



### Supportive Products/Services/Education

#### Education

**Turner P. Apples to Ulcers Pressure Ulcer Staging: Educational Comparison Tool. Presented at the Clinical Symposium on Advances in Skin & Wound Care & the Symposium on Advanced Wound Care, Fall; Las Vegas, NV; September & October 2014. (Ask your Medline representative for a copy of this poster, LIT002WC)**

Pressure ulcer staging became particularly important with the passing of the Deficit Reduction Act (DRA) which requires skin assessment upon admission to the hospital. This education tool compares various red apple conditions to the different pressure ulcer stages. Stage I, non-blanchable erythema, correlates to the normal state of a red apple, where the red color will not go away even with touch. Stage II, partial thickness, correlates to the skin of the apple being peeled off because the wounds lack depth, only the epidermis has been removed. Stage III, full thickness skin loss, correlates to an apple with a good bit taken out of it because a stage III ulcer involves the underlying subcutaneous tissue and all layers of the skin are missing. Stage IV, full thickness tissue loss, correlates to an apple in which the core is visible because the underlying structure (bone, muscle, or tendon) is visible. Unstageable, full thickness skin or tissue loss – depth unknown, correlates to a caramel covered apple because unstageable ulcers are completely covered with slough or eschar, so the depth of the wound cannot be visualized. Suspected deep tissue injury with unknown depth correlates to a bruised apple where the surface skin has localized maroon or purple discoloration, but you do not know how far down the injury extends.

#### CoFlex

**Laforet K. Case Series: Evaluation of new 2-Layer compression system in adult patients. Presented at the Symposium on Advanced Wound Care, Fall; Las Vegas, NV; September 2015. \*Pending LIT#**

The purpose of this study was to compare the clinical performance of a CoFlex TLC (new) to Coban 2 (current) and to obtain patient perspectives regarding wear and comfort. A total of 20 patients currently using bilateral 2-layer compression bandaging system completed the evaluation. Clinical evaluation included: observed slippage, leg circumference, wound surface area and first layer absorbency. Clinician's feedback included: ease of application, ease of learning and overall impression. Patients were asked to document feedback on dressing comfort at each visit. CoFlex TLC was applied on one leg and Coban 2 on the other. Each patient received a minimum of four applications over a four week period. For slippage, 40% reported less slippage and 20% reported an increase. The leg circumference remained consistent, and wound area did not deteriorate. 95% of nurses stated the ease of application was "similar to" or "better than" the current system and would recommend product be added to the formulary; 90% of the patients rated the new compression system "as comfortable as" or "much more comfortable" than the current system.

**Carr C, Shadwell J, Regan P, Hammett S. An evaluation of short-stretch compression systems for chronic lower-limb leg ulcers. *Br J Community Nurs.* 2015 Mar;Suppl Wound Care:S38, S40-7. doi: 10.12968/bjcn.2015.20.Sup3.S38.**



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**Abstract:** <http://www.ncbi.nlm.nih.gov/pubmed/25757382>

**Purpose:** The purpose of this study was to evaluate of a new short-stretch compression system (Co Flex UBZ[n=14], TLC[n=3],and TLC Lite[n=2]) in four leg ulcer clinics with regards to quality of life measurements, wear time, slippage, exudate strikethrough and pain using a numerical pain score.

**Conclusion:** Both the clinician and patient comments supported the use of the CoFlex system, and it performed well in terms of exudate management, reduction of edema, comfort and conformability, increasing wear time and concordance with compression. The CoFlex system was also found to be cost effective when compared to the previous month of treatment without CoFlex.

