

# Diabetic foot ulcer or pressure ulcer? That is the question

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## Article points

1. Confusion exists when naming (diagnosing) and treating pressure-related foot ulceration in people with diabetes, particularly when ulceration occurs on the heel.
2. Diagnosis can and does affect subsequent assessments and management and this could potentially compromise outcome.
3. All people with diabetes and foot ulceration, irrespective of wound aetiology, should benefit from multidisciplinary foot team input.

## Key words

- Care pathways
- Diabetic foot ulcer
- Pressure ulcer

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**The establishment of a correct diagnosis links care to established guidelines and underpins all subsequent therapeutic activity. Problems can arise when definitions of disease overlap, as is the case with diabetic foot ulceration and pressure ulcers on the foot occurring in people with diabetes. In such cases, clinicians must ensure that patients receive a care bundle that recognises both the wound causation (pressure and shear) and the underlying pathology (diabetic neuropathy, potential foot architecture disruption and ischaemia). All patients with diabetes who have foot ulceration, irrespective of wound aetiology should, therefore, be seen by the multidisciplinary diabetic foot team. Care can then be optimised to include appropriate assessments, including assessment of peripheral perfusion, correct offloading, appropriate diabetic management, and general foot and skin care.**

**W**hat's in a name? That which we call a rose by any other name would smell as sweet.

Romeo and Juliet (II, ii, 1-2)

Unlike in a Shakespearean play, where a name is seen as an artificial and meaningless convention, the whole basis of managing a patient's illness is to establish a diagnosis or name for the illness. Once a healthcare professional has named a problem, a treatment strategy — often laid out in specific guidelines — follows. The name of an ulcer is, therefore, key to its subsequent management.

## What is a pressure ulcer?

According to the European Pressure Ulcer Advisory Panel (EPUAP) guidelines (EPUAP and Nation Pressure Ulcer Advisory Panel, 2014), a pressure ulcer is defined as: "A localized injury to the skin and or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear." Although intended to be specific, this definition is wide reaching. It includes skin and deep tissue damage caused by pressure and/or shear, irrespective of the

underlying medical condition of the patient or the mechanism by which the damage occurred. The EPUAP definition goes on to state: "A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated." This indicates the complexity of pressure ulceration and highlights the gaps in our knowledge both in accurately identifying patients' risk and confirming ulcer aetiology.

This definition of pressure ulceration includes pressure damage that occurs at the 'end of life', sometimes referred to as 'Kennedy ulcers' (Schank, 2009), and also includes bandage trauma or compression bandage damage, ulceration from devices such as oxygen masks or nasogastric tubes, urinary or other catheters, and pressure and shear damage from plaster casts or footwear.

Most pressure ulcer prevalence studies (Barczak et al, 1997; Clark et al, 2004; Vangilder et al, 2008; Vowden and Vowden, 2009a) identify the heel area as the second most frequent location for a pressure ulcer, the most prevalent being the sacrum. The heel accounts for between 23% and 28% of all pressure ulcers (Barczak et al, 1997; Clark et al,

**“Overlap between definitions causes problems in wound management pathways.”**

2004; Vangilder et al, 2008; Vowden and Vowden, 2009a; 2009d) and is the most frequent site for pressure ulceration in specific patient sub-groups, namely the critically ill, older people and people with diabetes.

Salcido et al (2011) state that the heel is the most common area for deep tissue injury. Heel pressure ulcers are commonly found in both acute and long-term care facilities (Vangilder et al, 2008), are frequently associated with delayed wound healing (Chipchase et al, 2005; Pickwell et al, 2013) and have a significant impact on patients' quality of life (Spilsbury et al, 2007). In a small retrospective study of 57 patients, Han and Ezquerro (2011) reported that 42% (18 patients) of cases of heel pressure ulcers required amputation due to persistent infection or non-healing.

### **What is a diabetic foot ulcer?**

In the *International Consensus on the Diabetic Foot* (International Working Group on the Diabetic foot, 2007), a diabetic foot ulcer is defined as: “A full-thickness wound below the ankle in a diabetic patient, irrespective of duration. Skin necrosis and gangrene are also included in the current system as ulcers.” This definition is similar to that of the EPUAP, all-inclusive and, as such, any pressure ulcer on the foot of a person with diabetes is a diabetic foot ulcer — as is any traumatic wound, including a thermal or chemical injury. It constitutes part of the ‘diabetic foot’ — an interrelated group of complications, including infection, ulceration, neuropathy and peripheral arterial disease that place the foot at risk of amputation (Apelqvist, 2014).

### **Conflicting definitions**

This overlap between definitions causes problems in wound management pathways. Describing and classifying a wound helps guide clinicians' subsequent management strategies and therapeutic requirements. For example, a leg wound described as a venous leg ulcer will receive compression therapy with appropriate venous investigations in line with the NICE guidelines for venous disease (NICE, 2013). The Comprehensive Classification System for Chronic Venous Disorders (Eklof et al, 2004) also allows a detailed description of both the ulcer and the underlying pathology.

