

Protocol 2 · Groin wound breakdown or lymph leak after femoral artery surgery

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

Indication

Groin wound breakdown or lymph leak after femoral artery surgery.

What this means

The groin is the commonest place vascular surgeons open the femoral artery. The incision runs through lymph channels and sits in a moist skin fold, so groin wounds after arterial surgery become infected often: 21 percent in two cohorts that examined every wound at a visit, 8.6 percent in the largest cohort (1,337 groins), which counted only infections its units had recorded and whose authors say the true figure is higher; in South African series 7 to 21 percent by the same logic, with 17 percent after infra-inguinal bypass when a blinded observer graded every wound. The wound may open (dehiscence), become infected, or leak clear lymph fluid (lymphorrhoea). There are two quite different uses of NPWT here: open-wound NPWT for an established defect, and closed-incision NPWT applied over the sutured wound to prevent trouble (see protocol 3).

Why NPWT is used here

For an open groin wound, NPWT prepares the bed and manages fluid without disturbing the vessel repair beneath. Lymph leaks after femoral exposure stopped in a mean of 14 days with NPWT in one series after tying off the leak had failed. For prevention, ten randomised trials in 1,449 patients show closed-incision NPWT roughly halves infection (10.8 versus 20.9 percent), but only in groins already at high risk.

Patient selection

- Open-wound NPWT: a dehiscent, infected or leaking groin wound after endarterectomy, bypass inflow or arterial access, once any dead tissue has been removed.
- The femoral vessels or graft beneath must be either covered by tissue or protected by a barrier layer.
- Prevention (closed-incision): a high-risk groin only. Published risk factors: obesity (BMI 25 or more), diabetes, re-operation, a cut-down or patch closure rather than clean fascial closure, prolonged surgery. Trials in unselected low-risk 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

- Exposed femoral vessels or anastomosis with no barrier.
- Untreated arterial inflow disease: the wound will not heal whatever the dressing.
- A lymphatic fistula that needs ligation: suction is not a substitute for tying it off.

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

- Bleeding from the femoral repair beneath the wound. The regulator specifically lists groin wounds and leg grafts among the bleeding deaths.
- For closed-incision devices: blistering (risk ratio 3.55) and device-related adverse events (about 1 in 11 patients).
- 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

Open wound: pressure

Minus 50 to minus 100 mmHg continuous. Start with the lowest possible pressure that allows a seal and increase gradually; minus 100 is a ceiling.

Open wound: interface	Barrier over any exposed vessel (PVA foam or paraffin gauze); black foam elsewhere.
Open wound: change	Every 48 to 72 hours; look for bleeding at every change.
Closed incision: device	A single-use closed-incision device over the sutured line, applied in theatre at closure.
Closed incision: pressure	Fixed by the device: minus 125 mmHg with the foam-based canister device (Prevena), minus 80 mmHg with the canister-free single-use device (PICO). Neither is chosen by the surgeon. Name the device in any letter.
Closed incision: duration	Five to seven days, then remove. Both manufacturers specify seven days.

Step by step

1. Decide which mode applies: an open defect needs open-wound NPWT; an intact suture line at high risk needs a closed-incision device. They are not interchangeable.
2. Open wound: debride, confirm haemostasis, protect the vessel, apply foam, seal, set the lowest pressure that works.
3. Closed incision: apply the device in theatre over the closed line before the patient leaves, and leave it undisturbed for five to seven days unless it fails.
4. Record the device name and its own pressure.
5. Review the groin daily for bleeding, and at each change for lymph volume, redness and separation.

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, using a stated definition (CDC), and noting that 30 days captures only about half of all groin complications and a fifth of the major ones.
- Wound revision or return to theatre.
- Lymph leak volume per day and the date it stopped.
- Depth of any infection: superficial, deep, or involving the graft (Szilagyi grade). Prevention is proven only for the superficial layer.
- Length of stay and 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

This library's position changed in August 2026 after two randomised trials in the same journal disagreed: a five-centre trial in unselected groins was negative on every endpoint, while a single-centre trial restricted to high-risk groins was positive. The benefit of closed-incision NPWT scales with the baseline risk of the groin being dressed. It is justified for a defined high-risk group and is not supported as a routine dressing for every groin. Selecting patients is what makes the evidence apply.