### **Marathon**

**Patterson T, Thomas R, Bryant RA, Knaff R, Best M, Wrigley E, Nguyen C, Wells T. Management of Skin Erosion Due to ITD with a Cyanoacrylate Skin Barrier: a Feasibility Study. Presented at the Symposium on Advanced Wound Care, Fall; Las Vegas, NV; September 2015. \*Pending LIT#**

The purpose of this feasibility study was to determine if Marathon in patients with a BMI of 28 or greater with ITD had better clinical outcomes (pain, manifestations/appearance, and resolution). The feasibility study found that there are typically five cases over a six week period and the resolution of open areas occurred by the third day after one application. This feasibility study will be expanded into a single site randomized control trial comparing this intervention with Marathon to standard practice.

**Souder S, Langdon M. Bordered Foam versus Cyanoacrylate No-Sting Liquid Skin Protectant for Pressure Ulcer Prevention: A Retrospective Quality Improvement Comparative Study. Presented at the Symposium on Advanced Wound Care, Fall; Las Vegas, NV; September 2015.\*Pending LIT#**

After using a bordered foam dressing on the sacrum for prevention it was noted that the dressings were being changed more frequently in many patients due to moisture, incontinence and friction. In an effort to find an alternative solution, Marathon was evaluated for effectiveness, ease of use, and cost containment. Sixty patient charts from medical surgical and intensive care units that implemented either the bordered foam (n = 30) or Marathon (n = 30) were reviewed. Inclusion criteria for the study included patients age 18 or older with intact skin on sacral area combined with a Braden score of 18 or less. There was no skin breakdown or pressure ulcer development on the sacrum in the 30 patients that used Marathon. Four out of 30 patients that used the bordered foam dressing had skin breakdown, 2 of which were pressure ulcers. Marathon remained intact for the needed length of use which was 2-3 days, with no unscheduled dressing changes. The group utilizing the bordered foam had 21 extra dressing changes. Overall, Marathon showed a \$1.61 per day cost savings. The additional cost incurred from the unscheduled bordered foam dressing changes was \$144.43.

**Chakravarthy D, Kruse M, Turturro M, Roman M. Comparison of the load to break the ampoule in a new plastic vial to the old plastic vial of a cyanoacrylate no-sting liquid skin protectant. 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, LIT054WC)**

Marathon is composed of a mixture of butyl and octyl cyanoacrylate, which polymerize rapidly in presence of



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ionic substances like bodily fluids. Marathon is supplied in a single use sterile plastic vial that needs to be crushed to break the inner ampoule containing the cyanoacrylate adhesive to initiate polymerization. Therefore, the vial needs to be strong enough to prevent accidental breakage, but it must also be user-friendly. People with weaker hand strength, due to age or disease, should still be able to break the vial. The purpose of this study was to compare the load required to break a new vial to the load required to break the old vial. The load required to break the ampoule was recorded in pound force (lbf) for 30 specimens, 15 of each vial. The average loads at break for the old and new vials were  $22.54 \pm 3.76$  lbf and  $17.06 \pm 3.25$  lbf, respectively, which was significantly less than the average load at break of the old vial,  $p$ -value=0.0006.

**Gibson D, Schultz G. Comparing Incision Closure and Skin Protectant Cyanoacrylate-Based Adhesives in a Rat Skin Acute injury Model. Presented at the Symposium on Advances in Wound Care; San Antonio, TX; May 2015.**

The purpose of the in vitro study was to analyze how wound cells covered with a variety of cyanoacrylate glues behave compared to a fibrin clotted wound. Four 6.0 mm partial thickness wounds were made on the skin of shaved rats. After each wound was generated, the blood was wiped off and the test glue was applied. The results presented are specific to glues A (Surgiseal, an incision closing glue) & B (Marathon). The glues did not appear to impede the epidermal migration. The same pattern was seen in the control, which suggests that the wound cells treated the glue in a manner similar to the fibrin clot. The polymeric films formed by the glues are both materially and visually reminiscent of occlusive film dressings (i.e. dry on the outer surface and reflective).

