



MIMOSA

WHITEPAPER



MULTISPECTRAL IMAGING IN WOUND CARE

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Making the invisible... Visible



Multispectral Imaging

One innovative diagnostic tool evolving which could be very useful to assess tissue health is multispectral imaging (MSI). MSI can determine levels of two major optical signals in tissue, these are oxyhemoglobin and deoxyhemoglobin. The signals provide a measure of local oxygenation, providing an assessment of the microcirculatory status of the tissue measured.

As an emerging imaging modality MSI offers great potential for non-invasive tissue health diagnosis and treatment guidance of patients with both acute and chronic wounds.

Currently, there are several more standard methods for evaluating perfusion of and assessing vascular status of a wound.

These include the ankle-brachial index (ABI), Doppler ultrasound, and transcutaneous oxygen partial pressure (TcPO₂). However, all have limitations and are not necessarily appropriate for all patients.

Early detection of tissue health status allows clinicians to be more proactive in preventing medical complications arising from tissue compromise. MSI has been clinically evaluated in the screening of patients who are at risk of developing diabetic-foot ulcerations, tissue breakdown and potential limb loss.

With multispectral imaging, the perfusion status of any tissue can be seen, which increases the possibility of taking preventative measures before complications (e.g. wound) arise.

Such assessment technologies will allow us to establish a new standard of care in preventative medicine in the area of chronic wounds and vascular conditions (e.g. PVD). MSI makes the invisible, visible.

There is a growing number of MSI devices on the market with many being further evaluated in tissue perfusion analysis for a variety of clinical situations and conditions. MSI is practical with results being obtained in seconds without direct skin contact, allowing clinicians to obtain results rapidly and independently of care setting. Other routine assessments require, extended assessment times, skin contact and often an expert practitioner to operate the device. This can be a real game changer in the management of these patient populations.

MIMOSA Pro

Multispectral Imaging Device



EASE OF USE

Portable and lightweight technology fits easily into your workflow. Both doctors and nurses can use it!



SAFE / NO - TOUCH

Non-invasive and COVID safe with no injectable dyes resulting in zero patient contact.



ACCURATE

Precise visualization of oxygen saturation for faster assessments and healing trajectory predictions.



ANY SKIN TONE

40% Global Population is NOT Caucasian. Built in control for skin melanin content. Overcomes systemic racial bias in healthcare.



ANY HEALTH SETTING

Portability and miniaturization permits utility in any healthcare setting directly by the patients side.



INSIGHT

Tissue health is determined by expert clinicians based on vascularity and oxygenation. Delays or lack of understanding of tissue health can lead to wounds, amputation, or even death.



RISK PROFILE

A means to track and document patient progress to improve clinical outcomes and mitigate risks early.



POINT OF CARE

A portable technology, driving efficiency and accuracy in the diagnostic capabilities of clinicians. The magic of this technology is that its skin pigment, clinical specialty, and care setting agnostic - hence providing equitable access.

MIMOSA Pro is a handheld device that uses near-infrared light to accurately and non-invasively assess tissue health. It can be easily used by a patient or a caregiver, and the images produced will help inform the next steps within patient navigation and management (e.g. you need to see a podiatrist, or a vascular surgeon to help with the blood flow, or you may need more urgent treatment to prevent severe complications like limb loss).

With more accurate monitoring and early diagnosis, patients are getting better treatment, and as a result the amputation rates can be reduced dramatically. Not only can this approach save limbs, but rather lives. This emerging assessment and diagnostic tool will have huge impact in the management of patients with compromised vasculature. MIMOSA Pro is going to change the way in which many of these patients are managed.

