

EFFICIENT AND ECONOMICAL SELF-ADAPTIVE DRESSING TECHNOLOGY for Management of Ulcers with Malodorous Heavy Drainage

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OBJECTIVE:

To evaluate the effectiveness of a novel self-adaptive advanced wound dressing* with respect to copious drainage management, wound odor, pain, management resource time, and peri-wound maceration in chronic venous leg ulcers.

BACKGROUND:

- Sequestering excess fluid from chronic wounds is critical in reducing inflammation, protecting surrounding skin against maceration, and maintaining an efficient moist wound healing environment.^{1,2}
- Yet, few dressings effectively control drainage in heavily exuding wounds, even with frequent dressing changes.³
- A self-adaptive wound dressing with high absorbency is recently available for treatment of wounds with heavy to copious drainage.^{4,5}
- The absorbent self-adaptive dressing is a synthetic polymer non-woven dressing with a microbial and strike-through barrier, designed to absorb and contain large amounts of exudate, including under compression.

METHODS:

- We retrospectively examined data records of patients with large, heavily/copiously draining venous insufficiency ulcers treated with the self-adaptive advanced wound dressing between November 1, 2012 and February 28, 2013.
- A single investigator applied similar treatment protocol to all ulcers:
 - Wound was debrided of all necrotic tissue, and culture-specific topical antibiotics were applied when appropriate.
 - Self-adaptive wound care dressing (10 x 10 or 15 x 15 cm) was placed over the wound, overlapping at least 2 to 3 cm onto intact skin. When more than one dressing was required, dressings were placed side by side and taped with cotton tape. Dressings were secured with a kerlix wrap or tape, elastic bandage, and self-adherent wrap for compression.
 - Dressings were changed daily initially, with a goal of reducing dressing change frequency to two to three times per week.
 - Patients were evaluated in clinic once per week or per two weeks.
 - Dressing leakage, dressing strike-through, change in wound size, pain, odor, drainage control, peri-wound maceration, dressing change frequency and debridement frequency were noted.
- Data was de-identified and extracted into a spreadsheet for analysis.

* Enluxtra Self-Adaptive Wound Dressing, OSNovation Systems, Inc., Santa Clara, CA, in cooperation with BASF www.AnyWound.com

CASE 1: HEAVILY DRAINING VENOUS ULCERS

71-year-old male with four heavily draining venous stasis ulcers on his right lower leg

A. Day 0.

Largest, right lower lateral venous insufficiency ulcer at presentation is slough-filled with raised, edematous wound edges. Drainage is copious, requiring twice daily dressing changes.



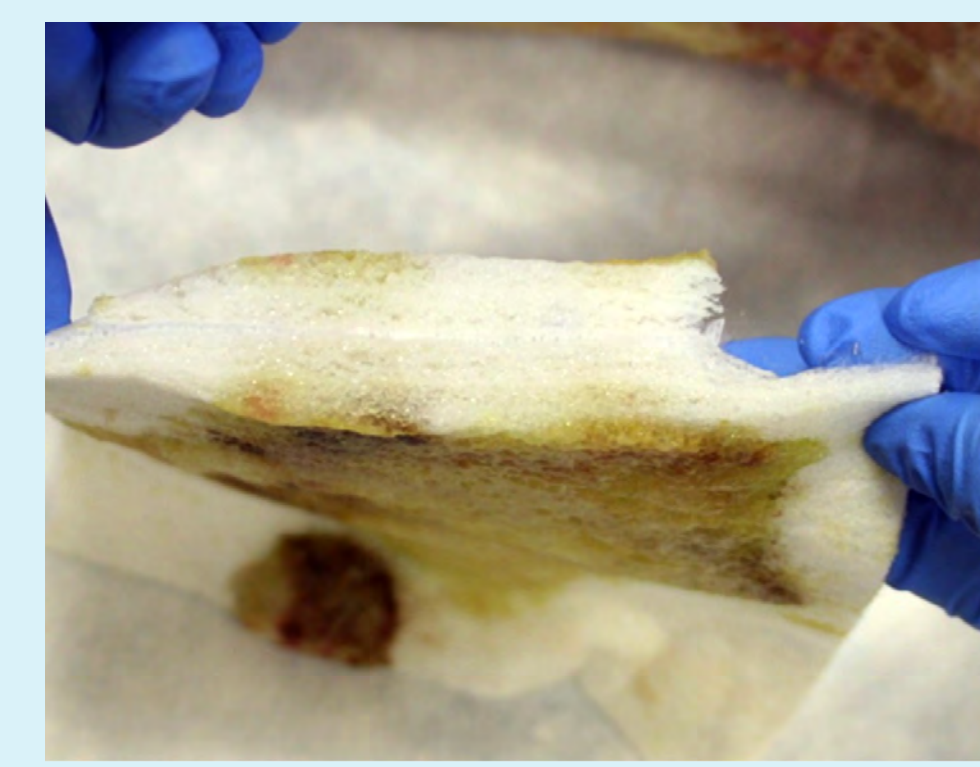
B. Day 2.

