

Protocol 10 · Open abdomen (laparostomy) and the dehisced abdominal wound

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

Indication

Open abdomen (laparostomy) and the dehisced abdominal wound.

What this means

An open abdomen is one that the surgeon has deliberately left unclosed after an emergency operation, because the swollen bowel cannot be closed without dangerous pressure inside the abdomen (abdominal compartment syndrome), or because a second look is planned. In vascular surgery it follows ruptured aneurysm and mesenteric ischaemia. NPWT is used as the temporary abdominal closure: a protective sheet lies over the bowel, foam sits above it, and suction removes fluid while keeping the abdominal wall under gentle traction so it can be closed later.

Why NPWT is used here

The World Society of the Abdominal Compartment Syndrome recommends NPWT as a temporary closure strategy with early fascial closure. No source here supports NPWT for the open abdomen at GRADE High or Moderate certainty, so the evidence position is Guarded. A meta-analysis of 1,225 patients found lower mortality with NPWT (28.5 versus 41.4 percent) and shorter ICU stay, and after aneurysm repair NPWT with mesh traction achieved primary fascial closure in 79 to 100 percent with no graft infection. The Cochrane review is the highest-quality synthesis and should be read before quoting any single series.

Patient selection

- An abdomen that cannot be closed safely after damage-control or emergency surgery, or that needs a planned re-look.
- A dehisced abdominal wound with an intact abdominal wall.
- The bowel can be protected by a visceral barrier layer and there is no unexplored fistula.
- The infected or septic open abdomen: instillation NPWT is an option, on observational evidence only.

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

- Foam placed directly on unprotected bowel: never. The visceral barrier layer is mandatory.
- An unexplored fistula, or a fistula that does not connect to the bowel.
- Uncontrolled bleeding in the abdomen.

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

- Enteroatmospheric fistula (bowel opening into the wound): the feared complication of any open abdomen. Two series at reduced pressure (45 patients) reported none, which is too few to give a rate but is reassuring.
- Loss of abdominal wall domain if closure is delayed: the longer the abdomen stays open, the harder it is to close.
- One cohort reported that more than seven dressing changes predicted death; those patients had NPWT for 58 days versus 12 and worse grades. The changes were a marker of severity, not the cause. Expect a funder to raise it.
- 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

System	A purpose-built open-abdomen NPWT kit with a fenestrated visceral protective layer, foam and drape.
Pressure	Minus 80 to minus 100 mmHg continuous over viscera (a South African trauma series used minus 80). Minus 125 mmHg is used in some kits; the lower setting is preferred over bowel.
Mode	Continuous.
Change interval	Every 48 to 72 hours, in theatre, each change being an attempt at fascial closure.
Duration	As short as possible. Aim for fascial closure within about a week; add mesh-mediated fascial traction where closure is delayed.

Step by step

1. In theatre: lay the visceral protective layer over the bowel, tucking it under the abdominal wall on all sides so no foam can touch bowel.
2. Place foam above the layer, between the fascial edges, without forcing it into the abdomen.
3. Seal, connect, set the pressure. Confirm draw-down and watch the canister for blood in the first hours.
4. At each 48 to 72 hour change in theatre: inspect the bowel, wash out, and attempt to bring the fascia closer. Record how far the edges are apart.
5. Close the fascia as soon as it can be done without tension. Record the day of closure.

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

- Primary fascial closure: achieved or not, and on which day. State the denominator (all patients, or survivors).
- Enteroatmospheric fistula: yes or no.
- Number of dressing changes and days open.
- In-hospital mortality, with the case mix stated.
- Incisional hernia at follow-up.

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

Reported mortality varies enormously with case selection: 4 percent in a selected series against 18.6 percent in an unselected one. Any number quoted must carry its patient group. A funding letter should present NPWT as the recommended temporary closure, not the only one: mesh closure is a documented alternative with its own results.

Funding note (South Africa)

ICD-10: T81.3 (lead); K65.9 for peritonitis; add the emergency condition code. **PMB:** Via the underlying abdominal emergency; 48-hour decision for the septic abdomen.

References

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