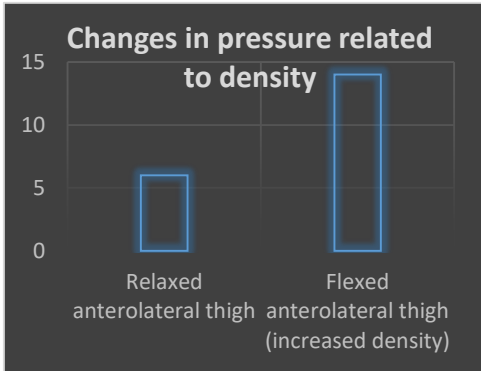


# Positive Pressure of Negative Pressure Wound Therapy

**Introduction :** Negative Wound Pressure Therapy is a common therapy used to promote healing in a wide range on acute and chronic wounds. Since the introduction of NWPT in 1995 there has been a steady increase in adoption and an ever increasing list of clinical applications described. NWPT is used extensively in the management of burns both for preparation of the debrided wound before grafting as well as splinting/stabilisation of the grafted burn. Recent articles have also reported the increasing use of NWPT over closed incisions. Negative wound pressure therapy applies suction via a tubing to the dressed wound and while the pressure at the microscopic level is negative compared to atmospheric pressure the macroscopic pressure of the dressing over a burn, closed skin or a closed incision is positive.

**Method :** We conducted a simple study to quantify the macroscopic positive pressure delivered via NWPT across a range of suction settings and for a range of commonly used dressings and interfaces. The NWPT dressing was first tested on a solid surface (stainless steel bench) to measure the pressure relationship of varying levels of suction and also the maximum levels of pressure. We used the Microlab PicoPress which is a validated sensor designed to measure pressure applied by pressure garments in the healthcare setting. The PicoPress sensor is 200microns thick, able to easily be placed under a NWPT dressing and accurate to 1mmHg of positive or negative pressure. The NWPT dressing device used for our study was the Renasys Touch (Smith&Nephew). We tested the pressure applied to a solid surface via the NWPT dressing from -25mmHg setting to -200mmHg and repeated all tests three times. We also tested the NWPT dressing on the anterolateral thigh of a healthy volunteer with 5 different commonly used NWPT dressings; single layer of black foam, single layer of black foam with a mepitel interface, double layer of black foam, 8 layers of kerlex and 16 layers of kerlex. We performed these tests with a relaxed and a flexed thigh muscles to record the influence of the density of the wound bed on the pressure applied.

**Results :** A linear relationship between the device setting and the positive pressure applied to the surface can be seen in Figure 1. The positive pressure applied ranges from 11mmHg positive pressure at a setting of -25mmHg to a maximum compression of 42mmHg at a setting of -200mmHg. All dressings combinations showed no appreciable variation in positive pressure delivered.



Results over the anterolateral thigh when the thigh muscles were flexed recorded higher positive pressures than when relaxed. The increased density of the wound bed showed an increase in pressure applied by the dressing.

**Discussion :** This simple study clearly documents that the macroscopic pressure applied during VAC application is positive. The macroscopic pressure applied by negative wound pressure therapy is dependent on the device setting but also the underlying surface or wound bed to which the dressing is applied.

