

# **WoundViewer Feature Presentation**

### Heal Faster, Live Better

Virtual CareWare Presentation Day 23 May 2024

Federica Sartori, Omnidermal Biomedics srl

### Omnidermal Biomedics s.r.l. Artificial intelligence applied to dermatology

Our Mission is to improve the living conditions of patients with dermatological and vascular diseases by developing medical devices, based on artificial intelligence, that support doctors and nurses during the decision-making process, providing them with accurate and objective data aimed at optimizing the process of care of patients.



Research team specialized in Artificial Intelligence applied to "Precision & Predictive Medicine".



Experience

AI algorithms trained on major international clinical protocols (e.g. WBP for ulcers).



### University

### Cooperations

Born as a spin-off of the Politecnico di Torino, and has academic relations in Italy, Europe and the United States



### **Our Roadmap**

«One of the most important challenges of my work as a wound care specialist is the monitoring and followup of patients with chronic skin ulcers. To date, there are no technological solutions that allow me to collect accurate and reliable clinical data to track the evolution of the wound and the effectiveness of therapy.» -Dr. Elia Ricci, President of Italian Association of Wound Healing (AIUC)

Omnidermal Biomedics s.r.l. was founded in 2017, the result of research conducted at the Polytechnic of Turin by the three founding researchers in the development of medical devices, based on artificial intelligence, that support health professionals in their decisions, through accurate and objective data.

2022-23 and forward

Scale-up, CE-mark (MDR) Commercialization in European market. Extension of technological platform to other dermatological

and cosmetic purposes









### Omnidermal Biomedics s.r.l. A Recent History of Wound Care



Skin ulcer (or chronic wound) is a syndrome that affects 2 percent of the world's population, especially patients older than 65 years, suffering from debilitating diseases or bedridden for prolonged periods (e.g., due to COVID-19 hospitalization).

### If an 'ulcer is not closely monitored in the first 4 weeks:



To achieve a better outcome of the clinical evolution of a wound, it is necessary to act at its onset, providing optimal treatment.

Optimal treatments are best performed by experts in wound healing who are not easy to find... To treat an ulcer, it is important to assess it properly.



Elia Ricci, MD – President AIUC (2019-2022)

An <u>objective and standard method</u> for assessing a wound and monitoring its evolution is necessary to overcome the lack of expertise and improve the overall clinical outcome and prevent its worsening.



# WoundViewer

Powered by Artificial Intelligence



### The WoundViewer Device

Wound Viewer is a Class IIa (MDR) handheld medical device, aimed at health care professionals, that enables a complete and automatic assessment of skin wound evolution in a matter of seconds. It comes in to two different configurations: the WoundViewer 02 and the WoundViewer LITE.

The devices, based on artificial intelligence algorithms, can provide in less than 2 minutes to the operator all the clinical parameters needed to assess and monitor the pathological status of skin ulcers (e.g., tissue granulation, ulcer classification, area, depth, and wound volume) based on the international Wound Bed Preparation Score (WBP) protocol.

The data are automatically **organized** in the patient's medical record in which the evolution of the disease state is shown, also graphically.



### Main Feature 1 – Patient Management

WoundViewer implements a digital clinical folder that contains the patient information. This informaztion can be inserted on the system by hand or it can be downloaded from the Hospital's EMRs automatically through our API systems.

### Main Feature 2 – Wound Management

In the same way, the system is capable of gathering the data regarding the single wounds. The data includes the Etiology (both acute and chronic) the clinical status and the body part. Also this information gan be either inserted by hand or gathred though APIs from the EMRs



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/ound data					
Etiology *	Ŧ	Age *			Ť
Clinic status *	~	Anatomical De	pth *		Ť
Pathological Proximal Anamnlesys		Healed	Ç	)	
Healing date		Lesion Borders	s *		÷
Body part *	Ť	Proven *	SURE	ALLEGED	
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### Main Feature 3 – Visit Management

WoundViewer, thanks to its proprietary Artificial Intelligence algorithms is capable of measuring and classifying the wound through three different intarnationally recongnized standards (the Wound Bed Preparation Score, The TIME Scale, and the TEXAS Scale).

In addition it is also possible to insert completary sets of data such as:

- 1. Infection score (through Cutting and Harding scale)
- 2. Dressings
- 3. Pain score
- 4. Picture of the dressing
- 5. Type of exudate

All the information is saved to a **statistics page** that summarizes the wound's clinical evolution.

