UK **CONSENSUS DOCUMENT**



Negative pressure wound therapy: Patient safety and risk management

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Foreword

Negative pressure wound therapy (NPWT) is an established intervention used across a range of clinical settings, from hospital-based acute and surgical care to community and home environments. By applying controlled negative pressure to the wound bed, NPWT can encourage healing through several mechanisms such as drawing wound edges together, stimulating granulation tissue formation, removing debris, reducing oedema and managing exudate (Apelqvist et al, 2017).

Despite its recognised clinical benefits, patient safety concerns reported through NHS England's Learning from Patient Safety Events (LFPSE) service have identified episodes of significant and, in some instances, life-threatening bleeding associated with the use of NPWT across the UK.

Analysis indicates that the NPWT device itself is not the primary cause of harm. Instead, contributory factors include gaps in clinical decision-making, inadequate risk assessment, delayed escalation, insufficient staff training, communication failures, particularly during transitions of care and inconsistent adherence to device and canister observation schedules following surgical debridement (Chetter et al, 2020).

These findings highlight the need for structured guidance to support clinical decision-making when initiating and managing patients receiving NPWT. This includes appropriate patient selection, holistic assessment, ongoing monitoring and clear safety-netting arrangements (providing patients and carers with clear guidance on warning signs and when to seek further help) to ensure patients and carers can access timely clinical support and escalate concerns when required, and accurate, transparent documentation.

This Consensus Document was developed following a multidisciplinary consensus meeting held in London in March 2026.

The purpose of this Consensus Document is to provide clinicians with practical, evidence-informed guidance on how to initiate treatment safely, and manage at-risk patients receiving NPWT, focussing particularly on the recognition and management of bleeding complications, safe initiation, transfer or discharge practices and clear escalation pathways. Practical tips are included throughout to support clinical decision-making and prioritise patient safety.

Jacqui Fletcher (Chair)

Background

What is negative pressure wound therapy?

Negative pressure wound therapy (NPWT) is an advanced wound management treatment that uses controlled negative pressure, typically between -75 and -125mmHg, to help promote wound healing. A wound filler or interface material (most commonly foam) is placed into the wound and sealed with an adhesive film dressing to create an airtight seal and stable environment. Tubing connects the dressing to a therapy unit, which delivers negative pressure across the wound bed **[Figure 1]**. Depending on the system used, wound exudate may be collected in a canister or managed through alternative fluid-handling mechanisms.

This controlled negative pressure helps remove exudate, reduces oedema, improves perfusion and stimulates granulation tissue formation (Orgill et al, 2009; Quacinella et al, 2023). First described in the 1990s, NPWT has since evolved, with indications expanding to include, but not limited to:

- Dehisced surgical wounds and prophylactic (incisional) use over primarily closed surgical incisions
- Traumatic wounds, including open fractures and soft tissue injuries
- Diabetic foot complications, including post-amputation wounds
- Chronic/non-healing wounds, such as pressure and leg ulcers
- Complex wounds requiring temporary abdominal closure or open abdominal management.

NPWT is now widely used within the NHS across a broad range of acute and chronic wound indications. The expansion of its use across different clinical settings has highlighted the importance of robust training, competency assessment and governance frameworks to support safe and effective practice (Arundel et al, 2025).

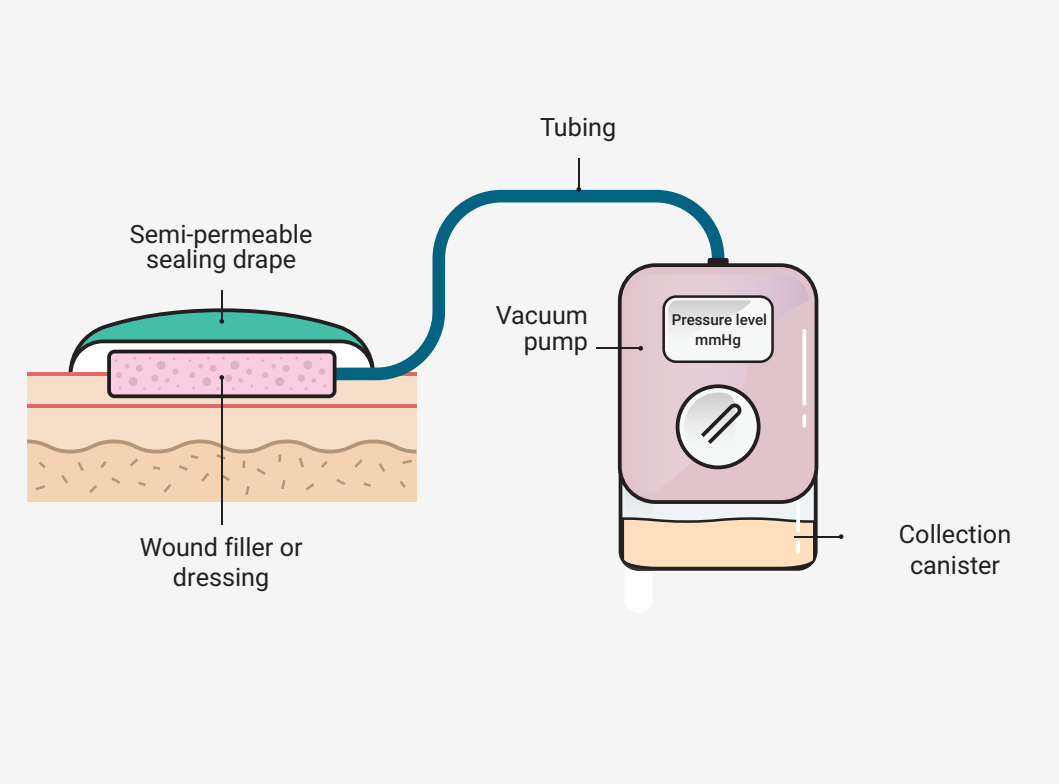


Figure 1. Components of a negative pressure wound therapy (NPWT) system.

Understanding the types of NPWT

NPWT includes a range of systems, each with specific indications, strengths and limitations, such as the following:

- Traditional pump-based systems with canisters, typically used for larger or highly exudating wounds
- Portable or single-use disposable systems, increasingly used for patients transitioning to community care or for lower-exudate wounds
- NPWT with instillation and dwell time (NPWTi-d), used in more complex wounds where infection management is also required (De Pellegrin et al, 2023), incorporating a topical solution (e.g. antimicrobial or saline)

Patient safety considerations associated with NPWT

NPWT has an established safety profile when used with appropriate clinical oversight. Like other wound care technologies, including compression therapy, electrical stimulation therapies and wound irrigation systems, NPWT carries known risks. These risks can be minimised when appropriate safeguards are in place, including careful patient selection, comprehensive risk assessment, ongoing monitoring and clinical oversight.

