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OF HIGHER EDUCATION  
«STAVROPOL STATE MEDICAL UNIVERSITY»  
OF THE MINISTRY OF HEALTHCARE OF THE RUSSIAN FEDERATION

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**THE INTERNATIONAL SCIENTIFIC CONFERENCE  
FOR STUDENTS AND YOUNG RESEARCHERS  
IN ENGLISH «TOPICAL ISSUES OF MEDICINE»**

*Abstract Book*

Stavropol, 2025

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ФЕДЕРАЛЬНОЕ ГОСУДАРСТВЕННОЕ БЮДЖЕТНОЕ  
ОБРАЗОВАТЕЛЬНОЕ УЧРЕЖДЕНИЕ ВЫСШЕГО ОБРАЗОВАНИЯ  
«СТАВРОПОЛЬСКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ»  
МИНИСТЕРСТВА ЗДРАВООХРАНЕНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ

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**МЕЖДУНАРОДНАЯ НАУЧНАЯ КОНФЕРЕНЦИЯ  
СТУДЕНТОВ И МОЛОДЫХ УЧЁНЫХ  
НА АНГЛИЙСКОМ ЯЗЫКЕ  
«АКТУАЛЬНЫЕ ВОПРОСЫ МЕДИЦИНЫ»**

*Сборник тезисов*

Ставрополь, 2025

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**МЕЖДУНАРОДНАЯ НАУЧНАЯ КОНФЕРЕНЦИЯ СТУДЕНТОВ И МОЛОДЫХ УЧЕНЫХ НА АНГЛИЙСКОМ ЯЗЫКЕ «АКТУАЛЬНЫЕ ВОПРОСЫ МЕДИЦИНЫ» (Сборник тезисов).** Ставрополь: Изд-во СтГМУ, 2025. – 152 с.

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В сборнике представлены тезисы работ авторов из российских и зарубежных учебных заведений для Международной научной конференции студентов и молодых ученых по актуальным вопросам теоретической, практической медицины и медико-биологических наук на английском языке.

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Dear friends!

I am pleased to welcome the participants of the International Scientific Conference of Students and Young Researchers in English “Topical Issues of Medicine”, which is being held at Stavropol State Medical University for the seventeenth time. It is especially significant that the Conference is taking place on the eve of a very important event both for Russia and for other countries of the world – the 80th Anniversary of Victory in the Great Patriotic War.



We all see how the world is changing rapidly. This is a natural process, and it requires in-depth study. A significant role here belongs to youth and students. Within the walls of your *alma mater*, you gain a sense of responsibility for the fate of the Motherland, creative thinking, knowledge and professionalism. And this will allow you to get an answer to the key question: how to solve the new challenges and problems facing our country and all of humanity. It is encouraging that the range of participants who are interested in the achievements in the field of medicine and the geography of this student forum are expanding from year to year.

Research work of young people is an integral part of education and training of qualified specialists who are able to independently solve professional and scientific problems. Research activity contributes to the formation of the readiness of future specialists for the creative implementation of the knowledge, skills and abilities obtained at the university, helps to master the methodology of scientific research, to gain research experience.

I wish all participants of the Conference fruitful work, creative productive discussion, activity, optimism and the acquisition of friendly contacts. I hope that it will be possible to create conditions for a constructive dialogue and exchange of experience and opinions between young scientists. Let our conference at Stavropol State Medical University become a place for further interesting and fruitful meetings. We are confident that the results of the conference will be useful to all participants of this conference, and the proposed recommendations will find their application in the further practical activities of each of them.

I wish you all good health, well-being and new scientific achievements in medical science!

***Mazharov Victor Nikolaevich***  
*Rector of Stavropol State Medical University, Russia*

**SCIENTIFIC ABSTRACTS  
OF STAVROPOL STATE  
MEDICAL UNIVERSITY STUDENTS  
AND YOUNG RESEARCHERS,  
RUSSIA**

**ABSTRACTS**  
**THE EFFECT OF STRESS ON THE PHYSICAL**  
**CONDITION OF MEDICAL STUDENTS ACCORDING**  
**TO HANS SELIE'S THEORY**

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**Background:** Many of us face stress every day. Stress is a state of very strong and severe psychological tension that occurs in people when the nervous system receives psycho-emotional overload, and not just pessimism and a bad mood. Stress interferes with a person's usual activities, spoils life and burdens the existence of both the individual himself and everyone around. Long-term and frequent stress often has a negative impact not only on mental, but also on physical health of a person, as it has a pronounced toxic effect. The body destroys itself from the inside, systems and tissues change their primary structure, lose their vital properties and functions. Hans Selye identifies 3 stages of stress reaction: 1) anxiety, 2) adaptive/adaptive, 3) exhaustion. G. Selye also created and introduced the triad ("response syndrome to damage"). It includes: increased work of the adrenal cortex, reduction (narrowing) of the thymus and glands of the lymphatic system, the appearance of hemorrhages in the mucous membranes. Stress phenomena occur when the normal adaptive response is insufficient. Since stress appeared precisely because of the perception of a threatening danger, its manifestation in certain cases can occur for subjective reasons associated with the characteristics of a particular individual. The effectiveness of adaptation at the mental level depends on the interaction of the individual in society. In cases of misunderstanding and conflicts in the family or in the production sphere, difficulties in building informal communication with people, violations of the mechanical adaptation process were revealed much more often than with intense social interaction. Also associated with adaptation is the analysis of the conditions and accompanying factors of some environment or surroundings, the assessment of the personal qualities of loved ones as an attractive factor in most cases was combined with effective adaptation in the psyche, and the assessment of the repulsive factor – with its pathological changes.

**Objective:** To study Hans Selye's stress theory and to detect changes occurring in the body as a result of stress in medical students of StSMU.

**Materials and methods:** To confirm Hans Selye's theory, we

interviewed 182 students of the Stavropol State Medical University, 1st and 2nd years of the medical and dental faculties.

**Results and discussion:** Of the 182 students of StSMU, 36 students do not experience stress. The remaining 146 respondents gave a positive answer. The leading symptoms were complaints such as headaches and abdominal pain. Having conducted an additional conversation with 20 respondents, we found out that people with the corresponding complaints suffer from diseases such as chronic headaches and gastritis. In this regard, it can be assumed that the development of these pathologies is associated with experienced stress, as G. Selye claimed. Consequently, the risk of developing acute diseases of the gastrointestinal tract and nervous systems is not excluded for the remaining subjects.

**Conclusions:** Having studied the works of Hans Selye, we have identified changes occurring in the human body as a result of stress. Thus, a person with a reduced adaptive reaction is more likely to have acute gastrointestinal diseases, myocardial infarctions and problems associated with the thymus gland.

**Keywords:** Stress, Hans Selye's stress theory, medical students, gastrointestinal diseases, thymus gland.

## **FEATURES OF THE DAILY BLOOD PRESSURE PROFILE IN YOUNG NORMOTENSIVE WOMEN TAKING INTO ACCOUNT THEIR BODY WEIGHT**

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**Background:** It has been shown that even a slight increase in weight that begins at an early age is associated with a higher risk of developing hypertension. It seems relevant to study the effect of body weight on monitoring hemodynamic parameters in young normotonic women, since this will allow for the earliest possible diagnostics of arterial hypertension (AH) at the initial stage of its development, when early preventive measures are most effective.

**Objective:** To evaluate the indicators of the 24-hour blood pressure monitor (ABPM) in young women with office and daily normotension depending on their body mass.

**Materials and methods:** The study included 71 women aged 18 to 35 years. The criterion for group formation was normotension based on the results of ABPM (systolic blood pressure (SBP) 24/diastolic blood pressure

(DBP)  $24 < 130/80$  mmHg) and office blood pressure measurement (SBP/DBP  $< 140/90$  mmHg). Two observation groups were formed depending on the body mass index (BMI). The first included 41 women with a BMI of  $18.5-24.9$  kg/m<sup>2</sup> ( $21.83 \pm 0.26$ ), the second – 30 with a BMI  $\geq 25.0$  kg/m<sup>2</sup> ( $31.08 \pm 0.52$ ).

**Results and discussion:** When comparing the ABPM values in overweight and normal weight women during the day and night, SBP was significantly higher in the overweight group ( $P_{1-2} = 0.0000$ ;  $P_{1-2} = 0.0090$ , respectively). SBP<sub>24</sub> and DBP<sub>24</sub> values were significantly higher in the overweight group relative to the control group. The lowest DBP value was found in normal weight women both during office and daily blood pressure (BP) measurements. When assessing the circadian rhythm, it turned out that 16.7% of overweight women had a prognostically unfavorable circadian rhythm profile, namely non-dipper, while in the group of normal weight women this figure was 14.6%.

**Conclusion:** Since normotensive women with minimal increase in MT have a stable increase in ABPM indicators, this contingent should be more widely monitored for BP. And also early measures to change lifestyle should be applied, in particular for overweight individuals, to prevent future cardiovascular diseases.

**Keywords:** Ambulatory blood pressure profile, overweight, young women.

## THE ROLE OF ROBOTIC SURGERY IN COMPLEX GENERAL SURGICAL PROCEDURES: OUTCOMES AND FUTURE DIRECTIONS

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**Background:** Robotic surgery has revolutionized the field of general surgery, offering enhanced precision, minimally invasive techniques, and improved patient outcomes. Its application in complex surgical procedures, such as gastrointestinal, hepatobiliary, and colorectal surgeries, has expanded rapidly. The accuracy is 99% and the speed is approximately the same as the corresponding or circulating nurse which is about 17s. Efficiency and cost savings are realized by decreased supplies on the shelves and personnel's needed to inventory and order all the supplies. The unique ability to store videos of the procedures and track hand motions greatly reduce the amount of time and efforts to collect and analyze data to improve patients care and safety, such documentations could also be used by the hospital credentialing

and privileging committee when the surgeons request for operating reports and annual review of the hospital operating procedures.

**Objective:** This study aims to assess the role of robotic-assisted surgery in complex general surgical procedures by evaluating its clinical outcomes, comparing it to conventional laparoscopic and open techniques, exploring future technological advancements and provide a revolutionary new way of performing surgery.

**Materials and methods:** We used a Jacob Rosen, Blake Hannaford and Richard M. Satava systematic review, applications and visions on Surgical Robotics which were of recent clinical studies conducted, analyzing patient outcomes, complication rates, operative time, hospital stay duration, and cost-effectiveness. Data from randomized controlled trials, retrospective studies, and case series were also included.

**Results and discussion:** The findings indicate that robotic surgery significantly reduces blood loss, post-operative pain, and hospital stays while improving surgical precision and dexterity. However, it is associated with longer operative times and higher costs. Future advancements may further enhance surgical efficiency and accessibility.

**Conclusion:** Robotic-assisted surgery has demonstrated substantial benefits in complex general surgical procedures, though challenges such as cost and learning curves are still dissolved but Continuous technological innovation and training programs will be essential for its widespread adoption and optimization to provide a revolutionary new way of performing surgery.

**Keywords:** Robotic surgery, minimally invasive surgery, general surgery, surgical outcomes, complex procedures, future and potential advancements.

## **SOCIO-PSYCHOLOGICAL ADAPTATION OF 1-2 YEAR MEDICAL STUDENTS**

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**Background:** The first and second years of medical education challenge students not only to study, but also to develop their professional and personal identity. This requires learning new skills, adapting to medical ethics and the demands of teamwork. 1-2 year medical students often need effective social support from the university, teachers and mates. The transition from school to higher medical education is often accompanied by stress and anxiety. Study load, new social environment, expectations from self and others may be triggering factors that require adaptation.

**Objective:** To analyze the adaptation process of 1-2 year medical students.

**Materials and methods:** The method of questionnaire was used in the work, the aim of which was to assess the social and psychological adaptation of medical university students by understanding how they adapt to the learning process, interact with classmates and lecturers, as well as what difficulties they encounter in the adaptation process and to what extent they feel supported by the university community. In accordance with the purpose of the study, we defined the unit of observation – a student of SSMU. The target group was formed quite wide: from 1st to 5th year of all faculties of our university. A total of 139 students participated in the study, including: 78 female students and 61 male students. Polls were conducted during 2024 by means of online questionnaires on the “Yandex” platform.

**Results and discussion:** The study revealed a number of factors that influence the success of students’ adaptation in a new social and learning environment. It is important to note that the level of social support, availability of adaptive strategies and psychological resources play a crucial role in the adaptation process. We found that students who had strong social support and actively used adaptive strategies showed higher levels of adaptation and were more successful in coping with the challenges of the first and second years of medical education. Research showed that stress and adaptation difficulties can have a negative impact on academic performance and learning motivation.

**Conclusion:** First and second year medical students who have high levels of social support, actively apply adaptation strategies and have more developed coping mechanisms showed more successful social-psychological adaptation, manifested in improved academic performance and general well-being compared to students who have low levels of social support and inactive adaptation strategies. This highlights the importance of creating a supportive social environment and developing support programs for medical students.

**Keywords:** Socio-psychological adaptation, 1-2 year medical students, support, social environment, adaptive strategies.

## ANAESTHESIA

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**Background:** General anesthesia is defined as ‘an induced state of unconsciousness accompanied by partial or complete loss of protective reflexes, including the ability to independently maintain an airway

and respond purposefully to physical stimulation or verbal command.’ Anesthetics are generally categorized into two classes according to their functions: local anesthetics and general anesthetics. Local anesthetics are composed of esters and amides and are administered to skin, subcutaneous tissues and intrathecal and epidural spaces to block pain sensations. General anesthetics are either gases or volatile liquids that evaporates when inhaled with oxygen or anesthetic agents that are administered intravenously to produce a state of unconsciousness.

**Objective:**

- Define anesthesia, balanced anesthesia and pre-anesthetic medication.
- Distinguish between inhalation and intravenous anesthetics.
- Identify the pharmacokinetics, pharmacological actions, and side effects of inhalation anesthetics.
- Identify pharmacodynamics and side effects of intravenous anesthetics.

**Materials and methods:** Patients scheduled to undergo elective surgery in the age group from 18 to 65 years with the American Society of Anesthesiologists [ASA] grades 1 and 2, who are willing to participate and given written informed consent. Patient whose age is <18 years and more than 65 years, ASA health status class 3 and above were excluded. Statistical analysis was done by calculating percentages.

**Results and discussion:** Twenty percent of participants were illiterate and of the educated, none were graduates or postgraduates. Patients with higher level of education had better knowledge of anesthesiology and role of an anesthesiologist with  $P < 0.05$  than those with lesser education. Forty-eight percent of the participants had no idea about anesthesia despite the majority [62%] having previous surgery with no statistically significant difference [ $P > 0.05$ ] between those with previous surgery and those without previous surgery regarding their knowledge of anesthesiology and anesthesiologists. 90% did not know the complications, types of anesthesia and 44% did not know that anesthesiologist is a doctor.

**Conclusion:** Most of the participants were not aware of the role of anesthesia and anesthesiologists inside and outside the operation theatre. Although this could be attributed to their lower level of education, the fraternity of anesthesiologists has to educate patients and surgeons about the role of anesthesia.

**Keywords:** Anesthesia, anesthesiologists, anesthetics.

# ANEMIA AS A FACTOR OF REDUCING THE QUALITY OF STUDENTS' LIFE

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**Background:** Iron deficiency anemia is an urgent problem of modern healthcare. According to WHO, it affects more than 1.5 billion people. The incidence of anemia among women (outside pregnancy) reaches 30%, in men – 12%, in the elderly – 24%. Today it is known that anemia is a syndrome of many diseases observed in the practice of doctors of all specialties.

**Objective:** To determine the impact of iron deficiency in adolescence on the general well-being, education and quality of life of students.

**Materials and methods:** The study was conducted in 3 stages: a survey of 145 students (125 girls and 20 boys aged 18 to 25 years), laboratory examination (clinical blood test), copying of the data of the certification sheets.

**Results:** The analysis of the survey results determined the probable iron deficiency in 80 students who were recommended to undergo a laboratory examination (clinical blood test). Interpretation of the laboratory analysis of peripheral blood revealed a decrease in hemoglobin in 40% of the subjects. To prove the impact of iron deficiency on the quality of life and academic performance of students, a statistical analysis of the results of the intra-semester assessment was conducted. Of the 145 participants in our study, 50 students did not pass the certification, including 10 people with diagnose of iron deficiency. The data obtained confirm the negative impact of iron deficiency on student academic performance.

**Conclusion:** Iron deficiency anemia still remains one of the urgent problems of the healthcare system due to its widespread and adverse effects on the human body. At the current stage of medical development, iron deficiency can be easily cured with timely diagnosis and strict adherence to the doctor's recommendations. Eliminating the cause of iron deficiency and following the rules of a healthy lifestyle will help to avoid the negative consequences of this disease.

**Keywords:** Anemia, hemoglobin, peripheral blood, iron deficiency.

# CARDIOSPECIFIC ENZYME LEVELS IN PATIENTS WITH ACUTE MYOCARDIAL INFARCTION (AMI)

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**Background:** Cardiovascular diseases are the main cause of death and one of the main factors contributing to disability. It is estimated that the number of deaths from cardiovascular diseases worldwide increased from 12.1 million in 1990 (equally distributed between men and women) to 18.6 million (9.6 million men and 8.9 million women) in 2019.

**Objective:** To present the correlation of cardiospecific enzymes depending on gender, age, and depth of myocardial damage in patients with AMI.

**Materials and methods:** Medical records of 30 patients with acute myocardial infarction aged 45 to 90 years were studied. The study included data from people permanently residing in the Stavropol Territory. The data were divided into groups of 15 people, depending on gender, age, and depth of myocardial damage. Statistical analysis of the study results was performed using the Mann-Whitney U-test. The differences were statistically significant at  $p < 0.05$ .

**Results and discussion:** In men, the levels of ALT, CPK, and LDH were significantly higher, than in women (Mann-Whitney U-test was 37 in the first case, 34 – in the second, and 60.5 – in the third), while differences in the AST level were not statistically significant. Depending on the age (group 1 – middle age, 45-59 years, group 2 – elderly and senile age, 60-90 years) Mann-Whitney U-test was 73 for ALT, 86 for AST, 100 for CPK, and 85 for LDH. The analysis was also carried out depending on the depth of heart muscle damage (intramural and transmural myocardial infarction), the level of AST, CPK, LDH was significantly higher in transmural infarction (Mann-Whitney U-test in the first case was 40.5, in the second – 63, in the third – 61), differences in in the level of ALT were not determined.

**Conclusion:** In men, the level of cardiospecific enzymes was significantly higher than in women. No statistically significant differences were found depending on age. The level of cardiospecific enzymes was also significantly higher in transmural myocardial infarction.

**Keywords:** Cardiospecific, enzyme, acute myocardial infarction.

# ANATOMICAL CHARACTERISTICS OF THE RIGHT CORONARY ARTERY IN PEOPLE OF DIFFERENT SOMATOTYPES

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**Background:** Currently, the relationship between the development of myocardial infarction and body type has been proven, and somatotype is considered a prognostic factor in the occurrence of coronary diseases.

**Objective:** To present the anatomical characteristics of the main branches of the right coronary artery in asthenic and hypersthenic somatotypes.

**Materials and methods:** We studied the lifetime records of 62 coronary angiograms with the right-hepatic variant of coronary artery branching in elderly patients. The branching variant was determined according to the criteria of Professor Korobkeev, and the somatotype was determined using the Pinier index.

**Results and discussion:** in people with asthenic body type, the diameter of the mouth of the right marginal branch was 1.4mm, and the lumen of the posterior interventricular branch was 17.6% higher than that of the right marginal branch. In hypersthenics, the diameter of the initial part of the posterior interventricular branch exceeds the lumen of the right marginal branch by 1.3 times. The length of the main branches of the right coronary artery in asthenics varies from 70.2 to 74.4 mm, and in hypersthenics – in the range from 78.4 to 81.5 mm. The coefficient of tortuosity of the right marginal branch in people of asthenic body type was 1.31, the right marginal branch in asthenics shows slight tortuosity in 45.2% of cases, light – in 38.7%, and in 16.1% of cases a pronounced shape was determined. In the basin of the posterior interventricular branch, objects with slight tortuosity predominated, and light and pronounced forms were found in 16.1% and 3.2%. In hypersthenics, the tortuosity coefficient of the right coronary artery is higher than in the basin of the posterior interventricular branch. The right marginal branch with slight tortuosity was determined in 54.8% of cases, the pronounced form – in 25.8% and in 19.4% – easy.

**Conclusion:** In asthenics and hypersthenics, the diameter of the posterior interventricular branch prevails over the lumen of the right marginal branch; the diameter of the studied vessels is larger in hypersthenics ( $p < 0.05$ ); the tortuosity coefficient in people of both somatotypes is higher in the right

marginal branch compared to the posterior interventricular branch; in asthenics, the tortuosity coefficient of the studied vessels is larger.

**Keywords:** Coronary artery, somatotype, tortuosity coefficient.

## CHARACTERISTICS OF TYPES OF TEMPERAMENT OF 1-3 YEAR STUDENTS OF STAVROPOL STATE MEDICAL UNIVERSITY

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**Background:** Each student of Stavropol State Medical University is a unique person with his own unique character and potential. Each of them has their own characteristics, which manifest themselves in various aspects of their lives and studies. For example, the nervous system of each student reflects his mobility, excitability and activity of mental processes. These features affect the perception of information, the ability to concentrate and stress tolerance and reflect the concept of the type of temperament.

**Objective:** Description of different types of temperament among students of Stavropol State Medical University.

**Materials and methods:** The type of temperament was determined using A. Belov's questionnaire. The research was conducted among first-, second-, and third-year students at the Faculties of Medicine, Pediatrics, and Dentistry. The total number of students was 360. Data Statistical processing of the results was performed using the Microsoft Excel.

**Results and discussion:** As a result of a comprehensive analysis of data obtained through a survey of students from the 1st to 3rd courses of the medical, pediatric and dental faculties, it was found that the melancholic type of temperament (42%) is dominant in the first year, followed by choleric (39%), phlegmatic (11%) and sanguine (6%) types of temperament. In the second year, the temperamental characteristics of the students were arranged in the following order: phlegmatic (40%), sanguine (30%), choleric (23%), melancholic (5%). In the third year, the phlegmatic type of temperament also dominates (48%), sanguine (25%), choleric (16%), melancholic (10%) are located behind him. Thus, we can note the fact of phlegmatization.

**Conclusion:** As a result of the research work, various types of temperament have been identified. The most common type of temperament among students is phlegmatic, followed by choleric, sanguine, and melancholic temperament types.

**Keywords:** Student, type of temperament, medicine.

# CHRONOBIOLOGICAL CHARACTERISTICS OF 1-3 COURSES STUDENTS OF STAVROPOL STATE MEDICAL UNIVERSITY

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**Background:** Each person has a different level of performance during the day: some have peak activity in the morning, others in the evening, while others may be active throughout the day. The chronobiotype is a characteristic reflecting this feature. In the process of studying at a medical university, it is especially important to know your chronobiotype in order to successfully master the curriculum and implement the acquired skills.

