

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ
БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ»**



МАТЕРІАЛИ

**105-ї підсумкової науково-практичної конференції
з міжнародною участю
професорсько-викладацького персоналу
БУКОВИНСЬКОГО ДЕРЖАВНОГО МЕДИЧНОГО УНІВЕРСИТЕТУ
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Матеріали підсумкової 105-ї науково-практичної конференції з міжнародною участю професорсько-викладацького персоналу Буковинського державного медичного університету, присвяченої 80-річчю БДМУ (м. Чернівці, 05, 07, 12 лютого 2024 р.) – Чернівці: Медуніверситет, 2024. – 477 с. іл.

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У збірнику представлені матеріали 105-ї підсумкової науково-практичної конференції з міжнародною участю професорсько-викладацького персоналу Буковинського державного медичного університету, присвяченої 80-річчю БДМУ (м. Чернівці, 05, 07, 12 лютого 2024 р.) із стилістикою та орфографією у авторській редакції. Публікації присвячені актуальним проблемам фундаментальної, теоретичної та клінічної медицини.

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the dominant chromophore is water, in the visible range – blood and melanin, in the UV range – proteins and amino acids. The same depth of penetration describes different combinations of chromophores in the studied biological tissue – the so-called isosbestic points, which complicates unambiguous identification. The absorbed light energy can cause heating or luminescence at the absorption site. Cells in different disease states undergo different structural changes, which are manifested in changes in fluorescence spectra. This makes it possible to carry out live diagnostics without the introduction of exogenous fluorophores. In some spectral ranges, scattering is dominated by absorption, so the light propagation becomes diffuse. The knowledge about the tissue structural elements contribution to the scattering and absorption of light can simplify the interpretation of reflected light. Measurement of reflected light makes it possible to identify structural and biochemical features of the structure of the reflective part of biological tissue.

Results. Physiological processes, including pathological ones, lead to changes in the absorption, fluorescence or scattering of light by tissues. Therefore, HSI of reflection, transmission, or fluorescence provide quantitative diagnostic information regarding processes in biological tissues. Multimodal HSI combine information about absorption, reflection, or luminescence. In addition, the modern medical use of HSI requires a combination with various methods of microscopy, which allows obtaining additional information and detecting pathologies in tissues. Medical HSI techniques are classified according to the image acquisition method, spectral range, dispersing element, spatial resolution, detector arrays and are combined with other techniques. Mathematical methods for processing medical HSI focus on pre-processing, feature detection, selection, and classification.

Conclusions. Obtaining a HSI requires more complex and expensive equipment than conventional microscopy methods. In addition, mathematical methods for processing absorption, scattering and reflection spectra are complex and cumbersome. This reduces the technique accessibility. However, advances in recent years in the cameras for HSI production technology, in algorithms for processing and interpreting data, and in the power of computing devices allow us to talk about the possibility of wider use and emergence of new applications of the HSI technique in medicine.

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THE ROLE OF BONE PLATES IN FRACTURE MANAGEMENT

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Introduction. Fractures, or broken bones, are common injuries that require specialized medical attention. In the realm of orthopedics, the use of bone plates in fracture management has become a standard practice. These impeccable devices play a crucial role in stabilizing broken bones, aiding in the healing process, and restoring the affected limb's function. This research delves into the purpose of bone plates, the methods involved in their application, and the outcomes of their use in the treatment of fractures.

The aim of the study. The primary objective of this research is to elucidate the significance of bone plates in managing fractures. Specifically, the study aims to: Investigate the role of bone plates in stabilizing fractures; Evaluate the methods and materials used in the application of bone plates; Examine the effectiveness of bone plates in promoting fracture healing and patient recovery.

Material and Methods. Types of Bone Plates: Bone plates come in various materials, including stainless steel, titanium, and biocompatible alloys. The choice of material depends on the specific patient and fracture. Surgical Procedure: The surgical procedure involves an incision at the site of the fracture, repositioning the bone fragments, and the application of the bone plate. The plate is secured using screws or pins. Biological Factors: The study also considers the influence of biological factors, such as the patient's age, overall health, and bone quality, on the choice of bone plate and the success of the procedure. Follow-up and Rehabilitation: Post-surgery, patients are typically required to undergo physical therapy to regain strength and mobility in the affected limb. The study includes data on the rehabilitation process and its impact on recovery.

Results. The utilization of bone plates in fracture management has yielded several important findings: **Fracture Stability:** Bone plates provide exceptional stability, which is crucial for a successful healing process. This stability reduces pain and minimizes the risk of further complications. **Enhanced Healing:** The use of bone plates has been shown to promote faster and more efficient fracture healing. This is especially evident in complex fractures where stabilization is paramount. **Improved Functional Outcomes:** Patients who receive bone plates generally experience better functional outcomes, regaining a higher degree of mobility and function in the affected limb. **Material Matters:** The choice of bone plate material influences the overall success of the procedure. Titanium plates, for instance, offer the advantage of being both lightweight and strong. **Age and Health:** The patient's age and overall health significantly impact the healing process. Younger, healthier patients tend to have quicker recoveries.

Conclusions. Bone plates are invaluable tools in the field of orthopedics for managing fractures. Their stability, ability to promote healing, and positive impact on functional outcomes make them a key component of fracture treatment. The choice of material and the surgical procedure are vital factors in ensuring the success of the treatment. However, patient-specific factors, such as age and overall health, also play a significant role in the overall success of the procedure. In conclusion, the use of bone plates in fracture management has revolutionized the way orthopedic surgeons approach fractures. By understanding their importance and optimizing their application, medical professionals can continue to enhance patient outcomes and contribute to the overall well-being of patients with fractures.

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PROGRAMMING LANGUAGES AND DEVELOPMENT OF AI FOR MEDICINE

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Introduction. Artificial intelligence (AI) is a branch of applied computer science wherein computer algorithms are trained to perform tasks typically associated with human intelligence. Artificial intelligence is intelligence in perceiving, synthesizing, and inferring information which is demonstrated by machines or computers. It is opposite to intelligence displayed by humans.

The aim of the study. Based on the examples of the use of AI for medical tasks, we would like to demonstrate the potential of AI in this field. Obviously, tasks must include communication with patients, language and speech recognition, computer vision, translation between (natural) languages, as well as other mappings of input data. AI should also analyze the patient's medical history and conduct the verification of a patient. Preliminary examination and consultation of a patient conducted by AI would save time and smooth the overloaded workflow in a hospital. Addressing a patient to a proper doctor is a crucial step in medical treatment and AI may play a significant role in this.

Material and methods. Machine learning and artificial neural networks are two major concepts in the AI current research. Machine learning means the study of algorithms by a computer that improves automatically through experience. In order to develop these algorithms and build neural networks many programming languages can be employed. Python and Java are among them. Although Python was created in early 90's and before AI became crucial to businesses, it's one of the most popular languages for artificial intelligence. One of the main reasons Python is so popular within AI development is that it was created as a powerful data analysis tool and has always been popular within the field of major data.

Results. The most important reason why Python is always ranked near the top is that there are AI-specific frameworks that were created for the language. One of the most popular is Tensor Flow, which is an open-source library created specifically for machine learning and can be used for training and inference of deep neural networks. Other AI-centric frameworks includes cikit-learn for training machine learning models, Py Torch for visual and natural language processing, The PyDICOM library is a mature library offering a reliable, simple reading and writing of DICOM files