

## **A technique to monitor interventions for swelling in minor burns: A pilot study.**

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The control of oedema in burns injured patients is a priority as it can impede the wound healing process. There is currently no easy-to-use, accurate and sensitive measure of burn wound oedema volume change. Bioimpedance spectroscopy (BIS) has been identified as a method of swelling assessment that has merit after burns. It is a noninvasive technique that has the capacity to quantify the body's inter-compartmental fluid composition. It provides raw variables to monitor the tissue fluid resistance, with resistance hypothesized to be inversely proportional to fluid (oedema) volume.

Participants with single limb burn < 5% TBSA and less than 4 days old were included in this observational, repeated measures pilot study. Localized BIS triplicate measures and circumference limb measures (CLM) of the wound were collected at recruitment (T1) (mean 2.54 days, SD 1.4) and then within 14 days (T2) (mean 5.54 days, SD 3.16). Electrodes were placed 3cm longitudinally either side of the wound and on the hand and foot, and CLM was recorded at the site of the distal electrode for consistency.

Twelve burn patients with a mean age of 37 (SD=11.5) years and a mean TBSA of 2 (SD=2.2) % have been recruited to date. Preliminary results indicate that between T1 and T2, CLM measures decrease and tissue fluid resistance increases.

These preliminary results suggest that BIS assessment of a localized burn wound is a valid method to quantify oedema change. However, further patients will be recruited to complete this study, after which multivariable analyses will be performed to statistically support the preliminary findings.

**Key Words:** oedema, bioimpedance spectroscopy, circumference limb measures, acute burn.