**Brindle T. A Hospital Wide Toolkit for Preventing and Managing MASD. Presented at Wounds UK & APWCA; Harrogate, UK & Philadelphia, PA; November 2014 & March 2015. (Ask your Medline representative for a copy of this poster, LIT038WC)**

The purpose of the study is to describe the benefits of a skin care toolkit, including Marathon, Remedy Olivamine Skin Repair Cream and Remedy Phytoplex Z-Guard, utilized by a large academic university medical center demonstrating improved patient outcomes and cost effective solutions for the prevention and treatment of various forms of MASD. A retrospective descriptive analysis shows the implementation the toolkit improved patient outcomes for the prevention and treatment of peristomal MASD, incontinence associated dermatitis and periwound MASD. The introduction of Z-Guard allowed the facility to reduce the number of barrier cream products skus from 4 to 1 because of the product's ability to provide improved outcomes from neonates to geriatrics. Additionally, the use of Marathon for the treatment of moderate to severe IAD, peristomal skin damage and periwound MASD associated with fistulas prevented the conversion of MASD to HAPU and improved wear time for ostomy and fistula appliance. This demonstrated an immediate cost savings of over \$40,000 dollars annually.

**Woo K, Delmore B, Moir O. A Systemic Review of the Literature on Moisture-Associated Skin Damage as it Applies to the Periwound Area. Presented at the NPUAP; Orlando, FL; February 2015. (Ask your Medline representative for a copy of this poster, LIT036WC)**

The role that healthy periwound skin plays in wound healing is underestimated. The term 'moisture-associated



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skin damage' (MASD) has been introduced to describe a spectrum of skin damage resulting from prolonged exposure to a variety of moisture sources including wound exudate, sweat, urine, mucus, and other bodily fluids. Identification of risk factors, early detection, and provision of prompt intervention to prevent or treat damages in the periwound skin may promote healing. The purpose of this review is to develop an operational definition of periwound skin damage through a systematic review of the literature on moisture-associated skin damage as it applies to the periwound area. Based on this review, the authors propose practice recommendations for the management of periwound skin.

**Chakravarthy D, Roman M, Kushner K. In-vitro Evaluation of Moisture Vapor Transmission Rate of Cyanoacrylate Skin Protectant. Presented at Wounds UK & APWCA; Harrogate, UK & Philadelphia, PA; November 2014 & March 2015. (Ask your Medline representative for a copy of this poster, LIT021WC)**

This study was designed to determine the moisture vapor transmission rate (MVTR) of Marathon. A single application of Marathon was evenly applied on each of the five flat bovine gelatins and allowed to set for an hour. Then, the gelatin base was dissolved in water for two minutes, leaving behind an intact protectant film. After a 24-hour drying period, the protectant film disks were cut to cover the internal cross section of the cylinder. Cylinders were filled with deionized water and calcium chloride (to maintain humidity). The initial weight of the cylindrical systems was taken, and the systems were inverted so the solution was in contact with the film. Cylinders were heated at 37°C for 4 hours and then reweighed to determine MVTR. A high value is indicative of high breathability. The mean MVTR of the cyanoacrylate was  $4351.80 \pm 948.77$  g/m<sup>2</sup>/24-hour. To put this value in context, evidence shows that dressings with MVTR 2000–2500 g/m<sup>2</sup>/24-hour are deemed to be breathable.

**Chakravarthy D, Roman M, Kushner M, Schlesinger R. Pain Assessment Study: Comparison of Three Liquid Skin Protectants. 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, LIT009WC)**

