Marathon® No-Sting Liquid Skin Protectant

Clinical and Laboratory Evidence of the Effectiveness of the Novel Cyanoacrylate Skin Protectant

Marathon® No-Sting Liquid Skin Protectant is a liquid skin protectant that dries on and adheres to the skin, protecting it for several days after appliance. It is packaged as a purple liquid in a vial and can be squeezed out for appliance. There has been a significant amount of documented evidence demonstrating the usefulness of the cyanoacrylate skin protectant in the treatment and prevention of moisture associated skin damage and mechanical associated skin damage in adults and infants. This review will explore that evidence, as well as the evidence documenting the cost-effectiveness of the novel skin protectant. Laboratory testing of the strength, breathability, and adherence of the skin protectant will also be covered.
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Laboratory Testing on Marathon®

Pain Assessment Study: Comparison of Three Liquid Skin Protectants

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. (LIT009WC)

Liquid skin protectants are used to protect intact or damaged skin from incontinence, moisture, bodily fluids, friction, shear and adhesive stripping. The purpose of this study was to assess stinging related pain caused by the application of a cyanoacrylate protectant (Product A, Marathon Liquid Skin Protectant) compared to two no-sting polymer film forming products, both of which are 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 1.08, 2.04m, 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” product.

![Maximum Stinging Response (VAS Scale)](image-url)
Molecular Adhesion and Transepidermal Water Loss of Liquid Skin Protectants

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. (LIT008WC)

This study examines adhesion and Transepidermal Water Loss (TEWL) of a cyanoacrylate monomer blend skin protectant, Marathon®, versus a solvent-based polyacrylate skin protectant, Cavilon®, 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 Cavilon®, 3.072 μm ± 0.258 μm compared to 0.805 μm ± 0.472 μm (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 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 Marathon®.

Figure 1: The figure above displays the higher thickness and integration to skin of Marathon® compared to Cavilon®.
A Laboratory Comparison between Two Liquid Skin Barrier Products


**Purpose:** The purpose of this experimental study was to investigate the ability of a cyanoacrylate polymer film, Marathon®, to protect human skin against moisture and abrasion. A secondary purpose of this study was to compare this cyanoacrylate material to a traditional acrylate barrier film, Cavilon®.

**Method:** This study consisted of two parts. (1) In the first part, twelve healthy subjects participated in the wash-off resistance test to determine the percentage of dye that was left on the skin after repeated washing. Three sites on each volar forearm were stained with crystal violet. The barrier film products were applied according to manufacturer’s directions to four of six stained sites in duplicate, one on each arm. A central site on each arm was stained, but no barrier film was applied, to serve as the controls. Gauze pads saturated with synthetic urine were placed on the test sites and secured with plastic wrap to mimic the occlusive effects of a diaper against the skin. After the 20-minute soaking period, the test sites were cleansed. The colour of the test sites was measured following cleansing. A total of five soak-wash cycles were done. (2) In the second part, ten subjects participated in the abrasion test. Three sites on each are were outlined on each arm, and the test products were applied to two of the three test sites on each arm according to a randomisation schedule. After a 3-minute drying period, a scrub sponge was rubbed over each site 10 times in the same direction for all sites. Transepidermal water loss (TEWL) was measured before and after abrasion to determine the level of skin damage, as high water loss seen post-abrasion is indicative of skin damage post-abrasion. A repeated measures ANOVA and a Turkey-Kramer multiple comparisons test were run to analyse the data. An α level of 0.05 was taken as the level of significance for comparisons.

**Results:** (1) There was a statistically significant difference among the mean percent dye remaining after each cycle. After the first cycle, there was no difference between Product A and Product B, q=2.90, P>0.05. However, there was a statistically significant difference at each subsequent measurement where the sites treated with Product A had more dye remaining than sites treated with Product B or control sites. (2) The difference between baseline and post-abrasion TEWL measurements for the control sites, the sites treated with Product A, and the sites treated with product B was 3.04±0.80, 2.13±0.79, and 2.67±0.76, respectively. There was a statistically significant difference between mean TEWL change at sites treated with Product A compared with those treated with Product B and the control, q=4.16, P<0.05 and q=7.01, P<0.001, respectively. There was no difference in the mean TEWL change for the sites treated with Product B compared with the mean change in TEWL at the control sites, q=2.86, P>0.05.

