

# Negative pressure wound therapy with instillation for Category 3 and 4 pressure ulcers: Findings of an advisory board meeting

## KEY WORDS

- ▶ Challenging wounds
- ▶ Negative pressure wound therapy
- ▶ Pressure ulcers

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This report is based on an advisory board meeting that took place in London on 7th February 2019. The meeting convened an expert group to discuss the use of negative pressure wound therapy (NPWT), and specifically NPWT with instillation and dwell time (NPWTi-d), for managing Category 3 and 4 pressure ulcers (PUs). The aims and objectives of the meeting were to identify why there is currently an underuse of NPWTi-d for Category 3 and 4 PUs in the UK; to understand how to align recommendations for NPWTi-d with the national strategy for PUs; to propose actions needed to change practice; to suggest a framework for integrating NPWTi-d for this indication across trusts in the UK.

The expert group initially discussed definition and categorisation of pressure ulcers (PUs) and current perceptions in practice. As a general rule, predominantly only Category 3 or 4 PUs are treated using any form of negative pressure wound therapy (NPWT). According to international guidelines (National Pressure Ulcer Advisory Panel [NPUAP]/European Pressure Ulcer Advisory Panel [EPUAP]/Pan Pacific Pressure Injury Alliance [PPPIA] et al, 2014), these categories of PU can be described as follows:

▶ **Category 3:** Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunnelling. Bone/tendon is not visible or directly palpable.

▶ **Category 4:** Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunnelling.

It is well documented that the depth of a Category 3 and 4 PU varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have subcutaneous tissue, and Category 3 PUs can be shallow. In contrast, areas of significant adiposity can develop extremely deep in Category 3 PUs.

The group agreed that categorisation can be subjective, which can be problematic in practice.

The description 'unstageable' is also used, meaning that, due to elements, such as slough and necrotic tissue, the PU cannot be observed properly in order to assign the accurate category. However, evidence suggests that where slough and/or necrosis exist, a minimum of Category 3 PU exists. Additionally, in practice, PUs are often not accurately recorded.

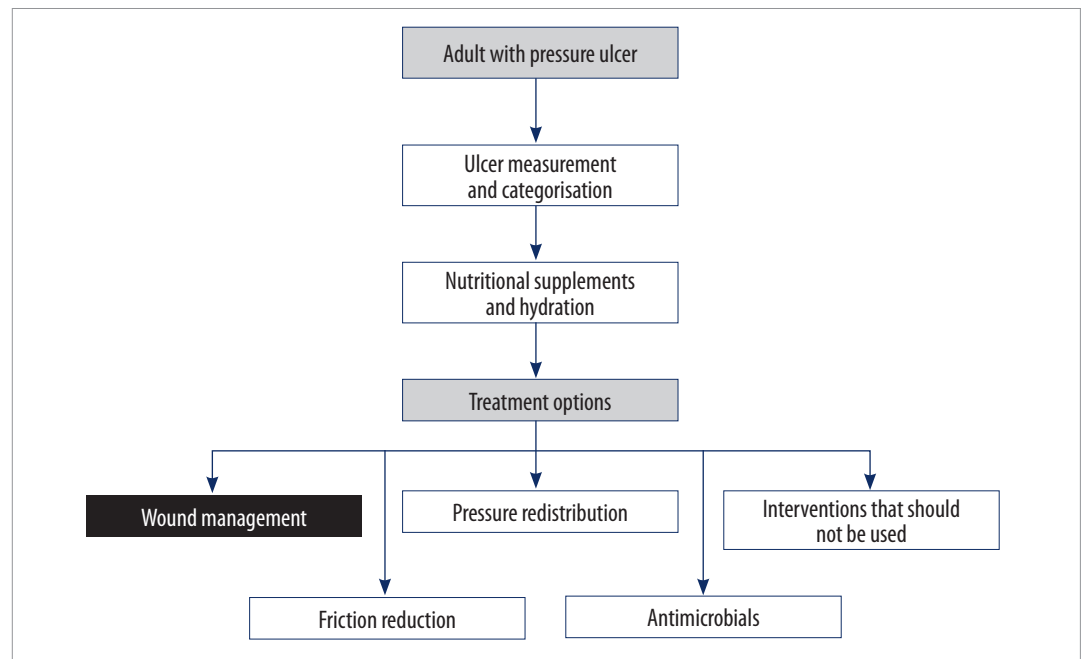
Prevalence studies have indicated that as many as 18% of PUs within an acute setting are not recorded within the existing reporting systems (Fletcher et al 2015; Coleman et al 2016). Furthermore, there is concern that in some care settings, e.g. nursing homes, reporting may not occur and the potential numbers being missed may be 'huge'.