The purpose of this study was to assess stinging related pain caused by the application of Product A, Marathon compared to two no-sting polymer film forming products, both of which are not solvent based (Product B†, Sureprep No-Sting Skin Protectant and Product C‡, Cavilon No Sting Barrier Film). The skin sensory perception of pain following test article application on normal, healthy adult subjects with slightly abraded ventral forearm skin was assessed. A repeat insult patch test was also conducted on 51 subjects using Product A. The positive (alcohol) and negative (saline) control yielded mean maximum visual analog scale (VAS) pain scores of 51.15mm and 10.12mm respectively. Products A, B, and C had mean maximum VAS pain scores of 17.15mm, 7.81mm, and 8.46mm, respectively. All products produced mean maximum pain scores statistically equivalent to the negative control and significantly lower pain scores than the positive control. The subjective pain assessment on the 10 point scale showed Products A, B, and C had pain scores of 2.08, 1.65, and 1.62, respectively, at the end of the visit. At 24 hours post application, Products A, B, and C had pain scores of 2.04, 1.08, and 1.04, respectively on the 10 point scale. In the repeat insult patch test, there was no visible skin reaction at any time point during induction or challenge with Product A in any of the 51 subjects. Since there was no statistically significant difference between Product A and Product C or the negative control, Product A may be described as a “no sting”



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product.

**Chakravarthy D, Roman M, Kushner M, Schlesinger R. Molecular Adhesion and Transepidermal Water Loss of Liquid Skin Protectants. 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, LIT008WC)**

This study examines adhesion and Transepidermal Water Loss (TEWL) of Marathon versus a solvent-based polyacrylate skin protectant (Cavilon No Sting Barrier Film) in order to probe barrier breathability profiles of barrier products over time. Thickness and integration to the skin were also examined. The product thickness and integration to pig skin were imaged using several microscopic techniques. To assess breathability, TEWL measurements of the volar forearms of 10 healthy subjects were taken at baseline and 1 and 2 hours post-application. Marathon had a significantly thicker barrier thickness than the polyacrylate skin protectant,  $3.072 \pm 0.258 \mu\text{m}$  compared to  $0.805 \pm 0.472 \mu\text{m}$  ( $P = 0.013$ ). A drop in TEWL indicates less moisture is released from the skin upon barrier application and suggests that the protectant barriers were indeed present on the skin. One hour post-application, both the polyacrylate and cyanoacrylate skin protectants had similar drops in TEWL ( $P < 0.05$ ), but after two hours, the TEWL values of the Marathon coated skin returned to a near-baseline measurement, despite the presence of a visibly intact barrier. Both the higher thickness of applied product and a quicker return to normal breathability were associated with the cyanoacrylate product.

**Woo, K., & Chakravarthy, D. A laboratory comparison between two liquid skin barrier products.**

*International Wound Journal*. 2014; 11(5): 561-566.

**Abstract:** <http://www.ncbi.nlm.nih.gov/pubmed/25040947>

**Purpose:** The purpose of this experimental study was to compare the ability of Marathon to the ability of Cavilon to protect human skin against moisture and abrasion.

**Conclusion:** After repeated wash-off cycles, skin treated with Marathon had significantly more dye remaining than sites treated with Cavilon or the control. Transepidermal water loss was measured before and after abrasion to determine the level of skin damage, because high water loss seen post-abrasion is indicative of skin damage post-abrasion. The change in TEWL was statistically lower for Marathon-treated areas.

**Ondrejko M. The use of a Cyanoacrylate based skin barrier in the protection of the skin around a tracheostomy. Presented at the Symposium on Advanced Wound Care, Spring; Denver, CO; May 2013. (Ask your Medline representative for a copy of this poster, LIT1011R)**

A tracheostomy is frequently associated with fluid leakage onto intact skin around the insertion point, which tends to corrode skin. The efficacy of Marathon was assessed on 11 patients with evidence of skin damage around the tracheostomy puncture wound. The days to discontinuing the cyanoacrylate averaged 12.5 days, with an outlier of 53 days. Without the outlier, Marathon discontinuation averaged 8.5 days. Skin improvement was observed in all 11 patients, and the liquid skin protectant did not cause pain or stinging. The nursing care time appeared to decrease significantly, and a health economic study was proposed.



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These publications were presented at various wound care conferences to share research and clinical results within a scientific community. The information is intended for healthcare professionals in the US only. It is provided for informational purposes and is not intended to replace a discussion with a healthcare provider. All decisions regarding patient care must be made with a healthcare provider and consider the unique characteristics of each patient.

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