

## Pathway to prevent pressure ulcers in the UK



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Heel ulcers are the second most common location for pressure ulcers to develop after the sacrum and cause long-term pain and emotional distress for patients. They are also a key indicator of the quality and experience of patient care, and it is paramount that a Trust designs and implements new ways of working to ensure proactivity in preventing pressure ulcers. Most pressure ulcers are preventable, and in 2016 the tissue viability team in the authors' Trust noticed a rise in hospital-acquired pressure ulcers to the heel; therefore, a new pathway and educational programme was designed on how to prevent pressure ulcers to the heels. The new approach to education was to take the new pathway and training to the staff on the ward; this was known as the 'Heel Dash', which later evolved to 'Trolley Dashes'. The first dash took place in 2017 and this involved tissue viability nurses and company representatives going onto the wards, approaching staff and educating them in relation to the heel prevention pathway, along with products available for them to use. Due to the 51% reduction in heel pressure ulcers following the first heel dash, it was decided that the dashes would continue, in order to sustain this reduction.

**T**here is a large volume of literature focused on the prevention of pressure ulcers (PUs) using specialist beds, mattresses, cushions and repositioning, as the majority of pressure ulcers occur over the bony prominences, most typically on the sacrum and heels (Van Gilder et al, 2012). However, very little of the evidence sets guidance on the correct placement and fixation of devices (Wounds UK, 2012). Education in how to use medical devices and when to use them is paramount to successful PU prevention. The Medway Trust Tissue Viability Nurse (TVN) team designed a pathway and an educational programme on how to prevent avoidable PUs. However, the authors faced difficulties in delivering the education to all ward staff members, as training of staff was problematic in a Trust with 588 beds.

In February 2017, the TVN team decided to start regular ward-to-ward visits in order to ensure that education was delivered to all healthcare professionals. This focused on helping prevent all PUs, with emphasis on those at the heel and device-related; this became known as the 'Trolley Dash'. Since then and to date, the authors have been able to demonstrate a decrease in reported

incidents of heel PUs, as well as a reduction in the cost of heel protection devices.

### Heel pressure ulcers

*"A pressure ulcer is a localised injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear and/or friction."*

(National Pressure Ulcer Advisory Panel [NPUAP] et al, 2014).

Pressure — particularly over bony prominences such as the ischium, trochanter, elbows, heels and other anatomic sites, leading directly to tissue damage and restricting blood flow, creating areas of cell death and ischaemia — has been widely recognised as a risk factor for PUs (Gefen et al, 2008; National Institute for Health and Care Excellence [NICE, 2014]). PUs cost the NHS in the UK £1.4m to £3.8m per day, and between £1,214 and £14,108 per ulcer (Dealey et al, 2012; NHS Improvement, 2018a; 2018b; NHS, 2019).

A PU can develop in 1–6 hours and can lead to an extended stay in hospital of 5–8 days per ulcer (NHS Improvement, 2017).

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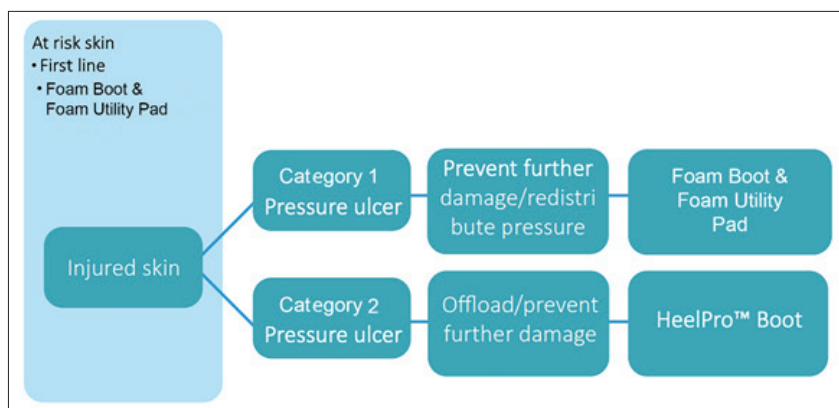


Figure 1. Pathway: how to prevent avoidable pressure ulcers.

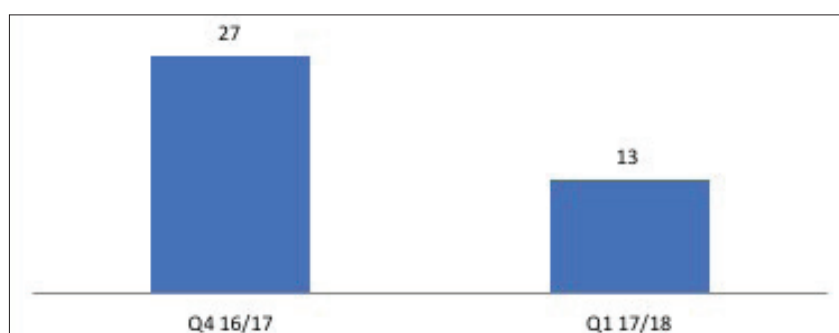


Figure 2. Hospital-acquired pressure ulcers, quarter 1 2017/18 compared to quarter 4 2016/17.

