useful in identifying trends and themes
- To implement change and for it to be successful, it has to involve all the stakeholders and adopt a collaborative approach

The PURPOSE T is a pressure ulcer risk assessment framework (PURAF). It is intended to identify adults at risk of pressure ulcer/injury development and those who already have a pressure ulcer/injury. It can be used in both hospital and community settings. This tool does not utilise a score but encourages staff to consider the profile of individual patient risks (pressure ulcer/injury risk factors present), which enables them to allocate patients on the appropriate care pathway—red (high risk), amber (at risk) and green (no risk)—and to help the planning of appropriate individualised interventions, for example, the SSKIN bundle care plan (Nixon et al, 2015). This tool must be used alongside clinical judgement.

The SSKIN bundle care plan is an initiative that was developed in 2004 to ensure patients receive the appropriate care to prevent pressure ulcers (Whitlock, 2011). The tissue viability team at the author's trust introduced an adapted SSKIN bundle to prioritise the importance of skin inspection in pressure ulcer prevention, to cover skin inspection, surface, keep moving, incontinence/increased moisture and nutrition. From the documentation on the SSKIN bundle care plans, it was recognised that patients who were in toe-to-knee bandaging for leg ulceration or wearing anti-embolic stockings were not having their heels checked as frequently as the SSKIN bundle care plan indicated. When the bandages or stockings were removed, advanced ulceration was found to have developed on the heels. It is now recommended that patients in toe-to-knee bandaging (not including compression bandaging) are bandaged leaving the heel exposed to allow staff to perform regular heel checks. Further, stockings are removed for each skin check. Inspecting the skin over the heels can be a difficult task if the positioning of the patient is not appropriate. Therefore, lanyard mirrors have been introduced for all staff to enable easier skin inspection of 'hard to see' areas. The mirrors chosen are shatter proof and meet infection prevention and control requirements. This initiative has now been rolled out to all teams working in the community. There are future plans to include these mirrors for patients and carers to use in a pressure ulcer/injury discharge pack.

As of April 2019, the trust has implemented the new NHS Improvement (NHSI) recommendations and no longer refers to the terms 'avoidable' and 'unavoidable' to describe pressure injury. The recommendations set out by NHSI (2018) are designed to help move the focus away from proving if an incident was unavoidable, with a greater emphasis on organisational and system learning.

## Conclusion

The 'Deal with heels' initiative focused on education and standardising practice across inpatient settings at a community-based trust and succeeded in reducing heel ulceration by 80% in 3 years. This simple and cost-effective intervention using a problem-solving approach is a good example of multidisciplinary working. **CWC**

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*Conflicts of interest: none*

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## CPD REFLECTIVE QUESTIONS

- How would you go about identifying patients at risk of developing heel pressure ulcers?
- Why are the heels particularly susceptible to pressure injury?
- Consider how you are offloading heels. Are you able to achieve 'free-floating heels' for patients at risk?
- How does your trust investigate pressure ulcers/injuries? How is learning identified, shared and cascaded to help implement change?