Identifying a wound as a pressure ulcer does not offer such a detailed descriptive classification system — limiting the classification to wound depth and exposed tissue type — but should still activate a care pathway that is in line with the National Institute for Health and Care Excellence (NICE) guidance for pressure ulcer treatment (NICE, 2014). This triggers risk and skin assessment, enhanced pressure relief and repositioning, but does not define a specific wound care strategy or identify care-supporting investigations. However, it does trigger prevalence and incident reporting, investigation and analysis of the root cause.

Identifying a wound as a diabetic foot ulcer may result in a more detailed descriptive definition of the ulcer (Abbas et al, 2008) and should also result in a care pathway that follows the NICE guidance (NICE, 2004; 2011). This will include timely referral to the multidisciplinary diabetic foot care team where assessment of peripheral perfusion, neuropathic status, wound and callus debridement, and appropriate offloading with general foot and nail care, as well as review of diabetes management, would be performed.

Differing guidance for each wound type impacts on care provision. The Bradford Wound Care Audit (Vowden and Vowden, 2009a; 2009b; 2009c; 2009d; Vowden et al, 2009) highlighted the differences that occur in management when foot ulceration among people with diabetes is classified as either a pressure ulcer or a diabetic foot ulcer (*Figure 1a* and *b*). People with diabetes in the community setting classified as having a heel pressure ulcer rather than a diabetic foot ulcer did not receive Doppler peripheral vascular assessment, were not referred to the diabetic foot service and did not, therefore, receive the benefits of general foot care, offloading or orthotic referral.

The mechanism of injury in both pressure ulceration and diabetic foot ulceration is often similar (*Figure 2*) and this can understandably lead to problems in allocating a wound type to a specific wound.

Chadwick, commenting on a pressure ulcer prevalence survey in his local hospital that showed a larger than expected increase in the

number of pressure ulcers, found that ward staff were counting diabetic foot ulcers as pressure ulcers and concluded that staff were struggling to differentiate between pressure ulcers and diabetic foot ulcers (Ousey et al, 2011). In the same article, Cook commented: “The real issue is not whether the ‘label’ of the wound is correct, but that the patient receives the most appropriate care through assessment and correct referral within a prompt timeframe to a ‘specialist’ in that area.”

Although not directly relevant to a discussion in relation to the naming of foot wounds among people with diabetes, there may be histological and transcriptional differences between diabetic foot ulcers and pressure ulcers. Mendoza-Mari et al (2013) demonstrated that in diabetic foot ulceration granulation tissue cells exhibit a molecular “imprinting” toward glucose homeostasis failure.

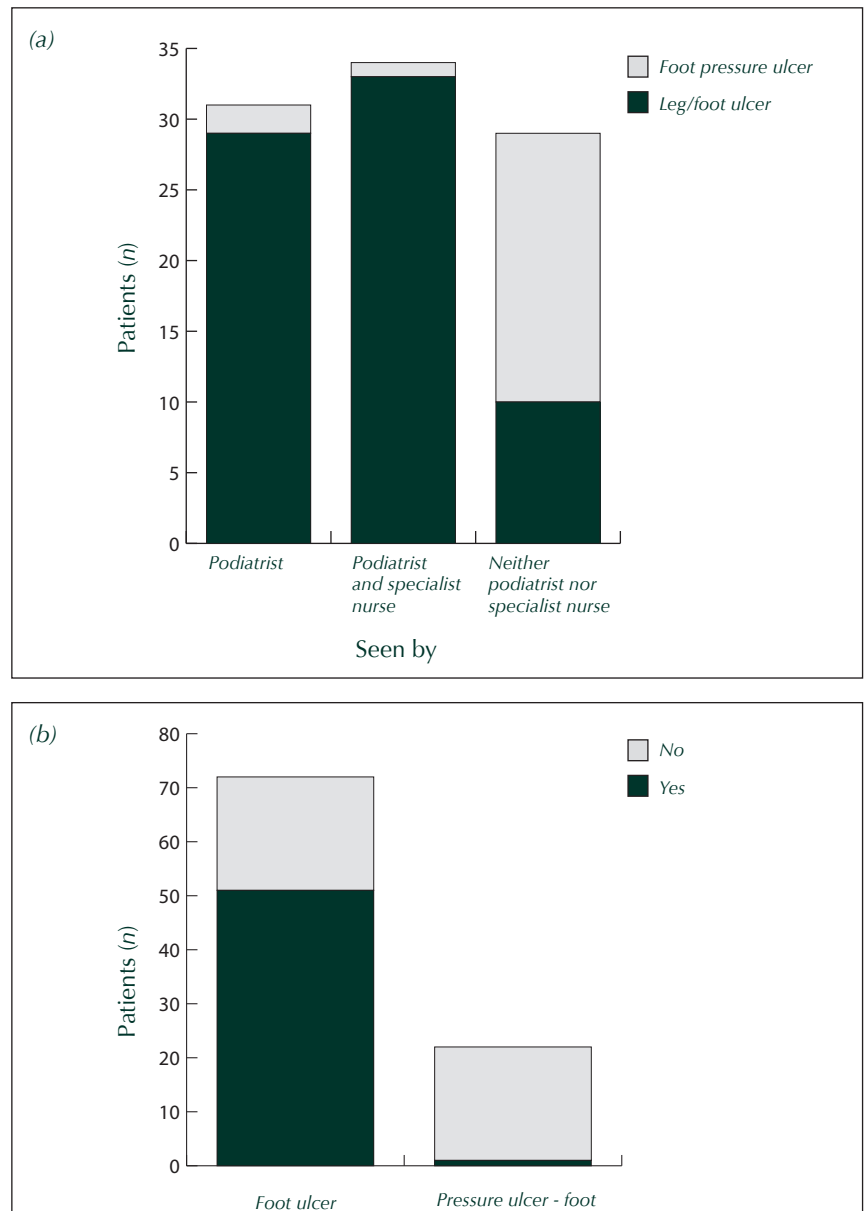
Irrespective of the name applied to a foot ulcer, any non-healing wound on the foot should trigger detailed assessment of the limb’s peripheral perfusion. Reliance on palpable pulses and a Doppler ankle-brachial pressure index may not be sufficient. The concept of foot and lower-leg angiosome (Wright and Fitridge, 2014) demonstrates the importance of identifying regional perfusion within the ulcerated area and, whenever possible, restoring in-line pulsatile perfusion to that region.