Self-adaptive dressings are taped together and applied to each ulcer.



C. Day 2.

Side view of self-adaptive wound dressing after removal. Fluid is wicked into dressing, which expands to absorb and contain fluid.



D. 1 Month.

After 1 month of self-adaptive dressings, slough is reduced to 10% and wound edges are flattened. Edema and drainage are considerably reduced. Peri-wound erythema is largely resolved, and each ulcer is granulating normally. Dressing change frequency is reduced to every four days.



E. 2 Months.

All ulcers are 100% granulated and re-epithelializing toward closure. Dressing changes are weekly.



F. 3 1/2 Months.

Re-epithelialization is nearly complete.



CASE 2: MULTIPLE COPIOUSLY DRAINING LEG ULCERS

59-year-old morbidly obese male with copiously draining venous sufficiency ulcers

A. Day 0.

Right and left lower lateral venous insufficiency ulcers at presentation are slough-filled with raised, edematous wound edges. Dressing changes required every 2-4 hours with traditional dressings due to copious drainage.



B. Day 21.

Wound edges are flattened and maceration is gone after three weeks of self-adaptive dressings. Dressing change frequency reduced to once per four days.



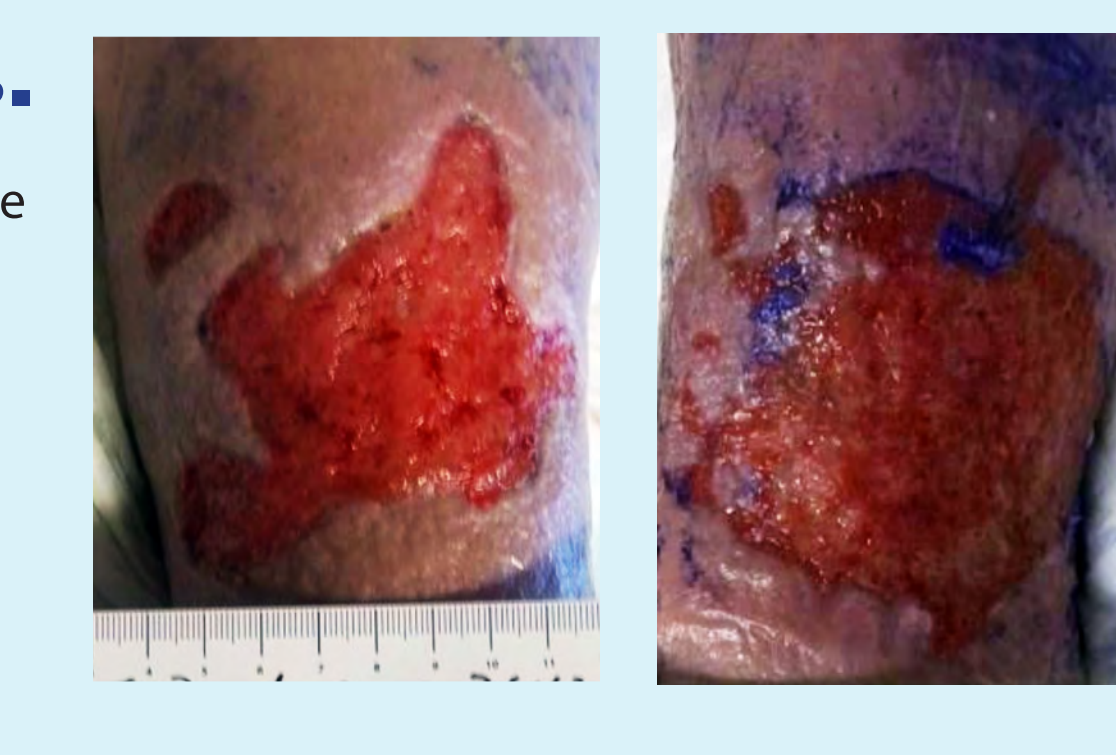
C. Day 30.

