

Protocol 17 · Venous leg ulcer: NPWT as bed preparation before grafting, under compression

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

Indication

Venous leg ulcer: NPWT as bed preparation before grafting, under compression.

Evidence position: Guarded. Not a primary treatment for venous ulcers (ESVS 2022; Cochrane). Consider it only where the ulcer has reduced by under 30 percent in 4 weeks of compression, and not below ABPI 0.6. One 60-patient trial, low certainty, so the evidence position is Guarded.

What this means

A venous leg ulcer is a chronic wound of the lower leg caused by high pressure in the leg veins. Compression is the treatment, together with treating the underlying veins. NPWT is an adjunct: it never displaces compression, and the vascular societies do not recommend it as routine primary therapy. Its one supported use is to prepare the ulcer bed for a skin graft in an ulcer that has failed to respond to properly applied compression, and then to hold the graft.

Why NPWT is used here

One randomised trial carries the indication: 60 hospitalised patients, NPWT before punch grafting. The bed was ready in 7 days versus 17, and complete healing came at 29 days versus 45. But recurrence at 12 months was 52 versus 42 percent (no different), and everyone healed eventually (proportion healed RR 1.00): NPWT changed the speed to a graftable bed, not whether the ulcer healed. Cochrane rates every outcome low certainty. Everything else is small series; in the one device trial the venous subgroup did not reach significance. No study shows any long-term benefit.

Patient selection

- An ulcer that has failed to shrink by 30 percent in four weeks of properly applied compression, with ABPI 0.8 to 1.2 documented (the usual prognostic threshold for compression failure).
- A defined surgical endpoint, punch or split-thickness grafting, with NPWT as the bed preparation and then the bolster.
- Superficial venous intervention considered first: long-term outcome depends on it, not on NPWT.
- The patient tolerates compression over the NPWT dressing and can attend for changes.

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

- ABPI below 0.6 (ESVS 2022: no sustained compression below ABPI 0.6, ankle pressure 60 mmHg or toe pressure 30 mmHg); mixed arterial-venous ulcer with unaddressed arterial disease (protocol 6).
- Compression over an extra-anatomic or superficially tunnelled arterial bypass at the site (ESVS 2022, Table 7).
- A long-standing ulcer not biopsied, or of uncertain cause (malignant change).
- Compression not yet optimised: NPWT is not the next step after inadequate compression.

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

- Pressure injury from tubing run under the compression bandage: bridge the tubing out above the wrap.
- In the one trial adverse events were 40 versus 23 percent (not significant), on 60 patients; the harm side is thinly measured.
- The numeric selection thresholds in circulation (over 40 square centimetres, over a year old, not below 12) carry no citation and must not be quoted to a scheme.
- 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 80 to minus 125 mmHg continuous for bed preparation, or a single-use device at its fixed minus 80 mmHg.
Compression	Retained and applied over the NPWT dressing; tubing bridged out above the bandage. Target at least 40 mmHg at the ankle by multilayer or inelastic bandage or adjustable garment (ESVS 2022, Class I A); full compression from ABPI 0.8; no sustained compression if ankle pressure is below 60 mmHg, toe pressure below 30 mmHg or ABPI below 0.6.
Interface	Black foam on the ulcer bed; non-adherent layer over the graft with PVA foam as bolster at minus 50 to minus 80 mmHg (protocol 12).
Change interval	Every 48 to 72 hours during bed preparation; bolster undisturbed 4 to 5 days.
Review	At four weeks against the grafting plan; if no graft is planned, stop.

Step by step

1. Document ABPI, the compression history, and the 4-week area change that justifies escalation.
2. Debride, apply foam, seal, then reapply compression over the dressing with the tubing bridged out above it.
3. Change every 48 to 72 hours until the bed is graftable (7 days in the trial); book the graft.
4. Graft, bolster at minus 50 to minus 80 mmHg for 4 to 5 days, then return to compression as the ongoing treatment.
5. Record recurrence at 12 months: the trial's recurrence did not differ.

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

- Days to a graftable bed; time to complete healing; graft take.
- Recurrence at 12 months (the outcome NPWT did not change).
- Pressure injury from tubing; seal failures under compression.
- Concordance with compression during and after therapy.

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

Long-term outcome in a venous ulcer depends on the venous intervention and concordance with compression, not on NPWT: the review says so itself. A request is supportable only as a bounded bed-preparation period before a dated graft, after compression has been shown to have failed by that threshold.

Funding note (South Africa)

ICD-10: I83.0 or I83.2 (varicose veins with ulcer) plus L97. **PMB:** Venous ulceration is not a PMB in its own right; fund via the underlying condition where one exists and confirm before quoting.

References

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