

Protocol 6 · Ischaemic or borderline-perfusion wounds: low-pressure NPWT, and when not to use NPWT at all

Evidence position: **Guarded** · Source: NPWT Evidence Library, www.wondsortg.co.za/NPWT.html, content as at 2026-10-04

Indication

Ischaemic or borderline-perfusion wounds: low-pressure NPWT, and when not to use NPWT at all.

What this means

An ischaemic wound is one in tissue that is not getting enough blood. NPWT on an ischaemic wound can make it worse, because suction raises the pressure inside the tissue and reduces blood flow further. This protocol therefore has two halves: the red line (when NPWT must not be used), and the narrow case in which low-pressure NPWT can be used after the blood supply has been addressed or measured.

Why NPWT is used here

Three non-revascularisable critical-ischaemia foot wounds (skin perfusion pressure 20 to 30 mmHg) healed at 50 mmHg with no wound-edge necrosis. That is proof of concept for the lowest-effective-pressure approach, not a licence to skip revascularisation. A 24-member expert panel recommends avoiding higher pressures in wounds with reduced vascularity.

Patient selection

- First, grade perfusion. Grade 1 (no PAD): palpable pulses, ABPI 0.9 to 1.3, toe pressure 55 mmHg or more, TcPO₂ above 40 mmHg. Grade 2 (PAD without critical ischaemia): ABPI below 0.9 with ankle pressure above 50 mmHg, toe pressure above 30 mmHg, TcPO₂ 30 to 60 mmHg. Grade 3 (critical limb ischaemia): no palpable pulses, TcPO₂ below 30 mmHg.
- Grade 3: refer for revascularisation. NPWT is not indicated until that has been done or formally declined.
- Grade 2 after revascularisation, or grade 2 where a vascular surgeon has documented that the wound is healable: low-pressure NPWT may be used with close monitoring.
- Use the healability triage: healable (adequate supply, correctable cause), maintenance, or non-healable. NPWT belongs in the healable group.

For all NPWT

- The patient must be compliant and compos mentis: able to understand what the device does, keep the seal, protect the tubing and pump, report bleeding, pain or alarms, and attend or receive dressing changes.
- The patient's circle of care must be included: family, carers, home-nursing service or ward team, whoever will be present when the seal fails at night. Document who was told what and who is responsible for the device between visits.

Contraindications

Specific to this indication

- Unaddressed arterial impairment: restore perfusion first.
- Acute limb ischaemia.
- ABPI below 0.5 (general) or below 0.6 for a venous ulcer.

For all NPWT: do not apply if

- Active bleeding beyond capillary ooze. Stop it first; NPWT does not control bleeding.
- An uncorrected clotting disorder.
- An exposed vessel, graft, anastomosis, organ or nerve with no barrier between it and the foam.
- Dead tissue not yet debrided, untreated bone infection, or cancer in the wound bed.

Proceed with caution and record the decision

- Blood thinners: a caution, not a bar. Lowest effective pressure, barrier over any vessel, inspect at every change, record the decision.
- Pacemaker or defibrillator: the pump of the canister-free single-use device (PICO) holds a magnet. Keep it 10 to 15 cm from the device, away from the chest, and record where it sits.
- Fragile surrounding skin or adhesive allergy. Children: no NPWT system was cleared for them as at 2011; treat as a hard limit unless current labelling says otherwise.

Potential risks and side-effects

- Wound-edge necrosis and extension of the ischaemic area. This is the harm to watch for at every change.
- Masking: a wound under a dressing can deteriorate unseen. Do not extend the change interval in this group.
- Bleeding: the serious harm. All six deaths in the regulator's first two-year series, and nine of twelve overall, were bleeds in patients whose bleeding risk had been missed (12 deaths, 174 injuries).
- Skin blistering: about 3.5 times more likely than with an ordinary dressing (risk ratio 3.55, 95% CI 1.43 to 8.77).
- Pain at changes (pre-medicate; soak a stuck sponge with saline) and anxiety in the first days, which settles. Say so beforehand.

- Retained foam, the regulator's commonest injury: count every piece in and out, and never cut foam over the wound. Adhesive damage to skin.

Treatment protocol

Pressure	Minus 50 mmHg continuous to start. Minus 80 mmHg is the usual ceiling here; some consensus documents allow minus 60 to minus 80 for occlusive lesions.
Mode	Continuous only.
Interface	Black foam with PVA foam over any exposed structure. Avoid circumferential (all-round-the-limb) dressings: they produce the highest tissue pressures.
Change interval	Every 48 hours; do not extend.
Review	Perfusion and wound edge inspected at every change. Stop at the first sign of edge necrosis.

Step by step

1. Measure perfusion with a toe pressure or TcPO₂ and record the grade. Do not rely on ABPI alone in a diabetic patient.
2. Ask whether revascularisation is possible. If it is, do it first.
3. If proceeding: debride, protect exposed structures, apply foam without wrapping the limb, and set minus 50 mmHg continuous.
4. At every 48-hour change inspect the wound edge for dusky or black change. If present, stop NPWT and review perfusion.
5. Record the perfusion grade, the reasoning, and the review date in the notes and in any funding letter.

When to stop and call for help

- Fresh bleeding into the canister or dressing: pump off, pressure on, call the surgeon.
- New or rising pain, spreading redness, fever or a foul smell: review the same day.
- A seal that cannot be held for more than two hours.
- No progress at four weeks: stop and re-plan.

Outcome measures

- Wound-edge necrosis: present or absent at each change.
- Perfusion measurement before therapy and again if the wound deteriorates.
- Wound area change and time to closure or graft.
- Limb salvage.

What to document at every change

- Indication; which contraindications were checked and excluded.
- Pressure, mode, interface, and the number of foam pieces placed and removed.
- Wound length, width and depth, a dated photograph, exudate, any bleeding, and the pain score.
- The planned review date and the endpoint (closure, graft or flap).

A point worth knowing

Handled openly, this indication strengthens every other vascular NPWT request: it shows that the clinician knows where the limit is. Documenting the perfusion grade against these thresholds turns an assertion into a finding.

Funding note (South Africa)

ICD-10: I70.21 or I73.9 (lead). **PMB:** 915E via the underlying arterial disease; the letter must show perfusion was assessed.

References

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