

From traditional to single-use: the evolution of negative pressure wound therapy

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Introduction

The safety and efficacy of negative pressure wound therapy (NPWT) is well established¹. However, its evolution has created two separate categories: traditional and single-use devices. Traditional (t)NPWT is defined as filler with drape attached to a canister-based system; single-use (s)NPWT is defined as a dressing-based canister-less system². Each mode has unique properties that benefit wound management criteria, care settings and patients³. Although clinical guidelines³ and evidence support the use of sNPWT for open wounds with low to moderate exudate and a depth of up to 4.5 cm⁴, it is still widely under-utilized in clinical practice across all care settings. The aim of this analysis is to assess the proportion of wounds treated with tNPWT that could be amenable to sNPWT, thus determining fit-for-purpose treatment and device modality.

Methods

A de-identified dataset of 11027 patients with wounds treated with tNPWT* within outpatient wound clinics was purchased from a United States electronic medical record vendor†. The dataset captured treatment from 2006–2020. Once all wounds treated with the tNPWT device were identified, each patient was screened for inclusion and exclusion criteria (table 1). Descriptive statistics were reported.

Table 1: Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
1. Diagnosed as open wound with secondary intention healing.	1. Wounds healing by primary intention i.e. closed incisions and skin grafts.
2. There were wounds with 0 or diminutive lengths, so only wounds with lengths greater than the device-specific first quantile were included.	2. Missing data in the following fields: depth of wound and exudate volume of wound.
3. There were wounds with 0 or diminutive width, so only wounds with width greater than the device-specific first quantile.	3. Wounds with a depth of greater than 4.5 cm.
4. Complete data in the following fields: depth of wound and exudate volume of wound.	4. Wounds with length and width of greater than 25 cm.
5. Patient had at least two documented visits for treating the same wound.	5. Patient with single wound treatment visit.

Results

A total of 5040 wounds were included in the analysis. In total, 10 wound types were identified, with the most prevalent being surgical open wound (n=2268; 45%); pressure injury (PI) (n=1033; 20.5%); diabetic foot ulcer (DFU) (n=877; 17.4%). All commercially available dressing sizes (n=8) of the sNPWT[‡] device were included and applicability to the instruction for use were matched (Table 2). Overall, 3403 (68%) wounds would have been suitable to receive sNPWT instead of tNPWT at treatment commencement.