**Objective:** To prescribe the different types of chronobiotype among students of Stavropol State Medical University.

**Materials and methods:** A special chronobiotype scale was used to determine the chronobiotype of the students. The research was conducted among first-, second-, and third-year students at the Faculties of Medicine, Pediatrics, and Dentistry. The total number of students was 360. Data Statistical processing of the results was performed using the Microsoft Excel.

**Results and discussion:** Investigating the chronobiotypic component, the first year students found an indifferent chronobiotype called “pigeon” in the predominant number of the first (62%), second (58%) and third year (57%). This is followed by a weakly pronounced evening type (WPET) in all faculties, 19% in the first year, 13% in the second year, and 29% in the third year. A mild morning type (MMT) in the first year is found in 15% of respondents from all faculties, in the second – in 13%, in the third – in 6%. The evening type of temperament is represented in smaller numbers in the first year and is only 1%, in the second year 4%, in the third – 4%. There is no pronounced morning type in the first year, 1% in the second, and 2% in the third.

**Conclusion:** As a result of the research work, various types of chronobiotype have been identified. It follows from the data obtained that the most popular is the indifferent chronobiotype, followed by the WPET, MMT, evening and morning chronobiotypes in the appropriate order.

**Keywords:** Student, type of chronobiotype, medicine.

# FEATURES OF DIASTOLIC DYSFUNCTION OF THE LEFT VENTRICLE IN PATIENTS WITH CORONARY ARTERY DISEASE IN THE LONG TERM AFTER CORONARY ARTERY STENTING

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**Objective:** To evaluate LV diastolic function in long-term follow-up in patients with coronary artery disease after myocardial revascularization.

**Materials and methods:** 74 patients with coronary heart disease (31 women and 43 men) aged 41 to 78 years were examined. The patients were conditionally divided into 2 groups: group 1 – 36 patients who underwent successful endovascular myocardial revascularization, which did not require repeated interventions for stent restenosis in the long term; group 2 – 38 patients who underwent repeated interventions for coronary stent restenosis after primary coronary artery stenting. Initially and 1, 2, 3 years after stenting, according to ECHOCG data, LV diastolic function was analyzed in groups of patients depending on the degree of LV systolic function impairment at the time of inclusion in the study: the 1st subgroup consisted of patients with left ventricular ejection fraction (LVEF) 50%; the 2nd subgroup – with LVEF 40-49%; the 3rd subgroup – with LVEF < 40%.

**Results:** At the time of inclusion in the study, in patients without repeated interventions for stent restenosis (group 1), LV diastolic dysfunction (DD) type I was diagnosed – 72.3% (subgroup 1), and types II and III DD were significantly less common. LV diastolic function (DF) improved 1 year after stenting in 10% of patients in subgroup 1 and in 50% – in subgroup 2 due to reversion from types II and III of DD to type I and to normal diastolic function. After 2 years, 2.3% of patients in subgroup 1 and 18% – in subgroup 2 showed an improvement in LVDF, which provided statistical significance for the intergroup differences. At subsequent stages, the structure of DF disorders in the 1st grade did not undergo any obvious changes. Type I diastolic dysfunction prevailed in patients with multiple repeat interventions in the initial period (2 group), but type II diastolic dysfunction was detected in 50% of subgroup patients with the LVEF < 40% ( $p=0.03$ ). After 1 year, the type of diastolic dysfunction in the subgroups did not change significantly, and by the third year of follow-up, in the subgroups with moderately reduced and <40% LV EF, there was a deterioration in DF due to the transition to a more

severe type of dysfunction ( $p=0.0005$ ). Attention is drawn to the fact that if in the subgroup of patients with preserved LVEF it practically did not change, then in the group with repeated ER its gradual decrease was noted, more pronounced in the subgroups with initially reduced LVEF<40%.

**Conclusions:** In patients without coronary stent restenosis, regardless of the initial LVEF, an improvement in LV diastolic function was revealed due to the reversion of type II and type III DD to type I. Progressive deterioration of LV diastolic function due to the progression of CHF was recorded in patients with repeated coronary stent restenosis and reduced LVEF.

**Keywords:** Coronary artery disease, diastolic dysfunction, left ventricle, coronary stent restenosis.

## THE ROLE OF THE NURSE IN PROPAGANDA OF THE FIGHT OF SMOKING AMONG TEENAGERS

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**Background:** In 2024 the prevalence of nicotine use among young people in different regions of Russia is very high: 28-67% among young men and 15-55% among young women, which will definitely affect the quality and life expectancy of our country's population in the future. The leading role in effective smoking cessation among teenagers is played by the nurse who organizes and implements prophylactic activities.

**Objective:** To define the role of the nurse in the organization and implementation of preventive measures to fight smoking among teenagers.

**Materials and methods:** The study was made in 3 stages: questionnaire survey of 120 pupils of the 9th classes of secondary school №3 in Essentuki, development and approbation of smoking prevention program among teenagers, repeated survey.

**Results:** Based on the questionnaire survey conducted among 9th grade pupils, 3 risk groups for smoking were identified. A smoking prophylactic program "Don't smoke!" was developed for medium and high risk groups, including 4 lessons in the form of lecture, experiment, role play and instruction. The program participants created a chat room with the nurse to support those who wanted to quit smoking. The results of the piloted program and the repeated survey proved that the professional competence of the nurse can improve the quality of preventive measures and ensure strong commitment to a healthy lifestyle among teenagers.

**Conclusion:** In order to organize effective preventive work in the adolescent environment, it is important for a nurse to study the reasons why children start smoking, draw up an effective prevention program according to age-related psychological characteristics, monitor the prevalence of smoking among adolescents, and provide support to those who want to overcome nicotine cravings.

**Keywords:** Nicotine, smoking, prevention program, nurse, preventive measures.

## **HOW BRAIN ADAPTS TO NEW SENSORY CONTEXTS**

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**Background:** Our brain is made of billions of neurons that send messages by electrical spikes which travel between neurons in a chain reaction sending messages to the parts of our brain. According to the research of many neuroscientists reveals how the brain rapidly adapts to the sensory changes using chain reaction between the olfactory cortex and the olfactory bulb.

**Objective:** Primary objective is to investigate the neural mechanisms underlying sensory adaptation in the brain and also to examine the effects of attention and prior experience on sensory adaptation- To explore the role of different brain regions in sensory adaptation.

**Materials and methods:** 3<sup>rd</sup> course students participated in the experimental design and followed a mixed-design study (i.e. within-subjects and between-subjects) component, followed by sensory tasks where participants performed various sensory tasks, such as visual, auditory, and tactile perception. The end results and performed statistical analysis were taken to examine changes in brain activity and behavioural performance.

**Results and discussion:** Behavioural results showed that the participants had improved performance in sensory tasks after adaptation to new sensory contexts and correlations were found between brain activity and behavioural performance also that 93% participants have excellent cognitive abilities, 5% have well and 2% have normal cognitive abilities.

**Conclusion:** The brain adapts to new sensory contexts through changes in brain activity and connectivity also the findings have implications for our understanding of neural plasticity, learning, and memory. And the Future studies can investigate the neural mechanisms underlying sensory

adaptation in different populations, such as individuals with sensory impairments.

**Keywords:** Cognitive abilities, correlations, neural mechanisms, sensory adaptation.

## **CORRELATION RELATIONSHIP BETWEEN VISION LOSS AND SLEEP DURATION OF 1<sup>st</sup>– 3<sup>rd</sup> YEAR STUDENTS OF MEDICAL UNIVERSITY**

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**Background:** Sleep plays a crucial role in physical and mental health, including vision. Vision loss can be caused by various factors, including sleep deprivation. There is limited research on the correlation between vision loss and sleep duration, particularly among medical students.

**Objective:** To examine the prevalence of visual impairment and the correlation between vision loss and sleep duration among 1st-3rd year students of the Stavropol State Medical University.

**Materials and methods:** 1. Study design: Cross-sectional study.

2. Participants: 1st-3rd year students of Stavropol State Medical University.

3. Data collection: questionnaire to assess sleep duration, vision problems, and other relevant factors; visual acuity tests (e.g., Snellen chart) to assess vision loss.

4. Data analysis: Statistical analysis (e.g., correlation, regression) to examine the relationship between vision loss and sleep duration.

**Results and discussion:** 1. Prevalence of vision loss: 29% of participants reported vision problems, with 50% having mild vision loss and 21% having moderate to severe vision loss.

2. Sleep duration: Participants who slept <7 hours per night had a higher prevalence of vision loss compared to those who slept ≥7 hours per night.

3. Correlation analysis: A significant correlation was found between vision loss and sleep duration ( $r = -0.3$ ,  $p < 0.01$ ), indicating that shorter sleep duration was associated with greater vision loss.

**Conclusion:** A significant correlation was found between vision loss and sleep duration among 1st-3rd year students of Stavropol State Medical University. Medical students should prioritize sleep and maintain

good sleep hygiene to prevent vision loss and other health problems. Longitudinal studies are needed to examine the causal relationship between sleep duration and vision loss among medical students.

**Keywords:** Vision loss, sleep duration, medical students, correlation analysis, sleep hygiene, eye health.

**THE EFFECT OF DAYTIME SLEEP ON THE ACADEMIC  
PERFORMANCE OF STUDENTS OF STAVROPOL  
STATE MEDICAL UNIVERSITY, DEPENDING  
ON THEIR NEUROPHYSIOLOGICAL PARAMETERS**  
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**Background:** The chronobiological type of students, which is determined by their preferred time of activity and rest, can have a significant impact on their ability to concentrate, memorize information, and complete learning tasks. The style of adaptation to different learning conditions can also be determined by temperament, which is defined as a set of stable individual characteristics. Research shows that sleep quality and sleep patterns also play an important role in students' learning activities.

**Objective:** Description of the effect of daytime sleep on the academic performance of students of Stavropol State Medical University, depending on their neurophysiologic parameters.

**Materials and methods:** The type of temperament was determined using A. Belov's questionnaire. The chronobiotype and academic performance of students, depending on the availability of daytime sleep, were determined using special questionnaires. The research was conducted among first-, second-, and third-year students at the Faculties of Medicine, Pediatrics, Dentistry and Faculty of the Faculty of International Students. The total number of students was 484. Data Statistical processing of the results was performed using the Microsoft Excel.

**Results and discussion:** As a result of a comprehensive analysis of data obtained through a survey of students from the 1st to 3rd courses the phlegmatic type of temperament is found in the largest number of students, followed by sanguine, choleric and melancholic types. The indifferent and weakly expressed evening chronobiotype prevails, with the least pronounced evening and morning types found. Among the students rated "good" and higher, the combination of "mild temperament + phlegmatic" was found in the largest number, which, combined with daytime sleep,

results in the best consolidation of memory and helps to switch attention to new educational material.

**Conclusion:** As a result of the research, various types of temperament and chronobiotypes were discovered, and a link between them and the availability of daytime sleep in students with high academic performance have been identified.

**Keywords:** Student, type of temperament, chronobiotype, medicine.

## THE IMPACT OF AUDIO TECHNOLOGY ON THE HUMAN BODY

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**Background:** While listening to music with headphones at a high volume level, many people noticed hearing loss more than once, but did not pay enough attention to this problem. With age, the age-related degradation of the hearing organs begins for everyone individually, attention is drawn to the hearing impairment in younger people. The aim of the study is to study the effect of headphones on the human body based on data obtained from the analysis of data from employees of the Unified Duty Dispatch Emergency Service – 112 (further UDDES-112), Izobilny, Stavropol region.

**Objective:** Investigating the impact of an audio headset on a person, a survey was conducted among people whose work is directly related to these devices – dispatchers of the UDDES-112.

**Methods and materials:** Employees use special monitoring headphones, similar to overhead ones, but with reduced pressure on the auricle and cranial vault. The staff consists of 39 women, aged 35 to 60 years. Statistical data processing was carried out by means of correlation analysis between the age of employees and the level of fatigue on an appropriate scale from 1 to 10; an analysis of the reliability of data differences according to the Student's criterion was carried out.

**Results and discussion:** Employees over the age of 45 received the highest marks, and the number of respondents in this age group was 24 (61%). They noted the following indicators: seven of them rated their fatigue level at 7 points, ten – at 9, the rest gave the highest score – 10. Employees under the age of 45 (39%) noted the following values: five of them rated the level of fatigue at 4, four – at 5, and the rest – at 6. A significant increase in fatigue levels was found among people over 45 ( $p < 0.05$ ).

**Conclusion:** There was a significant increase in the level of fatigue from wearing headphones among people over 45 years of age ( $p < 0.05$ ). Direct relationship between the age of the subjects and their level of fatigue was revealed. Prolonged use of headphones has a negative effect on both the central and peripheral parts of the audio analyzer.

**Keywords:** Headphones, dispatchers, devices.

## **STUDYING THE SHORT-TERM EFFECTS OF ENERGY DRINKS ON THE HUMAN HEALTH**

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**Background:** Energy drinks are gaining popularity among young people. However, this is a cause for concern in public and medical communities, since the effect of energy drinks has not been studied.

**Objective:** Systematization of the data obtained during the study of short-term influence of energy drinks components on the human body using questionnaires.

**Materials and methods:** The study was conducted by the survey method using the questionnaire aimed at identifying the degree of consumption of energy drinks, revealing the level of awareness of the harm of energy drinks, their negative impact on the body.

**Results and discussion:** According to the survey results, 221 people (38.8%) consume energy drinks. The survey revealed that 180 people (31.6%) did not experience negative consequences from drinking energy drinks, but 24 people (4.2%) noted the appearance of headaches, 62 people (10.9%) indicated palpitations and increased blood pressure, 24 people (4.2%) experienced limb tremors, 5 people (0.9%) experienced loss of consciousness, and 7 people (1.2%) had allergic reactions. 25 people (4.4%) indicated gastrointestinal disorders, 26 people (4.6%) noted increased excitability and nervousness. 56 people (9.8%) reported sleep disorders (difficulty falling asleep, frequent awakenings).

The study of the qualitative composition of energy drinks showed high concentrations of caffeine and taurine. Caffeine increases the secretion of adrenaline, triggers a number of metabolic processes, which contributes to increased physical and mental activation of the human body. Caffeine causes psychomotor agitation, insomnia, irritability, limb tremors, increased blood pressure, arrhythmia, tachycardia, nausea, and vomiting using regularly and in high doses.

Taurine reduces muscle fatigue during prolonged exertion, improves cardiac muscle function. Energy drinks contain synthetic taurine in high doses that exceed the permissible level. The combined use of taurine with caffeine leads to overexcitation of the central nervous system, reduction of inhibitory processes. An overdose of taurine may cause disruption of the heart, arrhythmia, allergic reactions, abdominal pain, gastritis, aggravation of stomach ulcer.

**Conclusion:** The analysis of the conducted research indicates that excessive consumption of energy drinks has an extremely unfavorable effect on human health, having short-term effects, creating a feeling of vigor and a surge of strength in the body, while not allowing realizing the full extent of the side effects on the functioning of organs and systems, causing addiction.

**Keywords:** Energy drinks, caffeine, taurine, human health.

## PREVALENCE OF GIARDIASIS IN NIGERIA

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**Background:** Infectious diarrhea is a major cause of death in children under 5 years old in Africa. *Giardia duodenalis* is the species infecting mammals, including humans, and is estimated to cause  $2.8 \times 10^8$  cases of intestinal diseases per annum globally, with a higher prevalence in developing countries including Africa. Unsafe water supplies and inadequate levels of sanitation and hygiene increase the transmission of diarrheal diseases and despite ongoing efforts to enhance disease surveillance and response, many African countries face challenges in accurately identifying, diagnosing and reporting infectious diseases due to the remoteness of communities, lack of transport and communication infrastructures, and a shortage of skilled health care workers and laboratory facilities to ensure accurate diagnosis.

**Objective:** The aim of this study is centered on providing information on the prevalence of giardiasis in Nigeria particularly in rural areas where access to clean water and sanitation facilities is limited for children and this can lead to malnutrition and stunted growth.

**Materials and methods:** Giardiasis prevalence data for in Nigeria were extracted from African journal online, National Institute of Health.

**Results and discussion:** *Giardia duodenalis* is an important cause

of diarrheal illness. Adequate knowledge of the molecular diversity and geographical distribution of this parasite and the environmental and climatic variables that influence their prevalence is important for effective control of infection in at-risk populations, yet relatively little is known about the epidemiology of this parasite in Africa. *Giardia* negatively affect child growth and development. Malnutrition and HIV status are also important contributors to the prevalence of *Giardia* in African countries.

**Conclusion:** The prevalence of *Giardia intestinalis* can be controlled and prevented using treatment options such as metronidazole, promoting hygiene practices (individually, socially), improving sanitation, and ensuring access to safe drinking water. Further research will help in planning, coordinating, and evaluating giardiasis control activities.

**Keywords:** Nigeria, *Giardia intestinalis*, parasite, prevalence.

## **ANATOMICAL VARIATIONS ACROSS RACIAL AND ETHNIC GROUPS: IMPLICATIONS FOR HEALTH DISPARITIES IN NIGERIA AND INDIA WITH EMPHASIS ON CRANIOFACIAL DISORDERS**

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**Background:** Anatomical variations among different racial and ethnic group can significantly influence health outcomes particularly in countries like Nigeria and India where diverse populations exhibit distinct morphological characteristics. Craniofacial structures refer to the bones and soft tissues that form the skull and face. Disorders in these areas can significantly impact both physical appearance and functional abilities.

**Objective:** The aim of this study is to explore the anatomical variations in these nations (Nigeria and India) focusing on skeletal, muscular and organ specific differences that may contribute to varying susceptibility to diseases, response to treatments and overall health disparities.

**Materials and methods:** In Nigeria, factors such as genetic diversity, environmental influence and cultural practice contribute to unique anatomical traits and within ethnic groups which can affect health conditions. Similarly, In India the vast ethnic diversity leads to significant anatomical differences that may impact health. Also in these countries (Nigeria and India) there is significant incidence of craniofacial disorders including cleft lip and palate which can also be caused by genetic predispositions,

environmental factors, maternal health, e.t.c. The review was made from Medline, Pubmed, springer linker and other sites.

**Results and discussion:** The implications of these anatomical variations are profound affecting clinical practices, public health strategies and health education. By recognizing and addressing these disparities there is the need to further studies on anatomical variations to enhance understanding and improve health outcomes in Nigeria and India.

**Conclusion:** A more equitable healthcare system that acknowledges the unique anatomical and physiological characteristics of various racial and ethnic groups ultimately leading to better health outcomes for all. Health professionals must be aware of these differences to provide the tailored healthcare solutions that address the specific need of diverse population, also public awareness and providing support for affected families and individuals in Nigeria and India should be encouraged.

**Keywords:** Nigeria, India, anatomical variations, health.

## **TYPES OF TEMPERAMENT AND RESPONSE TIME IN THE SCHOOL AND YOUTH PERIODS OF ONTOGENESIS**

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**Background:** A visual analyzer allows a person to get about 80% of the information about the world around them. The functional relationship of its departments is characterized by the rate of conduction of a nerve impulse from the retina of the eye to the spur sulcus, which can vary in people with a normally functioning organ of vision and pathology. One of the characteristics of the type of temperament is the rate of formation of conditioned connections in the cerebral cortex under the action of a conditioned stimulus.

**Objective:** Identification of the relationship between temperament type and response time during school and adolescence periods of ontogenesis.

**Materials and methods:** Types of temperament are evaluated according to the method of A. Belov. The time of a simple visuo-motor reaction (SVMR) is measured using the “Reaction time indicator” program. Subjects without strabismus – group 1 (n = 31), 9th-, 10th- and 11th-grade students of secondary school № 18 in the Izobilnensky municipal District of the Stavropol Territory; with strabismus, Group 2 (n = 8) registered at dispensaries in the Izobilnenskaya Central Regional Hospital. Statistical data processing of the results was carried out using Microsoft Excel.

**Results and discussion:** After analyzing the time of SVMR in patients with strabismus and in healthy subjects, a significant ( $p < 0.001$ ) increase in reaction time was revealed in subjects of the 2nd group ( $381.87 \pm 11.81$  ms) compared with the first ( $292.59 \pm 10.2$  ms). SVMR in the subjects: in both groups, for phlegmatic and melancholic patients, the time is the reaction time was 294.6 and 390.1 ms, respectively. For people with choleric and sanguine temperament types – 272 ms in healthy people, 398 ms in strabismus.

**Conclusion:** A significant increase in the time of SVMR was found in subjects with strabismus compared with healthy subjects. In both groups, the phlegmatic type of temperament was dominant, and to a lesser extent, the melancholic type of temperament, and in strabismus, the sanguine type.

**Keywords:** Strabismus, temperament, reaction.

## PARASITIC INVASIONS IN THE RUSSIAN REGION

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**Background:** The massive spread of parasitic diseases is registered all over the world, ranking third among the most significant infectious and parasitic causes. A silent epidemic of parasitosis is not always associated with high mortality rates, but leads to numerous complications and disability. The most common parasitic diseases include helminthiasis, and the most dangerous are protozoosis. Every year, more than 500 thousand people die from malaria alone.

**Objective:** To assess the prevalence of parasitosis among the population of Stavropol Territory (ST), to conduct a comparative analysis of morbidity with indicators in the Russian Federation (RF).

**Materials and methods:** Incidence rates of parasitic infestations based on data from the FBHI “Center for Hygiene and Epidemiology in Stavropol region” in 2024 and state reports “On the state of sanitary and epidemiological well-being of the population in Stavropol Territory and in the Russian Federation” in 2019-2023.

**Results and discussion:** In the structure of parasitoses, the most common in the ST in 2024 were contact helminthiasis – 75.8% (1305 cases). In second place in prevalence were protozooses – 14.4% (248 cases). Third place was geohelminthiasis – 9.2% (158 cases), fourth – biohelminthiasis – 0.6% (10 cases).

Among contact helminthiasis, enterobiasis was in the lead (42.49 per 100,000 population), since pinworm eggs, released from the human intestine, become invasive in the external environment after 5–6 hours and remain invasive for 2–4 weeks. Enterobiasis is characterized by family foci.

Hymenolipidosis was rare (0.03 per 100,000 population), probably due to the fact that the resistance of dwarf tapeworm eggs in the environment is only a few hours.

Among geohelminthiases, ascariasis was most often detected (5.41 per 100,000 population), less often – toxocariasis (0.1 per 100,000 population). *Toxocara* are dog roundworms and cause human disease due to an “address error” (*Toxocara canis*: mistax). The spread is facilitated by the uncontrolled increase in the number of stray dogs.

Among biohelminthiases, echinococcosis is the most common (0.28 per 100,000 population), characteristic of the North Caucasus region with traditionally developed sheep farming. Opisthorchiasis (0.03 per 100,000 population) and trichinellosis (0.03 per 100,000 population) were documented only in isolated cases in the ST, since there are no conditions for freshwater fishing and commercial hunting in the region.

Among protozoan diseases, the most common was giardiasis (8.58 per 100,000 population), characterized by widespread prevalence and a low invasive dose (only 8-10 cysts). Toxoplasmosis was rare (0.03 per 100,000 population), since “rare steak” is not a national tradition in the region. Malaria is not endemic to the ST (0.03 per 100,000 population).