Discussing specific terminology, the expert group agreed that the word 'category' should be used, in line with the recommendations from NHS Improvement (2018) rather than alternatives, such as 'grade'. The group agreed that the term 'pressure ulcer' should continue to be used as standard. The term 'pressure injury' has been adopted in some international regions, such as the US.

## THE ROLE OF NPWT

The group agreed that, in many clinical settings, NPWT is generally underused in practice. NPWT is not currently recommended for use in PUs except in specific circumstances. NICE guidance (2018) states: "Do not routinely offer adults negative pressure wound therapy to treat a pressure ulcer, unless it is necessary

Figure 1. Current recommended pathway for pressure ulcer management (NICE, 2018)



to reduce the number of dressing changes (for example, in a wound with a large amount of exudate)".

In practice, the current standard of care for Category 3 and 4 PUs includes the following options:

- » Debridement
- » Moist wound healing (often hydrofiber in cavity wounds)
- » Antimicrobial dressings
- » Larval therapy (used occasionally)
- » Pressure redistribution/management of shear/friction reduction/offloading
- » Systemic antibiotics
- » NPWT (with restrictions as above).

See Figure 1 for the current NICE (2018) pathway, which includes 'wound management' as a broad category.

The options for PU management are varied, which can result in confusion, particularly as there is not robust evidence for some products offered. The group noted that some options, such as antimicrobials, are overused (Gray et al, 2018) and are not always efficacious in the clinical scenario.

It is important that appropriate solutions are utilised, which optimise the outcome for the patient and their healing; in current practice the focus can often be merely on symptom management and infection prevention. There can be a tendency to treat 'passively' (*"just put a dressing on it"*), which needs to be challenged. Passive treatment in itself can

be harmful, as it is simply not enough. Furthermore, the focus should not only be on prevention, e.g. pressure-redistributing mattresses, but on healing existing PUs. Only a small proportion of patients are receiving 'aggressive' treatment with advanced dressings. It must be emphasised that these wounds should be 'treated-to-heal', not just 'treated-to-manage'. Action must be taken, rather than putting resources into 'ticking boxes'. The timescale of healing is also important, particularly given the impact on quality of life and mental health. Treatments that can speed time to healing should be adopted wherever possible.

All forms of NPWT are intended to create an environment that promotes wound healing by preparing the wound bed for closure, reducing oedema, promoting granulation tissue formation and perfusion, and removing exudate and infectious material.

#### NPWT WITH INSTILLATION AND DWELL TIME

NPWT with instillation and dwell time (NPWTi-d) differs from other forms of NPWT. NPWTi-d involves instillation or continuous irrigation, by having the chosen solution briefly instilled into the wound, followed by a dwell time. This method has been shown to facilitate exposure of the wound bed, including tunnels and undermining, to the solution

(Rycerz et al, 2013). The automated instillation of the solution creates a controlled, protected environment for flushing and cleansing wounds by the proposed mechanism of loosening soluble contaminants in the wound bed followed by subsequent removal during NPWT. Consequently, the planktonic bacterial burden can be decreased, contaminants removed and the wound cleansed, without manual intervention (Gupta et al, 2015).

NPWTi-d has been found to be most effective in properly selected complex cases, such as patients with multiple comorbidities and very severe, complex wounds. NPWTi-d should not be used routinely to treat simple wounds or patients without comorbidities (Kim et al, 2015). The expert group agreed that, based on their own experiences, NPWTi-d has been found to improve healing and patient outcomes in indicated complex wounds, including Category 3 and 4 PUs.

Additionally, NPWTi-d has been found by the group to achieve optimised results in clinical practice, and is an option that could be more widely used earlier in the wound healing continuum to improve outcomes in a more timely manner, in order to improve treatment.