Funding note (South Africa)

ICD-10: T81.3 or T81.4 (lead); I89.8 for lymph leak; pair with the arterial diagnosis. **PMB:** Via the underlying arterial disease (915E where gangrene or PVD is coded); 5-day or 48-hour decision depending on graft proximity.

References

1. Pleger SP, Nink N, Elzien M, Kunold A, Koshty A, Böning A. Reduction of groin wound complications in vascular surgery patients using closed incision negative pressure therapy (ciNPT): a prospective, randomised, single-institution study. *Int Wound J* 2018;15(1):75-83. doi:10.1111/iwj.12836
2. Labib M, Madera D, Andrade Rego R, Çetinel E, Frankowski Dagostin A, Olschewski P, et al. Closed incision negative-pressure wound therapy in inguinal arterial surgery — an updated meta-analysis with additional subgroup analysis for overweight and diabetic populations. *JVS-Vascular Insights* 2026;4:100383. doi:10.1016/j.jvsvi.2026.100383
3. Bertges DJ, Smith L, Scully RE, Wyers M, Eldrup-Jorgensen J, Suckow B, et al. A multicenter, prospective randomized trial of negative pressure wound therapy for infrainguinal revascularization with a groin incision. *Journal of Vascular Surgery* 2021;74(1):257-267.e1. doi:10.1016/j.jvs.2020.12.100
4. Kwon J, Staley C, McCullough M, Goss S, Arosemena M, Abai B, et al. A randomized clinical trial evaluating negative pressure therapy to decrease vascular groin incision complications. *Journal of Vascular Surgery* 2018;68(6):1744-1752. doi:10.1016/j.jvs.2018.05.224
5. Abai B, Zickler RW, Pappas PJ, Lal BK, Padberg FT Jr. Lymphorrhea responds to negative pressure wound therapy. *J Vasc Surg* 2007;45(3):610-613. doi:10.1016/j.jvs.2006.10.043
6. Turtiainen J, Hakala T, Hakkarainen T, Karhukorpi J. The Impact of Surgical Wound Bacterial Colonization on the Incidence of Surgical Site Infection After Lower Limb Vascular Surgery: A Prospective Observational Study. *Eur J Vasc Endovasc Surg* 2014;47(4):411-417. doi:10.1016/j.ejvs.2013.12.025
7. Audu CO, Columbo JA, Sun SJ, Perri JL, Goodney PP, Stone DH, et al. Variation in timing and type of groin wound complications highlights the need for uniform reporting standards. *J Vasc Surg* 2019;69(2):532-543. doi:10.1016/j.jvs.2018.05.221
8. Robbs JV, Reddy E, Ray R. Antibiotic Prophylaxis in Aortic and Peripheral Arterial Surgery in the Presence of Infected Extremity Lesions: Results of a Prospective Evaluation. *Drugs* 1988;35(Suppl 2):141-150. doi:10.2165/00003495-198800352-00030
9. Mulaudzi TV, Robbs JV, Paruk N, Pillay B, Madiba TE, Govindsamy V. The influence of diabetes on short-term outcome following a prosthetic above-the-knee femoro-popliteal bypass. *Cardiovasc J Afr* 2009;20(3):170-172.
10. Smit JGM, van Marle J. Repair of abdominal aortic aneurysms with aorto-uni-iliac stentgraft and femoro-femoral bypass. *S Afr J Surg* 2012;50(2):33-36.
11. Vascular and Endovascular Research Network. Groin wound infection after vascular exposure (GIVE) multicentre cohort study. *Int Wound J* 2021;18(2):164-175. doi:10.1111/iwj.13508
12. Antoniou GA, Onwuka CC, Antoniou SA, Russell D. Meta-analysis and trial sequential analysis of prophylactic negative pressure therapy for groin wounds in vascular surgery. *J Vasc Surg* 2019;70(5):1700-1710.e6. doi:10.1016/j.jvs.2019.01.083
13. Sorour AA, Kirksey L, Ambur V, Bena J. Surgical site complications after complex iliofemoral reconstruction and the role of negative pressure wound therapy: a retrospective, single-center study. *Wounds* 2022;34(4):E22-E28. doi:10.25270/wnds/2022.e22e28