NTVA: Non-Contact Tissue Viability Assessment

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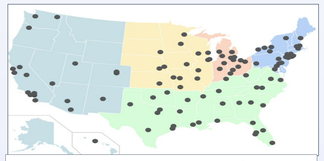
Burn Wound Treatment

According to the American Burn Association (ABA), there are approximately 128 Burn Centers in the US.

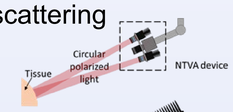


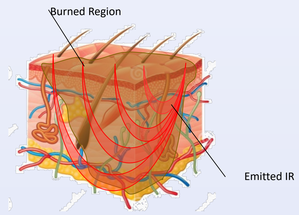
ABA Burn Center Regional Map

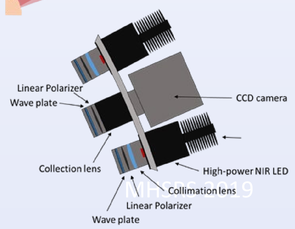
When treating severely burned patients, clinicians must balance the risk of infection and sepsis with **the level of excision necessary** to minimize inflammation and maximize the potential of preparing the burn surface for a successful skin grafting procedure. Grafting success depends on the **removal of all necrotic** (dead) **tissue** to clear the entire surface to the highly vascularized granulation tissue bed.

NTVA is engineered to assess tissue viability in the outer surface of the imaged tissue

NTVA is a non-invasive, non-contacting and easy-to-use real-time image acquisition system based on NIR (near-infrared) technology. A co-elliptical polarized NIR-light configuration was employed to provide the ideal contrast between perfused tissue and a thin layer of highly-scattering necrotic tissue.

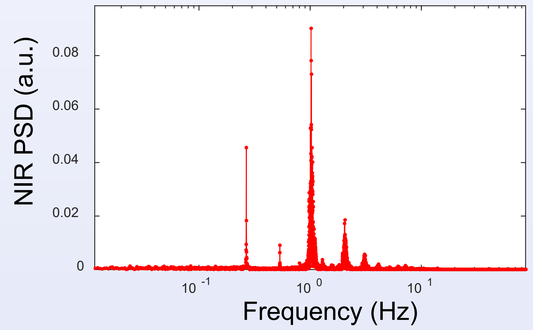




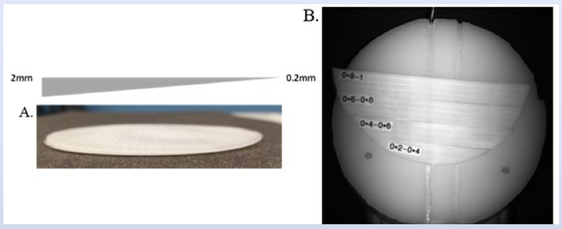


NTVA Novel methodology to discriminate viable from necrotic tissue

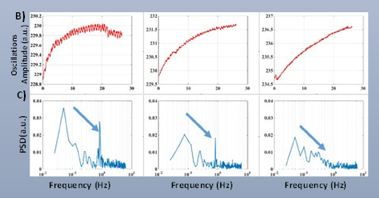
The NTVA non-contact imaging system, as opposed to common NIRS techniques, does not require absolute concentration retrieval of the chromophores present in the cardiovascular system; rather it will determine the health of the investigated tissue by analyzing spontaneous hemodynamic oscillations [cardio and respiratory induced: ~0.3 and ~1 Hz associated with blood volume changes.



In-vitro Study

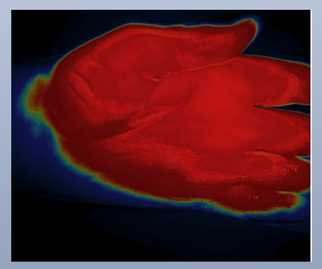


A series of optical phantoms for evaluation of the system were created. The phantoms simulate optical properties of human tissue and blood flow in the tissue. To objectively evaluate the effectiveness of the debridement we tested and demonstrated the depth sensitivity, and depth resolution of the NTVA system.



In-vivo preliminary testing (Pre-Clinical healthy human subjects)

Our proprietary algorithm successfully identifies viable tissue, through blood volume oscillations, down to the pixel level, as opposed to commercially available optical based technology



Conclusions / Next Steps / Other Applications

The patent-pending NTVA system and methodology promises to provide a powerful tool for burn-wound care management. The system now needs to be validated in an animal model, prior to human clinical trials.

The technology is also applicable to other medical applications, including:

- Chronic wound monitoring
- Dermatology screening
- Non-contacting vital signs monitoring.

Partners and Affiliates

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