### UNDERUSE AND BARRIERS TO UPTAKE

Evidence exists that highlights the significant positive impact that NPWTi can make to the most challenging wounds, but the addition of instillation to NPWT adds a level of complexity to the wound care process that may cause difficulty in practice (McKanna et al, 2016).

Perceptions and attitudes have a huge impact on the care and treatment being given to patients. Levels of care can vary significantly depending on the clinician's attitude, knowledge and skills, which can make a big difference to outcomes. There is a danger in care being 'ritualistic' and not considering all of the appropriate management options.

Clear and accurate information must be provided to patients on advanced therapies so that they can make informed choices on the benefits of targeted treatments.

The expert group suggested that PUs are not generally considered an 'attractive' area of care and not all clinicians want to deal with them. Ageism is also thought to play a part – if the patient is elderly and in overall poor health, there can be

a misconception that a PU is just part of their life journey. However, the understanding of PU development has evolved in the last decade and clinicians now acknowledge that PUs are not just a concern for the older adult. They can occur in any setting from the neonate to the older adult.

The expert group agreed that a patient-centric, multidisciplinary team (MDT) approach is required. Shared responsibility must be taken in order to meet the needs of patients. There needs to be a focus on addressing treatment goals and, ultimately, achieving healing.

Cost considerations can also be a barrier to the introduction of more advanced treatment modalities, as keeping patients in care in order to conduct NPWT can be expensive. However, it should be noted that total costs need to be considered, including the benefits gained from progressing a wound to healing in a more timely manner. Furthermore, many of these advanced treatments can be provided in the home care setting once the clinician has the knowledge and skill. The group suggested that it may be more effective to keep patients in acute care in order to achieve healing; otherwise, delayed healing and recurrence may be an issue, which results in rising costs over time. Making the case for this can be difficult, so building evidence in this area in order to improve care is key.

Costs and resource/time constraints in the NHS mean that care options can be limited. The 'fear factor' of advanced adjunct treatments, i.e. the misconceptions and myths of barriers to care, were discussed. Adjunct treatments are sometimes seen as over-complicated and daunting, so are avoided. Plus some staff do not want to take ownership of advanced therapy/devices as they see it outside of their role. There may also be the perception in some areas that nurses should only change dressings, rather than have a more proactive approach. Training and communication in these areas are required.

Awareness is a huge issue that needs to be addressed. The group emphasised that, in practice NPWTi-d improves healing outcomes, and as such currently represents a missed opportunity. The group estimated that the percentage of suitable wounds that currently receive NPWTi-d is very low at <5%.

As well as awareness, access is a practical issue that needs to be addressed. It is vital that advanced therapeutic options for suitable patients are made

available, with an emphasis on evidence in order to make the case for local budget holders.

**ALIGNING WITH THE NATIONAL STRATEGY**

A national strategy for wound care was launched in September 2018 by NHS England. This covers three clinical areas:

- ▶▶ Pressure ulcers
- ▶▶ Lower limb wounds
- ▶▶ Complex surgical wounds.

Each clinical area has its own work stream; the PU stream is closely aligned to the existing Stop the Pressure programme (NHS Improvement, 2018). Much of the work of the Stop the Pressure programme has so far focussed on prevention, but within the action plan for the coming year (2019/2020), there is a work stream that will focus on tracking and improve healing rates.

**V.A.C.ULTA™ NEGATIVE PRESSURE WOUND THERAPY SYSTEM**

The V.A.C.ULTA™ Negative Pressure Wound Therapy System (KCI) is an integrated wound management system that is designed to provide NPWT with an instillation option.

The instillation option is indicated for patients who would benefit from vacuum-assisted drainage and controlled delivery of topical wound treatment solutions and suspensions over the wound bed. The V.A.C.ULTA™ Negative Pressure Wound Therapy System with and without instillation is indicated for a wide range of wounds, which may include Category 3 and 4 PUs.

The V.A.C. VERAFLOR CLEANSE CHOICE™ Dressing (Box 1), in conjunction with V.A.C. VERAFLOR™ Therapy, can be used to promote wound healing and facilitate the removal of infectious materials.