**Conclusion:** Marathon®, a cyanoacrylate polymer film, was more effective than Cavilon® in protecting human skin against moisture and abrasion. The wash-off test demonstrated that Marathon® had persistence of protection which may have tremendous clinical potential with regards to protecting skin from repeated cycles of washing and urine exposure. Clinical outcome studies are warranted.
In-vitro Evaluation of Moisture Vapor Transmission Rate of Cyanoacrylate Skin Protectant


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 ± 948.77 g/m²/24-hour. To put this value in context, evidence shows that dressings with MVTR 2000–2500 g/m²/24-hour are deemed to be breathable.
Clinical Evidence on Marathon® to Treat and Prevent Moisture Associated Damage

Evaluation of a cyanoacrylate dressing to manage peristomal skin alterations under ostomy skin barrier wafers


**Background:** Peristomal skin alterations under ostomy barrier wafers are a commonly reported problem. While a number of interventions to manage this issue have been reported, the use of a topically applied cyanoacrylate has received little attention. This case series describes the use of Marathon® for the management of peristomal skin alterations in persons living with an ostomy.

**Case Presentations:** Using a convenience sample, Marathon® was applied to 11 patients with peristomal skin disruption under ostomy wafers in acute care and outpatient settings. The causes of barrier function interruption were also addressed to enhance outcomes. Patients were assessed for wound discomfort using a Likert Scale, time to healing, and number of appliance changes. Patient satisfaction was also examined.

**Conclusion:** Average reported discomfort levels were 9.5 out of 10 at the initial peristomal irritation assessment visit decreased to 3.5 at the first wafer change and were absent by the second wafer change. Wafers had increasing wear time between changes in both settings with acute care patients responding faster. Epidermal resurfacing occurred within 10.2 days in outpatients and within 7 days in acute care patients.

![Figure 2: Marathon® application to the skin surrounding a loop-ileostomy.](image)
The use of a Cyanoacrylate based skin barrier in the protection of the skin around a tracheostomy.

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. (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 average number of days to Marathon® discontinuation was 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.

Periwound Maceration Is Strongly Associated with Poor Healing of Venous Leg Ulcers and May Be Treated Effectively Using Liquid Cyanoacrylate Protectant.

Eisenbud D. Periwound Maceration Is Strongly Associated with Poor Healing of Venous Leg Ulcers and May Be Treated Effectively Using Liquid Cyanoacrylate Protectant. Presented at the Clinical Symposium on Advances in Skin & Wound Care; San Antonio, TX; October 2009. (LIT043R)

Anecdotal experience suggests that the maceration of the skin around a wound may indicate a worsening wound status, which predicts poor healing. The purpose of this study was to examine the relationship between periwound maceration and delayed or non-healing venous leg ulcers (VLU) in 13,880 outpatient visits at the Overlook Hospital Wound Healing Program. The results indicate a strong association between periwound maceration and delayed or non-healing VLU. The association may result due to heavy exudates, which causes maceration and possible poorly controlled congestive heart failure or an unidentified infection. Skin protection may help prevent skin maceration as well as promote faster wound closure.
Clinical Evidence of Marathon® to Manage and Prevent Mechanical Skin Damage

Pressure Ulcer Prophylaxis: Cyanoacrylate, thinking beyond the dressing.

Mercer DM, Kimpel K, Ruiz P. Pressure Ulcer Prophylaxis: Cyanoacrylate, thinking beyond the dressing.

Comprehensive pressure ulcer prevention programs indicate the use of sacral dressings, but the dressings often obstruct the view of the sacral skin, which makes clinical assessment difficult. The purpose of the study was to evaluate the use of Marathon® on 238 patients with intact skin and to determine the effectiveness in preventing sacral skin injury that may be a factor in pressure ulcer formation in adult surgical, trauma, and burn ICU patients compared to the 362 pre-cyanoacrylate patients. The incident rates of sacral skin injury for the pre-Marathon® group and Marathon® group were 0.6% and 0.4% respectively. The study concludes that Marathon® was a useful and effective tool for clinicians in the prevention of sacral skin injuries in critically ill adults.

Cost Analysis of Marathon®

Cost Comparison of Treatments Used on Recalcitrant Peristomal Skin Complications.


The purpose of the study was to evaluate the cost effectiveness and efficacy of seven peristomal ulcer treatment regimens on a 70-year old male with multiple peristomal ulcerations. The patient also presents with radiation colitis injury from prostate cancer treatment resulting in an anterior posterior resection and end ileostomy. Despite treatment with alginates, hydrocolloids, powdered polymer dressings, two collagen preparations, silver impregnated dressings, and polyvinyl alcohol sponge with methylene blue and gentian violet, ulcer management met with limited success. Treatment with 2-octyl cyanoacrylate monomer skin protectant led to progress toward deep tissue ulcer closure within 14 days.

Hospital Wide Toolkit for Preventing and Managing MASD


The purpose of the study is to describe the benefits of a skin care toolkit, including Marathon®, Remedy® Olivamine Skin Repair Cream, Remedy Phytoplex Z-Guard, and a moisture wicking incontinence pad 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 for all ages. Additionally, the use of Marathon® for the management 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.
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