Patient safety data reported to NHS England has identified a pattern of serious incidents associated with NPWT use across the UK, including cases of significant, and in some instances, life-threatening bleeding. Analysis of these incidents suggests that malfunction of the NPWT device itself was not the primary source of patient harm. Instead, contributing factors included gaps in clinical decision-making, inadequate risk assessment, delayed escalation, insufficient training, failures in communication, particularly at transitions of care, and inconsistent adherence to device and canister observation schedules following surgical debridement. These findings are echoed in the analysis by Chetter et al (2020), which similarly highlights system and human factors rather than device failure as the primary contributors to harm.

The patient safety challenge highlighted by NHS England data is therefore not principally one of device performance, but of variation in the systems, competencies and governance structures that support NPWT use. Where these structures are inconsistent, the risk of preventable patient harm increases.

NPWT is recognised as an important and beneficial treatment in suitable patients if used appropriately. It is vital that clinicians have the knowledge and confidence to ensure that this treatment is available to those who will benefit from it, with treatment underpinned by sound evidence and decision-making processes.

Regardless of the system used, the principles of safe initiation, monitoring, escalation and discharge apply equally across all devices. Clinicians must be familiar with the specific characteristics of the system in use, including how to identify complications within that system's design constraints.

The evolving evidence base for NPWT in England

The surgical wounds healing by secondary intention (SWHSI)-2 trial: clinical and economic evidence in SWHSI wounds

The National Institute for Health and Care Research (NIHR) funded the SWHSI-2 trial (Arundel et al, 2025), which evaluated the clinical effectiveness and cost-effectiveness of NPWT compared with standard dressings in patients with surgical wounds healing by secondary intention (SWHSI). The study recruited 686 participants across 29 NHS Trusts in the UK between May 2019 and January 2023. The majority of participants had lower limb vascular wounds, with a high prevalence of comorbidities, including diabetes.

In this specific patient population, the trial found no clear evidence that NPWT reduced time to healing compared with standard dressings, and it was not found to be cost-effective from an NHS perspective. A non-significant difference in quality of life outcomes was observed in favour of NPWT. Safety outcomes were reported as part of the trial data collection, with adverse events recorded in both groups, including a small number of serious adverse events. These findings relate to comparative effectiveness rather than device safety, but they provide important context regarding outcomes in a defined high-risk population.

See **Box 1** for a summary of the key findings.

These findings should be interpreted in context. The SWHSI-2 trial primarily recruited patients with small surgical wounds healing by secondary intention, most commonly lower limb wounds associated with diabetic peripheral vascular disease. A key recruitment challenge was identifying eligible patients, as many individuals with more complex or higher-exudate wounds, such as those needing open abdominal management, large volume exudate control, skin graft preparation or limb salvage, were not included in the study population.

Box 1. Key Findings: SWHSI-2 Trial (Arundel et al, 2025).

- National Institute for Health and Care Research funded multicentre UK trial involving 686 participants across 29 NHS Trusts
- Compared NPWT with standard dressings for surgical wounds healing by secondary intention (SWHSI)
- No clear evidence that NPWT reduced time to wound healing versus standard dressings in the cohort of patients included in the trial
- NPWT was not found to be cost-effective from an NHS perspective
- NPWT was associated with a non-significant improvement in patient-reported quality of life for patients
- 448 adverse events were reported across both treatment groups
- 124 adverse events were considered potentially treatment-related
- 14 serious adverse events occurred (9 NPWT; 5 standard care)
- Of the 14 serious adverse events, most (n=10, 71.4%) were deemed unrelated or unlikely to be related to treatment.

The trial therefore reflects a narrow and highly selected cohort rather than the full spectrum of NPWT use in clinical practice. While similar findings have been reported in other randomised controlled trials of NPWT in specific wound types, these findings should not be interpreted as a definitive assessment of NPWT across all indications.

Within this context, SWHSI-2 provides evidence relevant to a defined patient group, but its conclusions should be considered alongside the broader and more heterogeneous NPWT evidence base. This publication focuses on safety considerations, particularly reports of bleeding associated with device use, rather than efficacy or cost-effectiveness outcomes.

Reported incidents and known risks

NHS England patient safety data of reported incidents has identified a recurrent pattern of serious occurrences associated with NPWT use, with approximately 20 cases reported over a four-year period (2021 to 2024) involving

significant haemorrhage. The majority involve patients who have undergone vascular or complex surgical procedures, and wounds in the lower limb where proximity to major vascular structures is a known risk factor. An important and recurring finding across these cases is that the NPWT device itself is not implicated as the primary cause of patient harm. Instead, analysis consistently identifies human and system factors as the principal contributors. These include:

- Delayed or absent clinical escalation when bleeding was identified
- Failure to communicate patient risk and clinical concerns between nursing and surgical teams
- Premature discharge decisions despite ongoing clinical risk factors
- Incorrect risk stratification, with patients categorised as low risk despite clinical indicators suggesting otherwise
- Inadequate safety-netting information provided to patients and carers regarding signs of deterioration and when to seek urgent review
- Failure to ensure that staff are aware of and adhere to required post-debridement monitoring protocols, including routine observations of NPWT devices and canisters. This may include not implementing or recognising scheduled observations as an necessary component of post-debridement care, which can limit opportunities for early identification and escalation of bleeding complications.

A 2025 survey of NHS organisations highlighted significant inconsistencies in guidance, training and patient information related to NPWT. Of the 65 respondents:

- 39 reported having written local guidelines governing NPWT use
- 23 had formal policies
- 32 had standard operating procedure (SOP) documents
- 40 provided local instructions for use in addition to those produced by manufacturers
- 25 had access to training videos for NPWT.

Among 49 community-based organisations, fewer than half had written patient information and only nine of these included information directing patients to contact 111 in an emergency.

Risk assessment prior to NPWT initiation

Known risk factors

The decision to initiate NPWT requires a structured, holistic assessment of clinical risk. It is important to distinguish between contraindications (where NPWT should not be used) and risk factors (where NPWT may be used, but with additional caution, monitoring and clinical justification). These categories carry different clinical obligations; a risk factor demands consideration, not automatic exclusion.

