

Consensus statements to guide best practice on the use of Negative Pressure Wound Therapy (NPWT)

Introduction

Negative pressure wound therapy (NPWT) is a widely used treatment in NHSScotland. It has been used for approximately 20 years, and its use has expanded to include a variety of different wound types. Many clinical experts support the use of NPWT in selected patient groups. However, there are anecdotal concerns that NPWT is used inconsistently, and sometimes inappropriately, across different healthcare professionals and NHS boards.

Due to these concerns, a referral was made to the Scottish Health Technologies Group (SHTG) to undertake a rapid Health Technology Assessment on this topic. A review of the literature highlighted a number of clinical trials on NPWT, but these did not give a complete picture of when NPWT is indicated or contraindicated. Many of the published trials lacked methodological rigour, meaning that their conclusions need to be treated with caution. In addition, for some wound types there was too little published literature to reach any conclusions.

In order to encourage more consistent use of NPWT in NHSScotland, and reduce the perceived inappropriate use, the decision was made to produce guidance on the use of NPWT based on the consensus of clinical experts. The consensus approach used was a modified Delphi method. This involved three rounds of questioning, all done via email. After each round the results were analysed and fed back to participants. Questions/statements were refined based on respondents' comments for the subsequent rounds until consensus on statements was reached. Where consensus could not be reached, this has been reported.

Clinicians from NHSScotland were recruited using email distribution lists and 35 people registered their interest to be involved. Volunteers came from 10 of the 14 territorial boards. There was representation from podiatrists, tissue viability nurses (TVNs), practice nurses, and trauma/plastic/general/vascular surgeons.

The statements used in the first round of questioning were largely based on a local NHS protocol.

Twenty-one clinical experts responded to the first round of questioning; 18 responded to the second round; and 17 responded in the third, and final round. Consensus was achieved if 70% or more of the respondents 'strongly agreed' or 'agreed' with a statement.

Consensus was not reached on:

- Which wound types NPWT is clinically indicated.
- Which wound types NPWT is not clinically indicated.
- A statement regarding use in the paediatric population.

Further details are given at the end of the document.

Consensus was reached on seven statements.

Statement 1

The following NPWT contraindications (with reason and action) are based on the consensus of a group of clinical experts. Additional device-specific contraindications may be detailed in manufacturers' guidance, and NPWT users should be aware of these.

	NPWT contraindications	Reason	Action
1	Necrotic tissue with eschar present on the wound bed	Will have no action on necrotic tissue	Not suitable for NPWT Apply conventional dressing Discuss other treatment options with lead clinician
2	Malignancy in wound*	May spread the malignancy	
3	Untreated osteomyelitis	Simple surface treatment unlikely to be successful	
4	Non-enteric or unexplored fistula	Could worsen any fistulas, and cause damage to hidden organs/structures	
5	Direct placement over exposed vital structures (for example, anastomotic sites, organs, blood vessels, tendons, ligaments and nerves)	Could damage these vital structures	
6	Patients at high risk of bleeding (for example infected arteries, clotting disorders) or patients with active bleeding	Blood loss	

*** May be considered for the management of symptoms (for example, exudate) in patients with malignancy in palliative care, with lead clinician agreement and patient consent.**

Other contraindications were proposed by the group of clinical experts, but consensus was not reached for these (less than 70% agreement). Therefore, the above list should not be considered as exhaustive, and clinical judgement is required for each individual case.

In the third round of questioning, 16 out of 17 respondents (94%) strongly agreed or agreed with this statement.

Statement 2

The following NPWT precautions (with action) are based on the consensus of a group of clinical experts. Additional device-specific precautions may be detailed in manufacturers' guidance, and NPWT users should be aware of these.

	NPWT precautions	Action
1	Patients receiving anticoagulants or platelet aggregation inhibitor therapy	Refer to lead clinician
2	Infected wounds	
3	Osteomyelitis (untreated osteomyelitis is a contraindication)	Refer to manufacturer clinical guidelines
4	Exposed bone and/or sharp edges in the wound	
5	Spinal cord injury (stimulation of sympathetic nervous system)	
6	Enteric fistula or risk of fistula formation	Discuss with TVN or company nurse advisor to see if may be suitable
7	Use near vagus nerve (bradycardia)	
8	Circumferential dressing application	
9	NPWT should be removed in patients requiring: <ul style="list-style-type: none"> - Magnetic resonance imaging: MRI (remove NPWT pump) - hyperbaric chamber - defibrillation 	Consider whether NPWT requires to be undertaken in hospital setting (if assessing in community)
10	(For patients being treated in the community) Patients unable to safely accommodate NPWT at home or unable to manage daily activities with NPWT in place (consider, for example: home environment, cognitive ability, risk of falls)	
11	Non-concordant or combative patients	
12	Patients with burns (devitalised tissue must be debrided prior to application of NPWT)	

Other precautions were proposed by the group of clinical experts, but consensus was not reached for these (less than 70% agreement). Therefore, the above list should not be considered as exhaustive, and clinical judgement is required for each individual case.

In the third round of questioning, 16 out of 17 respondents (94%) strongly agreed or agreed with this statement.

Statement 3

All healthcare professionals who are involved in the provision of NPWT (including patient assessment, prescription, application and monitoring) must ensure that they have the necessary knowledge and competence by undertaking device specific training. Training needs to be accessible to all staff.

In the third round of questioning, 15 out of 17 respondents (88%) strongly agreed or agreed with this statement.

