

Leveraging StO₂ and Temperature Analytics for Enhanced Wound Care Decision-Making: A 3 Patient Case Series

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Introduction

Advanced wound care technologies offer valuable insights into healing processes. This study explores the use of tissue oxygen saturation (StO₂) and temperature analytics in clinical decision-making for complex wounds.

Methods

We present a case series of three patients with diverse wound types: a new ileostomy, a posterior rotational flap, and a spontaneous enterocutaneous fistula. StO₂ and temperature measurements were obtained by two clinical research assistants using non-invasive imaging technology*. Data were analyzed to assess healing progress and guide treatment decisions.

Discussion

StO₂ (tissue oxygen saturation) and temperature analytics enhance clinical decision-making in complex wound cases by providing real-time assessments of wound healing and early detection of potential complications. These non-invasive technologies allow for flexible monitoring across various diagnostic applications, improving patient care without causing additional discomfort. The objective data they provide supports informed treatment planning tailored to individual patient needs. However, further research is essential to integrate these technologies into standardized treatment protocols and optimize healing outcomes.

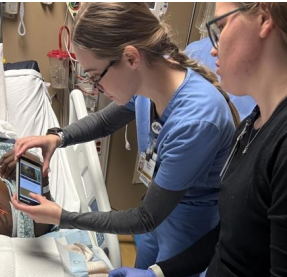


Figure A: Photographing an ileostomy using tri-imaging handheld device* to capture multispectral near-infrared spectroscopy (NIRS), infrared (IR) thermal and digital images.

Results

Case 1: A 63-year-old female with a new ileostomy. Over 53 days, StO₂ increased while temperature normalized, indicating improved perfusion and progression of healing. At day 82, an increase in temperature variance and a decrease in oxygenation in the skin surrounding the stoma was noted, which was consistent with the patient's clinical presentation of moisture associated skin damage. These markers helped differentiate normal healing from complications such as dermal fistula, abscess, seroma, or hematoma.

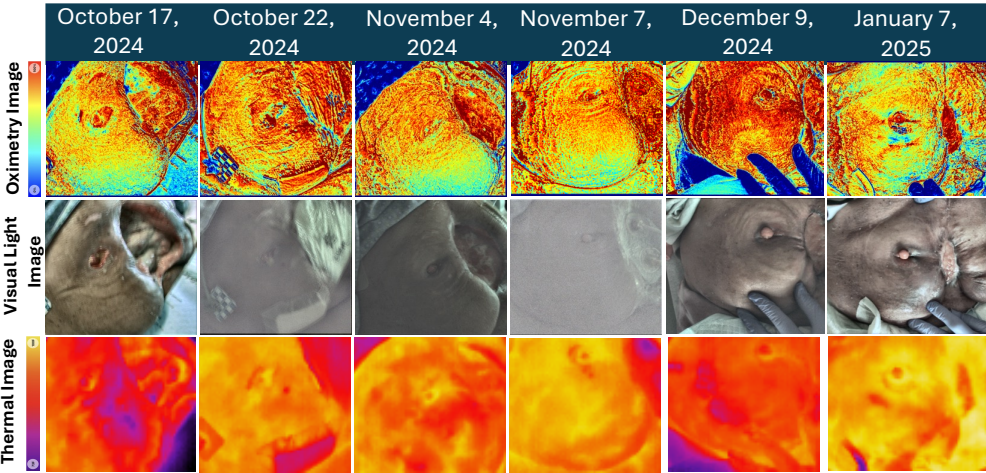


Figure B: Tissue oxygenation over time comparing stoma vs. surrounding skin.

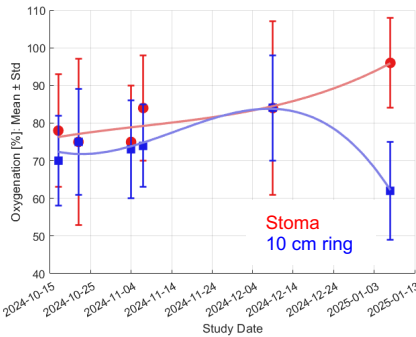
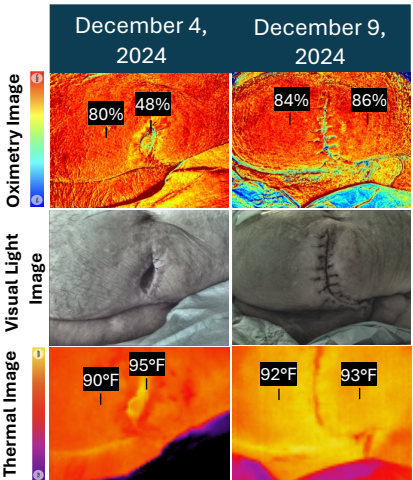
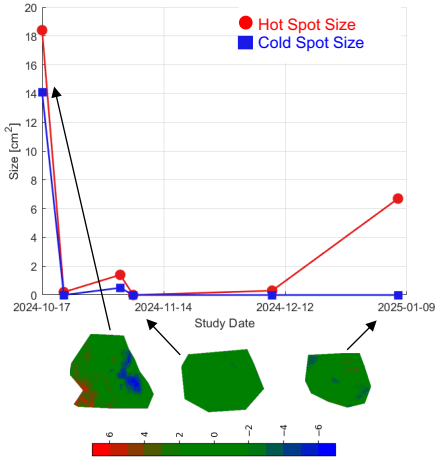
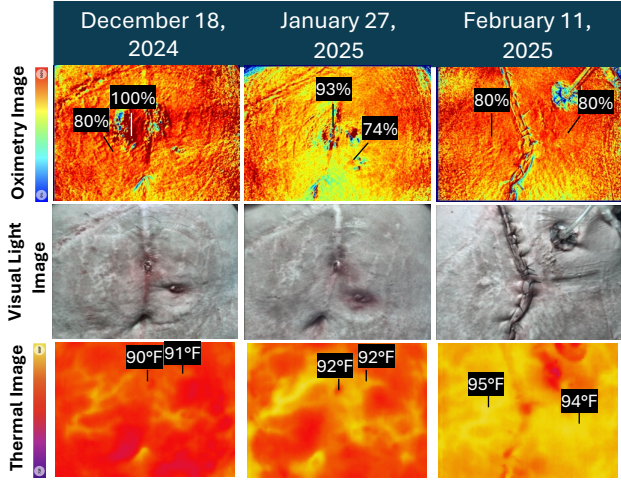


Figure C: Variance in hot and cold spot size on skin surrounding stoma over time.



Case 2: A 37-year-old male with a history of paraplegia following a Posterior Rotational Flap with a unilateral area of swelling. StO₂ and temperature measurements showed normal values bilaterally along the incision. Based on these findings, the plastic surgeon opted for a percutaneous drain approach instead of open surgery.



Case 3: A 73-year-old female with an Enterocutaneous Fistula. StO₂ was higher in areas of missing epithelial cells or moisture associated skin damage, while temperature remained unchanged. This information aided in precise identification of affected areas and guided targeted treatment.

*MIMOSA Pro, MIMOSA Diagnostics Inc., Toronto, ON

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