#### NoundViewer Patients > Debby Smith > Wound > Visit > Edit Visit data Area [cm2] \* 4,93 Depth [mm] \* Volume [cm<sup>3</sup>] \* 1,50 7,39 Black % \* Yellow % \* Red %.\* White % \* 41,55 58,45 0.00 0.00 Infection degree (C&H) \* Select one or more cases to calculate the exact value of K&I Dressing Abscess Bad Smell Retarded Healing Cellulitis Primary Dressing \* Easily Visible Bleeding Tissues Increased Pain Pocket Formation NONE Purulent Secretion Formation of Epithelial Bridges Wound Decaying Altered Coloration Set to 0 Primary Dressing Notes Pain \* Secondary Dressing NONE 1 2 3 4 5 6 7 8 9 10

### Granulation







### **Predictive inference**

- The methodology allows for extremely simplified feature extraction and can be used in different domains to perform automatic classification (i.e., automatic recognition and classification).
- It is based on multilayer neural networks in which up to 106 features are extracted for each feature searched.



# Thermal Camera (WV Lite)

- ✓ The methodology allows for an extremely simplified wound under the skin vision.
- ✓ Through this technique it is possible to identify certain clinical features such as inflammation, edema, and undermining.



### Wound Viewer Data Protection and Data Magaement Features

The Wound Viewer technology has been designed according to the best practices of information security and according to the "Privacy by Design" principle governed by the GDPR regulations.

#### Data encryption

All data collected are encrypted, transmitted and sent to servers through SSL and HTTPS transmission protocols.

#### Data anonimization

Patients' data are not only encrypted but also anonymized; in order to guarantee patients' privacy (i.e. only the healthcare operator has the possibility to check the patient's personal data).

#### Data and image portability

Clinical data can be exported in CVS, PDF or JSON format to ensure data portability to other information systems and/or to the final patient. Similarly, images can also be exported in JPEG format.

#### **Data decoupling**

Patient clinical data (wound data) are decoupled from personal data and wound images to ensure greater safety for hospital facilities on patient data.

#### Device authentication signature

Each Wound Viewer device is equipped with a unique digital authentication signature, which allows you to access the DB and perform synchronizations. Thanks to this mechanism it is impossible to access the DB by external users.

#### Data backup and restore

Data backup and restore capabilities are automatically guaranteed to the operator, offering periodic data back-up on a daily basis.

#### On device data security

All data on devices is contained in the application. Every time you logout, the data is deleted from the device. If the device is synchronized, an automatic logout occurs after eight hours.

#### **Data oblivion**

All data are (at patient, ulcer and examination level) can be deleted in order to guarantee the operator's right to oblivion. Once the data is deleted at device level, it is also deleted at backend level.

# **Clinical Trial Operations**



# Results – Morphological Assessment



[1] G. Zoppo, F. Marrone, M. Pittarello, M. Farina, A. Uberti, D. Demarchi, J. Secco, F. Corinto, and E. Ricci, "Ai technology for remote clinical assessment and monitoring," Journal of wound care, vol. 29, no. 12, pp. 692-706, 2020

# Results – Classification Skills



[1] G. Zoppo, F. Marrone, M. Pittarello, M. Farina, A. Uberti, D. Demarchi, J. Secco, F. Corinto, and E. Ricci, "Ai technology for remote clinical assessment and monitoring," Journal of wound care, vol. 29, no. 12, pp. 692-706, 2020

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# Expected benefits of wound care service with AI.

System for monitoring patients with skin ulcers at home. Nursing staff present in the area visit patients with AI system, acquire clinical data that are shared with the medical specialist present in the hospital/clinic, for the establishment of the treatment plan.



Number of chronic wound patients at ASL per year: <u>+ 5,000</u> \*Thanks to the ability to see patients more often in less time. WV takes only 2 minutes to assess a wound

Medical • Approval of the treatment specialist at the plan Second opinion clinic Management of complications mniderma **GDPR** cloud platform intelligence for your healt **Operator 1** Operator 2 **Operator N** 

Study Case:

Home care (dressings + data acquisition)

### Expected benefits of wound care service with AI.

#### HC costs for ulcer patients - CASE STUDY

Cost (€/patient)



#### **Highlights**

Following the reorganization of the Home Care structure of a Piedmont health care facility, it was decided to introduce a system for tracking and monitoring costs related to nursing access, medications and care plans, supported by systems with AI.

After one year of use, in addition to improved satisfaction for both the patient, because the solution is noninvasive, and the caregiver, because his or her operations are simplified, the Wound Viewer has resulted in the following savings\*.



### Omnidermal Biomedics s.r.l. Contacts

**OPERATIVE HQ** 

Corso Castelfidardo, 30/a 10129 Torino (To)



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### Contacts

For further information please contact jacopo.secco@omnidermal.it federica.sartori@omnidermal.it

To learn more www.omnidermal.com

### **ADMINISTRATIVE HQ**

Via Alessandro Volta, 8

43040 Rubbiano (Pr)



# THANK YOU! For further information:



www.carepartner.dk



www.omnidermal.it Federica Sartori federica.sartori@omnidermal.it