Clinical Evidence Surrounding Skin Health

Moisture Balance

Opticell

Schultz G, Chakravarthy D, Roman M, Nidenburg B. Chitin and Chitosan: Literature Review of Hemostatic Properties. Presented at the Clinical Symposium on Advances in Skin & Wound Care. New Orleans, LA. September 2015. (Ask your Medline representative for a copy of this poster, LIT070WC)

Chitosan has been found to be a particularly useful hemostatic agent. The hemostatic agent is thought to work by an interaction between the negatively charged cell membrane of erythrocytes and the protonated chitosan, positively charged, leading to involvement of platelets and rapid thrombus formation. In this literature review, a variety of chitin and chitosan based wound care products used for hemostasis was discussed as well as the accompanying research regarding their hemostatic properties. Opticell utilizes chitosan's hemostatic properties to control minor bleeding.

Chakravarthy D. Exudate Management Properties of a Chitosan Based Nonwoven Gelling Fiber Wound Dressing. Presented at the Symposium on Advanced Wound Care, Spring; Denver, CO; May 2013. (Ask your Medline representative for a copy of this poster, LIT720)

The absorbency of a chitosan based dressing (Opticell, Medline Industries Inc.) was compared to alginate dressings (Seasorb, Coloplast Inc and Sorbsan, Aspen Inc) and to carboxymethylcellulose dressings (Aquacel – non reinforced and Aquacel Extra – reinforced, ConvaTec Inc and Durafiber, Smith and Nephew Inc.). A known area of the dressing was weighed dry, immersed in saline solution for 30 minutes, and weighed again. Observational conformance to irregular tissue surfaces was also compared. The chitosan based dressing outperformed alginate dressings and the non-reinforced carboxymethylcellulose dressings in absorbency. The absorbency of the chitosan based dressing and the reinforced carboxymethylcellulose dressing was comparable. Also, the chitosan based dressing conformed more closely to the tissue surface than the reinforced carboxymethylcellulose dressing.

Optiva

Livingston M, Falconio-West M. The Use of Silicone Bordered Superabsorbent Foam Dressing in the Management of Venous Leg Ulcers. Presented at the Clinical Symposium on Advances in Skin & Wound Care; Orlando, FL; October 2013. (Ask your Medline representative for a copy of this poster, LIT918)

The purpose of the study was to evaluate the use of an absorbent dressing on venous leg wounds under compression regarding the compression and nature of periwound skin and the effect of high volumes of wound exudates. In nine patients with moderate to high drainage with the use of the Foam Superabsorbent (FSA, Optiva) coupled with a compression wrap, all wounds improved in size and did not increase in maceration while the FSA continuously and effectively removed exudate from the wound sites. Of the nine patients, three presented with high levels of exudate and maceration, which was reduced to levels that did not require the use of the FSA anymore.

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Optifoam Gentle

Arocho P. The Management of Moderately to Heavily Exudating Wounds for Optimal Moisture Balance with a Silicone Faced Bordered Foam Dressing with a Superabsorbent Core. Presented at the Wound, Ostomy and Continence Society's Conference; San Antonio, TX; June 2015. (Ask your Medline representative for a copy of this poster, LIT047WC)

The purpose of this case series was to compare Optifoam Gentle with a superabsorbent core to the standard of care silicone faced foam dressing in the management of 20 patients with moderately to heavily exudating wounds. Each wound was dressed with the standard of care silicone faced foam dressing for three days followed by three days with Optifoam Gentle SA. The dressings were given scores on a scale of 1 to 5, where 1=poor, 2=below average, 3= average, 4= above average and 5=excellent. Overall, the Optifoam Gentle SA received average scores of 4.6, 4.5, 4.2, 5 and 5, and the current standard of care foam dressing received scores of 2.4, 2.2, 2.1, 4.2 and 4.3 for their ability to manage exudate, manage moisture, manage maceration, and wear time and ease of removal respectively. The new superabsorbent silicone faced foam dressing performed in the above average to excellent range, and the standard of care foam dressing performed below average to above average.

Gibson D, Schultz G. Biomechanical Comparison of Two Multilayer Wound Dressings in Their Respective Abilities to Reduce Environmental Force Exposure to Skin. Presented at the Symposium on Advances in Wound Care; San Antonio, TX; May 2015.