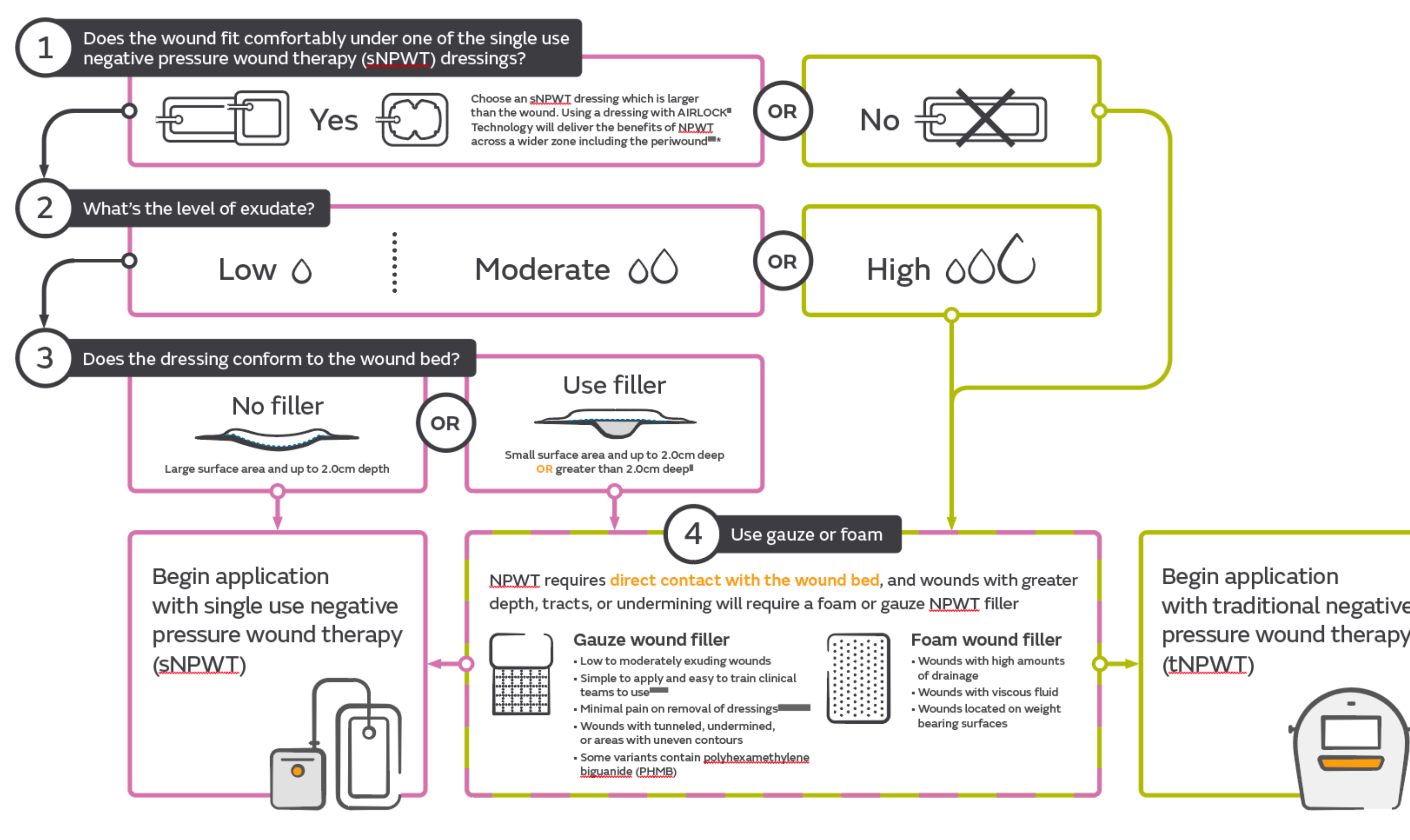
Table 2: Wound type and anatomical location of wound treated with tNPWT device (n=5040)

Characteristics	n (%)
Wound type	
Burn	10 (0.2%)
Dehiscence	43 (0.9%)
DFU	877 (17.4%)
Infected wound	127 (2.5%)
Malignant and fungating wounds	3 (0.1%)
Open wound	136 (2.7%)
PI	1,033 (20.5%)
Surgical open wound	2,268 (45.0%)
Trauma wound	281 (5.6%)
Venous	262 (5.2%)
Anatomical location	
Head	12 (0.2%)
Neck	12 (0.2%)
Upper extremities	96 (1.9%)
Lower extremities	2,604 (51.7%)
Torso	2,258 (44.8%)
Other	51 (1.0%)