A study by Teot et al (2017) used the therapy system in large complex wounds with thick exudate (including PUs, burns, and necrosis after skin excision) in 21 patients. After an average of one to three applications (3 to 9 days) of therapy, wound outcomes observed included:

- ▶▶ Most of the non-viable tissue was removed at the first dressing change after 3 days of therapy
- ▶▶ Post dressing change, the wound bed contained ≤10% surface area of black devitalised tissue and

yellow fibrinous slough in 18/21 (85.7%) and 12/21 (57.1%) wounds, respectively

- ▶▶ A rapid decrease of necrotic and fibrinous tissue was seen at each dressing change in the subgroup of non-surgically debrided wounds with a necrosis/fibrin cover.

Figure 2 shows the wound-healing progressions of three different PUs in the study. Each PU is shown at Day 0 and Day 9 after three successive applications (9 days) of NPWTi-d. Reduction of fibrinous tissue and cleansing of the wound as well as granulation tissue formation were noted at each dressing change.

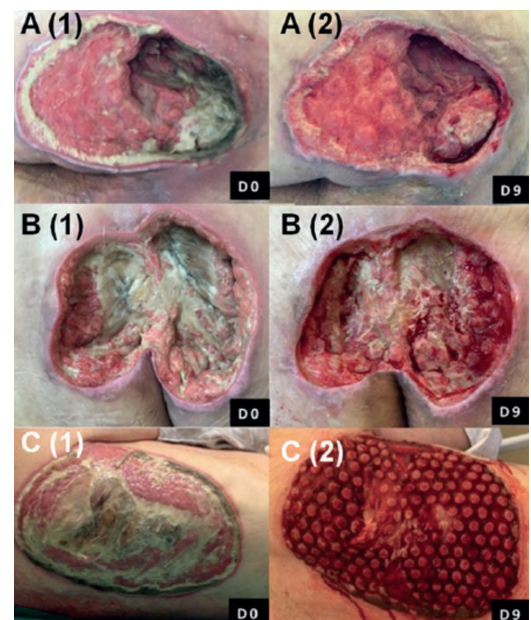


Figure 2. Wound-healing progressions of three pressure ulcers (Teot et al, 2017)

**PATHWAY FOR USE IN PRACTICE**

The group discussed how a pathway for use could improve uptake and, thus, patient outcomes. It was agreed that a pathway should be proactive, patient-centred and take an MDT approach.

It is important that, in order to avoid subjectivity and potential confusion, the pathway is evidence-based and uses clear measures. Accordingly, the group agreed in this instance to measure healing using the rule that a 40% reduction should be seen at 4 weeks for chronic wounds. However, all treatments should be monitored during that time and also assessed at 1–2 weeks.

Figure 3 is a draft pathway for use in practice. It is also important to note that any underlying

**Box 1. V.A.C. VERAFLOR CLEANSE CHOICE™ Dressing**

**Unique dressing:**

- ▶▶ Provides ‘mechanical’ movement at the wound surface in combination with cyclic delivery and dwell of topical solutions
- ▶▶ Facilitates removal of thick wound exudate, such as fibrin, slough and other infectious materials

**3-layer foam design includes:**

- ▶▶ A contact layer with a pattern of 10mm holes
- ▶▶ Two cover layers (without holes) to provide application options for wounds of varying depths