NPWT is not unique in carrying risk. Many clinical interventions carry known complications, and the risk-benefit discussion is central to good clinical decision-making. The issue is not that NPWT carries risk, but that these risks must be explicitly acknowledged, assessed and communicated. Clinical judgement, thorough assessment and accurate documentation to justify decision-making should underpin all treatment.

Contraindications to NPWT

The following issues are generally recognised as contraindications to NPWT use. Clinical judgement must always be applied, and where any contraindication is present, the initiating clinician must document their clinical reasoning if they choose to proceed. Additional device-specific contraindications may be detailed in manufacturers' guidance, and NPWT users must be aware of these:

- Active, uncontrolled haemorrhage
- Necrotic tissue with eschar present (unless debridement is planned as part of the treatment pathway)
- Untreated osteomyelitis
- Malignancy within or directly adjacent to the wound
- Non-enteric or unexplored fistulae
- Exposed blood vessels or organs (requires specific clinical evaluation and specialist input)
- Known allergy to any component of the NPWT dressing system.

The VALID-N framework: Bleeding risk assessment

The VALID-N framework **[Table 1]** was developed by the expert panel as a structured clinical prompt to support haemorrhage risk assessment prior to NPWT initiation and at transitions of care. It is not a formally validated scoring system and does not generate a numerical risk score. Rather, it was derived through expert consensus to ensure systematic consideration of the key domains relevant to bleeding risk in NPWT practice.

VALID-N should be applied at initiation and reviewed at every significant transition of care (e.g. ward to community transfer, change in clinical status, wound deterioration or following surgical debridement).

It is important to note that increased bleeding risk is not solely determined by patient or wound characteristics. Incorrect application technique, inappropriate dressing change intervals and poor understanding of device settings can also increase haemorrhage risk.

EXPERT CONSENSUS

Before initiating NPWT, clinicians should complete a structured holistic risk assessment, including application of the VALID-N framework for bleeding risk, assessment of contraindications and a documented risk-benefit discussion with the patient.

EXPERT CONSENSUS

All NPWT risk assessments, clinical decisions and risk-benefit discussions should be clearly documented in the patient record. This documentation should be updated at initiation and at every significant transition of care.

Closed versus open wounds

The risk profile of NPWT differs meaningfully between closed incisional and open wound applications, and this distinction should inform the initiation decision and the monitoring plan:

- **Closed incisional NPWT:** Applied over a sutured closed incision and typically left in place for several days depending on protocol and clinical assessment. Closed incisional NPWT may help protect the surgical incision by managing postoperative

Table 1. The VALID-N framework: Bleeding risk assessment.

Factor	Clinical consideration for risk assessment
Vessel	• Proximity to a major vessel • Presence of a prosthetic graft • Previous vessel surgery or vessel repair • Potential erosion
Anticoagulation	• Current anticoagulant or antiplatelet therapy • Drug type • Duration of therapy • Coagulation status and adequacy of monitoring (e.g. international normalised ratio for patients taking warfarin or renal function for patients taking direct oral anticoagulants) • Potential for temporary cessation, if clinically appropriate
Location	• Anatomical location and its implications for monitoring access and application • Ability to maintain adequate seal • Ability to apply and sustain compression if bleeding occurs
Infection	• Wound infection overlying or adjacent to a vessel may cause vessel erosion and precipitate haemorrhage, particularly relevant in postoperative vascular wound infections
Depth	• Tissue layers involved, not simply depth in centimetres • Proximity of deeper structures including vessels, organs and bone • Risk of cavity formation or retention of dressing material
Negative pressure type	• Risk-benefit profile of the selected system • Appropriateness of device settings • Dressing change frequency • Visibility of canister and tubing • Whether technique introduces additional risk

All six factors should be considered, and no single factor is determinative.

fluid and oedema, reducing mechanical stress at the incision line and supporting an optimal healing environment (Groenen et al, 2023). The risk of significant bleeding is generally low, although clinical vigilance is still required, particularly in patients with increased bleeding risk or on anticoagulation therapy. The sealed dressing may obscure early signs of infection or wound complications, needing structured postoperative review. Evidence supports its prophylactic use in selected patients to reduce surgical site complications, with meta-analysis and trial sequential analysis (Groenen et al, 2023) demonstrating reduced surgical site infection rates compared with standard dressings

- **Open wound NPWT:** Therapy is applied directly to the wound bed. The depth, tissue layers involved and proximity to vascular structures are key considerations. The risk of haemorrhage is more directly related to the wound environment.

Initiation of NPWT

Who should initiate?

The decision to initiate NPWT carries clinical accountability and should be made by a registered healthcare professional with appropriate skills, knowledge and demonstrable capability in wound management. The initiation of NPWT should not be delegated to staff without the relevant experience to perform a comprehensive risk assessment and take responsibility for the decision. Subsequent dressing changes may be carried out by appropriately trained, capable and competent registered healthcare professionals (e.g. nurses, podiatrists and other allied health professionals) in accordance with documented care instructions, provided clear accountability, competency assurance and escalation pathways are in place.

EXPERT CONSENSUS

The decision to initiate NPWT carries clinical accountability and should be made by a registered healthcare professional with appropriate skills, knowledge and demonstrable capability in wound management.

Clinician capability

Clinicians who initiate, manage or monitor NPWT should be able to demonstrate the following capabilities and competencies:

- Knowledge of indications and contraindications to NPWT use
- Completion of VALID-N and holistic risk assessment
- Correct application and removal of the NPWT dressing system being used
- Recognition of normal and abnormal wound fluid across different exudate types
- Bleeding management and escalation pathways
- Documentation requirements and clinical accountability
- Patient and carer education, including providing patients and carers with clear guidance on warning signs and when to seek further help.

Competency and capability should be supported through initial training and reviewed at regular intervals, and whenever staff move into a new clinical setting where NPWT is used. Registered healthcare professionals are expected to practise within their scope of capability and seek further support or education where required. There is currently no national standardised competency framework for NPWT in England, and this gap contributes to the inconsistency identified in the NHS survey. Organisations are encouraged to adopt formal competency assessment processes that align with manufacturer guidance and relevant professional and regulatory standards.

