

Ten Top Tips...

Using negative pressure wound therapy effectively



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Negative pressure wound therapy (NPWT) has revolutionised the approach to complex wounds, enabling a breakthrough in wound management.^[1,2] Drawing on current research-based evidence and expert consensus opinion, the

following tips can be used to aid appropriate use for optimal outcomes.

1 KNOW WHAT YOU WANT TO ACHIEVE

Select the right patient

NPWT can be used to treat full- and partial-thickness acute and chronic wounds, including pressure, diabetic foot and venous leg ulcers, traumatic, postoperative and dehisced surgical wounds, skin flaps and grafts, explored fistulae and partial-thickness burns. Large cavity wounds with high exudate levels are particularly suited to NPWT, although it can also be used on wounds with mild or moderate levels of exudate.

Treatment should only be commenced following a thorough assessment and patients for whom NPWT is contraindicated (e.g. those with untreated osteomyelitis or malignancy) have been excluded. Understand when precautions are needed (e.g. in patients with active bleeding or difficult wound haemostasis) and proceed accordingly. For example, this may include protecting vulnerable structures such as exposed blood vessels, anastomotic site, organs or nerves.

Define the treatment aims

When starting NPWT it is important to define what you want to achieve and establish both the timeline for care and the exit dressing or surgical strategy for individual patients. Review aims at every dressing change. If the initial treatment aims have not been met at 2 weeks, stop and re-evaluate the treatment plan.

2 PREPARE THE WOUND BEFORE STARTING THERAPY

Before starting therapy, ensure underlying and associated causes have been addressed.

Debride the wound to remove any devitalised and sloughy tissues, which impede delivery of negative pressure. NPWT may assist with ongoing wound bed preparation by removing body fluids, wound exudate, and infectious materials.^[3] However, NPWT can never replace debridement and is contraindicated in wounds containing dry, necrotic eschar.

Cleanse the wound thoroughly (including any tunnels or undermined areas) using saline or a suitable antiseptic irrigation solution (e.g. Prontosan [B Braun], Octenilin [Schülke and Mayr] and Dermacyn [Oculus])^[4] prior to NPWT application. This can help to reduce the bacterial load and remove any debris from the wound surface such as slough. It is important to dry the periwound area thoroughly after cleansing.

Consider using a light layer of a skin barrier product to protect the surrounding skin from repetitive removal of the NPWT dressing. This can also protect intact skin from contact with body fluids.^[5]

Always read the manufacturer's instructions for use, and relevant clinical guidelines, before commencing therapy.

3 FILL THE WOUND USING THE RIGHT AMOUNT OF FILLER

Fill the wound with sufficient material – this may be foam or gauze – contouring to fit the dimensions of the wound bed, which may be difficult in irregularly shaped wounds. A pre-cut (spiral) foam dressing can be useful in this situation and can make application easier to perform. Applying negative pressure will remove air from the dressing material and pull the wound edges together by reducing the volume of the cavity. If insufficient material is used, it can lead to sub-optimal delivery of negative pressure. Only fill explored tunnels or undermined areas and fill tunnels using the most appropriate

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wound filler and ensure it is visible in the open wound base. Our preferred method is to use the white foam in these regions of the wound due to its less adherent properties. Always count the number of foam pieces used in the wound and document on the label of the tubing and in the records.^[5] A wound diagram, with notes on dressing placement, can be helpful.

4 USE A WOUND CONTACT LAYER TO PROTECT UNDERLYING STRUCTURES AND PREVENT PAIN

A fenestrated wound contact layer should be placed underneath the wound filler to protect vulnerable structure (e.g. exposed blood vessels, organs or tendons). This can prevent disruption to the wound bed and reduce pain at dressing changes.^[6] Consider the use of white foam, which is softer and has a different pore structure to black foam, making it less adherent and ideal for use in tunnels and cavity wounds. It may also be considered where there are exposed structures in the wound bed.

5 CONSIDER THE WOUND LOCATION AND BRIDGE TO OFFLOAD

If a wound is over a bony prominence or on a weight-bearing area (e.g. plantar surface of the foot), it is important to use a pressure-relieving or offloading device.^[7] Bridging allows the tubing to be placed on a non-pressure bearing surface away from a wound (e.g. a posterior or lateral surface). To minimise the risk of pressure ulceration, check the patient's position when lying in bed to prevent the pad or tubing applying pressure to areas of the body.

Bridging may also be used when wounds are in close proximity to one another, allowing just one dressing kit to be used. Ensure the bridge material is wide enough to prevent collapse and that the underlying intact skin is protected.

