5th International Conference on

Wound Care, Tissue Repair and Regenerative Medicine

April 15-16, 2022 | Paris, France

Received date: 27-01-2022 | Accepted date: 20-02-2022 | Published date: 15-04-2022

Vladimir Emelianenko[1]

Alexander Sannikov[2]

[1]First Clinical Medical Center Ltd, Russia

[2]City Clinical Hospital № 2, Russia

Non-invasive methods for monitoring the state of tissues in the wound area

Monitoring the state of tissues in the wound area allows to evaluate the dynamics of the wound process, the effectiveness of the methods of treatment used and, on this basis, take timely measures to adjust the treatment. The importance of an in-depth knowledge of wound physiology is highlighted in Wound Care Clinical Guideline V1.1, developed and published by The Royal Cornwall Hospital in 2021.

For non-invasive assessment of the state of tissues in the wound area, various methods are used: measurement of saturation, temperature, plethysmography, impedancemetry, and others. At present, the level of technology makes it possible to set and solve the problems of continuous monitoring of the state of tissues in the area of wounds using miniature wearable sensors attached with a patch to the skin with telemetric transmission of information.

The purpose of this review is to draw the attention of specialists to the possibilities of various non-invasive methods for assessing the state of tissues. At present, methods for measuring tissue saturation and temperature have received the greatest development. The accuracy of determining the saturation of tissues with oxygen in modern high-resolution devices reaches 0.1%. However, saturation measurement devices are mainly based on finger-through techniques, which are of little use for assessing tissue oxygen saturation near most wounds. Therefore, the limited experience of using reflected light technologies to assess saturation should be carefully evaluated.

The measurement of temperature in most cases is based on the determination of skin temperature, while the temperature of deep tissues - wearable deep body thermometers is of the greatest value. Such methods based on infrared and ultrasonic sensors exist, but they are poorly validated in medicine, as disclosed in Improvement of zero-heat-flux type deep body thermometer intended for use in hot environments.

Plethysmography in the variant of photoplethysmography has found very wide application in the form of finger blood flow sensors. However, their application is difficult for other localizations, except for fingers. Therefore, electrical high-frequency impedancemetry of tissues is recognized as promising for assessing the dynamics of both the plethysmogram and blood flow pulsations, as presented in potential of impedance spectroscopy as a manifold non-invasive method for medical applications. D. Bouchaala, Hanen Nouri, O. Kanoun. Published 2021 Materials Science Smart Sensors, Measurement and Instrumentation. Thus, the literature data indicate the great potential of non-invasive methods for assessing the state of tissues for monitoring the wound process.

Recent Publications

1. Parshikova S A, Parshikov V V. Non-invasive methods of monitoring the wound process (review of the literature). Perspectives of their application in maxillofacial surgery in children. Modern problems of science and education. 2012. - No. 2.
2. Brailovskaya T V. Comprehensive morphofunctional characteristics of the results of surgical treatment of patients with facial soft tissue injuries. Dentistry. -2008. - T. 87, No. 5. - S. 35-40.
3. Milyukov V E, Polunin S V. Modern methods for determining the viability of muscle tissue when choosing the volume of surgery. Surgery. Journal them. N.I. Pirogov. 2011;(4):73-77.

5th International Conference on

Wound Care, Tissue Repair and Regenerative Medicine

April 15-16, 2022 | Paris, France

Speaker Biography

Vladimir Emelyanenko was born in 1953. The main areas of clinical work: cardiology, internal medicine, psychotherapy. He took part in the examination of sailors who suffered as a result of the accident of the nuclear reactor of the nuclear submarine K-19. Based on these materials, in collaboration with Professor E.E. Gogin, he wrote a monograph "Combined Radiation Injuries". In 1988, he provided assistance to the victims of the earthquake in Armenia. The results of treatment were published in several papers, where he outlined the features of wounds and lesions of internal organs that occur with prolonged compression syndrome. He revealed a phenomenon that causes Korotkov sounds, which determine systolic and diastolic blood pressure. Author of more than 100 scientific papers, Professor. From 2015 to the present the chief physician, then the scientific director of the private organization First Clinical Medical Center.

e: vla05@yandex.ru