

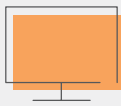
PICO[®] dressing is able to reduce lateral tension across a closed incision by 55%

Computer modelling and benchtop biomechanical testing were used to prove that PICO single use NPWT system resists the forces across a closed incision that may contribute to surgical site complications



Evidence

- Level 5 evidence
- Finite Element Analysis (FEA) computer model
- Bench top testing



FEA computer model

- Colour coded images from the computer model show that when PICO at -80 mm Hg is applied the closing force across the incision is increased
- The simulation shows that -80 mm Hg reduces the lateral tension on an individual suture from 1.31 N to 0.4 N
31% of the force
69% reduction in force



Bench top biomechanical testing

- A SynTissue synthetic skin tissue analogue and an external negative pressure pump were used to model the effect of PICO on a closed incision at different levels of negative pressure.
All experiments n=5
- The mean force required to stretch the incision by 8 mm at -80 mm Hg was 33.0 N
- At -40 mm Hg the mean force was 30.5 N and 35.0 N at -120 mm Hg suggesting that there was little extra benefit of the higher pressure in resisting lateral tension
- PICO reduces the tension across a closed incision as 55% more force would need to be applied for the same deformation effect.

S.M.A.* COMMENTS:

This publication describes studies conducted by Smith & Nephew in collaboration with external experts in FEA computer modelling and biomechanical testing.

With this paper PICO is shown to be able to act in the same way as the foam based Prevena™ device marketed by Acelyty Inc. which is described in the paper by Wilkes *et al.* (2012) Closed incision management with Negative Pressure Wound Therapy (CIM): biomechanics. *Surg Innov*;19(1):67–75.

The ability to reduce the lateral tension forces across a closed incision may help explain in part how NPWT is able to reduce surgical site complications and improve the quality of the scarring as shown in clinical studies.

Authors:	Loveluck J, Copeland T, Hill J, Hunt A, and Martin R ¹
Title:	Biomechanical Modeling of the Forces Applied to Closed Incisions During Single-Use Negative Pressure Wound Therapy
Aim of the study:	To determine the effects of PICO on reducing lateral tension and increasing the closing force upon the tissue edges in closed incisions
Study Type:	Computer modelling and benchtop testing with PICO
Wound Type:	Closed Surgical Incision
Speciality/Indication:	NPWT Mechanism of Action
Products:	PICO
Reference:	<i>Eplasty</i> (2016) Vol 16: 183-195. Article first published online 13 July 2016
Details:	Peer reviewed journal PubMed listed Free to download www.ncbi.nlm.nih.gov/pubmed/27555887

1. A Hunt and R Martin are Smith & Nephew employees

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