The purpose of the study was to identify the mechanical functions necessary for sacral protection and the modes employed by current dressings to address them. Modeling of stress and strain using the relationship between stress and strain and fluid removal (by capillary action) components were modeled. The final component of the model is the understanding that materials fail/break after they have been stretched a certain distance. Two foam dressings, one being Optifoam Gentle, contain similar materials, but in different configurations and differences in how the layers are attached, or not attached to each other. The combination of disjunction among the layers and the deformability of the layers provide strain relief to the skin in that the dressing moves and stretches itself providing corresponding relief to the underlying skin. This is achieved mostly by allowing several of the layers to move independently with force tangential to the surface of the dressing. The low friction layer in Optifoam Gentle could be significantly beneficial.

Chakravarthy D, Roman M. In Vitro Comparison of the Total Fluid Absorptive Capacity of Two Silicone Bordered Foam Dressings. 2015 (Ask your Medline representative for a copy of this poster, LIT025WC)

The purpose of this in vitro study was to compare the total fluid absorptive capacity of Optifoam Gentle Silicone Border to Aquacel Foam. The backings were removed from both dressings. The dressings were weighed before and after being placed into a 37˚C solution with an ionic composition comparable to wound exudate for 30 minutes. The 6.3 cm x 6.3 cm pad from the Optifoam Gentle Silicone Border absorbed a total of 22.70 g of fluid for an average total fluid absorptive capacity of 0.55 g/cm^2. The 7.0 cm x 7.0 cm pad from Aquacel Foam absorbed at total of 22.02 g of fluid for an average total fluid absorptive capacity of 0.45 g/cm^2. Optifoam Gentle Silicone Border absorbed 22% more fluid than Aquacel Foam.

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Chakravarthy D, Roman M. In Vitro Comparison of the Retained Fluid Capacity of Two Silicone Faced, Non-Bordered Foam Dressings. 2015 (Ask your Medline representative for a copy of this poster, LIT026WC)

The purpose of this in vitro study was to compare the retained fluid capacity of Optifoam Gentle Non-bordered to Mepilex non-bordered. The dressings were weighed before and after being saturated in a 37˚C solution with an iconic composition comparable to wound exudate. Then, a weight was placed on top of the dressings for 30 seconds. The average retained fluid capacity was 0.30 g/cm^2 for both dressings, so the market leading silicon face, non-bordered foam dressing had an equivalent average retained fluid capacity as Optifoam Gentle Non-bordered.

Chakravarthy D, Roman M. In Vitro Comparison of the Retained Fluid Capacity of Two Silicone Faced, Bordered Foam Superabsorbent Dressings. 2015 (Ask your Medline representative for a copy of this poster, LIT027WC)

The purpose of this in vitro study was to compare the retained fluid capacity of Optifoam Gentle Liquitrap to Mepilex. The backings were removed from both dressings. The dressings were weighed before and after being saturated in a 37˚C solution with an ionic composition comparable to wound exudate. Then, a weight was placed on top of the dressings for 30 seconds. The 6.3 cm x 6.3 cm pad from Optifoam Gentle Liquitrap retained an average of 16.13 g of fluid, with an average retained fluid capacity of 0.41 g/cm^2. The 6.5 cm x 6.5 cm pad from the market leading Mepilex retained an average of 12.69 g of fluid, with an average retained fluid capacity of 0.30 g/cm^2. Optifoam Gentle Liquitrap retained 37% more fluid than the leading competitor.

Call E. A Comparison of the Friction, Shear, Temperature, and Humidity Characteristics of Two Wound Dressings. Presented at the Wounds UK Conference; Harrogate, England; November 2014. (Ask your Medline representative for a copy of this poster, LIT023WC)