Wounds remain 100% granulated, showing healing progress at each dressing change.



D. 6 Weeks.

Wound dimensions are considerably smaller and edges are re-epithelializing toward center of the wounds.



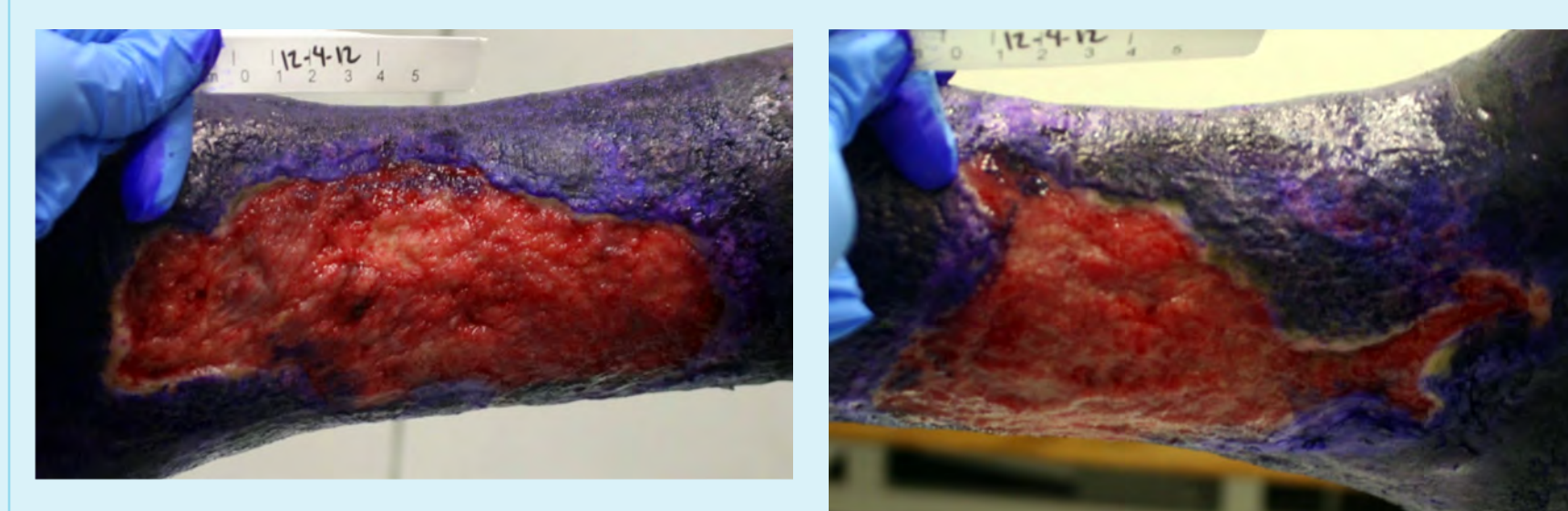
CASE 3: LARGE, CHRONIC VENOUS INSUFFICIENCY ULCERS

57-year-old male presented with bilateral heavily draining venous insufficiency ulcers that have been present for 20 years.



