

The Impact of a Unique New Disposable Negative Pressure Wound Therapy Device on Patient Tolerance of Therapy and Quality of Life

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Introduction

Negative pressure wound therapy (NPWT) has been shown to be effective in the management of wound exudate, formation of new granulation tissue and wound size reduction.¹ Clinicians have long learned to rely on the therapy for consistency in outcomes and a creative approach for almost all wound types with reassuringly predictive outcomes. The community dwelling patient or those requiring unencumbered mobility for physical or safety reasons have historically used smaller powered devices that while running on battery can be worn via a strap either on the shoulder or across the upper body. While this works for many, it can still be too restrictive in specific patient situations. New NPWT devices have emerged into the clinical arena with differences in pump styles and wound bed interface dressings providing options for different patient needs. Most recent options include non-electric, lightweight designs further freeing the patient of the need for power cords and the need to recharge on a daily basis.

One of these new options is an ultraportable device (SNaP® Wound Care System, Spiracur Inc., Sunnyvale, CA) utilizing specialized springs to generate preset continuous subatmospheric pressure. Because it requires neither power nor batteries it is entirely disposable.² The cartridges are available in 75, 100 and 125 mm Hg levels of negative pressure, are completely silent, and weigh only 3 ounces when empty. The cartridge holds 60 cc's of exudate and is approved for a twice weekly dressing change. There is a check valve to prevent reflux of exudate into the wound, and the cartridge is waterproof so does not require disconnection to shower. Another unique component to the system is the dressing material which is a very thin hydrocolloid enabling a rapid seal on many skin types and locations, is compatible with other pectin based products, and provides gentle peri-wound skin protection. The system uses Kerlix™ AMD™ gauze as the interface dressing. Dressing changes are simple and quick, and the quality of life improvement that has been shown in a recent randomized controlled clinical trial³ has been duplicated in our practice.

After close to a year of use we have found that the device has filled a void for a variety of patients who would benefit from NPWT but have either 1) failed our standard NPWT device, 2) have skin issues prohibiting the use of a film dressing material, 3) have lifestyle or employment issues prohibiting the use of even the smaller, powered devices, or 4) are under- or uninsured and either do not qualify or are waiting to qualify for a manufacturer's patient assistance program yet are ready to be discharged from the hospital.

The following five cases will demonstrate the impact that this novel device has had on the lives and activities of a sampling of the patients on whom we have utilized the therapy.

Discussion

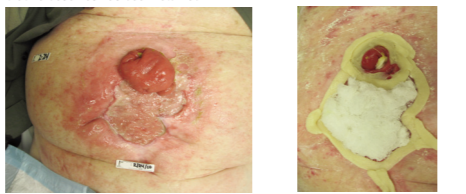
While not intended to replace our standard powered NPWT device, the SNaP® Wound Care System has proven to provide patients with lower-exuding wounds and special lifestyle, work or mobilization needs the ability to receive negative pressure wound therapy that otherwise would not benefit from this therapy. Currently only covered by a few private insurances and the VA System, it has still proven to be a cost effective option for facilitating earlier hospital discharge especially if the hospital system is planning to pay for the rental of a powered system. The most important and gratifying aspect of using this system has been the improvement in quality of life expressed by the patients who have had experience with it.

References

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- Armstrong D, Marston W, Reyzelman A, Kirsner R. Comparison of negative pressure wound therapy with an ultraportable mechanically powered device vs. traditional electrically powered device for the treatment of chronic lower extremity ulcers: a multicenter randomized-controlled trial. *Wound Rep Reg* (2011) 19, 173-180.

