

# Disposable Negative Pressure Wound Therapy Use in 16 Podiatry Clinic Patients with Chronic Wounds

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## Background

- Disposable mechanical negative pressure wound therapy (dNPWT\*) can be used to manage lower extremity wounds in the outpatient clinic.
- This small dNPWT device provides negative pressure while allowing the patient to maintain ambulation as the dNPWT device can be worn underneath clothing.

## Purpose

- We examined the use of dNPWT in 16 patients at a podiatry clinic and assessed wound healing and the development of granulation tissue.

## Methods

- This retrospective case series assessed the use of dNPWT followed by advanced wound dressings in 16 patients with chronic wounds.
- Patients were treated from October 31, 2019 to December 16, 2021.
- All patients received dNPWT treatment.
- dNPWT dressings were changed every 2-3 days.
- Standard of care dressings (SOC) or Oxidized regenerated cellulose (ORC)/collagen (C)/ ORC-silver dressings\* were utilized, if necessary, after dNPWT was discontinued.
- Demographics, baseline wound measurements, and subsequent wound visit data and treatments were recorded.
- The outcome measures included area, volume, duration of treatment, and healing status.

## Results

- The average age of the study patients was 59.6 years old at baseline and average body mass index (BMI) was 35.5 kg/m<sup>2</sup> (Table 1).
- Multiple comorbidities were present, including poor nutritional status, diabetes, hypertension, and coronary artery disease (Table 1).

## Results (Cont'd)

- Wound mix consisted of diabetic foot ulcers (DFU), surgical wounds, and pressure injury (PI) (Table 1).
- Approximately 50% of patients required amputation prior to wound treatment.
- Baseline wound characteristics included an average wound age of 15.6 weeks, average wound area of 5.46 cm<sup>2</sup>, and average wound volume of 3.32 cm<sup>3</sup>.
- The average time from presentation to end of dNPWT treatment was 45.5 days.

Table 1. Patient demographics

Characteristic	Study population (n=16)
Age (average years ± SD)	59.6 ± 8.9
Gender (n, %)	
Male	8 (50.0%)
Female	8 (50.0%)
BMI (average kg/m <sup>2</sup> ± SD)	35.5 ± 8.2
Comorbidities (n, %)	
Tobacco Use	10 (62.5%)
Current	3 (18.75%)
Former	7 (43.75%)
Poor Nutrition Status	16 (100%)
Diabetes	15 (93.75%)
Hypertension	14 (87.5%)
CAD	8 (50.0%)
PAD	4 (25.0%)
Autoimmune Disorder	3 (18.75%)
COPD	1 (6.25%)
Wound Type (n, %)	
Surgical	9 (56.25%)
DFU	6 (37.5%)
Pressure Injury	1 (6.25%)

CAD= Coronary artery disease; COPD= Chronic obstructive pulmonary disease; DFU= Diabetic foot ulcer; PAD= Peripheral arterial disease; SD= Standard deviation

- Table 2 shows the duration of treatment and number of days per application of product and SOC.
- A reduction in average area and volume was observed with dNPWT use (Figures 1-2).

## Results (Cont'd)

- Within the dNPWT treatment time frame, 81% of wounds showed an increase in granulation tissue amount, 69% showed wound area reduction, and 81% showed wound volume reduction.
- By the end of follow-up, 56% had healed wounds and 31% had wounds almost completely healed (Figure 3).
- Representative cases are shown in Figures 4-5.

Table 2. Duration of dNPWT and standard of care dressing use

Characteristic	Study population (n=16)
Total Treatment Length (average days ± SD)	128.6 ± 67.4
dNPWT Treatment Length (average days ± SD)	22.3 ± 12.4
dNPWT Office Visits (average n ± SD)	8.4 ± 5.0
Time between dNPWT dressing changes (average days ± SD)	3.1 ± 2.0
SOC Treatment Length (average days ± SD)	106.3 ± 67.0
Number of SOC Dressing Changes (average n ± SD)	11.3 ± 9.9
Time between SOC Dressing Changes (average days ± SD)	12.7 ± 6.6