The consensus panel drew on the Healthcare Improvement Scotland Delphi Best Practice Statement (2019) on NPWT as a reference point for initiation and accountability standards. Multidisciplinary Team (MDT) dialogue between surgical and nursing teams is strongly recommended, particularly for complex or high-risk patients. A registered nurse who has completed a risk assessment and has concerns about the appropriateness of NPWT is entitled, and professionally obligated, to raise those concerns, regardless of the seniority of the clinician requesting NPWT. However, it should be noted that there are minimum professional requirements regarding the clinician initiating treatment with NPWT **[see Box 2]**.

Pre-initiation assessment

Before initiating NPWT, the clinician must complete (and document) a holistic risk assessment addressing:

- Wound type, indication and clinical suitability for NPWT
- VALID-N bleeding risk factors (completed and documented)
- Any potential contraindications to NPWT use
- All patient comorbidities (e.g. anticoagulation, vascular disease, diabetes, nutritional status, immunosuppression)
- Patient capacity, understanding and consent
- Environment (considering both current and anticipated care settings)
- Support systems and monitoring capability.

Box 2. Minimum requirements to initiate NPWT according to the expert panel.

- **Nursing:** Band 6 or above with demonstrable wound management capability and competence, including completion of formal NPWT competency assessment
- **Medical:** CT3 or equivalent grade and above, or a specialist with appropriate wound management skills. Initiation by FY1 or other junior trainee grades without appropriate capability and competence is not appropriate
- **Registered allied health professionals (e.g. podiatrists, physiotherapists):** Demonstrable wound management competence, including completion of formal NPWT competency assessment, in line with their professional scope of practice.

The initiating clinician is responsible for conducting the risk assessment, making the clinical decision to commence NPWT and overseeing the consent process. This responsibility remains with the decision-maker even where application and ongoing management are undertaken by other appropriately trained clinicians.

Where NPWT is initiated as a delegated task, accountability remains with the delegating registered clinician, who must hold the relevant skills, capability and competence.

Patient consent must include an explicit discussion of the risks and benefits of NPWT, the alternatives available, and what the patient should do if problems arise. For patients managing NPWT in the community or at home, consent should specifically include:

- Understanding what normal exudate looks and feels like
- What changes should prompt them to seek help
- Clear, written contact numbers for emergency and non-emergency situations, including instructions on who to contact and how to escalate concerns if bleeding, device malfunction or other complications occur
- Emergency contacts must be available 24 hours a day, every day of the year (for example, NHS 111 systems).

NPWT following surgical debridement

Surgical debridement carries a well-recognised increased risk of haemorrhage, particularly where debridement involves proximity to vascular structures, infected tissue or a previously operated site. When NPWT is initiated following debridement or surgical revision, the clinical team must treat this as equivalent to a new initiation, with a full reassessment of risk.

Considerations include:

- Proximity of the debridement to major vascular structures
- Integrity of haemostasis at wound closure
- Whether the responsible surgeon has explicitly reviewed and agreed the NPWT plan postoperatively
- Timing of NPWT initiation in relation to surgery, and monitoring intensity in the immediate postoperative period.

EXPERT CONSENSUS

NPWT should only be initiated by a registered healthcare professional with appropriate skills, knowledge, capability and competence in wound management: at minimum, Band 6 nursing/podiatry or CT3 medical grade or equivalent. The initiating clinician holds accountability for the risk assessment, consent process and initiation decision.

EXPERT CONSENSUS

When NPWT is initiated following surgical debridement or wound revision, this should be treated as a new initiation with a full re-assessment of bleeding risk and clinical suitability.

Monitoring during NPWT

Who should monitor?

Monitoring of patients receiving NPWT should be the responsibility of a registered healthcare professional. While support workers may undertake delegated observations and report concerns, formal wound assessment, including evaluation of wound progress, canister contents and overall patient condition, remains the responsibility of a registered healthcare professional. Follow-up assessments undertaken by other members of the healthcare team should be delegated appropriately, supported by training, and undertaken within local policy and governance frameworks, with clear escalation pathways in place.

In community settings where a qualified clinician is not always immediately present, clear protocols must define what healthcare assistants, patients and informal carers should observe, report and escalate, and who they should contact if concerns arise.

What to assess at every contact

Every clinical contact with a patient receiving NPWT, whether a scheduled dressing change, a well-being check or an unplanned visit, is an opportunity to identify early warning signs and, where needed, to revise the treatment plan.

The following should be assessed as part of routine postoperative observations and scheduled NPWT reviews, with the frequency determined by the clinical setting, patient risk factors and local protocol. Patients and carers should also be educated on what to observe and report between reviews:

- Canister contents: exudate colour, consistency, volume and rate of fill relative to wound size and expected trajectory
- Tubing: check for presence of fresh blood, clot or unexpected exudate
- Wound site and dressing: integrity of the seal, signs of bleeding, haematoma or clot at the wound margin
- Periwound skin: signs of maceration, skin damage or irritation
- Patient symptoms: pain, discomfort, dizziness or any systemic concern (e.g. sepsis).

Monitoring expectations should be calibrated to the clinical timeline. In the first 24 to 48 hours following surgery or debridement, some haemoserous or blood-stained exudate is expected and should not automatically cause alarm. However, clinicians should remain alert to the presence of fresh or flowing blood in the canister, which is different from blood-stained exudate and warrants immediate clinical review. After the initial postoperative period, persistent or increasing fresh blood, or a significant change in exudate characteristics, should be treated as a clinical concern until proven otherwise. If a canister is filling within an hour of emptying, irrespective of exudate type, this warrants immediate escalation.

See **Table 2** for guidance on identifying different types of exudate (adapted from World Union of Wound Healing Societies, 2019; Sheehan et al, 2025).

EXPERT CONSENSUS

Wound assessment during NPWT, including evaluation of canister content, wound appearance and patient condition, should be performed by a registered healthcare professional. Elements of monitoring may be delegated to appropriately trained and supported members of the healthcare team in accordance with local policy, provided responsibilities, accountability and escalation pathways are clearly defined.

HINTS AND TIPS

Blood-stained or haemoserous exudate is frequently seen in the early postoperative period and is not in itself a cause for concern. It is the presence of fresh, bright red or freely flowing blood, particularly if increasing in volume, that requires urgent attention.

Table 2. Identifying different types of exudate (adapted from World Union of Wound Healing Societies, 2019; Sheehan et al, 2025).