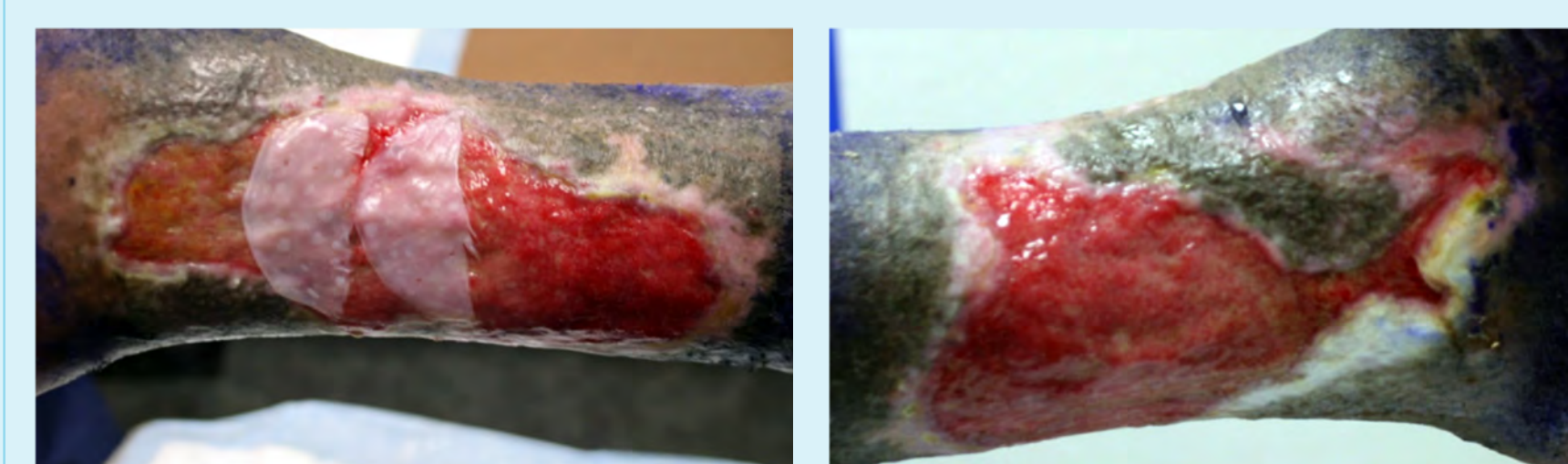
A. Presentation.

Heavily draining medial and lateral venous insufficiency ulcers on right lower leg, connected across posterior calf. Wound odor is foul with thick, yellow drainage. Wound and peri-wound areas are chronically inflamed with raised wound edges.



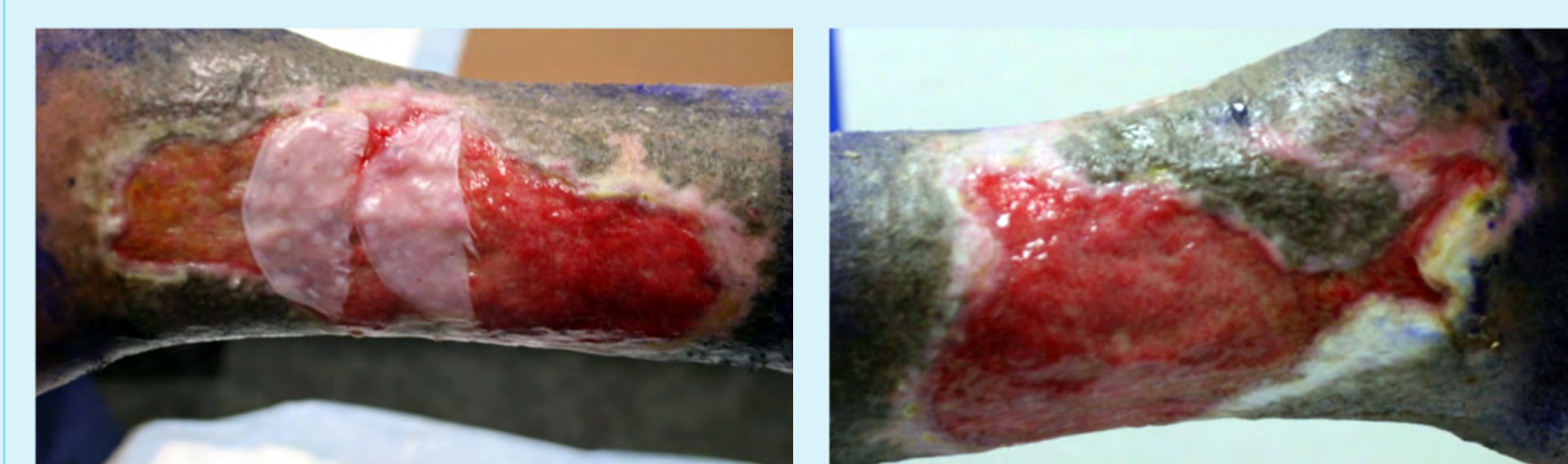
B. Day 0.