Statement 4

Prior to making a decision about whether to commence NPWT or not, it is the responsibility of the initiating healthcare team to:

1. Undertake a full holistic assessment of the patient and the wound, considering patient/carer opinions, choice and quality of life.
2. Consult the manufacturer's clinical guidelines for the NPWT system being used.
3. Identify and document if contraindications/precautions are present or not.
4. Identify and document when a specific technique or NPWT system is required, such as in the case of an open abdomen or when there are exposed structures in the wound (bone, tendon and ligament).
5. Discuss NPWT with the patient, including any contraindications/precautions, and any alternative treatment options, before obtaining informed consent.
6.
 - a. Identify if patient and wound type would be suitable for transfer to other healthcare settings.
 - b. Identify process for transfer to take place, for example communication routes, timeframes to ensure training in place, quantity of supplies to be sent with patient.
 - c. If relevant, ensure that patients (or carers/family) have the necessary skills and knowledge to use the device at home (for example, what to do if the machine stops working, alarms, how to change canisters), and who to contact within working hours and outwith.
7. Document the following:
 - a. That informed consent has been obtained for commencement of treatment
 - b. Rationale for treatment and treatment objectives
 - c. Discussion and agreement for commencement and discontinuation of treatment with senior clinical staff
 - d. The NPWT system required, including pump and dressing type
 - e. The required pressure and mode of therapy (intermittent versus continuous negative pressure)
 - f. Alternative treatment options if NPWT does not happen/has to be discontinued
 - g. The time period for dressing change and any specific instructions

Fifteen out of 18 respondents strongly agreed or agreed with this statement in round two (two people disagreed and one person did not vote but provided comments). Given that 83% of respondents agreed or strongly agreed, consensus was reached. Some minor changes were made after voting based on respondent's comments, but these were not significant enough to warrant an additional vote on this statement in round three.

A peer reviewer of this work highlighted the need to be mindful of health literacy, and to consider the cultural and language needs of patients/carers.

Statement 5

It is the responsibility of the initiating healthcare team to ensure processes are in place for ongoing evaluation of patients receiving NPWT, and for treatment review within 2 weeks. The initiating healthcare provider must provide documented information as guidance to those responsible for ongoing wound management, indicating:

1. The desired outcome of treatment.
2. Contact details if required to discuss treatment.
3. When further review is required by the initiating consultant or the alternative arrangements made for review to ensure the requirement for and effectiveness of treatment are monitored.

The clinician responsible for ongoing management of NPWT patients will continually assess the requirement for continuation of this therapy.

All professionals involved in NPWT should be aware of the initiating consultant's care plan.

Seventeen out of 18 respondents agreed or strongly agreed with this statement in round two (one person neither agreed nor disagreed). Given that 94% of respondents agreed or strongly agreed, consensus was reached. Some minor changes were made after voting based on respondent's comments, but these were not significant enough to warrant an additional vote on this statement in round three.

Statement 6

When discontinuation of NPWT treatment is required due to clinical or patient-related issues, it is the responsibility of the person discontinuing the treatment to ensure that she/he has informed the initiating healthcare professional of this decision and that an updated treatment plan is documented in the case record.

Consensus was reached for this statement after the first round of questioning; 20 out of 21 (95.2%) respondents strongly agreed or agreed with this statement.

Statement 7

All adverse events should be reported via local adverse/critical incident reporting system.

In the second round of questioning, 13 out of 18 respondents (72%) voted for this consensus statement to be added.

Statements for which consensus was not reached

1. Clinical experts were asked in round one to indicate for which wound types they considered NPWT to be appropriate. They were asked to select from a long list of wound types. However, from the answers given it was not possible to compile a definitive list of wound types for which NPWT was appropriate. Therefore this line of questioning was abandoned after round one.
2. In round one, clinical experts were asked to complete the following statement: '*In the following wound types, NPWT is not appropriate, and standard dressings/treatments should be used:*'. However, from the disparity of responses it was apparent that it was not going to be possible to compose a statement on which consensus could be reached. Some clinical experts also queried the appropriateness of the statement. Therefore this line of questioning was abandoned after round one.
3. An additional statement for paediatrics was proposed in round three. However, the clinical experts did not reach consensus on including this statement. Nine out of 17 respondents strongly agreed or agreed with the statement. The remaining eight respondents felt unable to agree to the statement as they were not experts in the area.
4. Some additional contraindications/precautions were proposed by the clinical experts, and considered by the whole group, but consensus was not reached. These included:
 - a. Patients taking steroids long term
 - b. Any cavity/sinus of which origin is not clearly visible or cannot be gently probed to gain an indication of origin
 - c. Over-granulated wounds
 - d. Grossly contaminated wounds
 - e. Malnourished patients with no adequate nutrition/nutritional supplements
 - f. Children (monitor fluid balance)
 - g. Patients with neuropathic aetiologies or circulatory compromise
 - h. Patients with diabetes
 - i. Patients with hypertension
 - j. Patients with blood disorders
 - k. Patients who are immune-compromised
 - l. Weakened, irradiated, sutured blood vessels or organs
 - m. Previous grafting of vessels at or near the wound bed (*voted to include, but then removed as this point is covered by 'high risk of bleeding'*)
 - n. Patient size or weight

- o. Circumferential dressing application
- p. Bone fragments
- q. Low platelet count
- r. Mental health/self-harm issues
- s. Geographical locations
- t. Pain

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- Linda McGlynn, Regional Engagement Manager Scotland, Diabetes Scotland
- Fiona Russell, Nurse Consultant – Tissue Viability, NHS Grampian
- Heather Hodgson, Lead Nurse Tissue Viability, NHS Greater Glasgow & Clyde

Declarations of interest were sought from all peer reviewers. All contributions from peer reviewers were considered by the group. However the peer reviewers had no role in authorship or editorial control.

These consensus statements are intended to inform and guide best practice. The implementation of these consensus statements will be for local determination.