Type	Colour/opacity	Consistency	Cause
Serous	Clear/amber/ straw-coloured	Thin, watery	Often a normal part of healing, but an increase or excessive amounts may indicate an underlying issue requiring reassessment
Haemorrhagic	Red, opaque	Thick	May indicate trauma to the wound, bacterial infection, or active bleeding
Fibrinous	Cloudy	Thin, watery	Contains fibrin strands; may indicate inflammation (with or without infection)
Serosanguinous (haemoserous)	Clear, pink or light red	Thin, slightly thicker than water	Presence of red blood cells indicates capillary damage; may occur postoperatively or due to traumatic dressing removal
Sanguinous	Red	Thin, watery	Low protein content or presence of red blood cells indicating capillary damage; may be associated with hypergranulation
Seropurulent	Cloudy, yellow or tan	Thin, slightly thicker than water, creamy	Serous exudate containing pus; may indicate impending infection
Purulent	Opaque, milky, yellow, tan or brown; sometimes green	Often thick and sticky	Indicates infection; may be associated with malodour
Haemopurulent	Reddish, milky, opaque	Thick	Mixture of blood and pus; often due to established infection

Box 3. Monitoring: canister assessment guidance.

- Fresh blood in the canister or tubing beyond the immediate postoperative period should always prompt clinical review
- Consider exudate volume, colour and rate of fill in the context of wound size, type and expected healing stage. A large canister filling slowly in an abdominal wound may be less concerning than a small canister filling rapidly in a lower limb wound
- A significant, unexplained change in exudate characteristics, colour or volume is a red flag
- Spots of blood on the dressing at change are less concerning than active oozing from the wound bed, but should still be documented and the cause assessed
- Patients and carers should be specifically instructed to contact their clinical team if the canister fills unexpectedly rapidly, if they notice fresh blood in the canister or at the wound site, or if blood is escaping around the dressing, causing loss of suction. They should also be advised that significant bleeding may not always be visible in the canister, as clotting within the dressing or foam can sometimes reduce visible drainage despite ongoing haemorrhage.

Recognition and management of bleeding

Understanding wound bleeding

Many wounds produce exudate, and a degree of blood-stained fluid may be expected following surgery, debridement or dressing removal. Clinicians and patients managing NPWT at home must be able to distinguish between normal and abnormal wound fluid in order to respond appropriately. **Table 3** describes the three main types of bleeding encountered in wound care.

Bleeding characteristics may not always be clear-cut, particularly in community settings where NPWT canister inspection may be the primary means of assessment. Fresh blood in a canister that was previously collecting serous or serosanguinous fluid represents a clinically significant change irrespective of volume.

EXPERT CONSENSUS

After deep debridement to bone, bleeding may also originate from exposed cancellous or cortical bone surfaces. This "osseous" bleeding is often non-pulsatile but can be clinically significant and may require surgical haemostasis (e.g. electrocautery/ diathermy, topical haemostatic agents or return to theatre) if not controlled promptly.

EXPERT CONSENSUS

Any significant, unexplained change in the characteristics, colour or volume of wound exudate, particularly the presence of fresh blood in the canister or tubing, should trigger immediate clinical review. Clinicians should not wait for a scheduled visit if concerns arise between appointments.

HINTS AND TIPS

Adequate lighting during wound assessment is an important and frequently overlooked patient safety consideration. Poor lighting in a patient's home can lead to inaccurate assessment of exudate colour and characteristics.

Management of bleeding during NPWT

Bleeding can occur in any wound, with or without NPWT. It is not unique to NPWT, and clinicians should approach its management using standard principles of wound haemostasis, augmented by the specific considerations that apply when NPWT is in use.

The following five-step response should be followed whenever unexpected or significant bleeding is identified during NPWT **[Figure 2]**.

Table 3. Three main types of bleeding encountered in wound care.

Arterial	Venous	Capillary
Bright red	Dark red	Bright red
Pulsatile/spurting	Steady flow or heavy ooze	Slow, even ooze
High pressure, high volume	Moderate pressure	Low pressure, superficial
Rapid, difficult to control	Usually controllable with pressure	Usually self-limiting
Medical emergency	Apply firm pressure ≥5 minutes with no releases. Escalate if not controlled	Apply gentle pressure and monitor