SD= Standard deviation; SOC= standard of care dressings

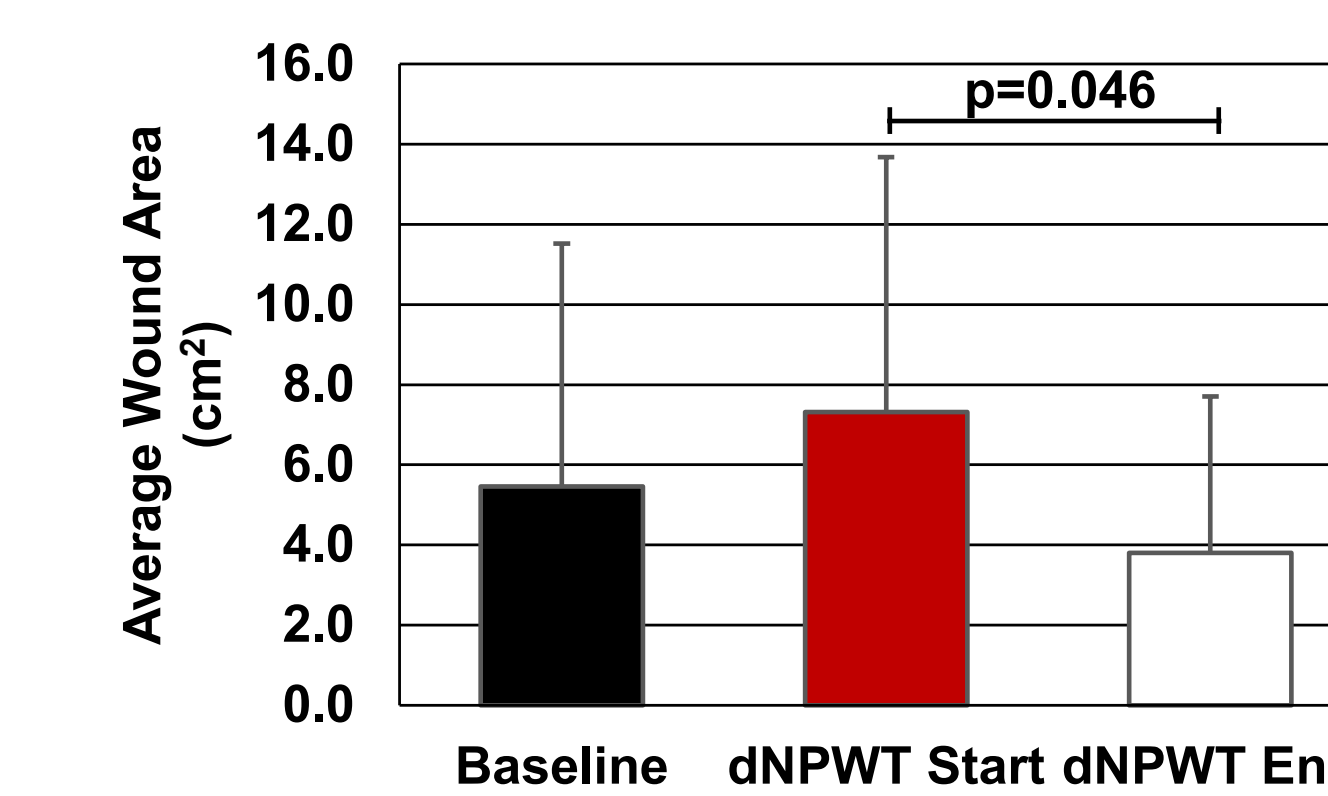


Figure 1. Average wound area reduction.