Self-adaptive dressing application. After three months of treatment with standard foam dressings and ABD pads with three-layer compression, ulcers remain heavily draining, foul smelling and painful (7/10). Self-adaptive advanced wound dressings are applied.



C. Day 14.

Wound edges are flattened and re-epithelializing. Wound odor is no longer detectable, and wound-related pain is reduced to 2/10, significantly lowering the narcotic requirement for the patient. Medial ulcer (left) receives a bi-layered bioengineered skin substitute.



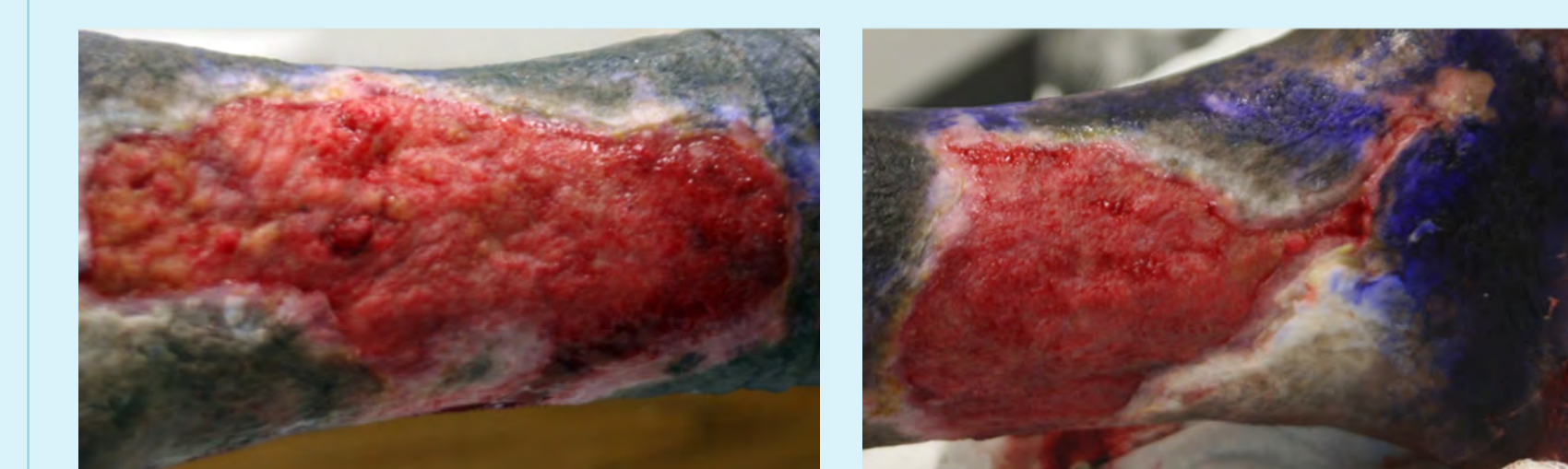
D. Day 18.

Wound-side layer of self-adaptive dressing after removal. Dressing has strike-through barrier, contains exudate and does not leak between twice weekly dressing changes.