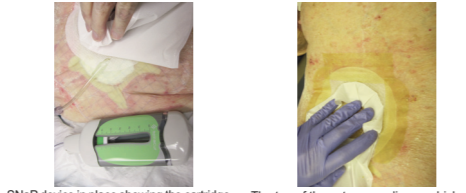
Case 1

This gentleman was our impetus for seeking an alternative device just over one year ago. 7 years ago, following coronary artery bypass surgery, he developed an ischemic bowel and had emergent surgery for bowel resection. He developed a postoperative anastomotic leak resulting in an open wound and ultimately transverse colon fistulae which have matured into what appears to be a large loop colostomy; but with stool coming from three areas of the large protuberant mucosa. At 87 years old, this 3 time Purple Heart recipient from WWII was relegated to staying at home, and had endured 6 years of daily home care visits to clean him and his clothing of wound exudate and stool, totally destroying his quality of life. His early visits to the clinic were with dark glasses on, head down, and very little conversation. Now one year later, after much early trial and error, utilizing the SNaP® Wound Care System we have his procedure down to twice weekly changes, the VA is providing the product, the dark glasses are off, and his wise and engaging personality has returned. His wound is slowly getting smaller, though just about 2.5 cm circumferential reductions in a year, even if he never completely heals, the quality of life and dignity that he deserves has been returned.

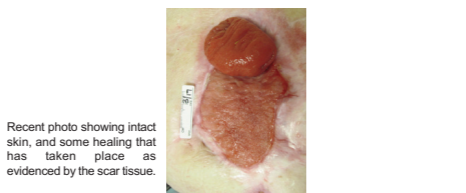


Appearance of wound and peri-wound skin at initial visit

After trial and error, we found that bordering the wound and bowel mucosa with pectin strips enabled us to get a secure seal because of the adhesion of the SNaP hydrocolloid dressing.



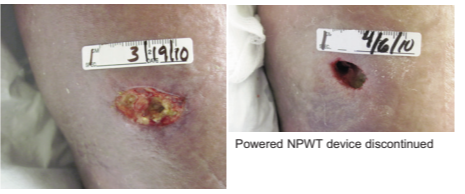
SNaP device in place showing the cartridge and placement of the ostomy appliance. The patient is able to discreetly slip the cartridge into his right pants pocket.



Recent photo showing intact skin, and some healing that has taken place as evidenced by the scar tissue.

Case 2

This was a 44 year old gentleman, morbidly obese, hypertensive, with 2 month history of deep (1.8 x 2.5 x 2.0 cm) ulcer to his upper posterior calf secondary to venous insufficiency. Because of the depth, following debridement our standard powered NPWT with foam dressing was initiated with twice weekly dressing and multi-layer wrap changes at the clinic. After 2.5 weeks of therapy, no change was appreciated in the wound depth, and when queried if he was utilizing the NPWT he admitted that he worked two jobs daily, Walt Disney World and a convenience store in order to support his family, and at neither location could he have the carry the device for appearance and safety reasons. We changed him over to the SNaP device which was able to be "snaked" up his leg, out the waistband of his pants, and into his pocket for discreet use. After one month of use the wound had minimal depth, the patient was fit with compression garments and independent dressing changes and returned one month later with his wound resolved.



Wound on initial presentation; once debrided was found to be 2 cm deep, powered NPWT initiated.

One week later, SNaP® Wound Care System initiated.

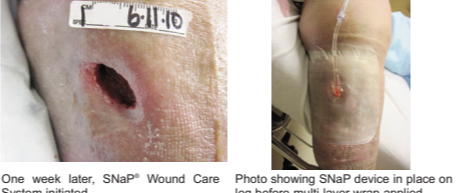


Photo showing SNaP device in place on leg before multi-layer wrap applied.



After 4 weeks, wound had minimal depth, SNaP device discontinued. Last visit, wound resolved.

