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# The level of pain experienced during therapy and dressing changes of gauze-based Negative Pressure Wound Therapy

## Introduction

Negative Pressure Wound Therapy (NPWT) is an increasingly used method of treating hard-to-heal wounds consisting of a negative pressure source and a wound filler material, commonly consisting of a porous polyurethane foam. Several reports have shown that tissue may be able to grow into the foam and its removal during dressing changes may be painful as a result. More recently however, gauze has been adopted as a wound filler for use in NPWT and is equally efficient at transmitting pressure to the wound bed<sup>1</sup>. Good clinical results have been reported using gauze-based NPWT on a range of wound types<sup>2</sup>. Anecdotally, less pain is reported when using gauze than when using foam as the wound filler. Key opinion leaders from around the world have emphasised the significance of minimising pain at wound dressing-related procedures<sup>3</sup>. Unresolved pain negatively affects wound healing and has an impact on quality of life and patient compliance with therapy. Although it may not be feasible to eliminate wound-related pain, it is usually possible to modify the pain the patient experiences. The null hypothesis of this study was that gauze-based NPWT may provide a means of reducing patient pain during NPWT. The aim was to assess the level of pain experienced during therapy and dressing changes of a gauze based NPWT system. Previous retrospective studies have reported pain at dressing removal and for up to 20 minutes following application of foam based NPWT when used in children that was managed using analgesia, distraction and sometimes anaesthetic techniques<sup>5</sup>.

## Method

A prospective, multi-centre evaluation of 152 patients in a variety of settings was conducted. A sub-analysis on a set of 57 patients in home, long-term or out-patient clinic settings and excluding in-patient hospital settings were assessed with chronic and acute wounds. Wounds were treated with gauze based NPWT according to the supplier's instructions for use.

A semi-quantitative scoring method was devised to measure pain. The need for analgesics was also monitored. Data was captured at every dressing change (up to a maximum of 10 changes per patient). Wound area and depth was also recorded and baseline wound dimensions were compared with dimensions at the end of therapy.

## Results

The majority of patients (n=57) experienced no pain during NPWT (93.6%) or during dressing removal (90.7%) as shown in Figure 1. 88.4% of patients described the therapy as comfortable and 14.2% as acceptable (Figure 2). Only 24.5% of these patients took analgesics, therefore masking of pain by wide use of analgesic did not entirely account for the low levels of pain experienced. No damage to the wound surface granulation tissue was observed in the majority of wound assessments (96.9%) with only minimal damage observed in the remainder. Overall, good wound progression was also observed (9.1% reduction in wound area and 10.3% reduction in depth per week of therapy) as shown in Figure 3.

## Discussion

Dressing removal has consistently been identified as the time when patients undergoing NPWT experience the most pain and this is often caused by trauma to the wound and surrounding tissues when dressings are removed. Correctly matching the parameters of a dressing to the status of the wound and surrounding tissues helps to manage pain, for example choice of a dressing that minimises pain in a wound which is very painful. A recently published prospective randomized study that compared gauze vs foam based negative pressure<sup>4</sup> reported that the median pain scores during and after dressing changes and the median requirements for pain medication required during and after dressing changes were significantly less in the gauze group. It is clear that factors affecting dressing choice must not only include appropriateness to the type and condition of the wound but also on compassionate grounds include an assessment of patient pain and matching of the therapy accordingly.

## Conclusion

In patients susceptible to pain, gauze-based negative pressure therapy may be of considerable benefit. Minimal pain during therapy and during dressing changes was reported. A principle reason for this may be that no damage to the granulating surface was observed in the majority of dressing changes. Recently published work has compared gauze to foam in relation to pain at application, during wear time and removal of NPWT and has found gauze to be significantly better when measuring this parameter.

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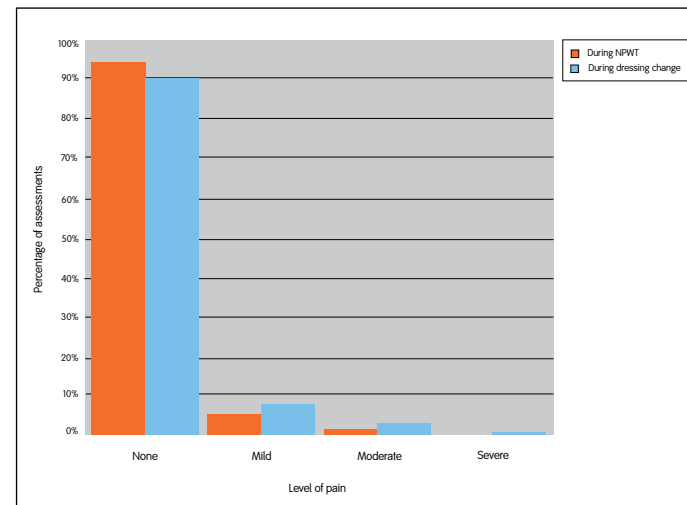


Figure 1 Pain experienced during NPWT and during dressing changes. The level of pain was reported by the patient at each assessment (n=57)

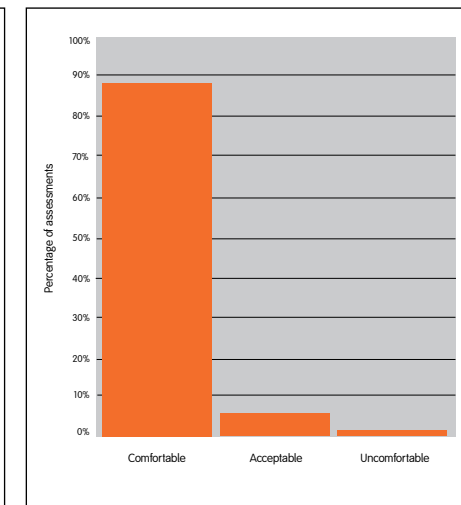


Figure 2. Patient comfort level during NPWT (n=57)

	% reduction over therapy	% reduction per week
Wound area	36.3	9.1
Wound depth	44.4	10.3

Figure 3. Wound progress during NPWT. Median percentage reduction in wound area and depth (n=57). Good wound progress towards healing was observed during the course of therapy.

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