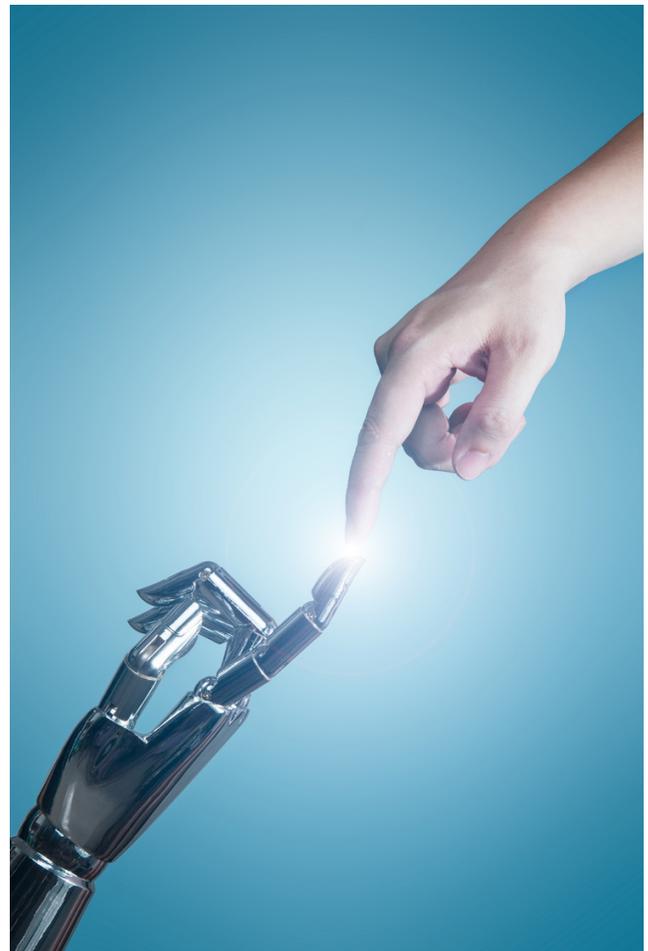
Clinical Monitoring & Assessment

For many acute and chronic pathologies, poor individual outcomes and overall statistics reflect the current unsatisfactory state of healthcare.¹ Severe chronic pathologies such as cardiovascular disorders, diabetes, and cancer are treated after the onset of the disease, frequently at near end stages.^{2,3} Replacing the current paradigm of reactive medical treatment with an innovative approach incorporating predictive, preventive, and personalised medicine (PPPM) is crucial for healthcare.⁴

The prevalence and economic burden of wounds are not insignificant, with the United States alone spending over \$25 billion annually treating chronic wounds in over 6 million patients. Chronic wounds may result from a range of suboptimal health conditions and severe pathologies (eg, diabetes). Both modifiable and non-modifiable

risk factors make prevention and management highly individual. Individualised patient profiling utilises systems medicine, predictive diagnostics, prevention, and treatment tailored to the individual person, that is, the innovative approaches of PPPM. How is this complex process achievable in wound care?

Artificial intelligence (AI) “is the ability of a machine to perform cognitive tasks to achieve a particular goal based on provided data.”⁵ This new approach is revolutionising and reshaping healthcare systems around the world. The ever-increasing computational power of AI’s highly developed and clinically relevant algorithms, in addition to advanced image processing software, is changing the assessment and diagnosis of patients through medical imaging. This combined power permits the “cognitive” computer to scan billions of pieces of unstructured information, extract the relevant data, and recognise complex patterns with increasing confidence through mass iterative learning,⁶ something that would be impossible for human clinicians to do irrespective of competence and training.



Risk Profiling in Wound Care

In today's fast-moving technologically enhanced world, diagnosis by machines is still in its evolution, although, growing rapidly in many facets of clinical care.^{7,8} Wound care needs to adapt to this changing world to develop highly accurate AI-based decision support applications to improve patient care. This journey has started with the development of wound measurement apps,⁹ treatment decision support apps,¹⁰ and more recently, wound imaging devices.¹¹⁻¹³ The use of such approaches is changing the way in which persons with wounds are both assessed and managed. From treatment to prevention, this technological approach will change the wound care landscape.

Preventive intervention relies on the identification of regularities or risk profiles, moving from risk factors to risk pattern recognition.¹⁴ Risk profiling is natural for clinicians but is not an easy task, requiring significant clinical skill and time. The adoption of a complex systems approach ^{8,15,16} may push wound care forward in terms of concepts and methods to improve healing prediction, for example.

References

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