

# EFFECTIVENESS OF TRAUMATIC WOUNDS TREATMENT WITH NEGATIVE-PRESSURE WOUND THERAPY WITH INSTILLATION PRAGMATIC RANDOMIZED CONTROLLED TRIAL

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**Purpose.** Negative Pressure Wound Therapy (NPWT) has been associated with instillation (NPWTi) to provide cleaning cycles combined with vacuum therapy, avoiding constant dressings changes. NPWTi meets the treatment demands of wounds at risk infection. The aim of this study is to compare clinical results and direct costs of soft tissue traumatic wounds treatment submitted to three different coverings.



**Figure 1 / Group 1.** A male, 45 y-o, run over victim, presenting with a degloving injury. A) Initial presentation. B) Third debridement (9th day). C) Wound bed prepared after 5 debridements followed by gauze dressings (21st day). D) Skin graft result in the 30th postoperative day.



**Figure 2 / Group 2.** A male, 33 y-o, run over victim, presenting with a degloving injury. A) Initial presentation. B) NPWT placement. C) Wound aspect after 8 days. A gastrocnemius flap was performed. D) Skin graft view in the 7th postoperative day.



**Figure 3 / Group 3.** A male, 25 y-o, involved in a motorcycle accident, presenting with a degloving injury and open fibula fracture. A) Initial presentation. B) NPWT with instillation placement. C) Wound after 3 days. D) Skin graft view (3 months result).

**Methods.** Prospective, pragmatic randomized controlled trial evaluating adult patients with traumatic wounds. 120 patients with 131 wounds were randomized to standard of care, mainly with layers of gauze (n=41), conventional NPWT (n=46), and NPWTi (n=44). Negative pressure was set at -125 mmHg in continuous mode, applied for two hours in the NPWTi group, followed by normal saline instillation with 20 minutes of dwell time.

**Results.** Sample consisted of 120 patients from 139 screened for eligibility. The mean age was 37.3 (SD14.9; min16; max86) years, primarily male (78%) with low Charlson Index (0.36;SD 1.0). Wounds were mainly degloving injuries (57%) with a mean size of 192 cm<sup>2</sup> (min 13; max 1303), affecting predominantly lower extremities (85%), caused by vehicle accidents. There were no statistical differences between groups regarding baseline data. Wound time of closure (in days) was lower in the instillation group (9.2 NPWTi; 11.5 NPWT; 14.6 Layering; p=0.005), as well as the number of surgical procedures (2.9 NPWTi; 3.5 NPWT; 6.9 Layering; p<0.001). Length of stay (in days) was slightly lower in the NPWT group (25.1 NPWT; 27.8 NPWTi; 29.1 Layering; p=0.226). Costs (in \$USD) were higher in the Gauze group (\$5510 NPWTi; \$5,643 NPWT; \$7,162 Gauze; p=0.873).

**Conclusion.** Negative pressure with or without installation therapy was more effective and less costly than gauze therapy in treating complex traumatic wounds.