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



# М А Т Е Р І А Л И
**105-ї підсумкової науково-практичної конференції**
**з міжнародною участю**
**професорсько-викладацького персоналу**
**БУКОВИНСЬКОГО ДЕРЖАВНОГО МЕДИЧНОГО УНІВЕРСИТЕТУ**
**присвяченої 80-річчю БДМУ**
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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.

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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**Hinhuliak O.M.**
**FORMATION OF CHD AGAINST THE DEVELOPMENT OF ENDOTHELIAL DYSFUNCTION IN PERSONS WITH SUBCLINICAL ATHEROSCLEROSIS**
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**Introduction.**Today, the main reason for the development of coronary heart disease (CHD) is atherosclerosis. It is regarded as one of the forms of chronic inflammation, which is based on the disorders of cholesterol metabolism. CHD occurs in men in the absence of explicit risk factors, usually at the age of 55 years due to not always known causes. Its occurrence is possible at an earlier age as well. Recent studies have undeniably proved that inflammation is one of the main pathogenetic mechanisms of atherosclerosis, starting with the first manifestations of damage to the vascular wall and resulting in rupture of the atherosclerotic plaque and the onset of acute coronary syndrome. Therefore, the study of atherogenesis by examining the intima-media complex will make it possible to detect patients at the subclinical stage of atherosclerosis, and administration of various therapies (metabolic, hypolipidemic) objectivizes the therapeutic approach that is more effective in the treatment and prevention of early atherosclerosis, which will enable to prevent development of severe vascular diseases of the cardiovascular system and central nervous system.

**The aim of the study**. To determine the early signs of endothelial dysfunction and increase the thickness of the intima-media complex (TCIM) of the carotid arteries and to objectify the level of inflammation markers in individuals with subclinical atherosclerosis, the effect of treatment.

**Materials and methods**. The following research methods were used: a detailed collection of complaints and anamnesis, a thorough objective examination, laboratory, biochemical, instrumental research methods. Experts of the European Society for hypertension and the European Society of Cardiologists in 2003 determined the optimal values of TCIM <0.9 mm; an increase is considered to be TCIM of 0.9 mm to 1.3 mm, and criterion of atherosclerotic plaque - TCIM ≥ 1.3 mm.

**Results**. A total of 45 young men with the phenomena of subclinical atherosclerosis were examined, at the beginning of treatment and after treatment after 3 months. The colored duplex scan (CDS) was examined by the internal right and left carotid artery (ICA) TCIM. Before the treatment with hypolipidemic drugs TCIM was - <0.9 mm, which was diagnosed for asthma in 26.7% of cases among the examined patients, 0.9-1.3 mm - in 33.3% of the subjects,> 1.3 mm in 40 % of patients. For the assessment of the left ICA, the data were as follows: TCIM - <0.9 mm at 26.7%, 0.9-1.3 mm -4.6.7%,> 1.3 mm in 26.7% of the subjects. After the treatment, which lasted for 3 months, the following parameters were obtained: TKIM - <0,9 mm on right VAA in 43,5%, 0,9-1,3 mm in 30,4%,> 1,3 mm in 26,1. The left CCA study was 56.5%, 26.1% and 17.3% respectively, indicating a positive effect of treatment and indicating an increase in the number of patients with normal CI (<0.9 mm) and a significant decrease in CIM thickening.

**Conclusions**: the use of anti-atherosclerotic therapy at the stage of subclinical atherosclerosis, which is diagnosed with color duplex scan with the evaluation of TCIM, makes it possible to reduce the level of coronary and cerebral pathology, and the use of hypolipidemic therapy significantly reduces the signs of atherosclerosis.

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**ARTIFICIAL INTELLIGENCE-BASED PREDICTION MODEL OF LONG-TERM COVID-19 CARDIOVASCULAR OUTCOMES**
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**Introduction.** The global impact of the COVID-19 pandemic has created a severe health crisis with widespread repercussions. Ongoing research indicates a potential link between COVID-19 and the development of various issues, particularly cardiovascular disorders. Despite these

findings, there is a notable absence of strategies for anticipating post-acute cardiovascular consequences of COVID-19, and a lack of scientific examination into these effects. It is imperative to address this knowledge gap to enhance the quality of post-acute COVID-19 care.

**The aim of the study.** To conduct a 12-month follow-up longitudinal observation study to explore potential long-term cardiovascular outcomes of COVID-19 and develop an AI-based predictive model.

**Material and methods.** In the period between November 2021 and January 2022, our study actively recruited 412 individuals diagnosed with COVID-19, providing a diverse representation of experiences. Within this cohort, the average age was 42.8 years, encompassing a broad spectrum of age groups. Notably, 57% of the enrolled individuals were female, contributing to a nuanced exploration of gender-specific implications in the long-term outcomes of COVID-19. Excluding individuals with severe comorbidities, prior major adverse cardiovascular events, and intra-hospital mortality, we monitored patients for 12 months. The data were randomly partitioned into derivation (n=201), validation (n=81), and an external cohort (n=47). Collected data encompass clinical records, laboratory and instrumental findings, and medical records over the year. Our AI model, a convolutional neural network (CNN) with sigmoid-activation-function neurons, underwent training using follow-up outcomes and was assessed on the external cohort for evaluation.

**Results.** In our longitudinal study, a significant number of patients experienced major adverse cardiovascular events. This included individuals with myocardial infarction, cerebrovascular disorders, and pulmonary embolism. Cardiovascular death occurred in a portion of the studied population. The total incidence of cardiovascular complications encompassed conditions such as first-detected hypertension, arrhythmias, and heart failure.

During the training phase of our CNN, both the derivation and validation datasets were employed. Rigorous evaluation through ROC analysis revealed the remarkable predictive prowess of our AI model for cardiovascular events during follow-up, boasting an impressive AUC of 0.891 with a 95% confidence interval ranging from 0.869 to 0.913 (p<0.001). The model exhibited a sensitivity of 92.4% and a specificity of 90.1%, underlining its precision in identifying cardiovascular outcomes. Further substantiating its efficacy, the external cohort data analysis demonstrated accurate predictions in 41 out of 47 patients, yielding an impressive accuracy rate of 87.2%. This noteworthy performance surpasses the capabilities of any other known methods for predicting cardiovascular outcomes within the 12 months following COVID-19, solidifying the significance of our AI model in advancing prognostic capabilities in post-COVID-19 cardiovascular care.

**Conclusions.** The imperative for special attention to cardiovascular health in COVID-19 survivors arises from the heightened risk of post-acute cardiovascular consequences associated with the virus. Recognizing this, the prediction of long-term outcomes for COVID-19 has found a valuable ally in AI-driven models. These sophisticated tools not only underscore the significance of proactive cardiovascular care for survivors but also offer a promising avenue for predicting and mitigating potential long-term complications associated with COVID-19.

**Hrechko S. I.**
**EARLY CARDIAC REHABILITATION OF PATIENTS WITH ACUTE CORONARY SYNDROME**
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**Introduction**. Ischaemic heart disease (IHD) is the most common manifestation of coronary artery disease (CAD) with 3.6 million new cases and 34.9 million people living with IHD. IHD and cerebrovascular disease are the most common causes of cardiovascular death and IHD accounts for 1.67 million deaths corresponding to 17% and 18% of all deaths in men and women, respectively. CAD is the most common cause of death in Europe accounting for 4.1 million deaths (2.2 mil in females, 1,9 mil in males) each year. Two-thirds (66%) of the participants (men 63%; women 73%) in EUROASPIRE V were not achieving the defined physical activity target. Of the 46% advised to