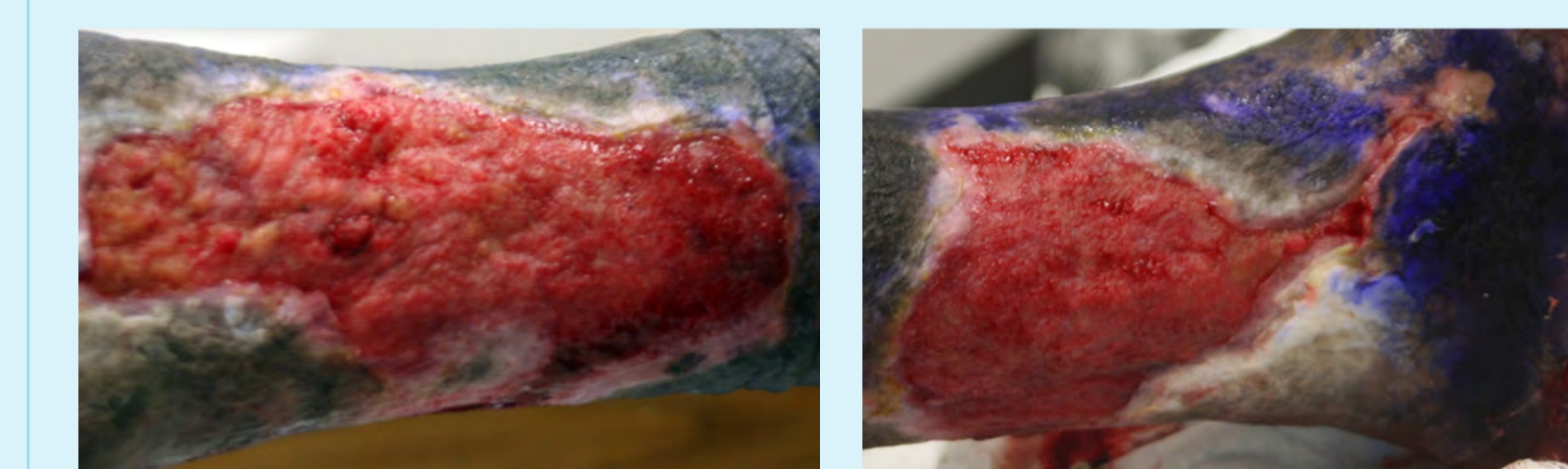
E. 6 weeks.

Patient has been out of town for three weeks, during which time the wound was treated with wet-to-dry gauze and non-adherent dressings. Wound-related pain and odor, as well as slough have returned, as pictured. Self-adaptive dressings are resumed.



F. 10 Weeks.

One month following treatment resumption with self-adaptive dressings, slough is no longer present and ulcers are 100% granulated and re-epithelializing toward closure. Odor is not detectable and wound-related pain is 0/10; patient requires no pain medication.



RESULTS:

- 6 patients with 15 ulcers were evaluated
- All patients were male; average age was 65 years old (range: 57 to 78 years).
- Use of the self-adaptive wound dressing in heavily or copiously draining wounds reduced dressing change frequency from an average of once per 17.5 hours to twice weekly.
- Average wound-related pain prior to start of self-adaptive dressings was 7/10. In all patients, pain during use of self-adaptive wound dressings was reduced to 0/10 in an average time of 14 days.
- All wounds had foul odor prior to start of self-adaptive wound dressings. Within an average of 7 to 10 days of self-adaptive dressing use, foul odor was not present in any of the wounds.
- The dressings effectively controlled drainage throughout treatment and did not express fluid under compression.
- When applied with proper overlap onto intact skin, dressings remained securely in place with no leakage at each dressing change.
- Study patients reported high satisfaction with dressing based on comfort attributes, including non-traumatic dressing changes, reduced wound-related pain, and low dressing change frequency.
- Previously macerated wound edges were resolved in 7 to 10 days and remained healthy throughout treatment.
- Self-adaptive wound dressings decreased inflammation and wound dimensions in all cases.

CONCLUSIONS:

- Use of self-adaptive dressing technology may aid in transitioning heavily draining wounds stalled in the inflammatory phase of wound healing toward a positive wound healing trajectory.
- Self-adaptive dressings are effective in absorbing and retaining exudate (no sideways spread) for multiple days, even in large, copiously draining wounds.
- Use of self-adaptive dressing reduces pain and malodor, provides effective control of wound drainage and therefore significantly improves quality of life for patients.
- Reduction in dressing change frequency achieved with this dressing results in reduced materials usage, nursing labor costs, and patient morbidity.
- In our opinion, the new self-adaptive dressing satisfies the vast majority of patient and wound requirements and can be used in lieu of a wide array of wound care products to simplify wound care in large, copiously draining wounds.

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