The five-year dynamics of incidence of the main parasitic diseases showed that in the period 2019-2023. The overall incidence of parasitosis in the ST (70.59–136.28 per 100,000 population) was 1.5–1.8 times lower than in the Russian Federation (118.17–202.17 per 100,000 population). The incidence of enterobiasis in the ST was 1.5–2 times lower than the incidence in the Russian Federation, probably due to insufficient detection. The incidence of ascariasis was comparable in the ST and the Russian Federation. The incidence of toxocariasis in the ST was 7–15 lower than the incidence in the Russian Federation. At the same time, soil contamination with toxocara eggs in different regions of Russia fluctuates from 1–3% to 50–60%. The incidence of echinococcosis in the ST is higher than in the Russian Federation, which is explained by the endemicity of the territory due to the developed animal husbandry. In the ST, opisthorchiasis is rare and is imported, since there are no freshwater rivers in the region. In the Russian Federation, opisthorchiasis is the third most common parasitic disease. Malaria is characterized by a low incidence rate both in the ST and in the Russian Federation (0.01–0.09 per 100,000 population), since it is imported.

**Conclusion:** Helminthiasis and protozoosis remain a pressing problem in the Stavropol Territory. The high level of population invasion and the diversity of parasitoses determine the socio-economic significance of this pathology for the region.

**Keywords:** Parasitic diseases, helminthiasis, geohelminthiasis, biohelminthiasis, protozoosis.

# EFFICACY OF SIALORRHEA TREATMENT WITH XEOMIN (BOTULINUM THERAPY)

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**Background:** Sialorrhea also known as drooling means excessive saliva flow. Sialorrhea results in physical and psychosocial complications. Sialorrhea results from various causes including Cerebral palsy and cognitive disorders. Botulinum toxin A improves sialorrhea in cerebral palsy and cognitive disorders, as shown here with Xeomin.

**Objective:** To evaluate efficacy of Xeomin (Botulinum Therapy) in children aged 2–18 years with Sialorrhea. The correlation between psychological and motor function was also studied.

**Materials and methods:** Ten confirmed cases of Sialorrhea. Eight children were patient of cerebral palsy and the remaining two had cognitive disorders. Efficacy of Xeomin was evaluated by counting the number of bibs/ cloth/t-shirts, and using DIS Salivation Significance Scale, Modified Teacher's Drooling Scale (mTDS), Salivation Index (DQ) and Global Impression Change Scale (GICS) on all children.

**Results and discussion:** Ten patients were included. We used the ultrasound for navigation of injection on the patients. Sialorrhea was related to cerebral palsy in 8 patients and cognitive disorder in 2. All the patients were infiltrated at the parotid glands and submandibular glands (average dose 12 U and 8 U respectively). The dosage was given according to the instructions of Xeomin. The evaluation tests according to scales were performed before and after two months of injection. Improvement in drooling was achieved in 87.5 % patients with cerebral palsy and 100% patients with cognitive disorders. In all we received 90 % results.

**Conclusion:** Xeomin was effective for the treatment of Sialorrhea in our patients. After two months of observation and experimentation quantity of saliva was reduced, severity of bronchitis was lesser and significant psychological improvement was observed.

**Keywords:** Botulinum toxin A; sialorrhea; cerebral palsy; cognitive disorder.

# COMPARISON OF VARIOUS DIAGNOSTIC METHODS AND TREATMENTS OF CROHN'S DISEASE

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**Background:** Crohn's disease represents a persistent inflammatory disorder affecting the digestive tract, resulting from impaired regulation of the body's initial defense mechanisms in individuals with a genetic susceptibility, potentially causing progressive intestinal injury and reduced quality of life.

**Objective:** The present analysis seeks to evaluate and contrast diverse approaches to diagnosing and treating Crohn's disease, shifting the focus from conventional symptom control to more comprehensive goals of mucosal, cellular, and full-thickness tissue restoration.

**Materials and methods:** Investigated resources incorporate current publications concerning ileocolonoscopy and tissue examination (the established criterion for identification), laboratory testing to detect irregularities such as nutritional inadequacies, radiologic assessment for example CT and MRI to determine the extent and severity of illness and presence of subsequent effects, as well as psychosocial evaluations to improve patient welfare.

**Results:** We anticipate that the findings will illustrate that prompt utilization of potent innovative treatments, encompassing biological medications and targeted molecules that modulate alternative immunological routes, substantially enhances results by facilitating mucosal and tissue-level recovery.

**Conclusion:** Further investigation of integrating cutting-edge treatments with nutritional adjustments, pioneering biological compounds, and refined monitoring methods, coupled with the discovery of prognostic indicators, presents a significant opportunity to optimize Crohn's disease care and fundamentally change the disease trajectory.

**Keywords:** Crohn's disease, prognostic indicators, alternative immunological routes, pioneering biological compounds.

# ABNORMAL UTERINE BLEEDING IN WOMEN DURING THE PERIMENOPAUSAL PERIOD

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**Background:** Abnormal uterine bleeding (AUB) is one of the most common reasons women seek consultation with a gynecologist and undergo intrauterine interventions. AUB reduces the quality of life for women, leading to iron deficiency anemia, and has significant social and clinical importance. The choice of treatment for AUB should be based on the results of a comprehensive diagnostic workup to determine the causes, taking into account the woman's age, reproductive plans, and associated diseases.

**Objective:** To investigate the main causes of bleeding in women during the premenopausal period and their association with coexisting genital and extragenital pathology, number of childbirths, and abortions.

**Materials and methods:** Retrospective analysis of medical histories. Clinical base: Gynecology department, GBUZ SK "GKB SMP," Stavropol. Inclusion criteria for the study: 60 patients aged 45 to 56 years with uterine bleeding. Description of the intervention structure: A review of case histories for 2024 was conducted for women aged 45 to 56 years who were hospitalized in the gynecology department due to uterine bleeding.

**Results and discussion:** The age distribution was as follows: 23 women aged 45 to 50 years (38.33%), 24 women aged 50 to 55 years (40%), and 13 women aged 56 and older (21.67%). Regarding associated pathology, the patients were distributed as follows: cardiovascular diseases – 33 women (55%), endocrine pathology – 7 women (11.67%), urinary system pathology – 7 women (11.67%), obesity – 13 women (21.67%). The number of childbirths was as follows: one childbirth – 7 women (11.67%), two childbirths – 27 women (45%), three childbirths – 8 women (13.33%), more than three childbirths – 6 women (10%), no childbirths – 12 women (20%).

**Conclusions:** The majority of women in the premenopausal period, hospitalized due to uterine bleeding, have endometrial pathology. A link with extragenital pathology (cardiovascular diseases, obesity, and diabetes mellitus) was also noted. Thus, women over 45 years of age with bleeding should raise heightened oncological suspicion and undergo thorough examination.

**Keywords:** Bleeding, analysis, premenopausal.

# GESTATIONAL TROPHOBLASTIC DISEASE (GTD)

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**Background:** Ovarian failure, including Premature Ovarian Insufficiency (POI) and age-related ovarian decline, is a major cause of infertility among women worldwide. Conventional treatments such as hormone replacement therapy (HRT) and assisted reproductive technologies (ART) have limitations. Stem cell therapy has emerged as a promising regenerative approach to restore ovarian function and improve fertility outcomes.

**Objective:** The objective of this presentation is to explore the potential of stem cell therapy in the treatment of ovarian failure and infertility, supported by clinical data and ongoing research in India and Russia.

**Material and methods:** This study is based on a review of clinical trials, preclinical research, and statistical data from leading institutions such as AIIMS, India, and Moscow State University, Russia. Sources of stem cells, including bone marrow, adipose tissue, and menstrual blood-derived stem cells, were analysed for their regenerative effects on ovarian tissue.

**Results and discussion:** Clinical and preclinical studies have demonstrated that stem cell therapy can restore hormone production, follicle development, and improve ovarian function. In India, bone marrow-derived stem cell therapy has shown a 50% improvement rate, while Russian trials reported a 45% success rate in restoring ovarian activity. Despite these positive outcomes, challenges such as ethical concerns, regulatory issues, and high treatment costs persist.

**Conclusion:** Stem cell therapy presents a promising future for the treatment of ovarian failure and infertility. While early results are encouraging, further large-scale clinical trials and ethical standardization are required to establish its long-term efficacy and accessibility.

**Keywords:** Stem Cell Therapy, ovarian failure, infertility, Premature Ovarian Insufficiency (POI), regenerative medicine, fertility treatment, clinical trials.

# THE ROLE OF ARTIFICIAL INTELLIGENCE IN DISEASE PREVENTION AND PUBLIC HEALTH SURVEILLANCE

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**Background:** Artificial Intelligence (AI) has emerged as a transformative tool in public health, enabling early disease detection, predictive analytics, real-time surveillance, and improving healthcare outcomes. Its role in disease prevention, outbreak prediction, and healthcare cost reduction is increasingly significant in global health systems.

**Objective:** The objective of this presentation is to explore the applications, benefits, and challenges of AI in disease prevention and public health surveillance, with a focus on real-world case studies and future directions.

**Material and methods:** This study is based on a comprehensive review of recent literature, real-time healthcare data analysis, and case studies, including an AI-based dengue prediction model from Singapore. Data sources include medical imaging, electronic health records, climate data, and social media analytics to evaluate AI's impact on surveillance and predictive capabilities.

**Results and discussion:** AI has shown promising results in early disease diagnosis, predicting epidemic outbreaks, and monitoring diseases such as COVID-19 and dengue. AI-driven tools help optimize healthcare resources, reduce diagnostic errors, and assist in pandemic response. However, ethical concerns, model biases, high implementation costs, and the need for skilled personnel remain key challenges.

**Conclusion:** AI is revolutionizing disease prevention and public health surveillance. Despite current limitations, its continued development and responsible use can significantly enhance healthcare systems and global health security.

**Keywords:** Artificial intelligence, disease prevention, Public Health Surveillance, predictive analytics, outbreak forecasting, Healthcare Cost Reduction, COVID-19, Dengue Prediction.

# CECAL VOLVULUS AND SIGMOID VOLVULUS

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**Background:** Cecal and sigmoid volvulus is uncommon but significant causes of large bowel obstruction, often requiring surgical intervention.

While endoscopic detorsion is a first-line approach, its high recurrence rate necessitates definitive surgical management to prevent complications such as ischemia, necrosis, and perforation.

**Objective:** This study aims to evaluate the surgical approaches for cecal and sigmoid volvulus, comparing outcomes of traditional and modern techniques to determine the best interventions for patient survival and reduced recurrence.

**Material and methods:** A comprehensive review of etiologies, pathophysiology, surgical techniques, and statistical data from India and Russia was conducted. Surgical interventions, including right hemicolectomy, sigmoid colectomy, and minimally invasive laparoscopic techniques, were analysed in terms of efficacy, postoperative complications, and recovery outcomes.

**Results and discussion:** Right hemicolectomy is the gold standard for cecal volvulus, while sigmoid resection with primary anastomosis is the preferred approach for sigmoid volvulus. Laparoscopic techniques are increasingly favoured due to faster recovery and lower complication rates. Endoscopic detorsion alone has a recurrence rate of up to 50%, reinforcing the need for surgical intervention. Statistics reveal a higher incidence of sigmoid volvulus in elderly and neuropsychiatric patients. Emerging trends include AI-assisted recurrence prediction and robotic surgery.

**Conclusion:** Early diagnosis and surgical intervention significantly improve patient outcomes in cecal and sigmoid volvulus. Endoscopic decompression serves as a temporary measure, while definitive resection is crucial for preventing recurrence and complications. Future advancements in imaging, AI-based risk assessment, and minimally invasive techniques will further refine treatment approaches.

**Keywords:** Cecal volvulus, sigmoid volvulus, large bowel obstruction, surgical intervention, laparoscopic surgery, recurrence prevention.

## COMPARATIVE CHARACTERISTICS OF THE MAIN METHODS OF SURGICAL INTERVENTION IN THE TREATMENT OF UTERINE FIBROIDS

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**Background:** The frequency of detection of uterine leiomyoma in the modern female population varies significantly, ranging from 20% to 77%. At present, the indications for surgical intervention are clearly defined;

however, the percentage ratio of these indications and the various surgical treatment methods according to the literature differ substantially.

**Objective:** Comparing of the main methods of surgical intervention in the treatment of uterine fibroids.

**Materials and methods:** The medical records of 549 patients who received inpatient treatment from September 2020 to December 2022 were analyzed. The patients were divided into groups based on age (under 30, 31–40, 41–50, 51–60, and over 60), the size and location of the leading fibroid, the type of surgery performed, the duration of the procedure, and the volume of blood loss, depending on the size of the fibroid.

**Results and discussion:** A lot of patients were aged 41–50 years, with 365 cases (66.5%). In 42.3% of cases, surgery was performed for fibroids with a diameter of 4–7 cm, and in 31.1% for fibroids 8–12 cm in diameter. In 38.6% of cases, the indication for surgery was submucous location of the fibroid, in 40.8% – large fibroid size, and in 9% – impaired function of adjacent organs (primarily the bladder). A direct correlation was found between the size of the fibroid, the duration of the operation, and the amount of blood loss (up to 3 cm – 55.2 min and 89.83 ml; over 16 cm – 95.5 min and 355.5 ml).

**Conclusion:** The study established that organ-preserving surgeries (myomectomy) are performed in younger women (average age 35.96 years), whereas radical surgeries (hysterectomy with or without adnexal removal) are performed at older ages (after 46), which is explained by the desire to preserve fertility in younger women. Vaginal access is used most frequently 91.8% because it is the least traumatic for the patient and leads to fewer complications. The frequency of complications during surgery in modern conditions does not exceed 1%.

**Keywords:** Myomectomy, uterine fibroids, studied patients.

## ECTOPIC PREGNANCY

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**Background:** Ectopic pregnancy (EP) is a common and serious early pregnancy problem with a significant morbidity rate and the potential for maternal death. The most common site of ectopic pregnancy is the fallopian tube, this type of ectopic pregnancy is called tubal pregnancy. Sometimes, an ectopic pregnancy (EP) occurs in other areas of the body, such as the ovary, abdominal cavity, or the lower part of the uterus (cervix), which

connects to the vagina. Sites of ectopic pregnancy are, tubal 95%, interstitial 2%–4%, Ovarian < 3%, heterotopic 1%–3%, abdominal, 1% cesarean scar, < 1% and cervical < 1%. Diagnosis of ectopic pregnancy by serum Beta-human chorionic gonadotrophin ( $\beta$ -hCG) levels in correlation-with transvaginal ultrasound (TVUS) or transabdominal ultrasound (TAUS) findings. Women commonly present with minimal vaginal bleeding and abdominal pain. Most cases of tubal ectopic pregnancy (EP) that are detected early can be treated successfully either with minimally invasive surgery or with medical management using methotrexate.

**Objective:** The main objective of the study was to evaluate the risk factors, clinical presentation, sites, and management outcomes of ectopic pregnancies.

**Material and methods:** It was a descriptive prospective cross-sectional hospital-based study conducted at Maternity Hospital India during the period January 2024 – June 2024. The Study population that was included all women diagnosed with ectopic pregnancy who came during the study period to the gynecology clinic and emergency room, and they agreed to participate in the study. About 82 women who were diagnosed with ectopic pregnancy were included. Data was collected by direct interview by using a well-structured questionnaire. The participants were interviewed about age, education, gestational age, parity, risk factors for ectopic pregnancy, type of ectopic, management type, hospital stay, Anti-D administration, and blood transfusion.

**Results and discussion:** During the study period total of 4091 pregnant women came to the hospital, and 82 were diagnosed with ectopic pregnancy, so the incidence of ectopic pregnancies is found in approximately 2% of all pregnant women infection 29.3%, surgery 15.9%, miscarriage 13.4%, infertility 12.2%, tubal surgery 4.9%, previous ectopic pregnancy 4.9%, intrauterine contraceptive device (IUCD) 3.6%, and tubal ligation 2.4%. Women presented with bleeding and abdominal pain at 47.5%, bleeding at 18.3%, abdominal pain at 9.7%, and shock at 8.5%. The sites are ampullary (57.3%), fimbria (9.7%), interstitial (8.5%), isthmus (8.5%), ovarian (7.3%), cervical (4.8%), and abdominal (3.6%). Surgical management was 93.9%, medical and surgical management was 3.6% and medical management was 2.4%. A blood transfusion was received at 37.8%.

**Conclusion:** The study concluded that women of reproductive age are at risk of ectopic pregnancy, so healthcare providers and doctors should have a high index of suspicion, prompt diagnosis, and intervention for ectopic pregnancy. Assessment of women at risk factors and modifications will reduce incidence.

**Keywords:** Ectopic pregnancy, fallopian tube, vaginal bleeding, Methotrexate, maternal death.

## **EPILEPSY IN INDIA**

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**Background:** Epilepsy is a neurological disorder that results from abnormal and disrupted electrical activity in the brain. It is a group of non-communicable neurological disorders characterized by recurrent epileptic seizures. It is estimated in various studies that the overall prevalence of epilepsy in India is 5.59-10 per 1000.

**Objective:** To discuss the prevalence of Epilepsy in developing countries like India.

**Materials and methods:** We used the online data from the National Library of Medicine, the World Health Organization (WHO), the Centre for Disease Control and Prevention (CDC), National institutes of Health, Indian Epilepsy centre and from the Journal of Epilepsy Research.

**Result and discussion:** There are 50 million people living with epilepsy worldwide, and most of them reside in developing countries. According to a conservative estimate, with a prevalence of epilepsy of 1%, there are more than 12 million people with the condition in India. Since rural population constitutes 74% of India's population, the number of people with epilepsy in rural areas will be approximately 4.1 million, three-quarters of whom will not receive any specific treatment as per the current standard.

**Conclusion:** These statistics highlight the significant impact of Epilepsy in rural areas of India and their deprivation of proper treatment and the misconceptions of the neurological disorder.

**Keywords:** Epilepsy in India, rural, seizures, developing countries.

## **COMPARATIVE ANALYSIS OF CONSERVATIVE AND MODERN CONCEPTS OF HERNIA**

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**Background:** A hernia is the abnormal exit of tissue or an organ, such as the bowel, through the wall of the cavity in which it normally resides, the bulging of an internal organ through a weak area or tear in the muscle or other tissue that holds it in place.

**Objective:** To compare the prevalence of hernia in conservative and modern times.

**Materials and methods:** The study is based on the online data from the National Library of Medicine, the World Health Organization (WHO) and the Centre for Disease Control and Prevention (CDC) and the World Laparoscopy Hospital.

**Results and discussion:** From the above reports and information, hernia has gradually increased prevalence, it's a major global health concern. Global hernia prevalence saw a 36% absolute rise, with cases increasing from nearly 23.92 million to 32.53 million. While specific numbers can vary widely based on geography, demographics, and study design, the general trend indicates an increasing recognition and diagnosis of hernias in conjunction with an aging population and rising obesity rates.

**Conclusion:** Despite the presence of hernia being traced back to Roman times, it is still one of the most common and major global concern, The World Health Organization (WHO) estimates that about 20 million hernia repairs are performed globally each year. Efforts from governments, healthcare organizations, and communities are essential to tackle this ongoing concern effectively. Ongoing research continues to shed light on the epidemiology of hernias, helping inform prevention and treatment strategies.

**Keywords:** hernia prevalence, conservative, modern, WHO, Global concern.

## **STUDY OF MOTIVATION FOR OBTAINING A MEDICAL PROFESSION AMONG JUNIOR STUDENTS OF A FOREIGN FACULTY**

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**Background:** Motivation plays a crucial role in shaping the academic success and professional aspirations of medical students, particularly those studying abroad. Getting to understand the motivational factors influencing junior students of foreign medical faculty can provide insights into their educational engagement, career commitment and goals and potential challenges in medical training.

**Objective:** This study aims are to analyse the key motivational determinants driving junior students of a foreign medical faculty to pursue

a medical profession, identifying factors (both intrinsic and extrinsic) influencing their academic and career choice.

**Materials and methods:** A cross-sectional study was conducted among first-fourth-year foreign medical students to assess their motivational factors for pursuing medical education. Data were collected using a simple random sampling method with a structured questionnaire evaluating key motivational aspects including personal aspirations, societal influences, financial incentives and perceived professional prestige. A total of 100 students completed the questionnaire. Statistical analyses were performed to identify dominant motivational patterns and examine their correlation with demographic variables.

**Results and discussion:** The study revealed that intrinsic motivation such as a strong personal interest in medicine and a desire to help others was the predominant factor in choosing a medical career. However extrinsic factors including family expectations, social status and financial stability also played a significant role. Observed differences in motivation were based on cultural and regional backgrounds with some students from certain regions demonstrating higher influence from family expectations while others were driven by a strong desire to help others. Additionally academic challenges and adaptation difficulties in a foreign environment were found to impact motivation levels over time.

**Conclusion:** Understanding the diverse motivational factors among junior foreign medical students can help educators develop targeted support strategies to enhance student engagement and career commitment. Strengthening intrinsic motivational factors while addressing extrinsic pressures can highly contribute to the formation of a more resilient and dedicated future medical workforce.

**Keywords:** Medical education, motivation, foreign medical students, intrinsic and extrinsic factors, professional aspirations.

## **PHYSIOLOGICAL BASIS OF DIALYSIS**

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**Background:** Dialysis is a life-saving treatment for patients with kidney failure, designed to replicate kidney functions such as the removal of toxins, excess fluids, and solutes. Typically, this condition is typically a result of end-stage renal disease (ESRD) or acute kidney injury (AKI). According to reports from the International Society of Nephrology and other health organizations, it is estimated that there are approximately 3 million patients worldwide who are undergoing dialysis treatment each year.

**Objective:** The study was aimed to provide a comprehensive understanding of the efficacy and limitations of dialysis therapies in India and Russia.

**Materials and methods:** A comprehensive review of existing literature on dialysis physiology and analysis of clinical data from patients undergoing dialysis was evaluated. The relevant data was taken from databases such as Guyton and Hall Textbook of Medical Physiology and Peer reviewed articles on dialysis.

**Results and discussion:** Dialysis is a type of treatment that helps your body to remove extra fluid and waste products from your blood when the kidneys are not able to. There are two primary types, hemodialysis (HD) and peritoneal dialysis (PD). The number of patients undergoing hemodialysis in India is 18,659 per year and 8,458 per year in Russia. The number of patients undergoing peritoneal dialysis in India is 6,507 per year while 13,847 per year in Russia. Peritoneal dialysis is usually done every day at home, while hemodialysis is typically administered at a dialysis centre about three times a week.

People on dialysis can lead active lifestyle, working, exercising, and traveling, with many surviving for 10–20 years or more. Survival rates vary by age and health status, with younger patients living longer. Despite challenges, survival rates on dialysis have improved and are expected to continue improving.

