Skin Hydration with a Novel In-Situ Crosslinked Silicone Film: A Pilot Skin Conductance Study

Alpesh Patel, Maria Xu, Soo-Young Kang, Betty Yu, Thomas Jozefiak
Living Proof, Inc. Cambridge MA

Statement of Purpose: Healthy human skin provides a critically important barrier function essential for maintaining hydration, and preventing disease. Compromised skin barrier function can result in increased transepidermal water loss, decreased skin hydration, and loss of elasticity. Living Proof has developed Strateris™, a safe, flowable, silicone emulsion system that forms an invisible, breathable, elastic, and occlusive film on skin using in-situ hydrosilylation chemistry (1). Strateris has been elegantly formulated as a two-part skin cream with excellent feel and spread ability. The user is instructed to spread Step-1 (containing reactive siloxanes) on the area to be treated, and then apply Step-2 (containing catalyst) on top. An elastomeric film begins to form within minutes, and continues to cure for 1-2 hours. The resulting film can be comfortably worn to provide remarkable skin hydration and aesthetic benefits. It is also durable, providing these benefits all day without reapplication. Relative changes in skin hydration can be determined using surface conductance measurements. The purpose of this study is to compare skin hydration levels for skin treated with Strateris film and well-known commercial occlusive or moisturizing creams.

Methods: Commercial creams were purchased at retail: Vaseline© (Unilever, London), Crème de La Mer™ (Estee Lauder, New York, NY). Strateris™ was formulated by Living Proof in Cambridge MA. Skin conductance measurements were made using a DermaLab USB single parameter unit with hydration probe conductance (Pin Probe, Cortex Technology). Both volar forearms of 24 healthy participants were cleaned with a standard wet wipe and allowed to dry. Two 5x5 cm^2 squares were drawn on each forearm. A white circular reinforcement label (Avery Dennison) was placed in the center of each square as a mask to create an uncovered area for direct contact with the conductance probe. Creams were then applied to cover the entire 5x5 cm test square using the following doses: Strateris 0.015 gm (per each step), Crème de La Mer: 0.02 gm, and Vaseline: 0.02 gm. Each participant had 4-application sites randomly assigned as Strateris™, Vaseline©, Crème de La Mer™, and untreated control. Once the creams were applied to the test sites, the circular mask was carefully removed and a baseline measurement was taken. Skin conductance was measured by placing the circular probe on the uncovered skin at the center of each test square (Figure 1). Additional measurements were made at 1, 2, 3, 4 and 6 hr time points. Participants wore short-sleeve clothing and did not touch or disturb the test sites during the study. Room temperature and humidity varied between 20-22 C and 32%-20% RH on test days.

Results: Skin conductance was found to vary significantly among individuals. Therefore, it was important to consider relative conductance changes for each test subject in assessing the four treatment regimens. The net change in skin conductance for the 24 participants is shown in Figure 2. Interestingly, an increase in conductance was seen for the untreated group within the first hour, but then remained stable for the duration of the test. This is likely due to a slight drying effect from the initial cleaning procedure. Strateris™ treated skin showed higher conductance measurements relative to the other three groups (table 1). Skin treated with Vaseline© or with Crème de La Mer ™ showed increased conductance over untreated skin.

Conclusions: Changes in skin conductance after treatment with three moisturizing creams were measured and compared in a pilot study. The greater conductance of Strateris™ treated skin suggests that this in-situ formed occlusive and hydrating material can provide remarkable skin hydration. Further study is warranted to characterize the hydrating effects of Strateris™ on human skin.

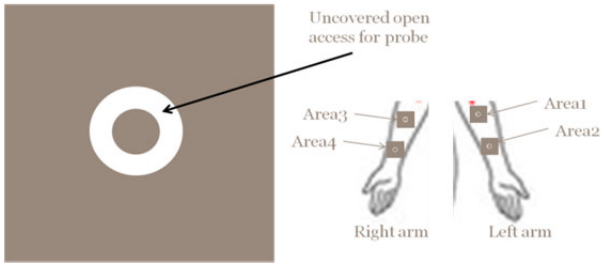

FIGURE 1. Geometry of treatment and probe-contact site

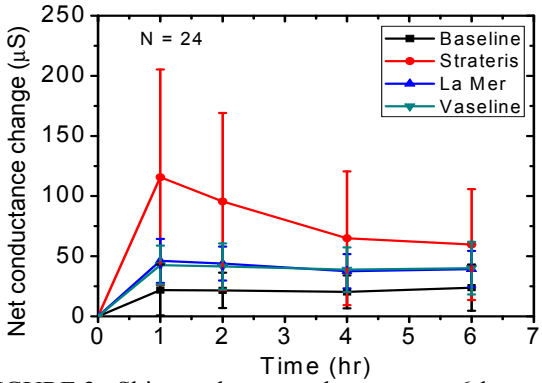

FIGURE 2. Skin conductance changes over 6-hours

Time(hr)	Untreated	Strateris	La Mer	Vaseline
1	21.95	115.65	46.15	42.65
2	21.67	95.54	43.90	41.54
4	20.35	64.93	37.53	38.73
6	23.85	59.67	39.27	40.10

TABLE 1. Conductance changes (µS)

References: 1. Yu B., Lomakin J., Kang S-Y., Adams B.W., US Patent Application No: 2012/0251600 A1