Effectiveness of a Self-Adaptive Advanced Wound Care Dressing in Multiple Wound Types

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ABSTRACT:
The purpose of this study was to determine the effectiveness of a novel humifiber advanced wound dressing in achieving optimal moisture balance in multiple wound types. The subject dressing had the ability to self-adjust to the wound’s amount of exudate or conversely prevent desiccation of a dry wound. The dressing was applied once or three times per week either in clinic or home settings, based on wound conditions and in conjunction with local best practices throughout the duration of the study. Our overall approach was to use this dressing on any wound regardless of etiology or amount of exudate, and to reduce dressing changes to a minimum (once a week) until the wound was completely re-epithelialized. Our conclusion was that this dressing was effective on all types of wounds with minimal to heavy exudates and was an effective dressing solution for dressing customization. We observed notable improvements of wound edge conditions. The dressing demonstrated excellent properties with regard to preservation of peri-wound skin. Dressing removal was painless and non-invasive. It also seemed that this dressing minimized formation of biofilm, therefore reducing bacterial colonization.

OBJECTIVE:
To evaluate the effectiveness of a new self-adaptive advanced wound dressing in achieving optimal moisture balance in multiple wound types.

METHODS:
- We prospectively evaluated effectiveness of a novel humifiber advanced wound dressing in patients with chronic, subacute, and acute wounds.
- With patient consent, consecutive wounds, regardless of etiology or amount of exudate, were included in the study.
- Wound was debrided of all necrotic tissue, and culture-specific topical antibiotics were applied when appropriate.
- A humifiber dressing (sized 10.2 x 10.2 or 12.7 x 15.2 cm) was placed over the wound, overlapping 2.5 cm onto intact skin. When more than one dressing was required, dressings were placed side by side and held in place with cotton tape. Dressings were secured with a elastic wrap or tape.
- Initially, dressings were changed daily in wounds with moderate to heavy drainage, and changed every other day in wounds with minimal drainage.
- Goal was to gradually reduce dressing change frequency to once per week when appropriate.
- Patients were evaluated by clinic once per week or every other week.
- Dressing leakage, dressing strike-through, change in wound size, wound closure rate, drainage control, peri-wound maceration, dressing change frequency and debridement frequency were noted.
- Length of evaluation was 12 weeks or until wound was 100% granulated, including over tendon, with no edema or drainage. Wound and peri-wound area remain optimally moist.

RESULTS:
- 17 patients with 22 wounds were evaluated.
- 10 patients were male and 7 were female, average age was 65 years old (range: 39 to 94 years).
- Wound types consisted of pressure ulcers (n=4), diabetic foot wounds (n=3), chronic wound rotation (n=1), venous leg ulcers (n=4), and debrided surgical incisions post-amputation (n=4).
- 19 of 22 wounds (86.4%) showed consistent progression towards closure and 4/22 (18.1%) were completely closed during the study period.
- Dressing change frequency was reduced in 16/22 (72.7%) wounds and debridement frequency was reduced in 16/22 wounds after 2 weeks of humifiber dressings, compared to initial 2 weeks of application.
- Wounds regained free of wound surface desiccation and peri-wound maceration during use of humifiber dressings.

CONCLUSIONS:
- Dressing selection in multiple wound conditions—from minimally to severely exuding wounds—and was effective in all wounds with no need for dressing customization.
- Notable improvements of wound edge conditions were observed during use of humifiber dressing.
- Healthy-periwound skin was preserved in all cases with humifiber dressings.
- In the majority of cases, formation of biofilm was reduced with the humifiber dressing, therefore reducing the need for debridement over time.
- The humifiber dressing appeared to prevent accumulation of fluid and desiccation in all chronic, subacute and acute wounds in this series.
- Study patients reported high satisfaction based on painless and non-invasive dressing removal, the ability to shower with the dressing in place, and reduced dressing change frequency and debridement frequency.
- Extended time between dressing changes lowered dressing cost for the patient and helped maximize Medicare/Medicaid benefits by reducing number of home health visits.
- A switch to this one-size fits all dressing simplified care, helped ensure standardization of care, reduced inventory costs, and diminished gauze waste and potential human error that can be associated with traditional dressing selection.
- In our opinion, the new humifiber 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 any healthcare setting.

Case 1: Chronic lower extremity venous stasis ulcer
53-year-old woman with a draining lateral lower leg venous ulcer that had been present for several months

A. Chronic venous leg ulcer with edematous raised bed after 4 months of advanced wound care and prior to humifiber application. After debridement, ulcer measured 4.0 x 4.0 x 0.5 cm.

B. Two weeks following initial use of humifiber dressing, drainage is considerably decreased and peri-wound erythema is completely re-epithelialized. Signs of inflammation are no longer present and the wound is nearly level with the foot.

C. After 1 month of therapy, wound size was reduced to 0.5 x 0.25 x 0.25 cm with no edema or drainage. The wound appeared optimally moist and mostly re-epithelialized.

D. Venous ulcer is completely closed with excellent wound and peri-wound healing and facilitated care continuity in the clinic, home and facility settings.

Case 2: Diabetic foot ulcer secondary to gout
65-year-old diabetic female with a draining foot ulcer secondary to gout and neuropathy on her right foot great toe

A. Wound secondary to gout at initial presentation, following debridement. Edges were undermined, edematous, and erythematous.

B. One week after initial use of humifiber dressing, wound margins and peri-wound erythema are considerably decreased; bone is exposed.

C. After 2 weeks of humifiber dressings, the wound is 100% granulated, including over tendon, with no edema or drainage. Wound and peri-wound area remain optimally moist.

D. Two months after initial presentation, wound edge conditions are improving and peri-wound is healthy with no edema.

E. At the 2-month follow-up post study period, the wound bed and peri-wound area remain optimally moist and 100% granulated.

Case 3: First metatarsal head full-thickness follow-up amputation
75-year-old diabetic male presented with a diabetic wound of the left foot that remained healed following two amputations 7 months prior.

A. Diabetes foot ulcer with severe peri-wound maceration after 7 months of advanced wound care and prior to humifiber dressing application

B. Three weeks following initial use of humifiber dressings, maceration is considerably decreased; wound bed and edges of bunion are no longer present.

C. After 6 weeks of humifiber dressings, ulcer area is reduced > 65% with minimal drainage.

D. After 8 weeks of humifiber dressings and toe tissue-engineered skin grafts, skin island are viable within the wound bed. Wound edges appear moist, even over calloused skin.