**Conclusion**

When is a diabetic foot ulcer a pressure ulcer and when should these ulcers be included in pressure ulcer prevalence data? These are questions that many clinicians struggle with. The breadth of the definition of pressure ulceration could be interpreted as including most diabetic neuropathic and neuroischaemic foot ulcers as the skin break, damage or ulceration is usually caused by pressure and or shear.

The authors’ view is that people with diabetes with an ulcer or wound on the foot should have the benefit of assessment by a specialist multidisciplinary team and treatment pathways established by the diabetic foot services, irrespective of the name placed on the ulcer. Patients with ulceration on the heel are, as a

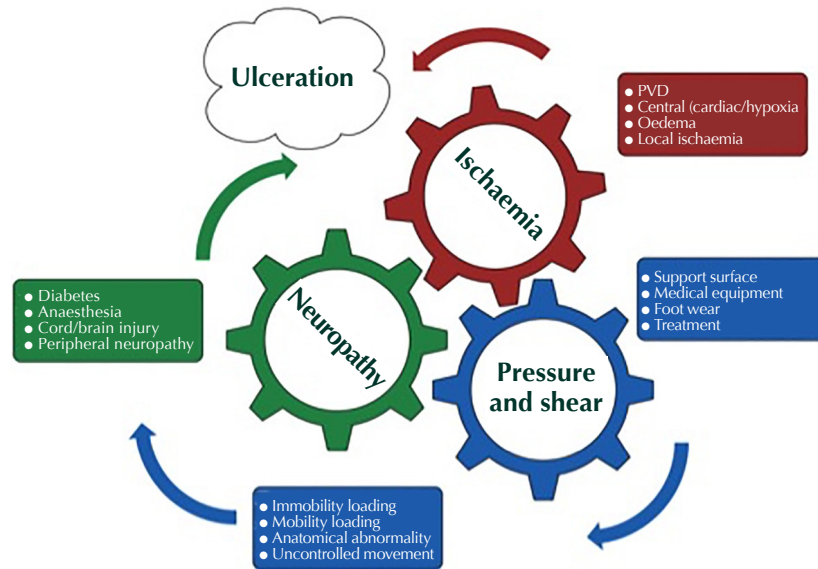
Figure 1. Differences in (a) the care pathway for foot pressure ulcer patients and (b) the vascular assessment pathway (Doppler ankle-brachial pressure index performed, yes or no) for foot ulceration in people with diabetes depending on classification as a diabetic foot ulcer or pressure ulcer.



group, most likely to be classified as having pressure ulceration. These patients frequently struggle with impaired mobility and poor healing and often fail to benefit from foot team intervention in their management.

Effective working and communications between healthcare professionals is essential to allow implementation of complex care for people with foot ulceration. To optimise

Figure 2. Causes of non-traumatic heel and foot ulceration.



outcomes, all people with foot ulceration should benefit from the input of a foot care team. Too many healthcare professionals focus solely on the management of the wound and ignore the integrated care benefits that follow multidisciplinary team involvement. ■

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