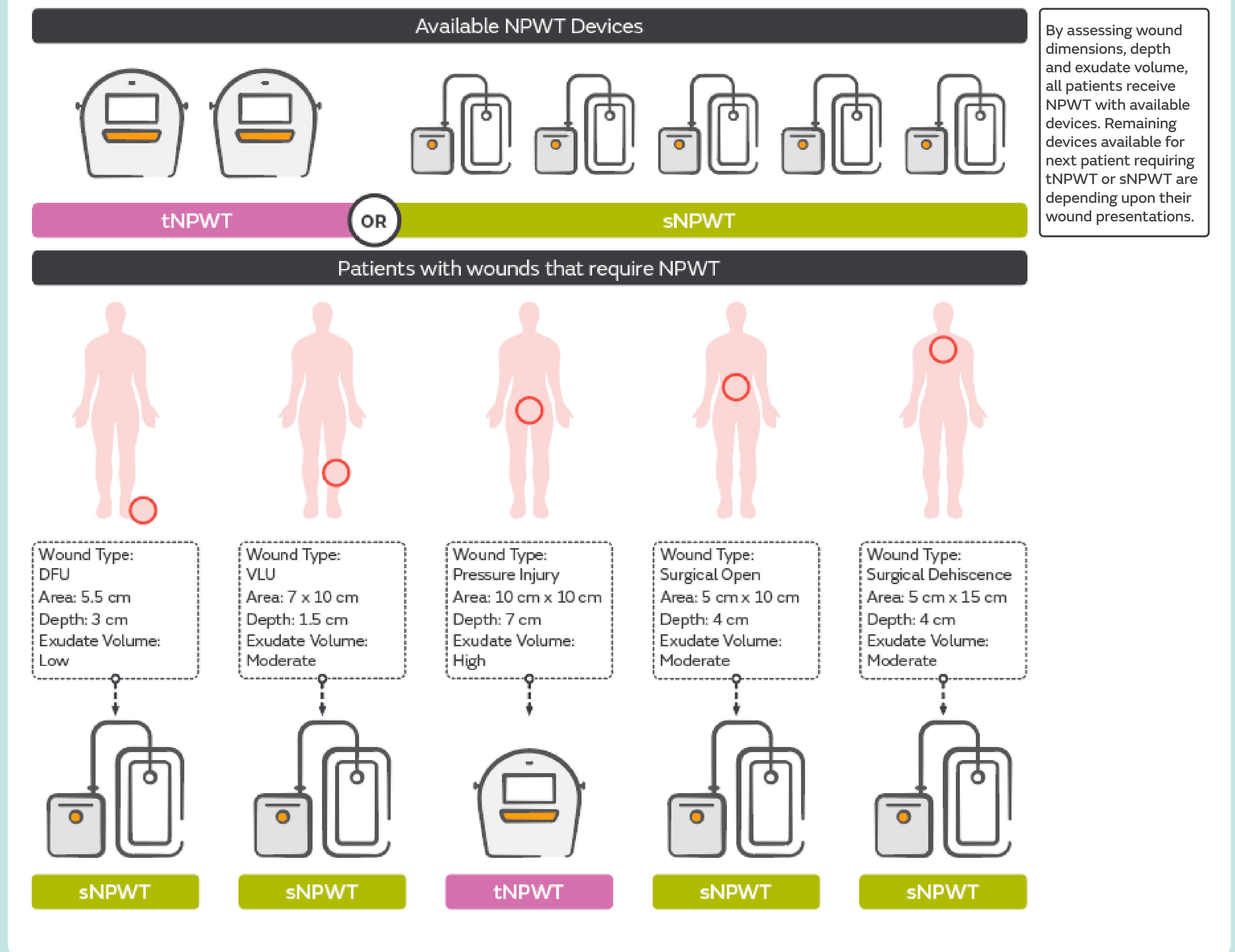
Discussion

Within healthcare systems resources are finite. Hospital systems do not have a never-ending supply of NPWT devices, making NPWT device choice important. sNPWT provides additional treatment options when resources are scarce. By assessing the wounds for NPWT device, a choice does not have to be made, as effective wound assessment enables tNPWT and sNPWT modes to be prescribed to the appropriate patients with the most suitable wounds, enabling effective treatment for all.

NPWT clinical decision tree for the treatment of open wounds³



Positioning of sNPWT and tNPWT devices by effective wound assessment



Conclusion

The evolution of NPWT from traditional canister-based systems to single-use cannister-less systems has enabled a multi factorial approach to wound management. This allows clinicians and patients the ability to choose the most appropriate NPWT modality for their wound. By effectively assessing a wound, the optimal NPWT device can be utilized.

*Solventum™ V.A.C.® Therapy, San Antonio, Texas, US

†Net Health®, Pittsburgh, PA, US

‡PICO® 7 Single Use Negative Pressure Wound Therapy System, Smith and Nephew, Hull, UK

References

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