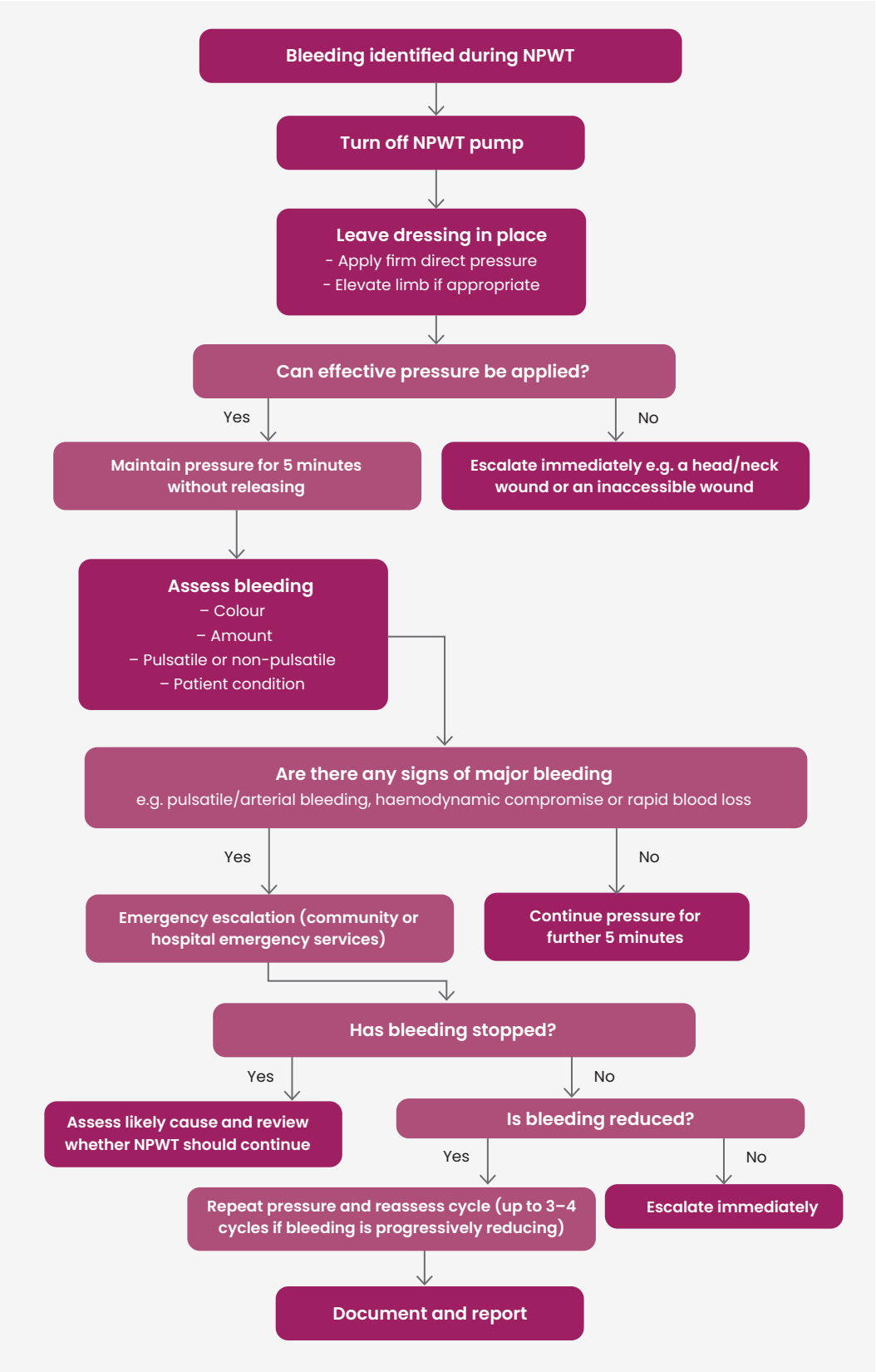


Figure 2. Suggested five-step response to bleeding identified during negative pressure wound therapy (NPWT).

EXPERT CONSENSUS

The immediate response to unexpected or significant bleeding during NPWT should follow a structured approach: turn off the pump, apply firm direct pressure, maintain pressure for at least 5 minutes, escalate if bleeding does not respond or the patient's condition is clearly deteriorating. The patient should never be left alone during active bleeding.

EXPERT CONSENSUS

NPWT should not be restarted following a significant bleeding episode until the source of bleeding has been identified, the responsible senior clinician has been informed, and an explicit clinical decision to continue has been made and documented.

The clotting cascade and time-to-haemostasis

Clinicians and patients should understand that effective haemostasis is not instantaneous. Haemostasis **[Figure 3]** is a coordinated physiological process that leads to cessation of bleeding from a blood vessel. It is a process that involves multiple interlinked steps.

This cascade culminates in the formation of a "platelet plug" that forms at the site of vascular injury and contributes to the control of bleeding. It begins with trauma to the lining of the blood vessel. The mechanism of haemostasis can be divided into four stages (LaPelusa and Dave, 2023):

1. Constriction of the blood vessel
2. Formation of a temporary "platelet plug"
3. Activation of the coagulation cascade
4. Formation of "fibrin plug" or final clot.

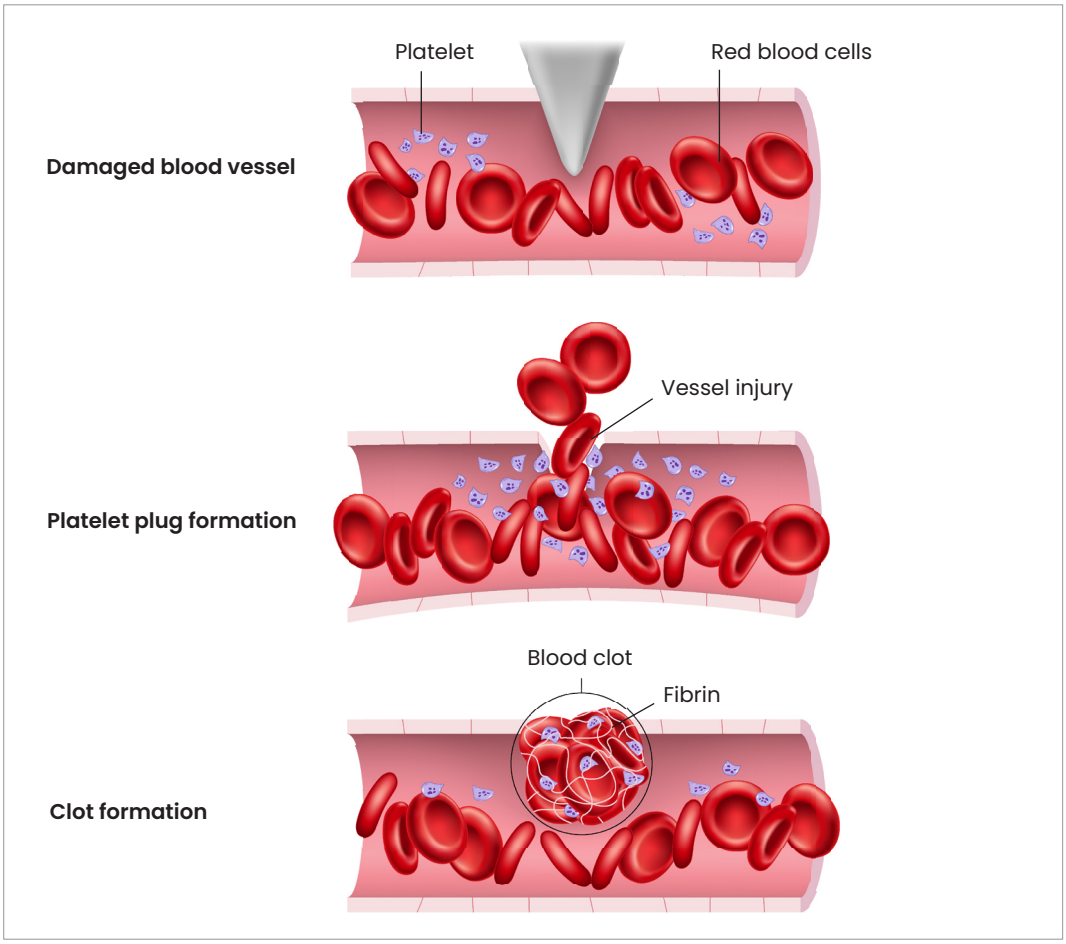


Figure 3. Coordinated physiological process of haemostasis.

