

Protocol 15 · Pressure injuries (stage 3 and 4): NPWT until surgical closure

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

Indication

Pressure injuries (stage 3 and 4): NPWT until surgical closure.

Evidence position: Guarded. The 2025 Japanese guideline gives a weak recommendation for stage 3 and 4 injuries until surgical closure. The randomised evidence is very low certainty on every outcome, so the evidence position is Guarded.

What this means

A pressure injury is damage to skin and deeper tissue over a bony prominence (sacrum, ischium, heel, trochanter) from sustained pressure, with or without shear. Stage 3 is full-thickness skin loss; stage 4 exposes bone, tendon or muscle. The treatment is off-loading, nutrition, moisture and continence control, debridement and, for a deep ulcer, flap closure. NPWT has one narrow role: to manage exudate, reduce dead space and prepare the bed of a stage 3 or 4 ulcer until surgical closure, in a patient in whom closure is planned.

Why NPWT is used here

The Cochrane review (8 trials, 327 patients, median trial 37 patients) rates every outcome very low certainty; the only usable healing analysis had 12 patients and one healed. No trial reported time to healing, infection, quality of life or recurrence. One guideline nonetheless endorses a narrow use, for stage 3 and 4 until surgical closure: the 2025 Japanese guideline, weak with very weak certainty (7 of 7 votes), on a meta-analysis that is itself null. The plain position: NPWT makes a deep ulcer manageable while a flap is arranged. It has not been shown to heal pressure injuries.

Patient selection

- Stage 3 or 4 pressure injury after debridement, with a planned surgical closure: the endpoint both guidelines attach the therapy to.
- The causes are being addressed: support surface and turning regime, nutrition, continence and moisture control, glycaemic and spasm control. NPWT on an ulcer that is still being lain on is a dressing on a cause.
- The wound has a mechanical reason for NPWT (high exudate, cavity, undermining, an exposed structure) and the request says so, rather than borrowing the diabetic-foot evidence.
- Heel ulcers: perfusion documented first (protocol 6). Spinal cord injury is an FDA-listed risk factor (sympathetic stimulation): monitor.

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

- An ulcer still under load.
- Untreated osteomyelitis of the underlying bone: common in stage 4; image and biopsy first.
- Dry eschar not yet debrided; malignant change (Marjolin's) in a long-standing ulcer; unaddressed ischaemia at a heel.

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

- Seal failure from incontinence in the natal cleft, leading to contamination and maceration; a faecal management system or diversion may be needed to hold a seal.
- Retained foam in a deep sacral or ischial cavity: count every piece, use the fewest pieces.
- Continuing past the point of purpose: if closure is not going to happen, NPWT is not a maintenance dressing.

- 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. No held source gives a setting specific to this indication; the standard range is carried by default.
Mode	Continuous for 48 hours; intermittent may follow once the bed is stable.
Interface	Black foam filling the cavity without packing; PVA (white) foam over exposed bone or tendon. Count and record every piece.
Change interval	Every 48 to 72 hours; 24 to 48 hours if infected. Instillation (protocol 11) where the bed needs cleansing before flap.
Review	At four weeks against the surgical plan. State the flap date at the start.

Step by step

1. Confirm off-loading, nutrition and continence plans are in place and written down. Confirm the flap plan and date.
2. Debride in theatre or at the bedside; image and biopsy bone if stage 4 or if osteomyelitis is suspected.
3. Fill the cavity with foam, protect exposed bone, seal with attention to the natal cleft, connect, confirm draw-down.
4. At each change: reconcile the piece count, photograph, measure depth and undermining, and reassess against the flap date.
5. Hand over to the reconstructive team when the bed is clean and granulating.

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 from first NPWT to flap closure (the endpoint), and whether closure happened.
- Wound volume and undermining at each change; osteomyelitis status.
- Seal failures and contamination events; retained foam reconciled at every change.
- Recurrence at the site after closure.

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

This library's own Cochrane page argued against creating this indication on present evidence, and it was created anyway because two guidelines endorse the narrow bridging use. That tension is stated on the page rather than hidden. A request for a bounded bed-preparation period before a dated flap is supportable; a request that claims healing is contradicted by the first review a scheme will read.

Funding note (South Africa)

ICD-10: L89.2 (stage 3) or L89.3 (stage 4), by site, plus the underlying condition. **PMB:** No pressure-injury code is recorded in this library; fund via the underlying condition and confirm before quoting.

References

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