

Protocol 3 · Closed-incision NPWT to prevent infection over a high-risk sutured wound

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

Indication

Closed-incision NPWT to prevent infection over a high-risk sutured wound.

What this means

Closed-incision NPWT (ciNPWT) is a small single-use suction dressing placed over a wound that has already been sutured closed. It is prevention, not treatment: the aim is to stop the incision from opening, collecting fluid (seroma) or becoming infected. It works only on the skin, the fat and the fascia. It cannot reach an anastomosis or an organ, so it does not prevent deep organ-space infection or a leaking bowel join.

Why NPWT is used here

The Cochrane review of 62 randomised trials (13,340 patients) found infection fell from 11.75 to 8.7 percent (risk ratio 0.73, moderate certainty). The largest synthesis, 85 trials and 16,980 patients, found the same (risk ratio 0.64). In the vascular groin the effect is larger: infection 10.8 versus 20.9 percent. But in a large abdominal pooling the benefit was absent when the control infection rate was below 20 percent and present only above it. The device works where the risk is high.

Patient selection

- A closed incision with a high risk of infection: the vascular groin, an obese sternotomy, re-operation through scar, a contaminated or emergency field, prolonged surgery, immunosuppression.
- Know what the baseline means: the vascular groin becomes infected in about 21 percent of cases when every wound is examined at a visit, but in 8.6 percent (3.8 percent deep) in the largest cohort, which counted only what its units had recorded. Quote the figure with its method; the device is justified where the examined risk is high, not for every groin.
- Best-supported sub-groups: BMI 25 or more (risk ratio 0.43, number needed to treat about 5) and diabetes (risk ratio 0.47, number needed to treat about 6). Both rest on only three trials.
- Emergency laparotomy: 15 studies show superficial and deep infection both cut by about 60 percent. Not for a low-risk wound: trials in lower-limb fractures, simple mastectomy and unselected groins were negative.

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

- Any bleeding from the incision: stop it first.
- Skin that is already damaged or blistered at the site.
- A wound that is not fully closed: an open defect needs open-wound NPWT, not this device.

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

- Blistering of the surrounding skin: risk ratio 3.55 (Cochrane) and 4.51 (the 85-trial synthesis). Roughly one extra patient blisters for every 18 treated.
- Device-related problems (seal failure, alarms, skin reaction): about one in 11 patients.
- Cochrane finds it probably does not reduce dehiscence (risk ratio 0.97). Do not promise that. In 2,035 caesareans the ordinary dressing was cheaper with no quality-of-life difference: cost-effectiveness depends on the risk of the wound.
- 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

Device	a foam-based canister device (Prevena, KCI/3M) or a canister-free single-use device (PICO, Smith and Nephew), applied in theatre at closure.
Pressure	Fixed by the device and not adjustable: minus 125 mmHg with the foam-based canister device (Prevena), minus 80 mmHg with the canister-free single-use device (PICO). Both are correct for their own device.
Mode	Continuous, set by the device.
Duration	Five to seven days, then remove. Do not re-apply routinely.
Pacemaker or defibrillator	pump of the canister-free single-use device (PICO) contains a magnet: keep it 10 to 15 cm from the device, secure it away from the chest, record where it sits.

Step by step

1. Confirm the wound is at high risk using stated criteria, not impression. Write the risk factors in the notes.
2. Do the cheap things first: antibiotics on time, skin preparation with drying time, careful closure. With all four basic measures done, one caesarean patient in five still had a complication: that residual risk is the target.
3. Apply the device in theatre over the closed incision with intact dry skin either side. Confirm it draws down before leaving theatre.
4. Leave for five to seven days. Check daily that the seal holds and the skin edge is not blistering.
5. Remove gently. Document the wound and any blister.

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

- Surgical site infection at 30 days, superficial and deep recorded separately, with the definition used.
- Skin blistering (yes or no, size).
- Seroma needing drainage, dehiscence, return to theatre.
- Days of wear achieved and reason for early removal, if any.
- Readmission within 30 days.

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

In one 11-trial comparison after caesarean section, the six trials at minus 80 mmHg improved infection outcomes and the five at minus 125 mmHg did not. The evidence does not favour the higher pressure. Because the pressure is a property of the device, the practical decision is which device to use, not which number to set.

Funding note (South Africa)

ICD-10: Code the disease being operated on (for example I70.20 or E11.5), not the dressing. **PMB:** Via the underlying disease; usually an elective (21-day) request.

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