**Conclusion:** Dialysis artificially replaces the kidney's function of removing waste products and excess fluids from the blood. Dialysis allows patients to manage their condition effectively, improving quality of life and extending survival. However, it is not a cure and requires ongoing treatment unless a kidney transplant is possible. It's not always possible to carry out a kidney transplant straight away, so dialysis may be needed until a suitable donor kidney becomes available. Haemodialysis can cause itchy skin and muscle cramps. Peritoneal dialysis can put you at risk of developing peritonitis. Dialysis can make you feel exhausted.

**Keywords:** Dialysis, ESRD, AKI, kidney transplant, India, Russia.

## **AI-DRIVEN REAL-TIME DECISION MAKING IN COMPLEX GASTROINTESTINAL SURGERY: EVALUATING PREDICTIVE ANALYTICS AND OUTCOME**

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**Background:** Complex gastrointestinal (GI) surgeries present significant challenges due to the intricate anatomy and high risk of

complications. Traditional decision-making relies on surgeon experience and static preoperative data, which may not account for dynamic intraoperative changes. Artificial intelligence (AI) and predictive analytics offer potential for real-time, data-driven decision support, improving surgical precision and patient outcomes.

**Objective:** This study evaluates the efficacy of an AI-driven real-time decision-making system in complex GI surgery, assessing its predictive accuracy, clinical utility, and impact on postoperative outcomes.

**Materials and methods:** A prospective cohort study was carried out involving 200 patients undergoing major GI surgeries. An AI model integrating intraoperative vital signs, endoscopic/imaging data, and historical patient records provided real-time risk predictions (anastomotic leak, haemorrhage, sepsis). Outcomes were compared with a control group managed with conventional methods. Statistical analysis included sensitivity, specificity, and multivariate regression to assess AI performance and clinical impact.

**Results and discussion:** The AI system demonstrated 92% accuracy in predicting complications (AUC: 0.94), reducing unplanned reoperations by 35% ( $p < 0.01$ ). Surgeons reported improved confidence in 78% of cases with AI assistance. However, latency in data integration (mean: 8 seconds) occasionally delayed alerts. The discussion highlights AI's role in mitigating cognitive overload while emphasizing the need for seamless human-AI collaboration.

**Conclusion:** AI-driven real-time analytics significantly enhance decision-making in complex GI surgery, improving predictive accuracy and reducing adverse events. Further refinements in latency and interpretability are needed for broader adoption.

**Keywords:** Artificial intelligence, real-time decision-making, gastrointestinal surgery, predictive analytics, surgical outcomes.

## ASSESSMENT OF THE RISK OF ARTERIAL HYPERTENSION DEVELOPMENT IN 1<sup>ST</sup>-3<sup>RD</sup> YEAR STUDENTS OF MEDICAL UNIVERSITY

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**Background:** Currently, there is a steady trend towards an increase in the proportion of young people among the patients suffering from arterial hypertension. If earlier it was believed that such pathology is characteristic

only of elderly people, now arterial hypertension is increasingly registered at the age of 18 to 44 years.

**Objective:** to analyze the nature of risk factors for the development of arterial hypertension in 1<sup>st</sup>–3<sup>rd</sup> year students of the Stavropol State Medical University.

**Materials and methods:** The study included 360 students studying at the 1st to the 3rd year of the Medical, Pediatric and Dental faculties, who voluntarily characterized their socio-demographic data, the presence of bad habits, emotional state, quality of sleep, temperament, chronobiotype, anthropometric parameters.

**Results and discussion:** Risk factor – overweight, obesity. There is an increase in the body mass index, and there is a gradual increase in this indicator with the increase in the course of study, reaching  $\frac{1}{4}$  of the respondents by the third year of study, which can be explained by unbalanced, irregular food consumption, with a predominance of fatty, fried foods in the diet; consumption of large amounts of salt and spices with food. Risk factor – smoking. Among smoking students, the majority are second-year students, the number of cigarettes smoked is more than 10 per day. Risk factor – disturbed circadian rhythms. It was found that students of all three courses devote less time to sleep, which is probably due to the intensity of training. Risk factor – stress. The study revealed that emotional stress is present in students of all three courses, this indicator reaches its maximum values in third-year students.

**Conclusion:** Based on the results of the study, it is obvious that control of risk factors in the development of arterial hypertension and promotion of a healthy lifestyle is a primary preventive task for the younger generation.

**Keywords:** Arterial hypertension, risk factors, students, stress, smoking, overweight.

## COMPARATIVE ANALYSIS OF THE USE OF THE OPALESCENCE AT-HOME TEETH WHITENING SYSTEM AND PROFESSIONAL WHITENING WITH BEYOND POLUS

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**Background:** In recent years, special attention has been paid to the aesthetic direction in dentistry, associated with the development of new technologies, the emergence of high-quality materials that meet the highest requirements and the increasing demand for a dazzling

white smile. A snow-white smile becomes an essential attribute of an attractive and prosperous person. An increasing number of people are realizing that beautiful white teeth are not only a sign of good health, but also an element of modern culture, a symbol of well-being and prosperity.

**Objective:** To conduct a comparative analysis of the effectiveness of using the Opalescence at-home teeth whitening system and the Beyond Polus professional whitening system.

**Materials and methods:** The study involved 50 patients aged 18 to 25 years. By simple randomization, the patients were divided into 2 groups of 25 patients each, depending on the method of teeth whitening: home and professional.

In Group 1, teeth whitening was performed using custom trays filled with a whitening gel for approximately 6-8 hours, based on 15% carbamide peroxide, as part of the Opalescence at-home teeth whitening system. The treatment course lasted 5 days. In Group 2, patients underwent professional whitening using the Beyond Polus system, where the gel was applied to the front surface of the teeth and illuminated with a high-intensity cold LED lamp. Three cycles were conducted, each lasting 10 minutes.

**Results and discussion:** In the first four days after the start of home bleaching, almost all patients in-group 1 noted increased tooth sensitivity. Patients of both groups noted the following adverse effects: burning sensation in the throat – 5 people (10%), gum tissues, mainly among patients of the 1st group) – 13 people (26%), gum ulceration (mainly among patients in group 1) – 11 people (22%), tooth sensitivity – 37 people (74%). The shades of teeth were compared before and after the course of teeth whitening, based on the data of the photocall and the Vita scale: 4 people (8%) did not notice a significant difference between the original and the resulting color; 36 people (72%) noted a significant difference in shades of an average of 1.5–3.0 shades on the Vita scale, 10 people (20%) noted a slight difference in shades.

**Conclusion:** The study found that professional teeth whitening is effective and relatively safe. In contrast, the use of at-home whitening with the Opalescence system resulted in complications such as an unpleasant taste in the mouth, a burning sensation on the roof of the mouth, tooth sensitivity, and others. Thus, it can be concluded that professional whitening with the Beyond Polus system showed good results in changing tooth shades (on average, 1.5-3.0 shades on the Vita scale).

**Keywords:** Teeth whitening, sensitivity, professional vs. at-home.

# TAURINE STABILIZATION OF SILVER NANOPARTICLES AS A PART OF HYDROGEL FILMS BASED ON PVA

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**Background:** One of the most promising types of wound dressings are dressings based on synthetic polymers. For example, a water-soluble synthetic polymer – polyvinyl alcohol (PVA) is used in many areas of medicine: surgery, therapy, ophthalmology, dermatology, it is the basis or stabilizer for suspensions, ointments, plasters, emulsions, etc. Silver ions cause protein precipitation and thus exhibit a bactericidal effect. Reduced silver (silver nanoparticles, Ag NPs) interact with active enzyme groups and block them, disrupting metabolic processes in the microbial cell. In other words, the mechanism of antimicrobial activity is different for silver ions and nanoparticles – NPs act as a reservoir for prolonged release of cluster and ionic silver.

**Objective:** The aim of the work was to develop a method for producing hydrogel films with silver nanoparticles based on polyvinyl alcohol with antibacterial properties for medicine and biotechnology.

**Materials and methods:** Two series of samples were prepared: PVA (4%) + silver nitrate (1%) + taurine (4%) and PVA (4%) + silver nitrate (1%) + cysteine (4%) in different ratios. The gel samples were dried in Petri dishes (thermostat, 50°C, 5–10 ml, 2–4 h). The following methods were used to synthesize hydrogels with Ag NPs and analyze their physicochemical characteristics: microscopy (Primo Star, 100X); spectrophotometry (UNICO), nanoparticle size control (Photocor Compact-Z). Ag<sup>+</sup> ion reduction was controlled by measuring optical density and specific conductivity.

It was found that the properties of polymer composites with Ag nanoparticles largely depend on the concentration of nanoparticles in the polymer matrix and their morphology, including size, shape and spatial organization, which is directly related to the choice of nanoparticle stabilizers (taurine or cysteine).

**Results and discussion:** Hydrogel films with silver nanoparticles based on PVA can be used in the creation of medical materials, cosmetics and biologically active additives.

**Keywords:** Nanoparticles, polyvinyl alcohol, silver nitrate, taurine, cysteine, hydrogel.

# HERNIAS OF THE ESOPHAGEAL ORIFICE OF THE DIAPHRAGM AND THEIR COMPLICATIONS

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**Introduction:** Hernias of the esophageal orifice of the diaphragm, commonly referred to as hiatal hernias, represent a significant clinical concern due to their potential complications and impact on patient quality of life. These hernias occur when a portion of the stomach protrudes through the esophageal hiatus into the thoracic cavity, leading to various gastrointestinal symptoms such as heartburn, regurgitation, and dysphagia. The prevalence of hiatal hernias is notably high in the aging population, often exacerbated by factors such as obesity and increased intra-abdominal pressure. Complications arising from these hernias can range from gastroesophageal reflux disease (GERD) to more severe conditions like strangulation or incarceration of abdominal contents, which may necessitate surgical intervention. Understanding the pathophysiology, clinical presentation, and management strategies for hiatal hernias is crucial for healthcare providers to mitigate associated risks and improve patient outcomes. This abstract aims to explore the complexities surrounding esophageal orifice hernias and their complications, emphasizing the need for timely diagnosis and appropriate therapeutic approaches.

**Objective:** To study the clinical and epidemiological structure of hernias of the esophageal orifice of the diaphragm, complications and modern methods of their therapy.

**Methods and materials:** The research work was carried out on the basis of the surgical thoracic department of the Stavropol State Medical University IC “SKKB”. Of these, 22 were men and 63 were women aged 28 to 83 years (average age –  $55.5 \pm 1.9$  years). GI is a common pathology of the gastrointestinal tract and takes the 2nd–3rd place after peptic ulcer, chronic gastritis and cholecystitis. The detection rate of GCD ranges from 3 to 33%, and in the elderly it reaches 50%. HPDs account for 98% of all diaphragm hernias, and in 50% of cases they do not cause any clinical manifestations and, therefore, are not diagnosed. GPO leads to the chronic manifestation of gastroesophageal reflux, as well as to the development of severe complications (Barrett’s esophagus, peptic ulcer of the esophagus, adenocarcinoma of the esophagus, strictures and perforations of the esophagus). The recommendations of the American Association of Endoscopic Surgeons (SAGES) regarding the surgical treatment of

HIPOD show a positive effect of laparoscopic funduplications in 85-93% of patients whose drug therapy proved ineffective.

**Results:** As a rule, conservative treatment of patients with GCD is ineffective. In this regard, the surgical method of treatment is currently optimal. Antireflux surgical procedures performed by traditional laparotomy access entail a high number of complications, up to fatal outcomes, especially in elderly and senile patients. Therefore, today most types of antireflux operations, especially fundoplication, can be performed laparoscopically with minimal complications and adverse outcomes.

**Conclusion:** The detection rates of gastroesophageal conditions such as HEOD and HPDs highlight significant challenges in diagnosis, particularly among the elderly population where prevalence can reach 50%. The high incidence of HPDs, with a substantial proportion remaining asymptomatic, underscores the need for increased awareness and screening. Furthermore, the chronic manifestations associated with HEOD, including severe complications like Barrett's esophagus and adenocarcinoma, emphasize the critical importance of early detection and management to prevent adverse outcomes. These findings advocate for enhanced diagnostic strategies and proactive clinical approaches to improve patient care in this demographic.

**Keywords:** Laparotomy, hernia, funduplications, Barretts esophagus.

## **BLOOD PRESSURE DIFFERENCES ACROSS RACIAL AND ETHNIC GROUPS**

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**Background:** Blood pressure (BP) is the lateral force exerted by blood on the vessel wall while following through it.

**Objective:** This study aims to examine variations in blood pressure among different racial and ethnic groups and to determine whether these differences have a significant impact.

**Materials and methods:** The comprehensive survey was conducted among students to identify relevant studies on the different blood pressure across different races and ethnic groups. Studies that met the criteria were selected and data were extracted and analysed. The used method is called the Auscultatory method (the use of a sphygmomanometer and a stethoscope to check for the blood pressure involves listening to Korotkoff sounds produced by the blood flow in the artery as the cuff is gradually deflated).

**Results and discussion:** Students from Africa, India, and Middle East were examined. Totally, 15 people from 19 to 21 years old. In all the students we tested normal values of BP, the most low value was revealed in the Indians, the most high in African males and Middle Eastern females.

The findings of the review indicate that there is a difference in blood pressure across races and ethnic groups while genetics and sex play a role, research suggests that race is primarily a social construct, with biological variations occurring more at the individual and regional levels rather than across broad racial categories. Differences in blood pressure are more strongly influenced by factors such as ancestry, geography, environment, emotions and social determinants rather than race itself.

**Keywords:** Blood pressure, race, ethnic group, sphygmomanometer, Genetics.

## THE ROLE OF HYBRID MYOCARDIAL REVASCULARIZATION IN PATIENTS WITH CORONARY ARTERY DISEASE AND MULTIVESSEL LESIONS

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**Background:** Hybrid myocardial revascularization is an innovative approach to treating coronary artery disease (CAD) that combines elements of coronary artery bypass grafting (CABG) and percutaneous coronary intervention (PCI). This method optimizes treatment outcomes for patients with multivessel lesions by improving coronary blood flow and enhancing quality of life.

**Objective:** To determine the role and effectiveness of hybrid myocardial revascularization in CAD patients with multivessel coronary lesions.

**Materials and methods:** Fifty-eight CAD patients admitted to a vascular center at a regional clinical hospital were randomized into two groups for myocardial revascularization: “hybrid revascularization” and “aortocoronary bypass surgery (ACBS).” In the “hybrid revascularization” group, minimally invasive direct myocardial revascularization was performed on the anterior descending artery, followed by PCI (within 30 days) of other coronary vessels using drug-eluting stents. Procedure success rates and adverse cardiovascular events were assessed in all groups. ACBS was performed in 72.4% of patients, while hybrid revascularization was conducted in 16 patients (27.6%).

**Results and discussion:** A comparative analysis of primary and

secondary endpoints (significant adverse cardiovascular events) in both groups is presented. The immediate and long-term results regarding the frequency of major adverse coronary events in the hybrid revascularization group were comparable to those in the ACBS group. When analyzing complications such as the need for inotropic support (12.5% in group 1 vs. 28.5% in group 2), transient arrhythmias (42.9% in group 1 vs. 31.25% in group 2), and the development of acute cerebrovascular accidents (7.1% in group 1 vs. 6.25% in group 2), the frequency of these complications was significantly lower in the hybrid revascularization group ( $p<0.05$ ).

**Conclusions:** Hybrid coronary revascularization is the method of choice for treating patients with multivessel coronary artery lesions, considering the lower incidence of complications.

**Keywords:** Hybrid revascularization, coronary artery disease.

## PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND EARLY DIAGNOSIS OF CHRONIC KIDNEY DISEASE

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**Background:** In chronic obstructive pulmonary disease (COPD), markers of the inflammatory response are determined not only locally in the respiratory tract, but also systemically, causing damage to the endothelium, disrupting its function. The commonality of risk factors for chronic kidney disease (CKD) and COPD, the presence of chronic systemic inflammation determines the need to study renal function in patients with COPD.

**Objective:** To study biochemical markers of renal endothelial dysfunction in patients with COPD and to assess their impact on CKD.

**Materials and methods:** The study involved 116 patients suffering from COPD stages II and III, aged 60–82 years. Men were 63.8% and women 36.2%. The patients were divided into 2 groups: with moderate severity and with severe course. The following parameters were determined: creatinine (Cr), urea (Ur), C-reactive protein (CRP), homocysteine – (HC), tumor necrosis factor – (TNF- $\alpha$ ), interleukin (IL) IL-6, IL-8. Glomerular filtration rate (SFR) according to the CKD-EPI formula.

**Results and discussion:** SCF less than 60 ml/min/1.73 m<sup>2</sup> was detected in 92 patients (79%), including 51 (55%) patients with COPD for the first time. It was determined that the highest levels of CRP, IL-6, IL-8 were

observed in patients of the 2nd group with a severe course of the disease. The study revealed that creatinine was higher than normal in 23.5% of patients in the first group and 65.7% of patients in the second group. Elevated levels of TNF- $\alpha$  were detected in 18.6% of patients with COPD and in 93% of comorbid patients with COPD and CKD. All patients with COPD with reduced SCF had elevated homocysteine levels.

**Conclusions:** In comorbid patients with COPD and CKD, a significant increase in endothelial dysfunction indices and a more severe course of COPD were noted. Homocysteine, IL-6, IL-8, CRP were reliably corrected with the severity of renal dysfunction.

**Keywords:** Chronic obstructive pulmonary disease, chronic kidney disease, renal endothelial dysfunction.

## ROLE OF HYSTEROSCOPY IN DIAGNOSTICS OF INTRA-UTERINE PATHOLOGIES

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**Background:** Hysteroscopy represents the gold standard management of these diseases. In this scenario, the possibility offered by hysteroscopy-guided targeted endometrial biopsy may enhance the possibility to study these conditions even from the molecular point of view, from the genetic background to the epigenetic modifications that may lead to endometrial/myometrial pathological changes. Finally, the combination of intracavitary view offered by hysteroscopy and investigation of expression of some genes pivotal for the correct anatomical development of the reproductive tract, such as the ones from HOX transcription family, could be useful to shed new lights about common uterine malformation, such as uterine septa and subseptae, and even less common ones.

**Objective:** A retrospective descriptive study was conducted between 2020 and 2024 at Assisting Nature In Vitro Fertilization (IVF). The study population consisted of oocyte recipient women who underwent hysteroscopy one–three months before embryo transfer.

**Materials and methods:** This retrospective descriptive study included oocyte recipients of Caucasian origin that underwent hysteroscopy one–three months prior to embryo transfer (between 2013 and 2022) in

Assisting Nature Centre Reproduction and Genetics, IVF Unit. Notably, two senior reproductive consultants (R.N. and E.P.) performed all the procedures to prevent the possible confounding factor of multiple operators (inter-observer variability) that may adversely impact the evaluation of intrauterine view and outcomes.

**Results and discussions:** In total, 180 women underwent diagnostic hysteroscopy prior to embryo transfer with donor oocytes. The mean maternal age at the time of intervention was 38.9 (+5.2) years, while the mean duration of infertility was 6.03 (+1.23) years. In particular, congenital uterine anomalies (U1a: 1.1% {n=2}, U2a: 5.6% {n=10}, U2b: 2.2% {n=4}) and polyps (n=39) myoma 21% (n=20) adenomyosis 18%, mixed (myoma + polyps + adenomyosis – 18% and chronic endometriosis 4.1% were the main findings in the sample population. Also 2.8% (n=5) had submucous fibroids and 1.1% (n=2) were diagnosed with intrauterine adhesions. Notably, in recipients after repeated implantation failure intrauterine pathology rates were even higher (39.5%).

**Conclusion:** Oocyte recipients and especially those with repeated implantation failures probably have high rates of previously undiagnosed intrauterine pathology so hysteroscopy would be justified in these subfertile populations.

**Keywords:** IVF, intrauterine pathology, hysteroscopy.

## COMPARATIVE EVALUATION OF MINIMALLY INVASIVE METHODS OF TREATMENT OF PATIENTS WITH MECHANICAL JAUNDICE

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**Background:** According to scientific forecasting, the incidence of biliary tract diseases will increase by 30-50% worldwide in the next 15 years, which is explained by lifestyle, diet, and hereditary factors (Grigoryeva I.N., 2010; Galperin E.I., Vetshev P.S., 2011).

**Objective:** The aim of the work is to compare minimally invasive treatment methods in patients with mechanical jaundice.

**Material and methods:** The analysis of case histories of patients treated at the Surgical Thoracic Department of the Saratov Regional Clinical Hospital in 2013–2016 was conducted. The age of the patients

ranged from 23 to 86 years, with more than 70% being elderly and senile patients burdened with concomitant pathology and a high degree of surgical risk. There were 86 men (35.83%) and 154 women (64.14%). The complex of instrumental methods included ultrasound of the abdominal cavity, multispiral computed tomography, MR cholangiography, laboratory tests. The obtained results were processed using the computer program “Excel”.

**Results and discussion:** The causes of mechanical jaundice in 50.72% were choledocholithiasis, in 24.63% – malignant diseases, in 13.04% – pancreatitis and 8.69% – common bile duct strictures. Endoscopic retrograde cholangiopancreatography (ERCP) with endoscopic papillosphincterotomy (EPST) was performed in 56.52%, and percutaneous transhepatic cholangiography (PTC) with percutaneous transhepatic cholangiostomy (PTCS) in 43.47%. Complications after PTCS occurred in 4 patients (3.84%): drainage dislocation with bile leakage in 3 (2.88%), including 1 (0.96%) with a fatal outcome, bleeding in 1 (0.96%). In patients with ERCP and PST, bleeding from the PST zone was diagnosed in 4 (2.91%), post-manipulation pancreatitis in 2 (1.47%), cholangitis in 1 (0.73%), perforation with a fatal outcome in 1 (0.73%) and wedging of the Dormia basket in 3 (2.2%).

**Conclusion:** According to our data, in cases of unsuccessful attempts at endoscopic manipulations on the major duodenal papilla due to anatomical features of the parafacial zone and/or previous operations on the gastrointestinal tract, PTC with PTC or percutaneous transhepatic cholecystostomy (PTCS) with PTC were performed for preventive unloading of the ductal system and subsequent diagnostic. A significant number of complications after ERCP and PST were also reliably identified, compared with PTC or PTCS.

**Keywords:** Choledocholithiasis, cholangiostomy, papillosphincterotomy, minimally invasive.

## **PREDICTORS OF CIRRHOSIS FORMATION IN CHRONIC LIVER DISEASES**

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**Background:** Liver cirrhosis (LC) is the main cause of morbidity and mortality in chronic liver diseases (CLD), characterized by excessive accumulation of extracellular matrix in the liver parenchyma, disruption of its architecture. The “gold standard” for LC diagnostics is puncture biopsy,

however, given its shortcomings, the search for non-invasive predictors of its development continues.

**Objective:** To study the relationship between clinical and laboratory parameters of liver pathology and the risk of developing cirrhosis.