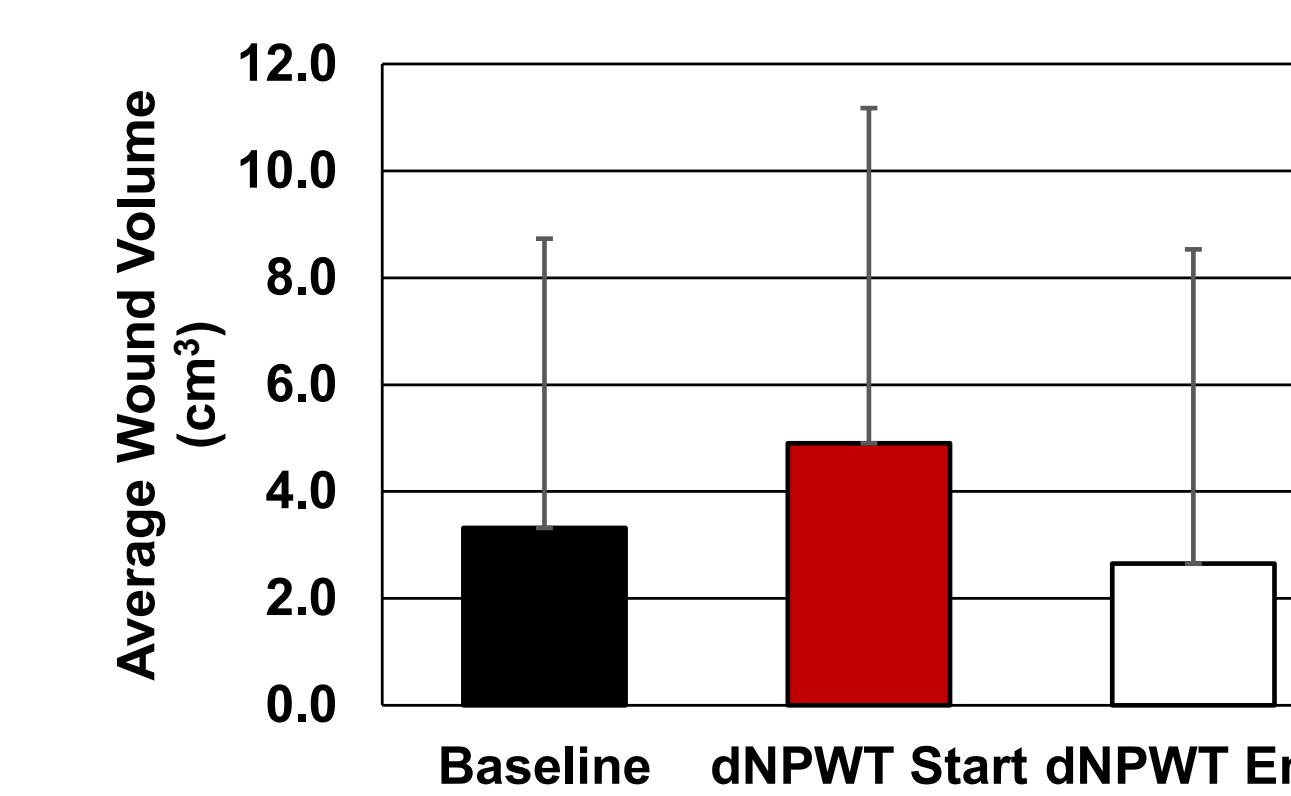


Figure 2. Average wound volume reduction.