This study examines the static and dynamic friction, shear stress, and the moisture and temperature retention characteristics of Optifoam Gentle Sacrum and Mepilex Border Sacrum. The dressings were clamped in a test fixture and a steel sled was drawn across the surface to determine the friction and shear forces. The dressings were also applied to a 37° C moisture producing pelvic indenter where sensors recorded the temperature and humidity both inside and outside the dressings. The mass of the dressings were taken before and after the test, and used to calculate the amount of moisture retained. Mepilex had a static coefficient of friction (CoFs) of 0.37 ± 0.04, a dynamic coefficient of friction (CoFd) of 0.34 ± 0.01, a shear stress of 863.3 ± 31.2 Pa on the surface of the dressing, and a shear stress of 8021.3 ± 113.6 Pa on the adhesive side of the dressing. Optifoam Gentle had a 0.31 ± 0.02 CoFs, 0.27 ±0.01 CoFd, 683.0 ±18.9 Pa of shear on the surface of the dressing and 3989.2 ± 69.2 Pa of shear on the adhesive side. Mepilex demonstrated 9.0 ± 1.3 % Relative Humidity (RH) difference from the adhesive side to the surface of the dressing where Optifoam Gentle demonstrated 3.2 ± 1.9% RH. Mepilex retained 0.24 ±0.02 g of water from vapor after testing and Optifoam Gentle retained 0.29 ± 0.04g. Mepilex trapped less water vapor but demonstrated higher friction and shear values than Optifoam Gentle.

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Chakravarthy D, Roman M, Kushner M, Schlesinger R. Differences in the Static and Dynamic Friction Coefficients of Two Wound Dressings. Presented at the Clinical Symposium on Advances in Skin & Wound Care; Las Vegas, NV; September 2014. (Ask your Medline representative for a copy of this poster, LIT007WC)

Any dressing employed preventatively must have a low friction coefficient, which would indicate a lesser force of friction acting on the adjoining skin. The purpose of the in vitro study was to evaluate and compare the frictional properties of two sacral dressings, Products A (Optifoam Gentle Sacrum) and B (Mepilex Border Sacrum). The static and dynamic friction properties of these products were measured three times under four clinically relevant conditions (i.e. dry dressing - dry fabric, dry dressing - wet fabric, wet dressing-dry fabric, and wet dressing-wet fabric). For the dry dressing-dry fabric and wet dressing-dry fabric tests, Product B's coefficients of static friction were significantly greater than those for Product A ($p=0.027$ & $p=0.007$, respectively). For the dry dressing-wet fabric test, Product B had a coefficient of static friction of 0.47 compared to 0.46 for Product A, and for the wet dressing-wet fabric test, Product A had a coefficient of static friction of 0.46 compared to 0.44 for Product B. In the dry dressing-dry fabric and wet dressing-dry fabric tests, the coefficients of dynamic friction for Product B were significantly greater than those for Product A ($p=0.017$ & $p=0.009$, respectively). For the dry dressing-wet fabric test, both products performed equivalently (0.43). For the wet dressing-wet fabric test, Product A displayed significantly higher dynamic friction than Product B ($p=0.009$). Product A performed better than or equivalently to Product B in 7 of the 8 clinically relevant test conditions, where dressing may be dry or saturated with exudate and the patient's clothes and/or bed linen are dry.

Barger JI, Young D, Chakravarthy D. Evaluation of the use of a foam dressing with a silicone adhesive border to help reduce hospital acquired pressure ulcers. Presented at the Clinical Symposium on Advances in Skin & Wound Care; Las Vegas, NV; September 2014. (Ask your Medline representative for a copy of this poster, LIT011WC)

Each year in the United States it is estimated that people get 2.5 million pressure ulcers (PU), and health care facilities have been incentivized financially and through mandatory reporting laws to make sure that patients do not develop a PU while in their care. The objective of this study was to evaluate a foam wound dressing with a silicone adhesive border, on the incidence of PU when applied to patients at risk for PU, in a 384-bed urban hospital intensive care unit (ICU). A secondary objective was to evaluate the potential impact in terms of cost-effectiveness. Of the 218 patients enrolled in the study during the 3- month period, 1 sustained a HAPU outside the area of the skin covered by the dressing leading to a monthly HAPU incidence of 0.333/month. During the 8 months prior to the trial, 13 patients out of 1,151 sustained a HAPU leading to a monthly HAPU incidence of 1.625/month. The use of an atraumatic dressing designed to fit the sacral area in this hospital ICU may have been a contributing factor that saved the facility between $31,000, and $378,355 in HAPU care costs. The use of a foam wound dressing with a silicone adhesive border results in a lower monthly HAPU incidence and favorable cost savings.