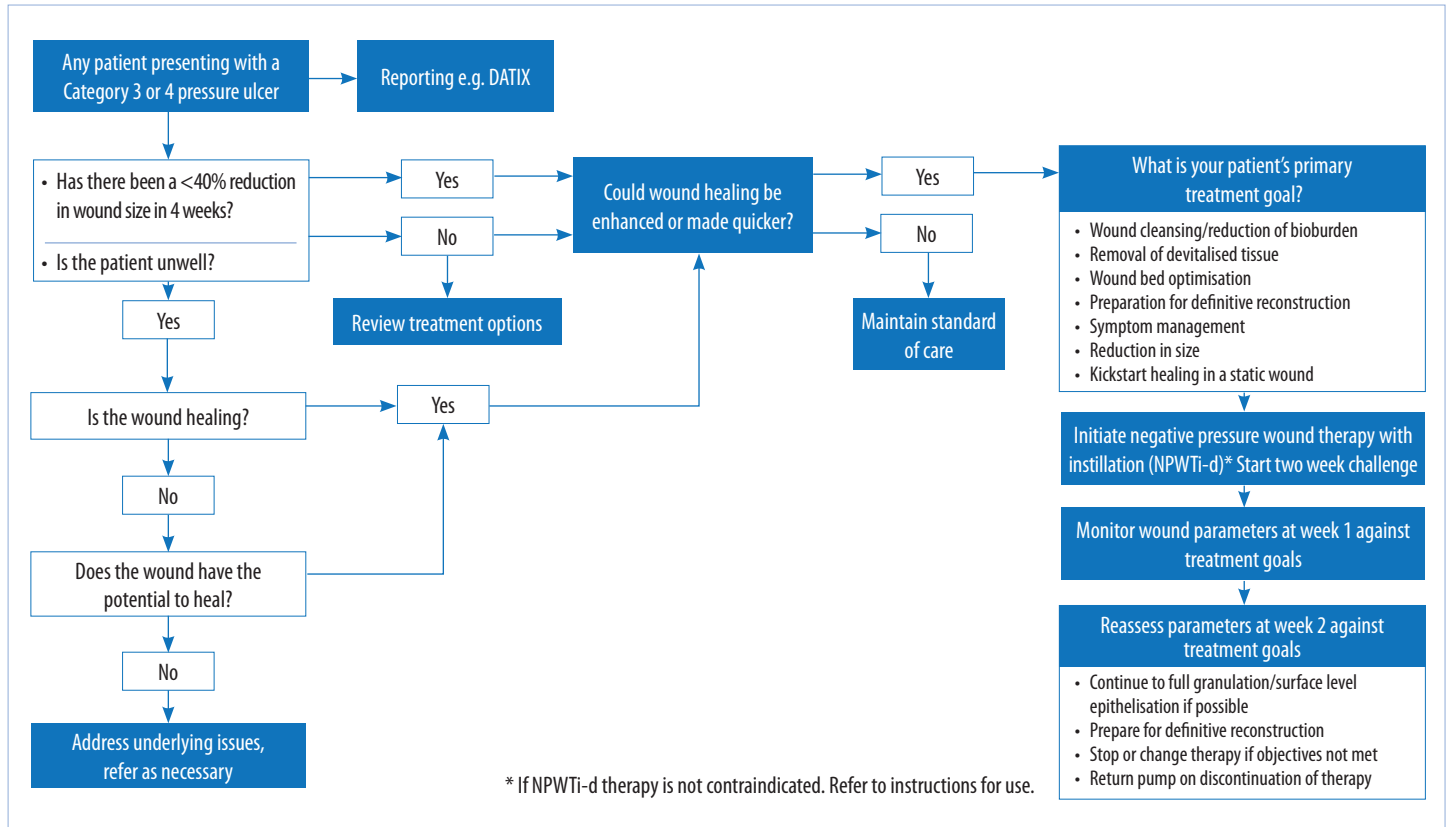


Figure 3. Draft pathway for use in practice

**Box 2. Tips for success**

- ▶▶ Assess patient for comorbidities and medications that may prohibit healing
- ▶▶ Stabilise nutritional status and comorbidities prior to beginning treatment
- ▶▶ Implement a robust educational plan
- ▶▶ Utilise support from suppliers and/or industry
- ▶▶ Organise advanced practice guideline and care plans
- ▶▶ Facilitate coordination and communication between healthcare professionals for a multidisciplinary approach
- ▶▶ Share and learn good practices and experiences from others
- ▶▶ Engage in multidisciplinary education
- ▶▶ Identify clear processes for improved funding and access
- ▶▶ Innovation is key to ensure practice develops – but this must be within a safe framework

factors that may be contributing to non-healing should be addressed separately. Additional practical tips are in *Box 2*.

**SUMMARY**

The expert group convened to discuss the use of NPWTi-d in the management of patients with Category 3 and Category 4 PUs at an earlier stage of the wound healing continuum. The group agreed that patients should receive proactive, ‘aggressive’ care. A patient-focused, MDT approach is vital. Building awareness and practical evidence to support use of NPWTi-d should be seen as key, as there is sufficient evidence in the literature to support the positive impact of this treatment modality in challenging wounds.



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