In patients who are anticoagulated, have systemic disease affecting coagulation (such as liver disease, renal failure or haematological conditions) or are malnourished, this process may be impaired or prolonged. Nutritional deficiency, particularly of vitamins C and K, can also independently delay clot formation and tissue repair.

Applying sustained, uninterrupted pressure and allowing adequate time for the clotting mechanism to proceed is an active, evidence-based clinical intervention, not a passive one (Kiessling et al, 2011; Flanagan, 2013; Nursing and Midwifery Council, 2018). Releasing pressure prematurely to inspect the wound may disrupt clot formation, delay haemostasis and increase the risk of re-bleeding.

Escalation routes

Every patient receiving NPWT should have access to clear escalation pathways for the duration of their treatment. As a minimum standard, this should include:

- **For patients in hospital:** named responsible clinician and ward-based escalation procedure
- **For patients in the community or at home:** written information including when and how to contact a named clinical contact for non-emergency concerns, when to contact 111 for out-of-hours advice, and when to call 999 in the event of a medical emergency.

PATIENT EXPECTATIONS

If you need to contact emergency services or a clinical team about bleeding, try not to say only "I am bleeding." Giving a few extra details can help the team understand how urgent the situation is and decide what support is needed.

If you can, describe:

- The colour of the blood: is it bright red, dark red or mixed with something else?
- How the blood is coming out: is it steady, dripping, flowing or spurting/pulsing?
- How much blood there is: estimates are helpful, but it does not need to be exact. You could compare it to everyday amounts such as:
  - A few drops
  - About a teaspoon
  - About a tablespoon
  - Around an egg cupful
  - About a teacupful
  - Soaking through dressings or clothing.

HINTS AND TIPS

When assessing the canister, particularly in community or home settings, ensure the carry case is removed to allow a full and accurate view of canister fill level and exudate characteristics. Staff and patients have reported difficulty gauging canister volume when the device remains in its carry case, which can delay recognition of a problem that needs escalating.

Transfer and discharge with NPWT

Transitions between care settings represent some of the highest-risk moments in the NPWT pathway. Continuity of clinical knowledge, responsibility and monitoring capability can all be disrupted when a patient moves from one environment to another, whether from an acute ward to a step-down unit, from hospital to community nursing, or from a tertiary specialist centre to a local hospital. Each transition point requires deliberate reassessment, not an assumption that existing arrangements will continue to hold.

Two types of risk at transfer

It is important to distinguish between:

- **Wound risk:** the risk inherent to the patient's wound
- **Transfer risk:** the risk inherent to the transfer itself and the destination environment, including the receiving team's familiarity and experience with NPWT.

A high-risk wound in a well-resourced acute setting may be managed safely; the same wound managed by a community nurse visiting once a day may not carry the same safety profile. Both dimensions must be assessed.

Theatre to ward: a specific high-risk window

The transfer from theatre to a ward following debridement, particularly within the first 24 hours, is a recognised peak period for bleeding-related complications with NPWT. This risk is compounded when the receiving ward has limited experience managing NPWT. A patient debrided close to a major vessel (e.g. the femoral vessel) and returned to a ward without regular NPWT exposure carries a materially higher risk than the same patient transferred to a surgical ward familiar with NPWT.

Where debridement has occurred close to a major vessel or another high-risk anatomical site, this should be explicitly communicated at handover, with consideration given to the receiving ward's NPWT experience when deciding on the appropriate postoperative destination.

Mandatory MDT review prior to transfer or discharge

Before any patient is transferred or discharged while receiving NPWT, a structured handover should take place between the responsible clinical team and the receiving team — wherever possible via telephone or virtual communication. The patient (and carer, where relevant) should be included in discharge planning, with clear communication of the ongoing care plan, escalation pathways and contact details for clinical support.

The MDT review must confirm:

1. Whether NPWT remains clinically indicated and whether the current NPWT format is appropriate (e.g. transitioning from traditional NPWT to a single-patient-use system). If not, discontinue NPWT and transition to an appropriate alternative therapy
2. What risks are associated with the new care setting
3. What safety-netting measures are required to ensure the transition is safe
4. Whether the patient understands the risks and has provided informed consent to transfer with NPWT.

Risk assessment framework: Destination environment vs transfer process

Two distinct sets of risk factors should be assessed before any transfer or discharge — risk associated with where the patient is going, and risk associated with how they get there. Both should be reviewed at each transition of care **[Table 4]**.

Discharge checklist for patients discharged with NPWT

The following checklist **[Table 5]** should be completed before a patient is discharged home or to a non-acute setting with NPWT in use.

Handover requirements (critical safety component)

Comprehensive handover must be completed and documented prior to discharge, confirming:

- Wound assessment and description (location, size, tissue type, exudate)

Table 4. Key considerations for safe transfer of patients receiving NPWT between healthcare settings.	
Destination environment	**Transfer process**
Physical environment: Cleanliness, space for equipment, safe storage of devices, access to electricity	**Logistics:** Duration, timing and mode of transport
Patient capability: Understanding of device function, mobility, cognitive status, ability to recognise and report complications	**Clinical monitoring:** Support available during transit
Support network: Availability and reliability of informal carers, or formal care provision	**Contingency planning:** Plans in place for device malfunction, bleeding or clinical deterioration during transfer
Community services: Access to community nursing, response times, NPWT competency, consumable availability and switch-over mechanisms if the pump must change per local formulary	**Accountability:** Clear identification of the clinician/team responsible for the patient during transit
Follow-up arrangements: Understanding of escalation pathways and access to specialist review	**Receiving confirmation:** Receiving team has accepted the transfer and has equipment/expertise ready on arrival
	Device/consumable changes: Any changes required to align with local policies or formularies

Long-distance transfers (e.g. tertiary centre to a setting several hours away) carry additional risk from prolonged transit time and reduced capacity to intervene en route. Ambulance and transport staff may have limited NPWT experience. A documented escalation plan should be agreed before transfer, defining responsibilities, contact points, and actions in the event of bleeding, device failure or clinical deterioration.

- Dressing type, size and configuration (including foam/gauze type and number of pieces inserted/removed)
- Canister type and size
- NPWT device settings and mode of therapy
- Duration of NPWT to date and clinical responses
- A clear ongoing plan of care from the responsible clinician, including escalation criteria and a defined review or discontinuation schedule.