**Material and methods:** A total of 76 patients with CLD of alcoholic or viral etiology (27 women, 49 men) aged 18 to 64 years were examined. F4 fibrosis (cirrhosis) was diagnosed in 17 patients. The comparative analysis included gender, age, aspartic aminotransferase (AST), alanine aminotransferase (ALT), gamma-glutamyl transpeptidase (GGT), alkaline phosphatase (ALP), total bilirubin, direct bilirubin, erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), fibrinogen, albumin, prothrombin time (PT), prothrombin index (PTI), international normalized ratio (INR), total cholesterol, platelets, and liver elasticity.

**Results and discussion:** Patients with liver cirrhosis (fibrosis F4) were characterized by older age, higher values of AST, GGT, total and direct bilirubin, ESR, liver elasticity, lower concentration of albumin and platelets in the blood. An increased chance of having cirrhosis (fibrosis F4) was associated with GGT values  $^367.8$  U/L, liver stiffness  $^311.1$  kPa, albumin  $^339.3$  g/l, platelets  $^3173 \times 10^9/l$ , age  $^345$  years old, AST  $^349.3$  U/L, ESR  $^39$  mm/hour, total bilirubin  $^316$   $\mu\text{mol/l}$ , direct bilirubin  $^38.4$   $\mu\text{mol/l}$ , ALT  $^365$  U/L. The largest area under the curve was found in cases of GGT indicators ( $0.89 \pm 0.05$ ), liver stiffness ( $0.84 \pm 0.06$ ), age ( $0.78 \pm 0.07$ ) and albumin ( $0.77 \pm 0.07$ ). The sensitivity and specificity values were 88.2% and 81.4% for GGT, 8.4% and 78.0% for liver elasticity, 76.5% and 79.7% for age, and 52.9% and 93.2% for albumin, respectively.

**Conclusion:** An increased risk of liver cirrhosis is associated with older age, higher levels of GGT, albumin, and liver elasticity.

**Keywords:** Liver cirrhosis, liver fibrosis, gamma-glutamyl transpeptidase, albumin, liver elasticity.

## RISK EVALUATION OF EATING DISORDER DEVELOPMENT IN TEENAGERS

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**Background:** Currently, eating disorders (EDs) diagnosed in 95% of cases among teenagers aged 13–18. Among them, 40–60% of girls are concerned about their weight; 44% of girls and 15% of young men engaged in systematic weight loss practices; 35% of “normal individuals” transition

to pathological dieting. Additionally, unhealthy weight control behaviors observed in half of teenage girls and nearly one-third of teenage boys.

**Objective:** This research aims to assess the risk of eating disorder development among first-year students using various diagnostic methods.

**Materials and methods:** The research conducted in two stages: anthropometric measurements and an anonymous survey with interpretation of the total scores across measured constructs.

**Results:** First, 72 students were performed anthropometric measurements and was calculated body mass index (BMI). Twenty students had violation of the norm and placed in the control group. Preclinical diagnostics of EDs were carried out using the Dutch Eating Behavior Questionnaire (DEBQ) and the Eating Attitudes Scale (EAS). Among the control group participants, 60% demonstrated a restrictive eating behavior type, 30% had an emotional eating behavior type and 10% had an external eating behavior type.

The survey revealed the presence of the following psychological characteristics: interpersonal distrust (45%), perfectionism (40%), body dissatisfaction (25%), drive for thinness (20%), feelings of inefficacy (10%), interoceptive deficits (10%), and bulimic tendencies (5%). Additionally, 15% of participants displayed abnormalities in one or more characteristics. More than half of the control group met the criteria for being classified as “at risk for EDs.” Three female students in the high-risk category advised to seek immediate professional consultation, as they met all three critical diagnostic criteria.

**Conclusion:** Eating disorder is a serious medical condition that, if left untreated, can lead to fatal outcomes. Mortality rates among individuals with EDs are the highest among all psychiatric disorders. Timely help and support will be the way to solve the problem of recovery and to return to an active and fulfilling life.

**Keywords:** Eating disorders, bulimia, body mass index, measured constructs.

## **HERNIA REPAIR IN THE ERA OF BARIATRIC SURGERY: CHALLENGES AND OPPORTUNITIES**

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**Background:** The rise of bariatric surgery has led to an increased incidence of hernias, particularly internal hernias, in obese patients. Hernia

repair in this population poses significant challenges due to altered anatomy, comorbidities, and the need for durable repair to withstand increased intra-abdominal pressure.

**Objective:** This study is to examine the complexities of hernia repair in patients who have undergone bariatric surgery, highlighting the challenges and opportunities in this emerging field. This study also aims to investigate the impact of bariatric surgery on hernia formation and evaluate the role of mesh selection and placement and the importance of multidisciplinary collaboration between surgeons, anesthesiologists and medical specialists in hernia repair.

**Materials and methods:** This study is a retrospective review of patients who underwent bariatric surgery and subsequently developed hernias, with data collected from electronic medical records. Hernia repair was performed using various techniques including mesh repair and suture repair with mesh selection and placement determined by the surgeon.

**Results and discussion:** Our analysis reveals that hernia repair in bariatric patients requires a tailored approach, taking into account the patient's weight loss history, comorbidities and anatomical changes. We also identify opportunities for innovation including the development of new mesh materials and techniques and the integration of hernia repair with bariatric surgery.

**Conclusion:** This study highlights the need for a multidisciplinary approach to hernia repair in bariatric patients, with the goal of providing optimal care and improving the quality of life.

**Keywords:** Hernia repair, bariatric surgery, obesity, mesh selection, comorbidities.

## **A COMPREHENSIVE STUDY OF CHRONOBIOLOGY AMONG STUDENTS OF MEDICAL UNIVERSITY**

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**Background:** The particular interest is the establishment of a connection between the chronobiotype of the body and its activity before sleep and the quantitative and qualitative characteristics of this sleep.

**Objective:** To analyze the sleep of the patterns and students chronotypes from different age and gender groups, determining an association between sleep characteristics, activity before sleep and meal timing.

**Materials methods:** A cross-sectional study was conducted among

Russian and Foreign students. Data on demographics, sleep duration, sleep quality, bedtime habits, meal timing and chronotypes were collected through structured questionnaires. Comprehensive analysis was performed to identify patterns and correlations.

**Results and discussion:** Preliminary findings indicate that male students tend to have shorter sleep durations and later sleep onset compared to female students. Foreign students exhibited a higher prevalence of evening chronotypes, while Russian students showed a balanced distribution. Sleep quality varied, with some students experiencing fatigue and frequent awakenings. Those with morning chronotypes reported better sleep efficiency and cognitive alertness. Additionally, students who engaged in stimulating activities before sleep had lower sleep quality. Late-night eating was associated with shorter and more fragmented sleep, particularly among evening chronotypes.

**Conclusion:** We found significant association between Chronobiological types and pre sleep activities to sleep patterns among students. Activities before sleep and time of the last meal play a crucial role in determining sleep quality and quantity. Understanding these differences and associations can help optimize academic schedules and promote healthy sleep hygiene practices through tailored interventions. Though this is an associative study, the pathophysiology underlying these findings is not yet fully understood by further research.

**Keywords:** Sleep quality, chronotype, students, sleep duration, gender differences, academic performance, pre-sleep activities, meal timing, sleep hygiene.

## **CORTISOL RESPONSE: A COMPARATIVE STUDY ON PERIOPERATIVE FACTORS**

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**Background:** Cortisol, the stress hormone, is an inevitable reaction to surgical trauma. Several factors influence its production, including surgical technique, anaesthesia, and the patient's comorbidities. This article attempts to compare specific factors that affect cortisol production during surgery.

**Objective:** To compare and assess individual cortisol response under their respective factors during the stages of surgery key variables analysed include type of surgery anaesthesia techniques preoperative anxiety and postoperative pain management.

**Methods:** A prospective study on individual factors exerting impact on cortisol release was done from pre registered elective and emergency surgical manipulations. The subjects were grouped under their respective factors and compared for correlations and differences through statistical analysis.

**Results:** Results suggest that open surgeries induce a significantly higher cortisol response compared to minimally invasive procedures. Local anaesthesia appears to attenuate cortisol elevation compared to general anaesthesia. Additionally, patients with high preoperative anxiety exhibited higher cortisol levels and prolonged recovery times. Effective postoperative pain management was associated with faster normalization of cortisol levels.

**Conclusion:** Multiple factors influence cortisol response during surgery, with surgical invasiveness, anaesthesia type, and psychological stress playing significant roles. Minimally invasive techniques and effective pain management strategies contribute to lower cortisol responses, potentially enhancing recovery. Further research is needed to develop personalized perioperative interventions aimed at modulating stress response and improving patient outcomes.

**Keywords:** Cortisol, surgical stress, anaesthesia, pain management, psychological stress, perioperative care.

## **COVID-19 VACCINES IN INDIA**

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**Background:** India reported its first COVID-19 case in January 2020, and the pandemic spread rapidly across the country, affecting millions of people. Vaccination was identified as a critical strategy to control the spread of COVID-19, reduce mortality, and prevent long-term health complications. The Indian government launched the world's largest vaccination drive on January 16, 2021, with the aim of vaccinating 300 million people by August 2021. Multiple COVID-19 vaccines were approved for emergency use in India, including Covishield, Covaxin, and Sputnik V, providing a range of options for vaccination.

**Objectives:** To provide an overview of the covid-19 vaccine scenario in India and importance of vaccination in controlling the Covid-19 pandemic; to discuss the Indian government's initiatives and strategies

for COVID-19 vaccination; to examine the challenges and limitations of COVID-19 vaccination in India.

**Materials and methods:** COVID-19 vaccine data extracted from Ministry of Health and Family Welfare reports from Indian Council of Medical Research and news articles and press releases.

**Results and discussion:** India's COVID-19 vaccination program has made significant progress, with over 1.025 billion people receiving at least one dose of the vaccine, with more than 74% of the population fully vaccinated. India's vaccination efforts have been instrumental in controlling the spread of COVID-19. 70% – 80% decline in COVID-19 cases. Vaccine 80%-90% is effective in preventing severe diseases. India's vaccination campaign has been successful in controlling the spread of COVID-19.

**Conclusion:** The government launched a massive awareness campaign to educate the public about the importance of vaccination and to dispel misconceptions surrounding the vaccines. This effort helped to build trust and confidence among the population, leading to a significant increase in vaccine uptake. The government also leveraged technology, using digital platforms to facilitate vaccine registration, scheduling, and tracking. This helped to streamline the vaccination process, reducing wait times and improving overall efficiency.

**Keywords:** Vaccine, Covid-19, India.

## SURGICAL TREATMENT OF POSTCOITAL CYSTITIS IN WOMEN

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**Background:** Female hypospadias with urethral hypermobility is one of the causes of postcoital cystitis. Morphologically, this is associated with shortening the length of urethra and dystopia of the meatus towards the vagina, which creates conditions for retrograde infection of the lower urinary tract with pathological genital microflora. This problem is an actual reason for studying and choosing the optimal surgical treatment.

**Objective:** Analysis of distal urethral diseases that caused chronic recurrent lower urinary tract infection.

**Materials and methods:** We observed 96 patients with female hypospadias. The age of the patients ranged from 16 to 47 years. The duration of the disease ranged from 6 months to 28 years. The patients were divided into two clinical groups:

– Group 1: 45 patients underwent surgical transposition of the distal urethra and meatus to a typical location.

– Group 2: 51 patients underwent injection of gel-like hyaluronic acid into the meatus area and along the distal third of the urethra in order to move the meatus to a typical location.

**Results and discussion:** In the patients of the 1st clinical group in the immediate postoperative period, there was no dysuria; urine tests were without pathological pathogens. In the long-term postoperative period, 4 patients experienced one episode of postcoital cystitis; no dyspareunia was observed.

In patients of the 2nd clinical group, in the immediate postoperative period there was no dysuria, urine tests were without pathological pathogens. In the long-term postoperative period, 10 patients had one episode of postcoital cystitis, two patients had 2 episodes of postcoital cystitis, and 3 patients had periodic episodes of dyspareunia.

**Conclusion:** Surgical transposition of the meatus and distal urethra to a typical location is a more effective method of treating than injection of hyaluronic acid gel into the meatus area and along the distal third of the urethra.

**Keywords:** Postcoital cystitis, female hypospadias, urethral surgery.

## COMPARATIVE ANALYSIS OF CONSERVATIVE AND MODERN CONCEPTS OF SEPSIS

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**Background:** Sepsis is a life-threatening condition that arises when the body's response to an infection causes a dysregulated immune response, leading to organ dysfunction and failure. It is a major global health concern, and the prevalence of sepsis is increasing, partially due to factors such as ageing populations, antibiotic resistance, and the rising incidence of infections.

**Objective:** To compare the prevalence of sepsis in traditional and modern times.

**Material and methods:** The online data from the National Library of Medicine, the World Health Organization (WHO) and the Centre for Disease Control and Prevention (CDC).

**Results and discussion:** From the above reports and information, although modern methods have gradually decreased its prevalence, it's

still a global health concern. In 1990, there were an estimated 60.2 million sepsis cases and 15.7 million deaths; by 2017, the incidence had dropped by 19% to 48.9 million cases and deaths by 30% to 11.0 million.

**Conclusion:** Despite the presence of sepsis being traced back to Roman times, sepsis is still one of the hardest conditions to treat and is responsible for thousands of hospital deaths every year; Sepsis remains a major cause of morbidity and mortality worldwide.

**Keywords:** Sepsis prevalence, conservative, modern, mortality, morbidity.

## INTELLECTUAL DISABILITY

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**Background:** The term intellectual disability refers to the level of cognitive functioning that is demonstrated by particular children. It is the circumstance in which a children's cognitive functioning is impeded to the point of causing a significant disability in receiving information from his or her surrounding, then effectively processing, problem solving and adapting to this information. This paper provides an overview of children with intellectual disability incorporating definition, causes and classification for conceptual understanding. Intellectual disability is characterized by significant limitations in intellectual functioning and adaptive behaviour, the latter expressed as conceptual, social and practical adaptive skills. An intellectual disability is defined as an IQ below 70 and deficits in adaptive behaviour or daily living skills (eating, dressing, communication, participate in group activity). People with intellectual disability learn slowly and have difficulty with abstract concepts. This paper also throws some light on the characteristics of people with intellectual disabilities.

**Objective:** During the last century, the persons with intellectual disability have experienced a radical change in all aspects of life: healthcare, employment, education, recreation, and living situation (World Health Organization, 2000). It has been denied and renamed many times throughout history. Mental retardation, which was in world use over till late 20th century, has now been replaced with intellectual disability in most countries. Diagnostic and Statistical Manual 5th Revision (DSM-V) has replaced it with intellectual disability.

**Materials and methods:** Intellectual disability (ID) is an abnormality that has enormous social effects. It affects not only the people who suffer from it but also the family and society as a group. Millions of people around the world have intellectual disability and prevalence is calculated to be 1 to 3% in developed countries.<sup>1</sup> In Mexico, according to INDESOL (National Social Development Institute) calculations, there are 2 925 000 persons with some type of intellectual disability.<sup>2</sup> In spite of this fact, knowledge of its causes is very limited and the etiological diagnosis in developed countries is almost always established as being a little less than half of the subjects affected. <sup>3</sup> The frequency with which exogenous and genetic causes are identified varies; some authors have reported proportions ranging from 17 to 47%.<sup>4,5</sup> Of course these differences are attributed to the selection of the studied population, the degree of mental delay, the heterogeneity of study protocols, technological advances and case definitions. This article outlines basic concepts related to intellectual disability as a function of diagnosis, treatment and prognosis.

**Results and discussion:** The greatest number of cases is patients with Down syndrome, <sup>7</sup> an anomaly that occurs in 15 of every 10 000 births and is due to chromosome 21 trisomy or the translocation of chromosomes 21 and 15. Other much less frequent chromosomal abnormalities are those of the fragile X chromosome syndrome, <sup>8</sup> Prader Willi syndrome, <sup>9</sup> Rett syndrome, neurofibromatosis,<sup>11</sup> tuberous sclerosis, <sup>12</sup> Lesch-Nyhan syndrome, <sup>13</sup> adrenoleukodystrophy <sup>14</sup> and other very rarely occurring related condition.

**Conclusion:** Human beings are social animal, so that intellectual disability should be treated in an inclusive and holistic way. They need encouragement and support to overcome potential obstacles. The rationale for the use of the term intellectual disability as less stigmatizing is not borne out by research. As it was noted by Dutchman et al., (2013), society is the locus of the problem – not the affected individual. The mocking of the terminology likely derives from the stereotypes and prejudices some people enforce when considering persons with intellectual disability. Stigma is a multifactorial and psychological problem (Dutchman et al., 2013) and not a terminology problem per se. Intellectual disability is characterized by significant impairment in cognitive and adaptive behavior. People with intellectual disability experience loss, as the typically developing individuals.

**Keywords:** Intellectual disability, Down syndrome, classification, causes and characteristics.

# ARNOLD-CHIARI MALFORMATION TYPE II IN COMBINATION WITH MULTIPLE DEVELOPMENTAL ANOMALIES: THE HISTORY OF ONE OBSERVATION

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**Background:** Arnold-Chiari malformation (ACM) type II is a dangerous, rapidly progressing congenital spinal dysraphism associated with severe neurological disorders, including occlusive hydrocephalus and spina bifida, which significantly affects the health of the infant and the possibilities of rehabilitation. It is characterized by high mortality in the perinatal period or in early childhood.

**Objective:** Using a clinical case as an example, to inform specialists about the features of the course of ACM type II, to demonstrate the work of an interprofessional team in achieving favorable results.

**Materials and methods:** We used a retrospective analysis of the medical history of a child with ACM type II, who was treated in the infectious diseases department of the Stavropol Regional Children's Clinical Hospital (SRCH).

**Results and discussions:** A boy I., 4 months old, from birth the child was observed by a neurologist for ACM type II, grade 3, spina bifida of the lumbosacral region, hydrocephalus. In the first month of life, plastic surgery for lumbar rachischisis was performed, at 3 months – ventriculoperitoneal shunting (VPSH). A month later, discharge from the postoperative wound appeared, he was consulted by a neurosurgeon (VPSH failure, shunt infection), sent to the infectious diseases department of the SKDKB, where he stayed for 106 days with the diagnosis: main: shunt-dependent progressive hydrocephalus; concomitant: multiple congenital malformations (MAC type II grade 3): spina bifida of the lumbosacral region (condition after plastic surgery), lipomyelomeningocele with liquorrhea. Partial atrophy of the optic nerve. Congenital right-sided hip dislocation. Installation deformity of the left foot. Extension contracture of the left knee joint. Sensorineural hearing loss on the left.

The condition upon admission is of moderate severity, due to neurological symptoms, concomitant pathology. There are no focal and meningeal symptoms. The dynamics of cerebrospinal fluid (CSF) parameters were assessed every 2–4 days (47 studies), cerebrospinal fluid was obtained from external drainage: neutrophilic (11–92%) pleocytosis

(15–1124 in  $\mu\text{l}$ ), hyperproteinarchia (0.73–7.8 g/l), hypoglycarchia (0.67–2.72 mmol/l), which prevented the implementation of VPS. External drainage of the ventricular system was performed three times with an interval of 1 month.

He received massive antibacterial therapy using, among other things, drugs of the reserve group in maximum dosages (amikacin, amoxicillin, vancomycin, lenisolid, maxiktam, meropenem, tobramycin, cefoperazone+sulbactam, ceftriaxone, ciprofloxacin), antiviral, fungicidal, symptomatic therapy. On the 97th day of treatment, relatively stable sanitation of the CSF was recorded, which made it possible to perform a repeated CSF shunting operation.

After stabilization of the general condition, the child was discharged under the supervision of a pediatrician, surgeon and neurologist.

**Conclusion:** Pediatricians need to know about the existence of such a congenital disease of the nervous system in children as MAC, its complications and adverse outcomes, in order to improve the effectiveness of early perinatal diagnosis and timely referral of patients to specialized institutions, which will help reduce perinatal mortality.

**Keywords:** Anomaly, Arnold-Chiari malformation, children, clinical case.

## **OSTEOCHONDRITIS DISSECANS OF THE KNEE**

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**Background:** Osteochondritis Dissecans (OCD) is a condition for which the aetiology remains unknown. It affects subchondral bone and secondarily its overlying cartilage and is mostly found in the knee. It can occur in adults, but is generally identified when growth remains, when it is referred to as juvenile OCD. As the condition progresses, the affected subchondral bone separates from adjacent healthy bone, and can lead to demarcation and separation of its associated articular cartilage. Any symptoms which arise relate to the stage of the disease. Early disease without separation of the lesion results in pain. Separation of the lesion leads to mechanical symptoms and swelling and, in advanced cases, the formation of loose bodies. Early identification of OCD is essential as untreated OCD can lead to the premature degeneration of the joint, whereas appropriate treatment can halt the disease process and lead to healing. Establishing the stability of the lesion is a key part of providing the correct treatment.

**Objective:** This article presents the aetiology and clinical presentation of OCD and the factors affecting outcome. As the evidence for specific treatment is inconclusive, an algorithm and rationale for treatment is provided.

**Materials and methods:** OCD was initially thought to be inflammation of the interface between articular cartilage and bone. However, subsequent studies have disproved this and although other hypotheses have included genetic causes, ischaemia, endocrinopathies, focal osteonecrosis and repetitive low-level trauma, the exact cause remains unknown. Of these it is thought that the most likely cause is repeated micro trauma as several studies have found a link between OCD and regular involvement in sport or other strenuous activities. The typical lesion on the lateral aspect of the medial femoral condyle may relate to repetitive impingement of this area against the medial tibial spine or inferomedial patella.

**Results and discussion:** Osteochondritis dissecans (OCD) is a disorder of subchondral bone, which secondarily affects the overlying articular cartilage. Separation of a fragment of articular cartilage, complete with a layer of its subchondral bone, occurs in end-stage disease. The layer of bone can be very thin, or even absent. Patients may be asymptomatic or present with pain and mechanical symptoms. The knee is most commonly affected. It classically affects skeletally immature patients who are keen on sport. In this group, the condition is usually described as juvenile OCD, but also occurs in adults for whom the prognosis is worse. It is possible to heal lesions, particularly in juvenile.

**Conclusion:** In conclusion, although treatment of OCD is discussed in the literature, there is no evidence base that has emerged to determine how to manage it best. Unfortunately, treatment of OCD is not always successful, with the literature reporting rates of failure of 10% at least, regardless of type of treatment. These significant rates of failure leading to what we believe are an unduly pessimistic view amongst orthopaedic surgeons regarding the treatment of OCD.

**Keywords:** Osteochondritis, endocrinopathies, osteonecrosis.

## **BURN SHOCK RESUSCITATION**

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**Background:** Burn injuries are complex and life-threatening conditions that require immediate and precise medical intervention. The pathophysiology of burn shock involves significant fluid loss, electrolyte

imbalances, and systemic inflammatory responses. Historically, advancements in burn resuscitation have been driven by tragic events, such as the Rialto Theater fire (1921) and the Coconut Grove fire (1942), which highlighted the critical need for effective fluid resuscitation strategies.