Table 1. Numbers of heel pressure ulcers per quarter over time.

	16/17	17/18	18/19	19/20
Q1	25	13	17	7
Q2	17	18	14	n/a
Q3	12	10	9	n/a
Q4	28	18	15	n/a
<b>Total</b>	<b>82</b>	<b>59</b>	<b>55</b>	<b>n/a</b>

Heels are at specific risk because of the weight of the foot, the shape of the calcaneus, lack of padding and relatively poor blood supply (Langemo, 2014) and the incidence of hospital-acquired heel PU may be as high as 30% (Baath et al, 2016), demonstrating the need for interventions to minimise the risk of skin breakdown caused by pressure and other factors, including friction and shear.

Because of its thin layer of subcutaneous tissue between the skin and bone, the heel is the second most common site for PU development (after the sacrum). Heel ulcers are costly and, if not treated promptly and properly, may lead to osteomyelitis and even limb amputation (Black, 2014).

A number of authors suggest that the incidence of heel PUs is increasing within the inpatient population (Meehan, 1994; Collier, 2000). McInnis (2015) suggests that the main

reason why the heel is the second most common location is due to a number of factors, namely bony prominences, and the foot being load-bearing. Also, the calcaneus heel bone is not well protected, with only 3.8mm between bone and skin and the heel, is subject to internal and external forces and, further, the Achilles tendon has little blood supply and lower limbs themselves are susceptible to arterial disease, neuropathy and oedema.

Black (2012) discussed the pathophysiological process that affects the heel's ability to withstand the causes of PUs; she describes how the hyperaemic response to pressure-loading on the heel does not differ from other tissue. However, the heel is a unique bony prominence, and with ageing the number of capillaries is reduced, the amount of soft tissue padding over the calcaneus decreased and blood flow at rest to the heel is relatively low. Owing to the unique anatomy of the heel and impaired ability to re-perfuse (restoration of the blood flow to a previously ischaemic tissue or organ), the heel is a common site for deep tissue injury PUs.

Along with the risk of ulceration, the heel is also reportedly more susceptible to the development of deep tissue injury (DTI): in a PU prevalence survey, Guilder et al (2010) revealed that the incidence of DTI on the heels was evident in 41.4% of all pressure area sites and the National Pressure Injury Advisory Panel (formerly NPUAP) argues that even with optimal treatment these lesions may develop into a category 3 or 4 PU. The NPUAP defines and differentiates between a category 1 PU and a DTI (NPUAP et al, 2014).

## Methods

The TVNs designed a heel prevention pathway to be utilised across the Trust that utilised foam boots as a first-line product for prevention and up to category 1 PUs with HeelPro Boot (Talarmade/Medicare Innovations) as a second-line product for category 2 and above as an offloading device.

The educational programme, which is known in the Trust as 'Trolley Dashes', started in February 2017 and consisted of 4 days over a monthly period. A total of 128 staff members attended.

The first dash conducted by the authors' Trust was called a 'Heel Dash' and this involved the TVNs and company representatives going onto the wards, approaching staff and educating them in relation to the heel prevention pathway, along with products available and when and how these should be used. The

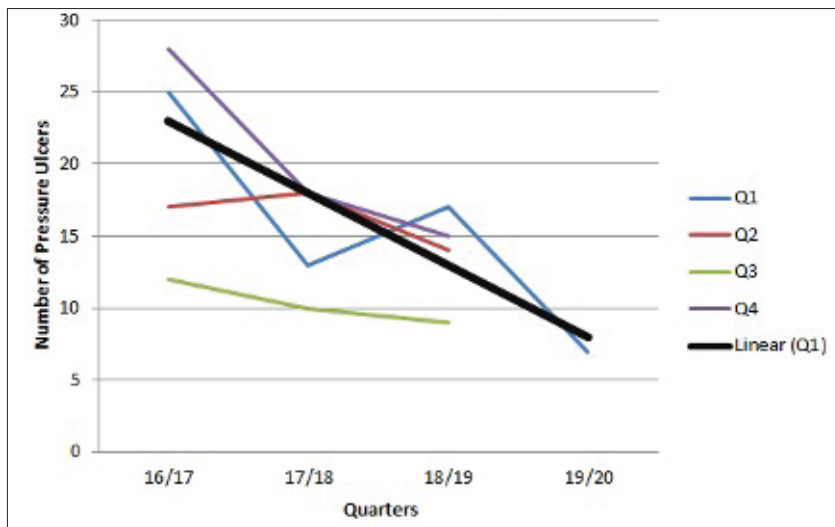


Figure 3. Pressure ulcers reported 2016/17–2019/20.