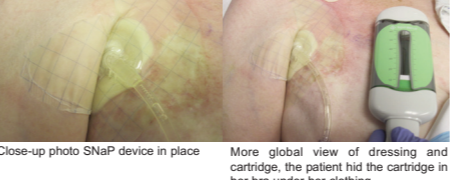
Case 3

74 year old very elegant female with past history significant for right breast cancer and mastectomy 28 years ago followed by aggressive radiation treatments resulting in chronic soft tissue and osteoradionecrosis leading to a completely destroyed right shoulder joint and total loss of the use of her right arm. Additionally, she had chronic right upper chest skin changes leading to extreme sensitivity to any type of adhesive products. She presented with a 3 month history of an abscess in her right axilla which probed down to bone and from which destroyed bone fragments were constantly being removed. A course of hyperbaric oxygen failed to demonstrate any improvement. Our standard NPWT device was not an option due to her fragile skin and use of only one shoulder and arm which limited her ability to carry a powered device. The wound was draining amounts requiring her to have dressing changes twice daily by home care due to her inability to lift her right arm independently. The SNaP system was initiated with the goal of improving her quality of life, and accomplishing wound debridement to reduce the wound bioburden and ultimately arrive at a management method that would likely be for life.



Initial wound appearance with evidence of moisture associated skin damage from wound exudate. Wound had been conservatively operatively debrided with significant moist slough remaining.

Initiation of SNaP® Wound Care System showing technique of use of pectin seal around wound and antimicrobial gauze packed to wound depth.



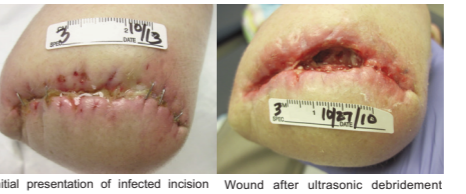
Close-up photo SNaP device in place. More global view of dressing and cartridge, the patient hid the cartridge in her bra under her clothing.



After 5 months of continuous therapy with twice weekly dressing changes, wound is cleaner with less drainage. Patient was hospitalized with complications related to a port, and at that time management was changed to a dressing regimen.

Case 4

60 year old female with hypertension, CAD, hyperlipidemia, and severe lower extremity arterial disease who underwent a left below knee amputation requiring a revision. Her initial presentation to the clinic revealed an incision with staples intact but clearly locally infected. Once the staples were removed and the wound exposed, NPWT was recommended to rapidly reduce peri-wound edema and improve the wound bed. The patient had previously used NPWT with success, but that was prior to her amputations, she opted not to use it as she lived alone, was in a wheelchair until she healed and could be fit for a prosthesis and felt that it would be too burdensome as well as a fall risk to have to try to independently mobilize and transfer with the device. We decided to utilize the SNaP® Wound Care System for a short time to hasten wound bed preparation for other advanced technologies.



Initial presentation of infected incision with staples present. Wound after ultrasonic debridement measuring 0.6 x 7.2 x 1.2 cm with undermining medially under the length of the incision.

Wound after 12 days of SNaP with undermining exposed, wound much cleaner, free of infection.



Wound clean, stable. SNaP discontinued to initiate treatment with active agents.



Packing and dressing in place with cartridge. Photo with patient sitting up. Small IV sized film dressings were placed at top edge of dressing to protect for patient to shower.

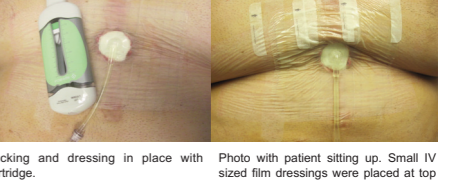
Case 5

42 year old morbidly obese gentleman with Type 2 diabetes, hypertension, hyperlipidemia and CAD with recent CABG with sternal wound dehiscence resulting in infected sternal wires. The patient is uninsured, so for initial wound our standard powered NPWT device was obtained through the manufacturer's patient assistance program. The wound closed leaving a narrow tract while the surgeons waited a length of time acceptable for the sternum to knit together. The patient was returned to surgery for the wires to be removed. While working with the manufacturer to resume the charity NPWT program, the SNaP® Wound Care System was initiated on the day of surgery so that he could be discharged from the hospital. While awaiting word on the charity program, the patient pleaded to be able to continue the disposable system as a result of the comfort, mobility and uninterrupted sleep he was experiencing with the SNaP device.



Pre-op photo prior to debridement and removal of the sternal wires. Post-operative wound which tracts down 7 cm to the sternum.

5.5 weeks after therapy initiated, SNaP device discontinued.



One month later, final visit, small area of wound still requiring epithelialization.