**Objective:** The primary objectives of this presentation are to understand the different types of burn depths and their implications. Calculate the Total Body Surface Area (TBSA) affected by burns. Implement the Parkland formula for fluid resuscitation. Comprehend the pathophysiology of burn shock and the consequences of over- and under-resuscitation. Identify causes for increased fluid needs in burn patients.

**Methods and materials:** The presentation reviews historical and contemporary approaches to burn resuscitation, focusing on the Parkland formula, which recommends 4 mL/kg/% TBSA of Lactated Ringer's solution over the first 24 hours post-burn. The formula divides the fluid administration into two phases: 50% in the first 8 hours and the remaining 50% over the next 16 hours. Additional considerations include the use of colloids, hypertonic saline, and high-dose vitamin C. Monitoring of resuscitation includes vital signs, urine output, and laboratory tests to ensure adequate perfusion and prevent complications such as acute renal injury or compartment syndrome.

**Observation:** Historical data from major burn incidents and clinical studies have demonstrated the effectiveness of early and aggressive fluid resuscitation. The Parkland formula has been validated in numerous studies, showing adequate resuscitation in 70% of patients. However, patients with deep burns, inhalation injuries, or delayed resuscitation often require additional fluids. Over-resuscitation can lead to complications such as edema, compartment syndromes, and ARDS, while under-resuscitation can result in hypoperfusion and organ failure.

**Conclusion:** Effective burn shock resuscitation requires a thorough understanding of burn pathophysiology, precise calculation of fluid needs, and vigilant monitoring to balance fluid administration. The Parkland formula remains a cornerstone of burn resuscitation, but individualized adjustments are necessary based on patient-specific factors. Continued research and advancements in burn care are essential to improve outcomes and reduce mortality in burn patients.

**Keywords:** Burn shock, Parkland formula, fluid resuscitation, TBSA.

**PROGNOSTIC FINDINGS AFTER INTRACEREBRAL  
HAEMATOMA REMOVAL IN A PAEDIATRIC  
NEUROSURGICAL PATIENT – CLINICAL CASE**

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**Background:** Severe head (cranio-cerebral) trauma is considered a serious issue in modern medicine. About 70 per cent of cases of the given trauma have a lethal outcome, and survivors remain disabled for the rest of their lives. Prompt and proper neurosurgical aid was provided to the involved patients can prevent the occurrence of not only death, but also neurological disruptions. The primary mission of the neurosurgeon and the intensive care doctor is to prevent the brain oedema and dislocation, and the requirement of anti-oedematous treatment is indispensable. In the case of brain compression, surgical intervention is inevitable for the purpose of fulfilling decompressive craniectomy, haematoma evacuation, and infratemporal decompression. Haematomas are classified according to their localisation, into epidural, subdural, and intracerebral. They are also classified into acute, subacute, and chronic, depending on the period of formation. The decision of performing the surgical intervention is taken with regards to the haematoma size (volume), the degree of cerebral midline shift, as well as the patient's neurological status.

**Objective:** To study the clinical case of a paediatric female patient, diagnosed with a compressive acute intracerebral haematoma and a depressed fracture of the cranial vault (calvaria).

**Materials and methods:** Due to the information in the discharge letter from the hospital where the patient (F, 15) was first admitted, and according to the data provided by the emergency paramedics, the patient received the trauma due to having been involved in a car crash as a passenger. The neurosurgical team in the first hospital, after consultation, recommended transferring her by aviation ambulance to the Stavropol Fourth Clinical Hospital. On board, the patient's condition has acutely worsened. A clinical death episode was documented. Resuscitative efforts impacted positively, and she was successfully delivered to the destination hospital, where a complex of clinical-diagnostic measures took place immediately. A head CT scan was performed and the diagnosis accordingly was confirmed to be: "Open penetrating head injury, severe brain contusion with formation of

intracerebral haematoma in the right frontal lobe and a subdural haematoma of the right frontotemporal lobes, subarachnoid haemorrhages, depressed fracture of the right frontal bone". The patient's state was critically severe, with consciousness level being first-degree coma (7 points by Glasgow Coma Scale). Decompressive craniectomy with evacuation of the intracerebral haematoma and removal of the depressed fracture was performed. The patient afterwards spent a severe postoperative period in the intensive care unit in November 2024. She was transferred in December to the neurosurgical unit with no unfavourable neurological symptoms.

**Results and discussion:** After a two-week postoperative stay in the intensive care unit with a first-degree coma and suspicion of meningitis, hospitalisation continued from mid-November in the neurosurgical unit with a 15-point consciousness level by GCS, quick regression of focal neurological signs and symptoms (paresis and hyposthesia), as well as restoration of orientation, speech, perception of the surrounding environment, and proper interaction with the medical personnel. Hospitalisation period lasted for 35 days, following which the patient was discharged in a satisfactory state. She was re-hospitalised in February 2025 for the purpose of insertion of a metallic plate bone flap. The postoperative period went smoothly. She was, as a result of the fulfilled work all together, able to return to her daily life without any neurological symptoms representing a handicap.

**Conclusion:** Severe head injury, accompanied by compression of the brain, is considered a serious problem for the patient involved. Positive outcome, in many cases, depends on the time of the surgical intervention, the necessary operational capacity, as well as the professional follow-up postoperatively. Upon the fulfilment of all the aforementioned, chances of a positive outcome from the received trauma would vividly increase.

**Keywords:** Subdural haematoma, depressed fracture, head trauma, brain contusion, decompressive craniectomy.

## **THE ROLE OF THROMBOPHILIA GENES IN THE DEVELOPMENT OF ACUTE MYOCARDIAL INFARCTION IN YOUNG PATIENTS WITH CORONARY HEART DISEASE (CHD)**

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**Background:** In Russia, coronary heart disease is a very common disease characterized by high mortality, so the problem of early prognosis and prevention of this disease is particularly relevant.

**Objective:** To determine the role of thrombophilia genes in the development of myocardial infarction in CHD patients depending on their age.

**Material and methods:** The study included 40 male patients aged 25–74 years with myocardial infarction living in the Stavropol Territory. The patients were divided into 2 groups (20 patients in each) aged (I group from 25 to 44 years, II group from 45 to 74 years). According to coronary angiography, all patients were found to have obstructive lesions of the coronary bed. Risk factors for atherosclerosis were analyzed: smoking, arterial hypertension, type 2 diabetes mellitus, obesity (according to body mass index) and hyperlipidemia. Genetic analysis of the hemostatic system genes was performed by PCR. The test panel included 8 genes (FGB, F2, F5, F7, F13A1, PAI-1, ITGA2, ITGB3). A statistical analysis was performed. Differences in values were evaluated as statistically significant at  $p < 0.05$ .

**Results and discussion:** In the group of young patients with AMI, thrombophilia genes were more common in comparison with group II, which indicates that genetic factors play a greater role in the development of myocardial infarction at a young age, while in the group of older patients with AMI, atherogenesis factors such as arterial hypertension, obesity, and dyslipidemia were significantly more common.

**Conclusion:** Myocardial infarction in young patients is associated with polymorphisms of the fibrinolysis genes (genotype -675 5G/4G of the plasminogen activator inhibitor type 1 gene) and platelet hemostasis (genotype 1565T/C of the platelet fibrinogen receptor gene), less often – plasma hemostasis (genotype 1691G/A of the blood clotting factor V gene).

**Keywords:** Gene, thrombophilia, acute myocardial infarction.

## **METHODOLOGY FOR DETERMINING H<sup>+</sup>-ATPASE ACTIVITY OF MITOCHONDRIA IN RAT LIVER USING THE VITALON400 BIOCHEMICAL ANALYZER**

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**Background:** The study of processes occurring in the mitochondria (MCH) of animals and humans is essential for understanding the mechanisms of many physiological processes and pathophysiological changes in various organs and tissues. There is also a particular interest

in obtaining functionally active MCH from frozen tissue, which simplifies and expands research opportunities. Mitochondria from rat liver tissue are among the most popular research objects due to their accessibility.

**Objective:** To determine the activity of H<sup>+</sup>-ATPase in rat liver mitochondria using the semi-automatic biochemical analyzer Vitalon400.

**Materials and methods:** To obtain a homogenate of rat liver, the tissue was first minced with scissors and then homogenized in a glass homogenizer. The ratio of tissue (g) to medium (ml) was 1:5. During the first centrifugation at low speed (2.000g for 10 minutes), intact cells, cell debris, and nuclei were separated. For the second stage, the supernatant was centrifuged at high speed (10.000g for 10 minutes), yielding a pellet containing mitochondria. The mitochondrial pellet was resuspended in 1 ml of Tris-HCl buffer. The concentration of mitochondrial protein was determined using a commercial reagent kit "Total Protein-Vital" by the biuret method. The activity of membrane fraction H<sup>+</sup>-ATPase was determined spectrophotometrically by measuring the amount of inorganic phosphate (IP) accumulating during the enzymatic hydrolysis of ATP. The molybdenum reagent from the commercial kit "Phosphorus-Vital" was used. The ATPase activity of the preparation was expressed in  $\mu\text{mol IP/mg protein per hour}$ .

**Results and discussion:** The use of the semi-automatic biochemical analyzer Vitalon400 with standard reagent kits accelerates and simplifies the methodology for determining enzyme activity in scientific biochemical research.

**Keywords:** Mitochondria, H<sup>+</sup>-ATPase activity, rat liver, semi-automatic biochemical analyzer.

## NEWER TREATMENT MODALITIES IN UTERINE FIBROIDS

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**Background:** Fibromyomas (uterine fibroids) are the commonest benign uterine neoplasm with incidence of 5 – 20 % in the reproductive age group among nulliparous women. They are slow growing tumors and take 3-5 years to be clinically palpable unlike ovarian tumors. They tend to be multiple in numbers. It is an estrogen and progesterone dependent tumor and is evidenced by endometrial hyperplasia, abnormal uterine bleeding and endometrial carcinoma.

**Objective:** Assessing the efficacy of minimally invasive treatment, comparing surgical approaches of treating uterine fibroids.

**Methods and materials:** In Chennai (India) from 2016 to 2022 a study analyzing data from rural and urban women aged 18 and over reported an incidence rate of 130.89 per 100,000 women and a prevalence rate of 735.80 per 100,000 women in 2016. Notably, by 2019, these rates increased significantly. Currently, the most commonly used surgical option in women with uterine fibroid is hysterectomy which is estimated around 66.8 – 76.5% of all surgical and minimally invasive procedures (according to a 2018 HealthCare Cost and Utilization project. Hysterectomy is the definitive treatment plan for uterine fibroid, when their malignancy, failure of myomectomy, when fibroids are large (more than 20-week uterus size).

Which increased the risks of pulmonary embolism and deep vein thrombosis according to Wilson et al 2020. Whereas, the new minimally invasive procedures tend to have low risk of development of deep vein thrombosis, pulmonary emboli and peritonitis and they have also drastically reduced the infertility rate by great extent. New minimally invasive procedures like Uterine artery embolization (UAE), MRI guided percutaneous thermal ablation using high intensity focused ultrasound (HIFU), radio frequency ablation, laparoscopic myolysis, progestin releasing IUD.

With the development of minimally invasive surgery, it is important to know the exact location of fibroid with 3D sonography, MRI, Intravenous pyelography for broad ligament fibroids.

Noninvasive treatments -GnRH (Gonadotropin releasing hormone) agonist continuously or GnRH antagonist is given which decrease the size of the fibroid by decreasing estrogen a novel drug, Elagolix, Merigolix oral GnRH antagonist approved in 2024 has fewer side effects.

**Results and discussion:** According to FDA, patient satisfaction score after minimally invasive procedure (endometrial ablation) is around 90–95%; amenorrhea rates are 15–60%. Data from randomized trials demonstrate that uterine fibroid embolization and MRI focused ultrasound result in shorter hospital stay and quicker return to work as compared with uterine hysterectomy. However, these procedures differ individually according to FIGO classification.

**Conclusion:** Uterine fibroids are more prevalent in future, with newer noninvasive and minimally invasive surgical procedures, we can reduce the mortality rate, infertility rate, and decrease complications compared with hysterectomy, Disability adjusted life years (DALY).

**Keywords:** Uterine fibroids, Hysterectomy, Uterine artery embolization, High intensity focused ultrasound, oral GnRH antagonist.

## POSTOPERATIVE VENTRAL HERNIAS

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**Background:** According to world statistics, surgical interventions that were performed using laparotomy surgical access are complicated by the formation of postoperative ventral hernia (POVH) in 7–24 %. POVH may gradually increase due to the development of a number of complications, such as strangulation, adhesive obstruction and irreducibility. Mortality in the treatment of giant POVH ranges from 3–7%, in the case of strangulated hernias up to 10%, and due to late admission up to 21%.

**Objective:** In the context of modern methods and possibilities of early diagnostics and timely treatment, the study of POVH has a number of grounds; use of endoprosthetics allows individualization of the treatment process and reduces complications.

**Methods and materials:** A retrospective analysis of the medical records of patients who were treated at the State Budgetary Healthcare Institution of the Stavropol region, Stavropol Region Clinical Hospital, based at the surgical Thoracic department from 2023–2024 was carried out. In this research, the age of patient ranged from 24 to 81 (under 60 years – 54 patients and over 60 with concomitant pathology – 59 patients) and included 28 males and 85 females. Postoperative ventral hernia (88.5 %), recurrent POVH noted in 9 patients (7.9%) and multi – chambered POVH in 4 patients (3.6%). The patients underwent different types of surgical interventions such as hernia repair with mesh endoprosthetics in 108 patients. (“sublay” techniques used in 94 patients and “inlay” technique in 19 patients fixed with interrupted sutures with non-absorbable sutures materials), hernia repair with local tissue plasty in 5 patients. Anterior separation Ramirez was performed in 3 cases, posterior separation according to Carbonell in 2 cases. “Esfil” endoprosthetics were used – classic mesh made up of monofilament polypropylene, “Ethicon” – macroporous surgical mesh covered with monocryl film with an anti – adhesive effect. In all cases, wound drainage was performed: with “Unovac” system (60.4%), drains according to “Radon” (39.6%). Postoperative complications were observed in 13.3%. The most common complication was Postoperative seroma in 12 patients (10.6%), Suppuration of mesh endoprosthetics in 2 patients (1.8%), intraoperative bleeding in one patient (0.9%). The patient with Suppurative mesh endoprosthetics was removed and VAC system was applied. In 3 patients the treatment resulted in death (2.6 %).

**Results and discussion:** The main method of treating this pathology based on retrospective analysis of medical records is herniotomy with mesh endoprosthetics, as it is one of the safest in terms of formation of relapses when eliminating hernial protrusions. The Sublay method is most applicable in practice. In patients with large hernias this treatment is significantly difficult. In such cases, various options for separation hernioplasty are used.

**Conclusion:** According to literary sources, the most commonly used technique is anterior separation according to Ramirez. This technique has flaws: need for extensive mobilization of the skin-fat flap increase the frequency of formation of seroma, loss of skeletal structure cause frog belly. A large number of patients with POVH, development of complications and relapses indicate the need for further development of new methods for treating POVH without tissue tension using synthetic prostheses and differentiated approach to the choice of the method of plastic surgery of postoperative ventral hernia.

**Keywords:** Postoperative ventral hernia, endoprosthetics, sublay and Inlay methods, Ramirez technique.

## **BIOPLASTIC WOUND HEALING TECHNIQUES WITH EXOGENOUS NITROGEN MONOXIDE IN THE SURGICAL TREATMENT OF DIABETIC FOOT SYNDROME**

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**Background:** Diabetes is one of the most important medical and social problem of our time. According to the International Diabetes Federation (IDF), the number of patients with diabetes will is about 537 millions and is projected to rise to 783 millions by 2045. Thus, we have to look and search for new ways to treat diabetes and diabetes complications.

**Objective:** To develop the effective tactics of complex treatment of infected forms of diabetic foot syndrome (DFS) using bioplastic material “Collost” and treatment with plasma flows of nitrogen monoxide apparatus “Plazon”. “Collost” is a domestic produced collagen-containing bioplastic material that promotes hemostasis, promotes the cleansing of necrotic tissue, increases granulation and angiogenesis, increases fibroplastic activity, normalise structure of healthy tissue. Collagen-containing materials activate chemotaxis and cell proliferation,

bind inactivate matrix metalloproteases, reduce proteolytic degradation of extracellular matrix proteins and biologically active substances, contribute to the protection of endogenous growth factors and accelerate wound epithelization.

**Materials and methods:** The study was conducted at the clinical base of the Stavropol Municipal Clinical Hospital №3 in the surgical department. The research involved 42 patients: 17 women, 25 men aged 29 to 82 years, treated in 2022–2023. All patients were with purulent-necrotic forms of diabetic foot syndrome without critical ischemia. 12 patients had type 1 diabetes and 30 patients had type II diabetes. The control group consisted of 20 patients who underwent standard surgical and conservative treatment and local treatment of wounds with “Levomekol” ointment. The main group included 22 patients who underwent standard surgical treatment with local wound treatment with “Levomekol” ointment + wound treatment with NO device “Plazon” + bioplastic wound closure with biomembra “Collost”. The patients were treated with exogenous NO with exposure of 60 seconds per 1 cm<sup>2</sup> from a distance of 4-5 cm daily up to 10 sessions. After cleansing of the wounds and with the appearance of granulations on the 6th-8th day the bioplastic material “Collost” in the form of biomembrane was fixed into the wound. Statistical analysis was performed using a package of statistical computer programs “IBM SPSS Statistics 20” and Microsoft Office Excel 2020. In the study we used: conjugation table analysis with Chi-square (x<sup>2</sup>) estimation, critical significance level “p” was taken as 0.05.

**Results and discussion:** Suppression of perifocal inflammation, wound sterilisation, cleansing of wounds from necrotic tissues, appearance of granulation in the wound in the main group averaged 5-6 days and the beginning of epithelization on 8-9 days, while in the control group this process has taken twice as many days. Wound closure with bioplastic material “Collost” after wound treatment NO accelerated in 2 times the process of wound epithelization without the use of plastic reconstruction of wounds. There were no amputations and repeated surgical operations on the foot in the main group, while in the control group there were 4 repeated operations.

**Conclusion:** The using of bioplastic material “Collost” with plasma streams of nitrogen monoxide together with standard surgical treatment allows to accelerate the healing of extensive infected wounds of diabetic feet by 2 times, closes the wound with full-fledged covering tissues.

**Keywords:** Diabetic foot syndrome, bioplastic material, surgical treatment.

**GENOME EDITING POTENTIAL  
IN CORRECTION OF GENETIC DEFECTS  
IN EMBRYOS OBTAINED THROUGH  
REPRODUCTIVE TECHNOLOGIES**

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**Background:** Genome editing offers promising opportunities for correcting genetic defects in embryos, potentially revolutionizing the treatment of hereditary diseases. This is especially relevant with the rise of assisted reproductive technologies like IVF, which may result in embryos with genetic abnormalities.

**Objective:** To investigate methods and possibilities of embryonic gene therapy to prevent inherited diseases.

**Materials and methods:** The study is based on literature analysis and data from current clinical and experimental research on genome editing technologies.

**Results and discussions:** Genome editing enables precise DNA modification in organisms, including humans. Early techniques like zinc finger nucleases (ZFNs) allowed targeted gene replacement but had limited specificity. The development of CRISPR-Cas9 has improved precision and efficiency. This system uses RNA guides and Cas9 protein to target and modify DNA sequences. Editing steps include selecting a target gene, synthesizing guide RNA, delivering it into the cell, activating Cas9, and repairing the DNA cut. Advanced methods such as base and prime editing offer even greater accuracy.

Germline genome editing raises ethical concerns. The 2019 birth of genetically modified babies in China prompted global debate. The UK has since permitted genome editing research in embryos under strict regulation.

**Conclusion:** Genome editing has strong potential for correcting genetic defects in embryos created through reproductive technologies. Despite ethical and technical challenges, it may significantly improve health outcomes by enabling early intervention.

**Keywords:** Genome editing, CRISPR-Cas9, reproductive technologies, gene therapy, embryonic correction.

# REMINERALIZING POTENTIAL OF ORAL FLUID IN PATIENTS WITH GASTROINTESTINAL DISEASES

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**Background:** Currently, a certain relationship has been proven between gastrointestinal diseases (GIT) and pathological processes occurring in the oral cavity.

Mixed saliva or oral fluid has a pH of 7–7.4. With a decrease in pH values, the rate of demineralization increases which initiates the carious process. At a pH below 6.2–6.0, saliva turns from supersaturated with calcium and phosphorus ions into unsaturated, and its function from mineralizing to demineralizing.

**Objective:** To determine the features of changes in the remineralizing potential in oral fluid in people suffering from gastroduodenal pathology.

**Materials and methods:** A dental examination was conducted among 40 respondents aged 18 to 49 years, who underwent an examination during which, based on typical complaints, physical, laboratory, endoscopic and morphological examination data, gastroduodenal pathology was diagnosed. Depending on their general somatic condition, all patients were divided into 2 groups: Group 1 (21 people) – patients suffering from chronic diseases of the gastroduodenal region (chronic gastritis, chronic gastroduodenitis, gastric ulcer and duodenal ulcer); Group 2 (19 people) – patients diagnosed with gastroesophageal reflux disease. The control group (20 people) consisted of patients without diagnosed concomitant general somatic pathology (practically healthy). A clinical examination of the oral cavity was carried out according to a uniform scheme: collection of complaints, anamnesis data, examination of the red border of the lips and the oral mucosa, examination of the tongue, periodontium, and hard tissues of the teeth. When assessing the condition of the teeth, the integrity of their hard tissues, the presence and condition of fillings, carious and non-carious lesions were determined. All patients underwent a study of unstimulated mixed saliva. Mixed saliva was collected on an empty stomach or 2 hours after a meal. The patient was asked not to do anything that could stimulate salivation before the collection procedure (chewing food, chewing gum, brushing teeth, drinking plenty of fluids). Mixed saliva was collected by spitting it into glass test tubes in an amount of at least 2 ml. The pH of the mixed saliva was determined, the concentration of calcium and magnesium ions, and the activity of alkaline phosphatase were determined. Clinical

examination of the oral cavity was carried out according to a single scheme: collection of complaints, anamnesis data, examination of the red border of the lips and the oral mucosa, examination of the tongue, periodontium, and hard tissues of the teeth. When assessing the condition of the teeth, the integrity of their hard tissues, the presence and condition of fillings, carious and non-carious lesions were determined.

The prevalence of carious lesions of the teeth and the intensity of caries were determined based on generally accepted indices.

**Results and discussion:** When examining patients of the 1st and 2nd groups, 5 people (16.6%) complained of increased sensitivity of teeth from cold and sweet. Such complaints were not encountered in patients of the control group. The prevalence of the carious process in patients with gastrointestinal diseases was 83.71%, which is significantly higher than in practically healthy children (67.5%).