Table 1 illustrates our decreasing numbers of heel PUs per quarter over time. The total for 2016/7 being 82; 2017/18 (59); 2018/19 (55) and 7 during the first quarter of 2019/20. This trend is highlighted in Figure 3.

Our spend on heel protection devices has been analysed and shows a reduction [Table 2]. In 2015/16, the authors spent a total of £82,000, with £56,000 allocated to heel-shaped gels and £26,000 on heel protection boots. The spend rose in 2016/17, with more boots purchased and fewer gels. The authors also started to introduce foam boots and pads, spending £1,000 on them. 2017/18 saw a price reduction in heel protection boots and an increased spend on foam boots and pads of £3,000. The total spend dropped to £28,000.

Table 2. Spend on heel protection devices (2015–16 to 2019–20).

		2015-16	2016-17	2017-18	2018-19	2019-20
Pressure redistributing support aids Heel shaped	Kerrapro	£56,361.36	£37,849.33	£5,620.12	£1,533.12	£71.85
Specialist wound care boot and shoe Offloading therapeutic reusable shoe	Kerraped			£37.34	£18.67	
HeelPro Heel Protection Boot — Universal	TalarMade	£25,920.00	£50,172.00	£19,464.12	£14,280.00	£2,520.00
31143178 — DEVON Convuluted Foot and Heel Protector	Aria Medical		£862.27			
31143384 — DEVON utility pad	Aria Medical		£103.56	£414.24	£3,313.92	
Devon Bootees Ref: 31143178	Aria Medical			£1,358.12		
Devon Utility Pads	H&R Healthcare					£517.80
Hadfield Boot Heel Protectors	Hadfield			£1,184.40	£3,851.90	£798.00
<b>TOTAL</b>		<b>£82,281.36</b>	<b>£88,987.16</b>	<b>£28,078.34</b>	<b>£22,997.61</b>	<b>£3,907.65</b>

Devon Bootees, Utility Pads & Hadfield Boot Heel Protectors were replaced with Safeguard Heel Boots & Utility Pads from TalarMade in Q2 2020, which will lead to further cost savings.

ward staff were given the pressure prevention pathways and product information [Figure 1].

On each trolley dash, a register of participants is recorded on each ward and feedback from staff is recorded. The ‘Trolley Dashes’ were carried out quarterly in 2017/18, with a total of 239 members of staff participating, and these were then switched to monthly events in 2018/19, with 297 recorded.

The first 4 months of 2019/20 have seen 160 attending, putting us on target to reach over 500 staff members this year. The authors have discovered that as the trolley dash has become a regular monthly fixture, more staff are being attracted to attend and even expect their visits.

The results from the first dash were a great success, showing a 51% reduction in PU at the heel from the previous quarter [Figure 2]. A huge achievement, compared to the previous quarter (quarter [Q]4: 16/17)  $n=17$  heel ulcers reported versus (Q1 17/18)  $n=13$  heel ulcers.

The 2018/19 total spend dropped to £23,000, with most of the spend being allocated to heel protection boots (£14,000) and foam boots and pads (£7,000). We expect to spend around the same amount in 2019/20. This is a saving in excess of 70% over the 2015/16 spend. Our belief is that our reduction in costs has occurred as a result of the training delivered and negotiations with suppliers to reduce prices. We now also have devices used appropriately, in addition to a shift towards using an easy clean heel protector (HeelPro Advance), which has to be replaced less often during the patient’s hospital stay.

### Evaluations — what our staff say

“Today we had training on pressure ulcer prevention using boots. It was really amazing and clear. I got more knowledge and ideas on how to prevent pressure ulcers and how to use the boots properly on patients. Thank you!”

“The trainer was confident in his teaching and was knowledgeable about the subject. The training was a good refresher and was helpful.”

“The training was carried out with available staff present. Trainers presentation was good, he used the available materials to demonstrate his teachings and the staff asked questions. Overall excellent teaching.”

With the prevalence of heel PUs on the rise, it was imperative that the tissue viability team found a new way of conducting training and ensuring that clinicians were being trained to prevent them. By designing and implementing new ways of working, the authors have been able to train clinicians on the importance of heel ulcer prevention. This has ensured that staff are aware of the heel pathway and know what devices should be used and when they should be used, in order to help prevent heel PUs.

By taking the training to the ward, the authors have not only been able to capture staff that would not have been able to leave the ward to partake in classroom training, but spend has also decreased by 70% on heel PU prevention devices by ensuring devices are used appropriately. Hospital-acquired PUs also decreased by 33% from 2016/17–2018/19.

These findings have a positive impact on the quality and experience of patient care, as well as costs for the NHS. The trolley dashes have clearly been a huge success and this new way of working for the prevention of heel PUs will continue.

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