



ATOPIC ECZEMA/DERMATITIS

MULTIFLUIDIC WEARABLE PH SENSOR AND SMARTPHONE APPLICATION FOR SKIN PH MONITORING AND SKIN PH MANAGEMENT RECOMMENDATION.

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Skin pH is a vital component of the normal skin function. Dysregulation of the acidity plays a role in a number of skin diseases, such as atopic dermatitis, eczema, and acne vulgaris. Skin care product can temporarily affect skin pH; however, the skin is able to regulate these small variations. Sometimes, however, combination of different internal and external factors results in longer-term pH changes that can affect skin health. In order to monitor and maintain healthy skin pH range on the personal level we developed a skin pH patch with a coaching app. The patch uses microfluidic technology to measure skin surface pH from skin surface sweat secretion. The microfluidic collection chamber concentrates small amounts of sweat that are constantly secreted on the skin surface and directs it to the reaction compartments where colorimetric reagents are used to detect proton concentration. Once the reaction takes place a cellphone application and an algorithm are used to quantify the color change and calculate the skin pH. Based on skin pH and other external factors such as outside temperature, humidity, and pollution level, personalized skin care regimen is recommended. The patch sensitivity, accuracy and utility were demonstrated in clinical evaluation studies.