**Conclusions:** 1. According to the data obtained, the prevalence and intensity of the carious process of hard dental tissues in patients with chronic pathology of the gastroduodenal area is higher than in patients without general somatic pathology. 2. The pH values of the oral fluid in patients of the 1st and control groups were within the normal range. In patients of the 2nd group, we experienced a shift in pH to the acidic side. 3. When assessing the ionic composition of the oral fluid, a decrease in the concentration of calcium and magnesium ions was noted in the main groups, which may indicate insufficient remineralizing activity of the oral fluid. 4. A comprehensive examination and treatment of patients with gastrointestinal pathology should include a consultation with a dentist for early detection of diseases of hard dental tissues and the appointment of adequate treatment and preventive measures.

**Keywords:** Remineralizing potential, pH of mixed saliva, carious process, gastrointestinal diseases.

## COMPARATIVE ASSESSMENT OF ENAMEL PERMEABILITY IN COMPOSITE RESTORATIONS OF VARIOUS FORMS OF FLUOROSIS

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**Background:** Endemic (fluorotic) enamel mottling is an endemic disease caused by fluoride intoxication when consuming drinking water with an increased content of it. Its prevalence, according to

E.M. Kuzmina (2018), reaches 18% among the adult population of Moscow and the Moscow region and tends to increase. In dental practice, the use of composite restorations in the treatment of non-carious lesions of hard dental tissues is widespread. Thus, the topic is relevant for research.

**Objective:** To conduct a comparative analysis of the permeability of tooth enamel for dye in different forms of fluorosis in composite restoration at the stage of using the adhesive protocol.

**Materials and methods:** The study was conducted in laboratory conditions on extracted teeth for orthodontic indications with a diagnosis of fluorosis according to ICD-10 Endemic (fluorosis) mottling of enamel (dental fluorosis) (K00.30). For the study, the teeth were divided into three groups, two teeth in each: the first group – teeth diagnosed with ulcerative fluorosis, the second group – destructive fluorosis, the third group (control) – two intact teeth. Identical cavities were prepared with a calibrated bur, the adhesive protocol AdperSingl Bond II (3M ESPE) was performed and composite restoration was performed using the direct method with Filtek™ Z250 (3M ESPE) material. After that, the teeth were placed in a methylene blue solution for three days. Transverse cuts of the teeth were made in laboratory conditions. The teeth were examined using light electron microscopy LCD – S 660 USB (digital microscope, maximum magnification 100x).

**Results and discussion:** 1. Changes in the enamel structure were revealed on tooth samples with both destructive forms (groups 1 and 2) using the electron microscopy method: numerous periodically alternating crystalline fibers (enamel prisms) were determined in the enamel thickness, occupying more than half of the entire enamel thickness. Unevenness and radial orientation of the bands (Hunter-Schreger bands) as well as alternation of these fibers and their size instability are noteworthy. On tooth sections of all three groups, it was possible to detect a narrow gap between the composite, adhesive and the outer surface of the enamel, the width of which is not the same along the length of the contacting surface. 2. When considering the depth of dye penetration, we obtained the following results: in group 1, the maximum depth was 6 nm, and in group 2, the maximum depth reached 8 nm. In the 3rd control group, these width values were 4 nm. When examining the gap structure (the distance from the enamel to the composite), we found uneven changes: in group 2 – with a destructive form of fluorosis, the gap had the most jagged (scalloped) edge with a minimum value of the composite gap width of 5 nm, and a maximum of 8 nm. When calculating similar values in group 1 (ulcerative form of fluorosis), no statistically significant difference was found compared to group 2, in which the gap width varied from 5 to 6 nm and had a less pronounced

scalloping of the edge. In the 3rd control group, the average width values were 3.7 nm.

**Conclusion:** Enamel has a heterogeneous structure formed by a complex interweaving of three differently directed crystalline fibers. The density between different groups of crystalline fibers in the thickness of the enamel increases to the edge of the surface layer. The width of the gap between the contact surfaces is the only sign when assessing the degree between enamel and adhesive. 2. As a result of the study, we found a direct correlation between the severity of fluorosis forms and the values of the width and depth of the contact surface of the enamel, adhesive and composite: the highest value of 8 nm was determined for the destructive form of fluorosis. 3. When determining the depth of dye penetration between the damaged surface of the enamel in fluorosis, adhesive and composite, we did not find a statistically significant difference. However, some difference in the structure (scalloped edge in the form of a broken line) and the values of the gap width between different destructive forms of fluorosis is determined: with an ulcerative form, the width is less than with its destructive form.

**Keywords:** Endemic disease, fluorosis, tooth enamel, composite restoration.

## VARIATIONS IN VEGETATIVE TONE AND AGGRESSION LEVEL AMONG MEDICAL UNIVERSITY STUDENTS

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**Background:** The psycho-emotional state of medical students is significantly influenced by the high academic workload, which may contribute to the development of stress and aggressive behavior. The study of vegetative tone and aggression levels is crucial for understanding individual adaptation mechanisms and psycho-physiological balance among students.

**Objective:** To examine the relationship between vegetative tone and aggression levels in medical university students.

**Materials and methods:** The study involved 51 second-year students of Stavropol State Medical University. Physiological indicators such as systolic and diastolic blood pressure, heart rate, respiratory rate, Kerdo and Hildebrandt indices were measured. The level and structure of aggression

were assessed using L.G. Pochebut's General Scale of Aggression. Data analysis was conducted using Microsoft Excel with statistical significance set at  $p < 0.05$ .

**Results and discussion:** Most students exhibited a normotonic type of vegetative regulation (58%) and a middle level of aggression (80%). Vagotonic type was identified in 40% of students, sympathicotonic – in 2%. The average aggression score was 14 points, corresponding to a medium level. Among students with normotonic vegetative tone, verbal aggression was predominant, while vagotonics demonstrated a higher incidence of self-aggression. No high levels of aggression were detected. Structural analysis showed that auto aggression was the most common type, followed by verbal, objective, emotional, and physical aggression. Gender differences revealed that self-aggression was more common among boys, while objective aggression prevailed among girls. Sympathicotonic students demonstrated the lowest aggression levels despite physiological signs of higher excitability.

**Conclusion:** The study identified individual variations in vegetative tone and aggression levels among medical students. Normotonic vegetative tone and medium aggression level were most common. The findings highlight the need for monitoring psycho-emotional wellbeing and adapting support programs to students' physiological characteristics for improving mental health and academic performance.

**Keywords:** Autonomic tone, aggression, psycho-emotional state, medical students, vegetative regulation.

## **ANALYSIS OF A CLINICAL CASE WITH AN ATYPICAL COURSE OF THE CUTANEOUS FORM OF ANTHRAX**

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**Background:** The clinical case of an atypical cutaneous form of anthrax (*Bacillus anthracis* infection). Anthrax is an acute bacterial zoonotic infection with a mixed transmission mechanism, characterized by severe intoxication, serous-hemorrhagic inflammation of the skin, lymphatic vessels, nodes, and internal organs. The disease is historically named after its prevalence in Siberia, Russia. Recent data from 2022 and 2023 show sporadic cases in Russia, primarily in rural areas, with the cutaneous form being the most common.

**Objective:** The objective is to analyze the clinical presentation, diagnosis, and treatment of atypical cutaneous anthrax, emphasizing the importance of early detection and appropriate antibiotic therapy to reduce mortality.

**Materials and methods:** The presentation reviews epidemiological data, clinical cases, and diagnostic methods, including serological tests, PCR, and molecular genetic studies. Treatment protocols involve antibiotics such as ceftriaxone, ciprofloxacin, and penicillin, with additional supportive care for severe cases.

**Results and discussion:** The cutaneous form of anthrax typically presents with localized skin lesions, progressing from papules to vesicles, pustules, and ulcers, often accompanied by edema and regional lymphadenitis. Early treatment with antibiotics significantly reduces mortality, while untreated cases can lead to severe complications, including sepsis and death. The presentation highlights several clinical cases, including a 50-year-old woman and a 7-month-old child, demonstrating the varied clinical manifestations and the importance of timely intervention.

**Conclusion:** Cutaneous anthrax, though rare, remains a significant public health concern, particularly in rural areas with close animal contact. Early diagnosis and appropriate antibiotic treatment are crucial for favorable outcomes. Public health measures, including vaccination and education on handling animal products, are essential to prevent outbreaks

**Keywords:** Anthrax, cutaneous anthrax, *Bacillus anthracis*, zoonotic infection, antibiotic treatment, epidemiology, clinical cases.

## EVALUATION OF THE EFFICIENCY OF POLISHING SYSTEMS BASED ON PROFILOMETRY AND SCANNING ELECTRON MICROSCOPY DATA

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**Background:** Today, modern composite materials make it possible to achieve satisfactory aesthetic results in the restoration of teeth using the direct restoration technique (Vanini L., 2017). Finishing and polishing of the composite surface are important for the subsequent functional operation of restorations, their durability and color stability (Nikolaev A.I., 2019). The result of the finishing depends on the choice of polishing systems and compliance with the algorithm for their application. At the same time, the

analysis of the microtexture surface of the composite material after using various components of the polishing system is relevant for study.

**Objective:** To conduct a comparative analysis of the effect of various polishing systems on the microtexture surface of composite restorations in laboratory conditions.

**Materials and methods:** 166 respondents took part in the medico-social survey. At the preparatory stage of the study, a medico-social survey of practicing dentists was conducted on the Google Forms online platform. At the 1st stage of the study, samples of composite restorations (n= 60) were prepared from light-cured composite material Enamel Plus HRi (Micerium SpA, Italy) by the anatomical stratification method using a silicone key. Composite restoration samples were divided into 3 groups randomly, according to the finishing protocols used:

Group 1 – Enamel Plus Shiny polishing system (Micerium S.p.A);

Group 2 – Enhance Composite Finishing & Polishing System (Dentsply);

Group 3 – TOR VM grinding discs and KENDA three-step polishing system (KENDA C.G.I.).

The microtexture of the sample surface after polishing was studied using scanning electron microscopy (SEM). To determine the roughness parameters according to GOST, 9 surface roughness profiles were obtained over a length of 0.08 mm using a Surftest SJ210 contact profilometer. Statistical data analysis was performed using IBM SPSS Statistics 26.

**Results and discussion:** The obtained data indicate that 41% of dentists use the KENDA C.G.I polishing system, 23% – Enhance Composite Finishing & Polishing System, 17% – Enamel Plus Shiny, 16% – Kerr, 3% – Kagayaki. According to the SEM results, it was revealed that the microtexture of the surface of 72 composite samples in the three study groups differed significantly ( $p < 0.05$ ). Accordingly, it was revealed that the best effect of finishing the surface of the restoration was achieved by using the Enamel Plus Shiny polishing system.

**Conclusion:** According to the survey data, the most frequently used system for finishing composite restorations is the KENDA C.G.I. system ( $p < 0.05$ ). It was found that the surface roughness of composite restorations according to the contact profilometer data is 4 and 9.5 times greater when using the Enhance Composite Finishing & Polishing System and KENDA than when using the Enamel Plus Shiny polishing system ( $p < 0.05$ ). Accordingly, it was found that the best effect of finishing the surface of the restoration was achieved by using the Enamel Plus Shiny polishing system.

**Keywords:** Modern polishing systems, finishing, composite restoration, aesthetic result.

# AI AND THE BRAIN – HOW DO BRAIN-COMPUTER INTERFACES WORK, AND COULD THEY HELP PEOPLE WITH NEUROLOGICAL DISORDERS?

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**Background:** Artificial intelligence (AI) is revolutionizing neuroscience, particularly in the development of brain-computer interfaces (BCIs), which facilitate direct communication between the brain and external devices. BCIs have demonstrated significant potential in aiding individuals with neurological disorders by restoring movement, enabling communication, and enhancing cognitive function. Recent breakthroughs have greatly enhanced BCI performance, with AI-driven learning improving noninvasive BCIs, as demonstrated by Carnegie Mellon University in 2024. In parallel, Neuralink launched human trials in 2023, enabling individuals with paralysis to control digital interfaces via neural signals. AI-powered neuroimaging techniques, including functional MRI (fMRI) and diffusion tensor imaging (DTI), have also advanced the diagnosis and treatment of conditions such as Alzheimer's and Parkinson's disease. As AI continues to enhance neurophysiological data analysis, BCIs are becoming more effective and widely accessible. This review examines the mechanics of BCIs, the role of AI in advancing their capabilities, and their potential applications in treating neurological disorders.

**Objective:** To explore and analyse BCI (brain computer interface) technology and its types, give more insight to its numerous potentials in different aspects of neuroscience, how they work to improve the quality of life of patients with neurological defects

**Materials and methods:** We conducted an extensive search of electronic databases to identify pertinent studies related to BCI technology. Eligible studies that met the inclusion criteria were chosen, and data extraction and analysis were performed. We used research from recommended sources: Science Direct journal, Functional Neurosurgery and Neuromodulation Articles on Clinical Neuropsychology.

**Results and discussion:** According to the clinical recommendations, AI-driven techniques are being applied in the development of brain-computer interfaces and understanding neural circuits, enable researchers to explore brain activity and connectivity with greater precision. Overall, the integration of AI in neuroscience advances our understanding of the

brain, aids in personalized medicine, and facilitates the development of innovative therapeutic approaches.

**Conclusion:** AI has contributed to improved diagnostic accuracy in neurodegenerative diseases, with some algorithms demonstrating over 90% accuracy in identifying Alzheimer's from neuroimaging and several clinical neurological aid among many others. These trends highlight the growing reliance on AI for both research and clinical applications in neuroscience.

**Keywords:** AI (Artificial Intelligence), BCIs, neurological diseases, Neuroscience, neurodegenerative diseases, neuroimaging, neurophysiological.

## THE EXTENT OF ENDOTHELIAL IMPAIRMENT IN CHILDREN WITH DIABETIC KETOACIDOSIS

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**Background:** Diabetic ketoacidosis (DKA), a common acute complication in children and adolescents with type 1 diabetes mellitus (T1DM), can cause endothelial dysfunction (ED). However, the diagnostic criteria for ED in the context of DKA remain understudied.

**Objective:** To evaluate the severity of endothelial dysfunction in children with T1DM based on the degree of DKA by analyzing markers of endothelial glycocalyx damage in the blood.

**Materials and methods:** The study involved 60 participants, including 30 individuals with type 1 diabetic ketoacidosis (DKA) and 30 conditionally healthy individuals. The participants were divided into two groups: those with DKA and those without it. Within the group with DKA, patients were further divided into three subgroups based on the severity of their clinical manifestations: severe (n=5), moderate (n=16), and mild (n=9). To assess endothelial cell damage, we measured the concentrations of several markers in serum, including syndecan-1 (CD1), syndecan 4 (CD4), endocan-1 (EC1), hyaluronic acid (HA), and angiotensin-1 (AP1). These measurements were performed using enzyme-linked immunosorbent assays.

**Results and discussion:** We observed an increase in the concentrations of all four markers of endothelial damage (CD1, EC1, HA, and AP1) in individuals with DKA compared to the control group. Among those with

DKA, individuals with severe disease exhibited the highest levels of CD1 and CD4, followed by a decrease in average concentrations as the severity of clinical manifestations decreased.

**Conclusion:** Elevated levels of markers for endothelial glycocalyx damage (CD1, HS, GC, and AP1) suggest the presence of endothelial impairment in children with Type 1 diabetes mellitus during the phase of decompensation of the disease. The severity of endothelial dysfunction is closely linked to the severity of diabetic ketoacidosis among these patients.

**Keywords:** Diabetic ketoacidosis, childhood and adolescence, endothelial dysfunction, indicators.

## **THE EFFECT OF EXPOSURE TO PM 2.5 PARTICLES ON THE GENERAL MORBIDITY OF THE RESPIRATORY SYSTEM IN CHILDREN FROM 0 TO 14 YEARS OF AGE**

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**Background:** Air pollution is one of the key environmental problems, especially due to fine PM<sub>2.5</sub> particles. They cause inflammation, intoxication and weakening of the immune system of the lungs. The study analyzes the effect of PM<sub>2.5</sub> on the morbidity of the respiratory system in children aged 0-14 years in Russia over the past 20 years.

**Objective:** The purpose of this study is to examine the effect of exposure to PM<sub>2.5</sub> particles on the overall morbidity of the respiratory system in children aged 0 to 14 years in the Russian Federation.

**Materials and methods:** The study used methods of statistical analysis of the overall incidence of respiratory diseases in children in Russia. A retrospective comparison revealed the relationship between air pollution and the number of children aged 0 to 14 years suffering from respiratory diseases.

**Results and discussion:** The PM<sub>2.5</sub> particles are actually soot, dust, microfragments of asphalt and rubber. PM<sub>2.5</sub> is able to penetrate deep into the lung tissue and cause activation of the immune system, which leads to the release of inflammatory mediators, which leads to a decrease in the functional activity of the lungs and increased morbidity. The main sources of PM<sub>2.5</sub> are transport, industry, and fires. In the 2000s, air pollution and morbidity increased. From 2010 to 2019, emission reduction

measures did not lead to significant improvements. In 2019-2020, the pandemic COVID -19 temporarily reduced the level of pollution, which led to a short-term decrease in morbidity. From 2020 to 2022, with the return of active traffic, pollution and morbidity increased again. In 2023, a decrease in the activity of the metal mining industry, as well as the introduction of new environmental initiatives, contributed to an improvement in the situation. The results of the study show a significant positive correlation between the concentration of PM2.5 and respiratory morbidity in children aged 0 to 14 years.

**Conclusion:** Air pollution from PM2.5 particles significantly affects the health of the population, especially children, increasing the risk of respiratory diseases. A positive correlation was found between the level of pollution and morbidity. The impact of polluted air, including fine PM2.5 particles on the respiratory system, has been and remains one of the most pressing health problems in the Russian Federation.

**Keywords:** respiratory organs, PM2.5 particles, air pollution, morbidity.

## EFFECT OF THE EXPERIMENTAL DRUG (ANI-261) ON MAJOR

### METABOLIC CHANGES IN HEALTHY RATS

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**Background:** Alzheimer's disease (AD) is one of the most common neurodegenerative diseases, accounting for up to 70% of dementia cases in the elderly. Acetylcholinesterase (ACh) inhibition is currently the most effective treatment for Alzheimer's disease (AD). At the Scientific and Technological Center for Organic and Pharmaceutical Chemistry of the National Academy of Sciences of the Republic of Armenia, the anticholinesterase properties of certain imidazoles-5-ones containing residues of  $\alpha$ ,  $\beta$ -dehydrotyrosine were studied using in silico models.

**Objective:** to systematize modern data on the key biochemical mechanisms of

Alzheimer's disease, to conduct practical work on the study of the effect of the drug ANI-261 on metabolic changes in healthy rats.

**Materials and methods:** 15 laboratory rats of the Wistar line weighing 200-250 g, distribution into groups of experimental rats, the collection of

biological material, measurement of indicators, and statistical processing of the data obtained were performed using a nonparametric criterion for small MANN-Whitney groups. Results and discussion: As a result of the study, we found that this drug has an effect on the level of carbohydrate, protein and lipid metabolism. The introduction of dosages of 500 mg/kg and 700 mg/kg resulted in various changes compared with the control group. It was possible to study the level of lipid metabolism only in rats that were given a dosage of 500 mg/kg, since the administration of a dose of 700 mg/kg led to the death of the animals.

**Conclusion:** 1) When ANI-261 was administered at a dosage of 500 mg/ kg, an increase in the total protein content in blood serum and a decrease in the percentage of glycated hemoglobin in whole blood was observed;

2) When ANI-261 was administered at a dose of 700 mg / kg, a decrease in protein content and an increase in the level of glycated hemoglobin were observed. The death of animals with a dosage of 700 mg / kg indicates the toxicity of the drug at this dose.

**Keywords:** Alzheimer's disease, metabolic changes, ANI-261.

## THE EFFECT OF CORONAVIRUS ON HUMAN BRAIN ACTIVITY

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**Background:** Everyone already knows the main symptoms and course of coronavirus infection. But besides severe shortness of breath, chills, dry, frequent cough and loss of the patient's sense of smell, the COVID virus also affects the psycho-neurological state of a person. This article examines the relationship between the COVID virus and human brain dysfunction.

**Objective:** To study the danger of such influence, to identify the consequences of the virus disease.

**Materials and methods:** Literature and statistics on the number of hospitalizations of people diagnosed with COVID, accompanied by brain dysfunctions, were studied, and frequently encountered brain dysfunctions were analyzed.

**Results:** The ability of the virus to affect the cells of the central nervous system has been established, as evidenced by the statistics for Russia for the past year 2024. Thus 3.8% (52729 people) were hospitalized with stroke during the course of the disease and 11.5% (80982 people) – after

COVID, 4 months later. 15365 stroke patients received thrombolysis for an additional five months after the disease. This virus is able to rapidly exaggerate in numbers in the interior of the nerve cell of the human brain. This is evidenced by the results of autopsies performed on the bodies of infected patients, the statistics of which demonstrate that the virus affects brain tissue. According to the analysis of statistical data of COVID patients every fourth out of 10 examined complained of frequent and severe headaches, sometimes with strong or weak dizziness, in 70% of patients psychomotor agitation was detected, in 1% seizures and general disorders of musculoskeletal apparatus were detected. Evidence of the negative impact of the virus among those who became ill was found in elderly people in cases of mild or severe disorders of consciousness, with impaired thinking, memory, attention, confusion, accompanied by hallucinations and delusions of patients.

**Conclusion:** The study revealed disappointing facts: COVID survivors had more frequent intracranial hemorrhages and strokes. Timely diagnosis and compliance with the recommendations of the attending physician, as well as complete examination after the disease will help people to avoid negative consequences of COVID.

**Keywords:** Coronavirus infection, stroke, virus, complications, disorders.

**SCIENTIFIC ABSTRACTS  
OF CONFERENCE PARTICIPANTS  
FROM OTHER MEDICAL UNIVERSITIES  
OF THE RUSSIAN FEDERATION**

# CLINICAL CASE OF TAKOTSUBO CARDIOMYOPATHY IN THE ASPECT OF DIFFERENTIAL DIAGNOSIS WITH MYOCARDIAL INFARCTION

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**Background:** According to statistics, takotsubo syndrome (TS) is diagnosed in 0.7–2.5% of patients hospitalized with suspected acute myocardial infarction (AMI). Timely and accurate differential diagnosis between TS and AMI is one of the important tasks for cardiologists.

**Objective:** To analyze the differential diagnosis between TS and AMI using a clinical case as an example.

**Material and methods:** Patient H., 55 years old, was admitted to the emergency cardiology department with a diagnosis of “Acute coronary syndrome with ST segment elevation”. The patient complained of burning pain in the precordial region radiating to the back, shortness of breath with minor physical exertion, weakness that arose after stress. Moderate condition, BP 95/60 mmHg, HR 95 bpm, RR 20 bpm, SaO<sub>2</sub> 95%. Troponin I – 64 ng/ml (normal 0–29 ng/ml). CPK-MB level is 32 units (normal values 5–28). LDL-C level is 1.9 mmol/l. ECG: Sinus tachycardia. HR 92 beats/min. ST segment elevation up to 3 mm in T I, aVL, V3–V6 with transition to negative PT. AV block of the 2nd degree, Mobitz 1. Prolongation of the QT interval. Coronary angiography (CAG): LCA contours are smooth, RCA without stenosis, LAD – stenosis of the artery lumen up to 46%. EchoCG revealed hyperkinesis of the basal and hypokinesis of the apical segments. No zones of left ventricular akinesis were detected. Ejection fraction (EF) is 46%. History: no previous heart pain.

