

Automation of image analysis software for real-time oxygenation imaging of wounds

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Preliminary work has shown that measuring tissue oxygenation in diabetic foot ulcers (DFU) using Near Infrared Spectroscopy (NIRS) using a Near Infrared Optical Scanner (NIROS) has promise in providing clinicians with subclinical physiological information on wound healing. This physiological information includes hemoglobin-based (oxy-hemoglobin, deoxy-hemoglobin, total hemoglobin, and oxygen saturation) concentration maps that undergo contrast analysis, image segmentation, image coregistration, measurements of wound areas, and statistical analysis. Currently, these methods have been implemented separately in MATLAB, requiring a time-consuming image analysis process. Herein, the objective of this project is to consolidate the various steps of image analysis into a single automated, user-friendly, graphical interface for efficient, real-time data analysis in the clinic. Consolidation and automation of the image analysis process can allow real-time assessment of wound healing status, apart from real-time imaging capabilities of the NIROS system. NIROS has the potential to complement the gold-standard clinical visual assessment of DFUs by providing supplementary physiological information on wound healing, and thus guiding treatment, with the possibility of improving patient outcomes.