Optilock

Vorbeck E. The Use of a Super-absorbent Dressing to Manage Periwound Maceration and Odor in Chronic

Wounds. Presented at the Wound, Ostomy and Continence Society's Conference; Seattle, WA; June 2013. (Ask your Medline representative for a copy of this poster, LIT1064)

Slow wound healing may result from periwound maceration. Though there are absorbent foams, alginates, and hydrogels to manage maceration, they often lose integrity when saturated, allow exudate back into the wound when compressed, or are unable to absorb under compression. In this wound center, a superabsorbent dressing (Optilock) was assessed on malodorous, highly exudative macerated wounds managed under compression dressings. In a convenience sample of six patients with venous or plebolymphedema, the duration of treatment with Optilock was 4-6 weeks with dressing changes 1-3 times a week. The results indicate the dressings were saturated with fluid at dressing changes, but the periwound skin showed no evidence of previously seen levels of maceration. The wounds demonstrated reduced odor levels over time. The dressing did not adhere to the wound and did not drip.

Qwick

Wahab N, Wray K. The Use of a Superabsorbent Three Layer Wicking Wound Dressing to Manage Diabetic Wounds in a Long-Term Care Facility. Presented at the APWCA; Philadelphia, PA; March 2015. (Ask your Medline representative for a copy of this poster, LIT031WC)

In this case series, the Qwick's ability to wick and absorb wound fluid was assessed in patients with diabetic foot ulcers. A convenience sample of 10 patients with 13 stalled diabetic wounds was selected, and the wound and periwound were assessed at every dressing change. All wounds achieved at least 50% granulation tissue by the third dressing change. Patient 3's second wound and patient 5's wounds healed by the third dressing change, and patient 2's wound healed by the fourth dressing change. Even with high levels of exudate, there were no incidences of maceration during the study. Patient 10 presented with a macerated wound, which resolved by the first dressing removal. Overall, there was an average wound area decrease of 75% and an average wound volume decrease of 85%. Additionally, there was an average 46% decrease in necrotic tissue between the initial and final dressing change. Qwick promoted effective exudate management.

Chakravarthy D, Roman M. In Vitro Comparison of the Absorption and Retention Capabilities of Two Superabsorbent Wicking Dressings. Presented at the APWCA; Philadelphia, PA; March 2015. (Ask your Medline representative for a copy of this poster, LIT029WC)

The purpose of this in vitro evaluation is to compare absorption and retention capabilities of Qwick to Drawtex. The 10 5cmx5cm samples of each dressing were weighed before and after being placed into a 37˚C solution with an ionic composition comparable to wound exudate for 30 minutes. For the fluid retention under compression test, the absorbency protocol was repeated, but the 10 samples were then placed under a weight of 1500 grams (equal to the standard for venous leg ulcer compression) for 60 seconds. Qwick absorbed 50.0±1.2 g/100cm^2 and retained 40.3±1.3 g/100cm^2. Drawtex absorbed 29.0 ±0.1 g/100cm^2 and retained 25.6±0.7 g/100cm^2. The test data shows that the absorbency of Qwick is nearly twice that of Drawtex. The retention capacity results show that Qwick can retain nearly 60% more fluid under pressure than Drawtex.

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Chakravarthy D, Roman M. In Vitro Vertical Wicking Capacity of a Three Layer Wicking Wound Dressing. Presented at the APWCA; Philadelphia, PA; March 2015. (Ask your Medline representative for a copy of this poster, LIT030WC)

This study was designed to evaluate Qwick's absorption capacity when it is placed on top of an already saturated sample to indirectly access the its vertical wicking ability. An empty petri dish was placed on a balance. A 6cmx6cm sample of Qwick was placed on the petri dish, blue layer facing up, followed by a solution with an iconic composition similar to wound exudate so that all but the top blue layer of the dressing was covered. The system was placed in a 37˚C chamber for 30 minutes. The weight was recorded. Another 5cmx5cm sample was then placed on top of the first sample, and the system was weighed. After 30 seconds, the 5cmx5cm sample was removed, and the system was reweighed. Once the first sample's second superabsorbent layer was saturated, the second sample's first layer vertically wicked the fluid into its superabsorbent layer. The results indicate that the 5cmx5cm sample of Qwick can wick and transport about 45g/100cm^2 fluid from the wet sample underneath.

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