NON-DUG PAIN CONTROL AND ACCELERATION OF GRANULATION AND EPITHELIALIZATION with Novel Self-Adaptive Dressing Technology

**OBJECTIVE**
To evaluate the effectiveness of a new non-drug, self-adaptive wound dressing technology with respect to slough removal, pain control, granulation tissue formation, re-epithelialization rates, and simplicity in acute and chronic wounds.

**BACKGROUND**
- Although uncontrolled pain is known to negatively affect wound healing and impact quality of life, pain remains a common experience among people with wounds [1].
- Wound pain is frequently, often intermittent, causes that may relate to the wound itself, ant-microbial, and surgical pathology [2].
- Although wound pain is multi-dimensional, it is a common indicator of inflammation and stalled wound healing [3].
- Dressings that actively reduce inflammation and edema, control biofilm, and involve non-trauma treatment may be instrumental in reducing pain and accelerating wound healing [7].
- Selection of appropriate dressings that minimize wound-related pain should be based on comfort, moisture balance, healing potential and maintenance of healthy periwound edges [3].
- A synthetic polymer self-adaptive dressing is recently available through the simultaneous absorption of fluid and release of water vapor [4].
- We evaluated the ability of the new self-adaptive advanced wound dressing to affect wound-related pain, comfort, moisture balance, granulation tissue and epithelialization rates, and maintenance of healthy periwound edges of acute and chronic wounds.

**METHODS**
- With patient consent, consecutive acute and chronic wounds, regardless of etiology or amount of exudate, were prospectively evaluated.
- Wounds were sharply debrided prior to initial dressing application, except in patients who were receiving post-anticoagulation therapy. and debridged at dressing changes as necessary.
- Topical gram stain was applied to the wound prior to the self-adaptive wound dressing in cases of suspected wound colonization.
- The self-adaptive wound dressing (width 8.0 x 10.0 x 0.3 cm) was placed over the wound, overlapping 2.0 x 2.5 cm into intact skin. When more than one dressing was required, dressings were placed side by side and taped with adhesive tape. Dressings were secured with a sterile wrap or adhesive tape.
- Dressings were changed over the 2-3 days, and weekly thereafter for 6 weeks or until the wound was fully epithelialized, whichever occurred first.

**RESULTS**
- The self-adaptive wound dressing was evaluated in eight patients (4 female) with 8 wounds. Average age was 66.8 years old (range: 34 to 92 years).
- Four wounds were acute and three were chronic. Chronic wound dressing included one (n=1), venous wound (n=1) and non-healing skin secondary to trauma (n=2). Average duration of chronic wounds prior to self-adaptive dressing initiation was 444.5 days (range: 30 to 912.5 days).
- Patients reported average healed pain of 3.0 (range, 0 to 9) on a 0-10 scale prior to first dressing application. Following dressing initiation, all patients reported pain of 0 within an average of 6-9 days.
- Average granulation tissue coverage was 40.0% on dressing initiation. In one wound, 100% granulation tissue coverage was not achieved. Mean time to 100% granulation tissue coverage in the remaining wounds was 15.6 days.
- Four of the 8 wounds healed, mean time to full epithelialization was 15.8 days. One wound received a living, bi-layered skin substitute at 6 weeks and was healed one week later. Two wounds were 100% granulated and decreased in dimension by 75% at 6 weeks. The remaining wound did not progress due to issues of patient non-compliance.
- Right intractation was observed in one wound, which resolved after care work. In a second wound with heavy wound drainage, the abscess developed a small amount of wound drainage. Wound edge maceration was not noted in the 6 remaining cases.

**CONCLUSIONS**
- All wound pain, both during treatment and dressing changes, was diminished with the use of the self-adaptive wound dressing, including chronic pain that had been present for months.
- The self-adaptive dressing assisted in atrophic debridement and healed a non-healing, chronic, ulcerated wound in the 100% granulation tissue coverage of 5 wounds, including wounds initially covered with 90% to 100% slough.
- The self-adaptive dressing promoted healthy, non-macerated periwound skin and was elected post-wound treatment.
- Particularly in highly exudative wounds, the self-adaptive dressing demonstrated superior absorption properties compared to all previously used dressings.
- Patients were very satisfied with the dressing due to comfort, pain elimination during treatment, and non-traumatic dressing removal.
- Preparation of the wound for homograft skin application was markedly faster with the use of the self-adaptive dressing, compared to previous dressings.
- Application of the self-adaptive dressing jump-started granulation tissue formation in all previously nonhealing wounds.
- The dressing was compatible with many topical therapies, including antibiotics.
- In the investigator’s opinion, the new self-adaptive wound dressing is economical, and can be used in lieu of a wide array of wound care products to simplify wound care in any healthcare setting.

**CASE 1**
Traumatic, painful extremity wound with slough.
Complete closure achieved using only 3 dressings.

72-year-old female with a trauma wound sustained on her left forearm during a fall two weeks prior. Patient is oxygen dependent with a history of congestive heart failure, coronary artery disease and hypertension.

**A Day 0**
Trauma wound with slough at presentation measured 4.0 x 0.0 x 0.0 cm. Patient received pain med 9/10.

**A Day 10**
Post initiation of self-adaptive dressings, wound was considerably contracted and measured 3.0 x 0.0 x 0.0 cm.

**RESULTS**
- After 3 days with self-adaptive wound dressing, the wound was 100% granulated and drainage was controlled. Pain was reduced to 0/10.
- Wound closure at one-week follow-up post discontinuation of self-adaptive dressings was documented.

**REFERENCES**
2.3. References include: non-macerated, non-excised wounds.

JUAN BRAVO, MD
Medical Director
Center for Wound Care and Hyperbaric Medicine, Broward Health, Coral Springs, FL

*Self-Adaptive Advanced Wound Dressing, OSNovation Systems, Inc., Sunny Isles, CA, in cooperation with B&Q SE; www.OSNovation.com

**CASE 2**
Non-healing foot ulcer with chronic osteomyelitis secondary to crush injury sustained four months prior.

44-year-old male with foot ulcer complicated by chronic osteomyelitis secondary to crush injury sustained four months prior.

**A Day 0**
Crush wound with 80% slough after four months of previous treatment measured 2.5 x 2.8 x 0.0 cm with wound edge epibole and slight undermining.

**A Day 16**
After two weeks of self-adaptive advanced wound dressings, the wound was 90% granulated and measured 2.0 x 2.5 x 0.0 cm. Wound edge was epithelialized. No intractation or pain was reported.

**CASE 3**
Non-healing extremity wound in anticoagulated patient with secondary to crush injury sustained four months prior.

72-year-old female with a wound induced by subcutaneous tissue hemathoma sustained on her right lower leg one month prior. Patient is oxygen dependent with history of hypoxic chronic obstructive pulmonary disease and chronic anticoagulation therapy requiring anticoagulation medicine.

**A Day 0**
Non-healing trauma wound, measured 2.8 x 3.8 x 0.5 cm. Patient reported wound pain of 5/10.

**A Day 15**
Exudate is contained within the dressing and there is no post wound maceration. The use of self-adaptive advanced wound dressings. Wound edge is epithelialized and wound pain is 0, requiring no topical pain medication.

**A Day 10**
Wound closure at one-week follow-up post discontinuation of self-adaptive dressings was documented.