Patient and carer education

Every patient receiving NPWT, whether in hospital or at home, should receive clear, written information about their therapy. At a minimum, this should cover:

- What NPWT is and why it is being used
- The expected appearance and odour of wound fluid, and how this may change over time
- What to do if fresh blood is noticed in the canister or at the wound site
- How to turn the device off
- Contact details for a named clinical contact, with clear guidance for emergency and non-emergency situations (including when to contact 111 or 999 as appropriate)
- A clear instruction not to restart NPWT after turning it off due to bleeding — wait for clinical advice.

The consensus panel also recommended considering QR codes or direct links on patient information materials, giving real-time access to decision-making guidance and escalation pathways for both patients and clinicians.

Transfer and discharge with NPWT *(Continued)*

Table 5. Discharge checklist for patients discharged with NPWT.
To be completed before a patient is discharged home or to a non-acute setting with NPWT in use

Items to confirm	Confirmed
Wound assessment and description documented (location, size, tissue type, exudate)	☐
Dressing type, size and configuration documented (foam/gauze type, number of pieces inserted/removed)	☐
Canister type and size documented, including the date and time of the last canister change. Where possible, send the patient with an empty canister to minimise the risk of requiring a canister change during transfer or if delays occur	☐
NPWT device settings and mode of therapy documented	☐
Duration of NPWT to date and clinical response documented	☐
Ongoing plan of care confirmed, including escalation criteria and review/discontinuation schedule	☐
Patient/carer education completed	☐
Receiving team/community service has accepted the transfer	☐
Proximity of debridement/wound to a major vessel. Flag explicitly if the wound is within or adjacent to a high-risk anatomical site (e.g. femoral vessel)	☐
Receiving ward/team's experience and familiarity with NPWT. Consider an alternative destination if the receiving team has limited experience with NPWT, particularly within the first 24 hours following theatre	☐

EXPERT CONSENSUS

A structured MDT review should take place before any patient is transferred or discharged while receiving NPWT. The review should include reassessment of whether NPWT and the current delivery system remain clinically indicated, a holistic risk assessment of the receiving care setting, a safety-netting plan, and documentation of the patient's informed consent.

EXPERT CONSENSUS

Every patient discharged home or to a non-acute setting with NPWT in use must receive written information including emergency contact numbers, guidance on what to do if they notice fresh blood, and a clear instruction to turn off the device and seek clinical advice rather than restart it themselves.

Conclusion

NPWT remains an important intervention in modern wound care, with established benefits across a range of surgical and complex wound indications. However, as highlighted by NHS England patient safety data and the experiences of the expert panel, the safe use of NPWT depends not only on the device itself but on the quality of the clinical systems, decision-making and communication that surround its use.

This Consensus Document emphasises that bleeding complications associated with NPWT are rarely attributable to the NPWT device. Instead, patient harm most commonly arises from gaps in risk assessment, delayed escalation, inadequate monitoring, inconsistent training and failures during transitions of care. Improving patient safety therefore requires a systematic approach that combines clinical competence, multidisciplinary collaboration, structured risk assessment and clear accountability.

The expert panel advocates for the routine use of the VALID-N framework to support bleeding risk assessment at initiation and throughout the patient journey, alongside strengthened governance, education and escalation pathways across acute and community settings.

Ultimately, NPWT should be regarded in the same way as any high-risk clinical intervention and not avoided because risk exists, but used thoughtfully, competently and with appropriate safeguards in place. By embedding consistent assessment processes, improving communication and supporting both clinicians and patients with clear guidance, healthcare organisations can reduce avoidable harm while ensuring patients continue to benefit from NPWT where clinically appropriate.

References

Apelqvist J, Willy C, Fagerdahl AM (2017) EWMA Document: Negative Pressure Wound Therapy. *J Wound Care* 26(3)1-154

Arundel C, Mandefield L, Fairhurst C et al (2025) SWHSI-2 Trial Investigators. Negative pressure wound therapy versus usual care in patients with surgical wound healing by secondary intention in the UK (SWHSI-2): an open-label, multicentre, parallel-group, randomised controlled trial. *Lancet* 405(10490): 1689-1699

Chetter I, Arundel C, Bell K et al (2020) The epidemiology, management and impact of surgical wounds healing by secondary intention: a research programme including the SWHSI feasibility RCT. Southampton (UK): *NIHR Journals Library*

De Pellegrin L, Feltri P, Filardo G (2023) Effects of negative pressure wound therapy with instillation and dwell time (NPWTi-d) versus NPWT or standard of care in orthoplastic surgery: A systematic review and meta-analysis. *Int Wound J* 20(6): 2402-2413

Flanagan M (2013) Wound Healing and Skin Integrity: Principles and Practice. Chichester: Wiley-Blackwell

Groenen H, Jalalzadeh H, Buis DR et al (2023) Incisional negative pressure wound therapy for the prevention of surgical site infection: an up-to-date meta-analysis and trial sequential analysis. *EClinicalMedicine* 62: 102105

Healthcare Improvement Scotland (2019) Consensus statements to guide best practice on the use of Negative Pressure Wound Therapy (NPWT). Available at: https://shtg.scot/media/1850/negative-pressure-wound-therapy-npwt-supplement-shtg-adv-state-01-19-plastic-and-derm-and-vascular.pdf

Kiessling AH, Lehmann A, Isgro F, Moritz A (2011) Tremendous bleeding complication after vacuum-assisted sternal closure. *J Cardiothorac Surg* 6: 16

LaPelusa A, Dave HD (2023) Physiology, Hemostasis. [Updated 2023]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2026 Jan-. Available at: www.ncbi.nlm.nih.gov/books/NBK545263/

Nursing and Midwifery Council (2018) The Code: Professional Standards of Practice and Behaviour for Nurses, Midwives and Nursing Associates. London: *Nursing and Midwifery Council*. Available at: www.nmc.org.uk/code

Orgill DP, Manders EK, Sumpio BE et al (2009) The mechanisms of action of vacuum assisted closure: more to learn. *Surgery* 146(1): 40–51

Quacinella MA, Yong TM, Obremskey WT, Stinner DJ (2023) Negative pressure wound therapy: where are we in 2022? *OTA Int* 6(1): e247

Sheehan L, Smithson J, Carter K et al (2025) The Role of the Australian Community Pharmacist in Acute Wound Care. *Wounds APAC*

World Union of Wound Healing Societies (2019) Consensus Document. Wound exudate: effective assessment and management. *Wounds International*

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