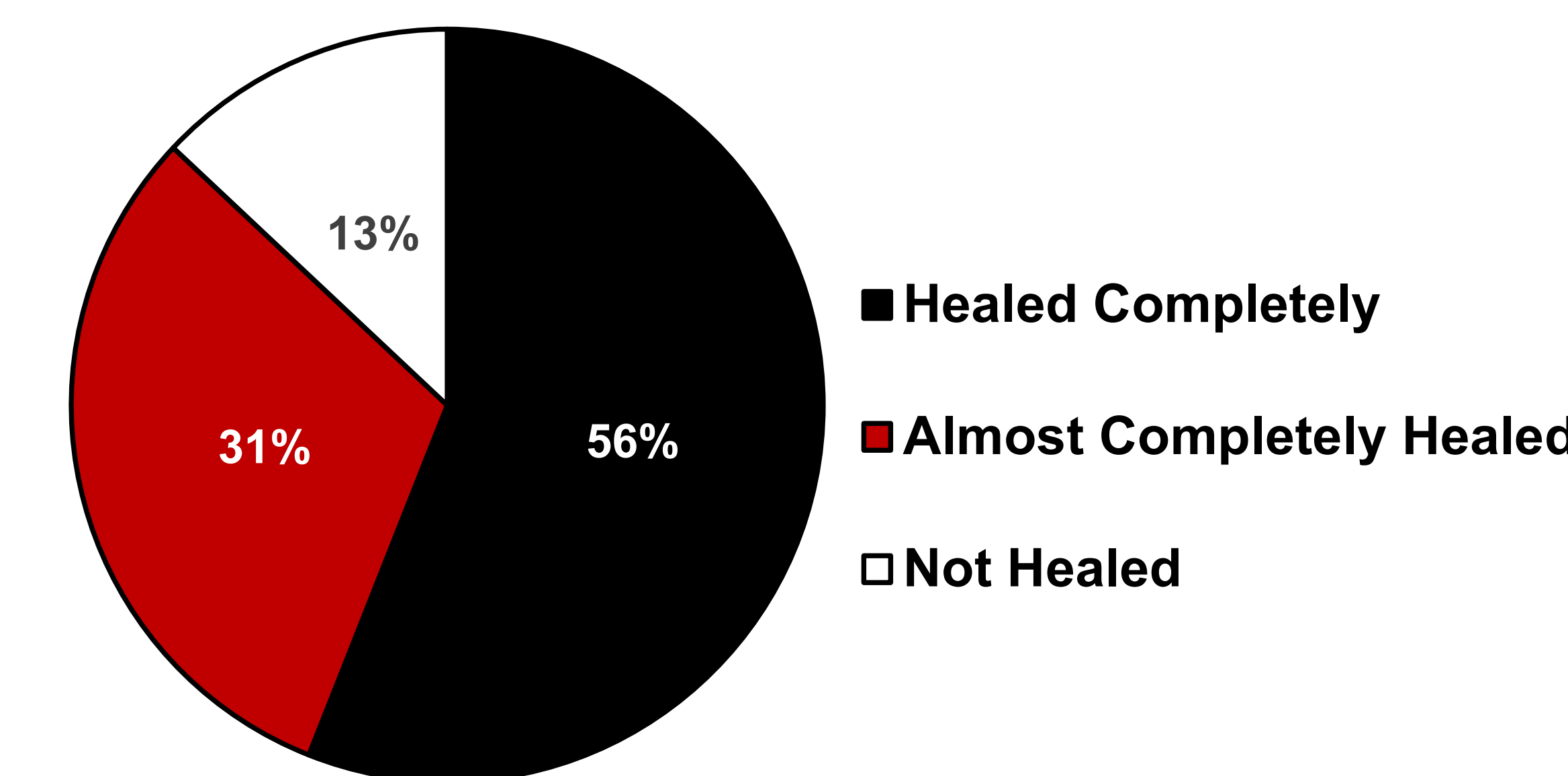


Figure 3. Wound outcomes

## Representative Cases

- **Surgical Wound.** Surgical wound following amputation. A hydrocolloid ring was applied during dNPWT application to help maintain a negative pressure seal. Wound care included dNPWT (21 days) and ORC/C/Silver-ORC dressings (28 days). The wound was fully healed 49 days after presentation.

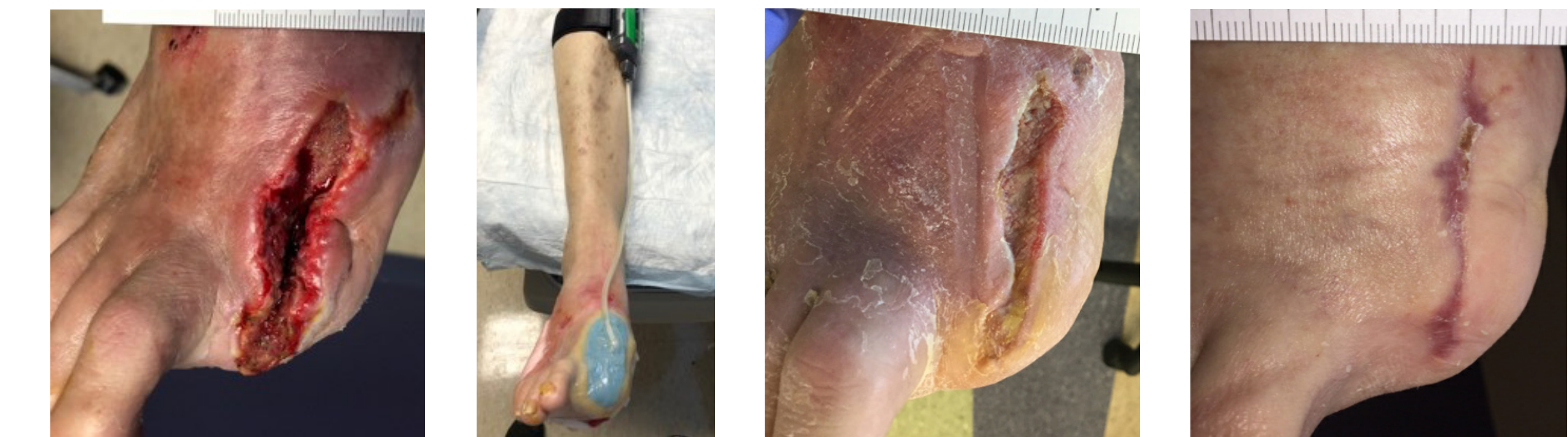


Figure 4A. Wound at presentation; Figure 4B. Application of dNPWT; Figure 4C. Wound after 21 days of dNPWT; Figure 4D. Wound fully healed 49 days after presentation

- **DFU.** Wagner Stage 2 DFU. A hydrocolloid ring was applied during dNPWT application to help maintain a negative pressure seal. Wound care included sharp debridement, dNPWT (28 days) and ORC/C/Silver-ORC dressings (21 days). The wound was fully healed 49 days after presentation.



Figure 5A. Wound at presentation; Figure 5B. Wound after sharp debridement; Figure 5C. Application of dNPWT; Figure 5D. Wound after 7 days of dNPWT; Figure 5E. Wound after 28 days of dNPWT

## Conclusions

- In this retrospective study, 14/16 patients displayed improvement in wound area, volume, and/or granulation tissue amount during dNPWT treatment.
- Most wounds (87%) were healed at, or shortly after, discontinuation of dNPWT.