6 TAKE YOUR TIME AT DRESSING CHANGES

Taking time to apply and remove NPWT dressings can reduce pain and increase patient comfort. Switch off the machine for half an hour before removing the dressing; this allows time for the pressure to equalise in the wound bed and for the dressing to separate from the tissues. Injecting saline solution under the dressing may also help to reduce pain at dressing changes and facilitate atraumatic removal.

7 EACH TIME A DRESSING IS CHANGED, CONSIDER THE PRESSURE SETTING AND MODE

There are currently no detailed clinical guidelines regarding the choice of pressure setting for individual wounds; the level of suction is based on individual assessment of the wound.^[8] Higher levels of negative pressure (e.g. -125mmHg) have been shown to have a positive effect on wound contraction,^[9] regional blood flow^[10] and the formation of granulation tissue^[9]. However, these higher levels can sometimes cause pain and therefore a reduction in negative pressure could be an option (e.g. >-75mmHg). There is a risk of reduced negative pressure in the wound bed when the transportation of fluids has to go against gravity (e.g. when the wound is on the leg and the unit is placed on the trouser belt of the mobile patient)^[11].

Continuous negative pressure is the most commonly used setting and is recommended for use over unstable structures to provide a splinting effect. However, intermittent (suction pump switches on and off) or dynamic/variable mode (amount of suction rotates between the target pressure and a minimum low level of negative pressure) may help to speed up granulation tissue formation and encourage blood flow at the wound edge^[10,12,13].

8 TAKE STEPS TO AVOID COMPLICATIONS

Pain

Some patients may experience pain during treatment or dressing changes. Consider reducing the negative pressure to a lower level that is acceptable for the patient. Take your time applying and/or removing the dressing (see Top Tip #6). In addition, a non-adherent fenestrated wound contact layer placed below the wound filler may help reduce pain but it may also reduce the formation of granulation tissue. Do not stretch the drape and do not apply it to the skin under tension. Analgesia or anaesthesia should be considered prior to dressing change and time allowed for this to take effect. Pain will reduce as the wound heals.

Maceration

Do not use too many layers of drape as this can decrease the moisture transmission rate. Ensure there is sufficient wound filler in the wound and that there is a good overlap of drape material, ensuring that the wound filler does not extend onto intact periwound skin. Protect

the surrounding tissue and provide adequate offloading to reduce external pressure on the wound/dressing. If the amount of wound fluid increases, look for potential causes, such as dependent oedema. Increasing exudate may also be a sign that the wound is infected.

Leaks

Avoid the use of skin care products containing glycerine, surfactant, or dimethicone as these can prevent adhesion of the drape and cause leaks. Alcohol-free barrier products (e.g. Cavilon [3M Healthcare]) are recommended for use with NPWT to protect intact skin. Keep the amount of drape material to a minimum^[14]. Barrier strips^[15] or hydrocolloid dressings^[14] placed around the wound may help to maintain an adequate seal, in particular, in difficult-to-dress areas. It may be helpful to cut a hole in the dressing, to frame the wound, before applying the NPWT device.

If therapy is interrupted for >2 hours at any given time, the dressing must be removed to prevent the development of an infection. A new dressing must then be reapplied and therapy reinitiated^[8].

9 CONSIDER INSTILLATION THERAPY TO REDUCE WOUND BIOBURDEN

For wounds that are colonised or infected, NPWT can be combined with fluid instillation (V.A.C. VeraFlo™ Therapy [KCI]^[16]). This delivers a wound instillation solution to the wound bed, which is left to rest for a short period of time and then removed during a cycle of NPWT^[17]. This method has been shown to reduce the number of operating room visits for surgical debridement on patients with infected wounds and may decrease the time to closure, while increasing the number of wounds closed^[16] and the volume of granulation tissue produced^[18]. This therapy option may also have a potential role in biofilm removal in complex wounds^[19].

10 PROVIDE APPROPRIATE TRAINING ON DEVICE USE

When applied correctly, NPWT is an effective option for managing complex wounds in a variety of healthcare settings. Appropriate training should be given to staff on how to apply the device as well as recognising and managing potential complications. When discharging patients home with NPWT *in situ*, all patients/carers should be given printed instructions and know who to contact in an emergency. Care arrangements need to be transferred effectively

and treatment status, aims and goals clearly described. For complex patients, a face-to-face handover of care may be appropriate. It is also important to ensure that the patient's home circumstances are appropriate for this form of care.

Remember, NPWT looks simple, but may not be simple. Always seek advice from the lead clinician when in doubt. ■

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Acknowledgement: This article has been supported by KCI.