**Results and discussion:** Taking into account the proposed “Diagnostic criteria of the Mayo Clinic” (Diagnosis of Takotsubo Cardiomyopathy – Mayo Clinic Criteria. 2014), a diagnosis of Takotsubo cardiomyopathy was made. In our clinical observation, the main criteria were: the absence of hemodynamically significant stenosis and damaged atherosclerotic plaque in the coronary arteries; transient hypokinesis of the middle and apical segments of the left ventricle; a slight increase in the level of cardiac troponins in the blood.

**Conclusion:** In recent years, the relevance of TS in modern cardiology practice has increased significantly. However, the currently available data are somewhat contradictory, which confirms the validity and need for further detailed study of the mechanisms of disease development, improvement of diagnostic and treatment methods.

**Keywords:** Takotsubo syndrome / takotsubo cardiomyopathy, acute myocardial infarction.

# MUSCLE STRENGTH AND MASS REDUCTION IN MULTIPLE SCLEROSIS PATIENTS DURING GLUCOCORTICOID THERAPY

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**Background:** Patients with multiple sclerosis (MS) are initially more predisposed to cardiovascular diseases (CVD), also due to adverse effects of glucocorticoids.

**Objective:** To evaluate the association of polymorphisms of the glucocorticoid receptor NR3C1 gene, FTO gene, melatonin receptor MTNR1A, MTNR1B genes with the development of changes in muscle mass and strength in the use of glucocorticoids in patients with MS.

**Materials and methods:** The study included 80 patients, age  $36.3 \pm 10.0$  years, duration of MS 6 (2.5; 10.0) years. The study included patients diagnosed with multiple sclerosis receiving pulse therapy during exacerbation. The control of muscle strength and mass before and after therapy was performed. Genotyping of polymorphisms was performed using real-time polymerase chain reaction. The analysis of the intergenic interaction by the MDR (multifactor dimensionality reduction) method was carried out. The statistical analysis was performed using R (version 3.2, R Foundation for Statistical Computing, Vienna, Austria).

**Results:** The doses of GC were 4 (3; 4) g of methylprednisolone. Among women with decreased muscle mass, there was an increased incidence of BclII (rs41423247) ( $p=0.005$ ). In the group of patients whose dominant hand strength decreased, BclII (rs41423247) polymorphism ( $p=0.02$ ) was more often observed, as well as genotypes including BclII (rs41423247), N363S. ( $p=0.03$ ). Combinations of genotypes of the NR3C1, FTO, MTNR1B genes with an increased and decreased risk of muscle loss among women after GC were identified. The analysis showed a pronounced synergy between the polymorphism rs993960 of the FTO gene and rs10830963 of the MTNR1B gene.

**Conclusion:** The presence of polymorphisms BclII, N363S of the NR3C1 gene is associated with a decrease in muscle strength and mass among women during glucocorticoid therapy for MS.

**Keywords:** Muscle mass, muscle strength, glucocorticoids; single nucleotide polymorphism, NR3C1, FTO, MTNR1B.

# COMPREHENSIVE APPROACH AND STAGING OF SURGICAL TREATMENT FOR OBSTRUCTIVE JAUNDICE OF NON-TUMOR ETIOLOGY

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**Background:** Endogenous intoxication plays the leading role in the development of complications in benign mechanical jaundice. In pathogenetic mechanisms, the greatest role is given to the toxic effect of increased amounts of bilirubin and bile acids on liver cells. Any factors that contribute to the destructive effect on the liver lead to hepatocellular insufficiency. The longer the duration of cholestasis, the more significant destruction is observed in liver cells and the severity of functional impairment increases. That is why timely diagnosis and treatment of emerging disorders is necessary.

**Objective:** To improve the diagnostic algorithm and treatment tactics for cholestasis of non-tumor etiology.

**Materials and methods:** We observed 154 patients with mechanical jaundice of non-tumor etiology. They were divided into a control group (82 patients after short-term standard preparation) and the main group (72 patients after complex preoperative preparation). All patients were divided by the duration of cholestasis (10 days, 14 days and 21 days in each group). Clinical, biochemical and ultrasound examinations were made. The treatment was carried out in three stages: the first – complex preoperative preparation and minimally invasive biliary decompression, the second – choletochotomy, biliodegistic anastomoses, the third – complex therapy.

**Results and discussion:** Surgical correction of cholestasis in almost all patients led to the elimination of jaundice, but even then, the dynamics of hemostasis and homeostasis indices in the study groups was not the same. In patients with prolonged cholemia, there was no normalization of homeostatic indices, manifesting the presence of morphofunctional changes in the liver, which are the cause of the development or progression of chronic liver diseases – secondary (biliary) cholestatic hepatitis and liver cirrhosis, as well as kidney damage.

**Conclusions:** Preoperative measures that improve electrolyte balance, homeostasis and hemostasis indices contribute to more favorable results and prognosis, and significantly reduce the risk of liver failure. The volume of complex measures directly depends on the duration of cholestasis.

**Keywords:** Mechanical jaundice, complex preoperative preparation.

# SEPSIS ASSOCIATED DISSEMINATED INTRAVASCULAR COAGULATION (DIC): DIAGNOSTIC CHALLENGES AND DIFFERENTIAL DIAGNOSES

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**Background:** Sepsis-associated disseminated intravascular coagulation (DIC) is a life-threatening condition that happens when a severe infection can disrupt blood clotting, leading to micro thrombosis and subsequent organ dysfunction. The bodies over reaction to infection causes blood clots, inflammation, and cell damage leading to organ failure which occurs in critically ill patients leading to increased morbidity and mortality. DIC occurs at higher rates in people with bacterial sepsis 83% worldwide.

**Objective:** This presentation aims to discuss the diagnostic challenges and differential diagnoses of sepsis-associated DIC, highlighting the importance of management strategies including early recognition, antimicrobial therapy, supportive care and adjunctive therapies and diagnosis in improving patient outcomes.

**Materials and methods:** A comprehensive review of the current literature on sepsis-associated DIC was conducted, focusing on diagnostic criteria, laboratory tests, and clinical manifestations and treatment options for patients. Expert opinions were also incorporated.

**Results and discussion:** The presentation will discuss the pathophysiology of DIC, clinical manifestation including differential diagnosis and management and treatment. The importance of a multidisciplinary approach and the role of laboratory tests and clinical assessment in diagnosis will be emphasized.

**Conclusion:** Sepsis-associated DIC is a complex condition that requires prompt recognition and accurate diagnosis is crucial to prevent severe sepsis or septic shock. A comprehensive understanding of its diagnostic challenges and differential diagnoses is crucial for improving patient outcomes and reducing mortality rates.

**Keywords:** Sepsis-associated disseminated intravascular coagulation (DIC), organ dysfunction, micro thrombosis, antimicrobial therapy, adjunctive therapy, pathophysiology of DIC, diagnostic challenges, septic shock, differential diagnoses.

# GINGIVAL FLUID-DEPENDENT CHANGES OF PLATELET AGGREGATION

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**Background:** To date, the second most important cause of tooth loss is periodontal inflammatory diseases. The course of gingivitis and periodontitis is more often chronic. Early diagnosis of these periodontal diseases is a predictor of timely and successful treatment. Taking into account the data of modern literature, as well as the classical understanding of the relationship between immunity and hemostasis, the study of gingival fluid-mediated shifts in the latter's system seems very promising.

**Objective:** To study changes of platelet aggregation induced by gingival fluid in vitro.

**Materials and methods:** The study group included 25 patients of both sexes (15 men and 10 women) aged 18 to 35 years with a diagnosis of K05.1 according to ICD-10. The control group consisted of 24 people with intact periodontal tissue (13 men and 11 women). The simplified hygiene index according to J.C. Green, J.R. Vermillion (OHI-S), as well as the periodontal index (PMA) modified by C. Parma were evaluated in all patients. Gingival fluid was collected by a standard procedure using paper points. Venous blood samples were taken from healthy male volunteers aged 18 to 20 years. The study was carried out on the ALAT-2 BIOLA device. Gingival fluid in a volume of 15  $\mu$ l was added to 285  $\mu$ l of platelet-rich plasma, then ADP-induced aggregation was studied according to the standard procedure. The maximum value and aggregation rates were determined by the amplitude and angle of the aggregation recording curve. Statistical processing of the obtained data was carried out using the Jamovi 2.6.26 program.

**Results and discussion:** A significant difference ( $p < 0,001$ ) in the maximum values of aggregation was found in the studied groups ( $67,8 \pm 2,33$  and  $76,4 \pm 2,54$ , respectively). The speed parameter showed less significant differences ( $p = 0,049$ ) in the two groups ( $76,6$  [ $61,8-88,1$ ] and  $81,7$  [ $70,9-97,6$ ], respectively). There was a significant positive relationship between OHI-S and the amplitude index ( $r_s = 0,884$ ,  $p < 0,001$ ), as well as a positive correlation between PMA and aggregation values ( $r_s = 0,891$ ,  $p < 0,001$ ).

**Conclusion:** The reliability of the differences in aggregation values in the studied groups indirectly indicates shifts in the platelet hemostasis system towards hyperaggregation in the microcirculation of the periodontium.

**Keywords:** Periodontitis, platelet aggregation, gingival fluid.

## **LYELL'S SYNDROME: RESPONSE TO MEASLES VACCINATION**

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**Background:** Lyell's syndrome/Toxic epidermal necrolysis (TEN) is a rapidly developing severe cutaneous mucosal reaction characterized by extensive erythematous bullous lesions (more than 30%), mainly caused by drugs. However, in rare cases, TEN can be caused by vaccination and infections caused by *Mycoplasma pneumoniae* or cytomegalovirus. According to the latest published data, the incidence of TEN ranges from 0.4 to 1.2 cases per 1 million.

**Objective:** To present a clinical case of a polysensitized 1-year-old child with Lyell's syndrome following administration of live cultured measles vaccine combined with cytomegalovirus infection in the acute phase.

**Materials and methods:** 1. Retrospective analysis of medical records of the polysensitized patient: outpatient charts, discharge epicurizes. 2. Personal curation of the patient in outpatient-polyclinic practice.

**Results and discussion:** The clinical case of a child with food, pollen and epidermal polysensitization was analyzed. From the anamnesis it is known – the patient has had atopic dermatitis since early childhood, of medium severity. At the time of vaccination atopic dermatitis is in remission. The first bullous rashes appeared on the 2nd day after vaccination and increased over time. The patient was admitted to the hospital with complaints of bullous erosive skin rashes almost all over the skin surface. Laboratory diagnostics revealed positive values of AT to IgG and IgM to cytomegalovirus, the infection was asymptomatic.

**Conclusion:** A single multifactorial exposure was most likely the trigger for the development of Lyell's syndrome. Early molecular allergodiagnosis is important in polysensitized patients to avoid life-threatening episodes of allergic reactions.

**Keywords:** Lyell's syndrome, children, vaccination.

## SMALL INVASIVE METHODS OF TREATMENT OF NARROW MAXILLA

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**Background:** Maxillary expansion is an important procedure in orthodontics and maxillofacial surgery aimed at correcting malocclusions and improving the functionality of the dental system. Traditional expansion methods, such as surgical osteotomy, can be invasive and require a long recovery period. In recent years, there has been a growing interest in small invasive techniques that provide a more comfortable and faster recovery for patients.

**Objective:** Improve treatment for outcomes patients with narrow maxilla.

**Materials and methods:** At the Novgorod dental clinic, surgical treatment was performed for 3 patients with stage C and 2 patients with stage D using a small invasive method – MARPE apparatus with additional osteotomy of the palatal suture. The process usually takes from 2 to 4 weeks, depending on the patient’s characteristics.

**Results and discussion:** Small invasive methods of maxillary expansion include the use of special orthodontic surgical apparatus and technologies that allow achieving the desired result with minimal intervention. These approaches not only reduce the risk of complications, but also relieve pain, which makes them more attractive to patients. At stage C, the palatine suture appears as 2 parallel, high-density serrated lines located close to each other, separated by small intervals of low maxillary bone density (between the incisive canal and the palatomaxillary suture and behind the palatomaxillary suture). The suture can be located either as a straight line or as a broken line (low-efficiency treatment with minimally invasive therapy results are 50%). At stage D, the palatine suture fuses, with ossification progressing from the posterior part of the hard palate to the anterior. The palatine suture cannot be visualized at this stage, and the bone density increases compared to the maxillary bone density in the paramedian region (indication for orthosurgical treatment in the Maxillofacial Surgery Department). All patients with stage C underwent expansion of the maxilla to the full length of the screw, i.e. 12 mm, while in patients with stage D, expansion was performed to 0.9-1.0 cm in width.

**Conclusion:** The use of the MARPE apparatus with additional

osteotomy of the palatal suture with an additional trepanation foramen allows for an effective solution to problems with a narrow maxilla, improving not only the aesthetic but also the functional aspects of the dental system.

**Keywords:** Narrow maxilla, small invasive orthodontic expansion of maxilla.

## **BILATERAL VARIABILITY OF THE SUPRAORBIAL NOTCHES (OPENINGS) IN INDIVIDUALS WITH DIFFERENT FACIAL SKULL SHAPE**

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**Background:** Understanding the variations in the shapes and dimensions of the anatomical structures of the facial skull is important for both theory and practice. It helps us understand how individual indicators or combinations of them affect the overall shape of the face.

The use of morphometric characteristics of the facial skull is in high demand in practical medicine, as it forms the basis for improving existing methods and developing new techniques for diagnostics and surgical interventions related to the skull in areas such as maxillofacial surgery, neurology, traumatology, and ophthalmology. Additionally, it plays a crucial role in reconstructive surgery.

The variant anatomy of the supraorbital notch (opening) is of great clinical importance, as the nerves and blood vessels with the same name pass through it, which must be taken into account when performing diagnostic and surgical procedures.

**Objective:** To identify the relationship between the presence of supraorbital notches (openings) and the type of human facial skull.

**Materials and methods:** The research data included 112 computed tomography scans (CT) of individuals, with a range in age from 17 to 89 years, (average age – 61 years).

The material and technical base for collecting spiral computed tomography data was the Department of Normal Anatomy and the Department of Magnetic Resonance and X-ray Computed Tomography of the Federal State Budgetary Educational Institution of Higher Education Rostov State Medical University of the Ministry of Health of the Russian Federation. Computed tomography was performed on a multi-slice spiral

X-ray computed tomograph “Brilliance 64 Slice” (“Philips Medical Systems”, the Netherlands).

The shapes of the face skull were determined by the size of the upper face index – according to the method of VP Vorobyov.

**Results and discussion:** To determine the relationship between the topography of supraorbital notches and openings and the type of skull, a study group was formed. The quantitative and percentage ratios of three types of facial skull were identified. Of the 112 subjects, 50.9% were euryens (57 people), 36.6% were mesens (41 people) and 12.5% were leptens (14 people).

The vast majority of subjects have two supraorbital notches, one on each side. Of the 112 people surveyed, 103 (91.96%) had this feature, of which 52 were euryens (50.5%), 37 were mesens (35.9%) and 14 were leptens (13.6%). In cases where one supraorbital foramen and one supraorbital notch were found, the most common location of the supraorbital foramen was on the left side, namely 5.35% (6 people). While on the right side, the supraorbital foramen was located only in 1.78% of the subjects (2 people).

A case of two supraorbital foramina was found on both sides of the face, which accounted for only 0.89%. (1 person)

In addition, a pattern has been found between the presence of a supraorbital foramen and a specific type of facial skull. Thus, it can be noted that the combination of a location of a supra-orbital foramen on the right and a supraorbital notch on the left is observed only among euryens. While the location of the supraorbital foramen on the left side and supraorbital notch on right side is typical for mesens and twice as common among euryens with this topographic supraorbital foramen. The presence of two supraorbital openings on both sides of the facial skull in this study group is characteristic of euryens only.

During the study, no leptens with supraorbital openings were found. All leptens studied during the study have only two supraorbital notches, one on each side.

**Conclusion:** During this investigation, various patterns of supraorbital notches and foramina were discovered. The most common pattern was the presence of two supraorbital notches on either side, which were observed in 91.9% of individuals studied.

The supraorbital opening on the left side was found in 5.35% of the total number of subjects, and this topographic variability was 2 times more common in mesens than in euryens, and was absent in leptens.

The supraorbital opening on the right side was found in 1.78% of the total number of subjects, and only in euryens.

All leptens in the study group had only two supraorbital notches, one

on each side, and no supraorbital openings. If there was one supraorbital opening, it was most often located on the left (three times more often than on the right).

The study of the patterns of anatomical variability, including supraorbital notch or opening, depending on the facial skull type, may have important clinical significance.

The study revealed a clear relationship between the type of facial skull and the presence of a supraorbital opening, as well as the features of its topography.

**Keywords:** Facial skull, multispiral computed tomography, supraorbital foramen, supraorbital notch.

### **ASSESSMENT OF SOME ADAPTATION RESERVES OF THE BODY AND RISK FACTORS OF ATHEROSCLEROSIS IN MEDICAL STUDENTS**

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**Background:** A decrease in adaptive capacity may be the leading cause of the occurrence and development of a disease in pre-clinical diagnostics of the body, and the analysis of functional reserves is important for assessing the level of health.

**Objective:** Analysis of the characteristics of adaptive-adaptive capabilities taking into account the risk factors for the development of atherosclerosis in medical students.

**Materials and methods:** The study involved 174 medical students of the SKGA aged 19 to 24 years (mean age  $21.4 \pm 0.2$  years). There were 103 girls (59,2%) and 71 boys (40,8%). The coefficient of endurance (CE) and adaptive potential (AP) of the cardiovascular system were assessed (according to R.M. Baevsky et al., 1987). Blood pressure, heart rate (HR), anthropometric data, lipid and psychological status, genetic factors and smoking were measured.

**Results and discussion:** Satisfactory adaptation was established in 67.8% of students. 32.2% of the subjects are in the risk group for the adaptation indicator. In this group, 46.4% were found to have tension in adaptation mechanisms, 37.5% had unsatisfactory adaptation, and 16.1% had a breakdown in adaptation. The normal value of the CE was found in 44.8% of the subjects. An increase in this indicator was found in 36.8%, indicating a weakening of the cardiovascular system function, and a decrease in the

indicator was found in 18.4%. Smoking at the time of the examination was found in 25.3% of students, overweight in 17.8%, and a genetic factor in 26.4%, while 11.5% of subjects were found to have anxiety and depressive disorders. No significant differences were found between the indicators of adaptive potential and such CVR factors as adverse heredity and dyslipemia ( $P < 0.05$ ), while a correlation was noted between the indicators of AP and smoking and the presence of anxiety-depressive disorders.

**Conclusion:** The obtained data demonstrate the prevalence of severe stress of regulatory mechanisms, as well as a fairly high prevalence of some risk factors for the development of atherosclerosis in young people. It is necessary to further improve and strengthen measures aimed at early detection and prevention of deviations in adaptive reserves and correction of risk factors for the development of atherosclerosis.

**Keywords:** Atherosclerosis, adaptation reserve, endurance coefficient, prevention, risk factors for atherosclerosis.

## ENVIRONMENT AS A FACTOR IN HUMAN PARASITE INFECTION

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**Background:** The study of environmental contamination with animal feces is of significant epidemiological and epizootological importance. Out of the 82 species of helminths registered in the Russian Federation, 32 species can parasitize humans, and 26 species can parasitize livestock. The increasing number of dogs in central urban areas poses a particular risk as a source of environmental contamination and human infection. In Russia, up to 1.5 million cases of human helminth infections are registered annually. The total number of people suffering from parasitic diseases reaches nearly 20 million, with 70% of them being children. In terms of the prevalence of geohelminthiasis in the Russian Federation, toxocarriasis, which is transmitted by dogs, ranks second. The relevance of this study lies in investigating areas that are not only recreational spaces for humans but also places where dogs, both domestic and stray, walked, and where contamination can occur.

**Objective:** The aim of this work was to investigate the most frequently visited recreational areas and determine the level of environmental contamination with dog feces.

**Materials and methods:** Fecal samples were collected from three parks: ODORA Park, Chess Park, and Pioneer Park during the autumn season. From each park, 9-10 samples were collected. The fecal was in specific gravity between the flotation solution and helminth eggs. The specific gravity of the flotation solution is higher, causing the helminth eggs to float to the surface of the liquid, where they can be detected in the surface film. The following materials were required for the method: 60 fecal containers, cover and slide glasses, a microscope, glass pipettes, ammonium nitrate, meta-xylene, petroleum ether, and glycerin. To ensure accuracy, the experiment was conducted twice. Native preparations were placed in a previously prepared flotation solution, and cover glasses, pre-treated with meta-xylene and ether, were placed on the solution-filled containers. After 60-70 minutes of incubation, 1-2 drops of glycerin were added to the cover glasses, followed by a slide glass. A total of 70 preparations were obtained and examined under a microscope.

**Results and discussion:** In the preparations obtained from the fecal samples of Chess Park, eggs of *Ascaris lumbricoides* L. and *Toxocara canis* were detected. The incidence index of *Ascaris* eggs was  $7.2 \pm 1.8$ , and the incidence index of *Toxocara* eggs was  $3.8 \pm 0.29$ . No parasite eggs were found in the samples from ODORA Park. Pioneer Park was found to be the most contaminated based on the results, with eggs of *Ascaris lumbricoides* L. and *Toxocara canis* also detected. The incidence index of *Ascaris* eggs was  $9.4 \pm 0.69$ , and the incidence index of *Toxocara* eggs was  $6.8 \pm 0.47$ . This park is actively visited not only by dog owners but also by stray animals, which increases fecal contamination in the park.

**Conclusion:** The intensive migration of animals from different regions, non-compliance with sanitary and hygienic rules for their maintenance, and the low level of veterinary care contribute to the spread of helminths that are dangerous to both animals and humans.

**Keywords:** Parasitize, Chita.

## ASSESSMENT OF THE EFFECT OF URIC ACID ON THE DEVELOPMENT OF HYPERTENSION IN CHILDREN

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**Background:** The combination of hypertension and hyperuricemia increases the risk of developing cardiovascular diseases and their complications by five times.

**Objective:** To determine the role of the uric acid (UA) in the development of primary hypertension.

**Materials and methods:** The diagnostic program included analysis of the age structure of patients, daily monitoring of blood pressure (MBP), assessment of body mass index (BMI), and lipid profile.

**Results and discussion:** 156 patients were tested, including 106 boys and 50 girls aged 8 to 17 years, the average age of the children was (14.9±2.0) years. According to the MBP data, patients were divided into three groups: children with labile hypertension – 72 people (46.2%); with stable hypertension of the 1st degree – 61 people (39.1%); with stable hypertension of the 2nd degree – 23 people (14.7%). When comparing pairs using the Student's criterion, the difference between the average UA concentrations for the group with labile hypertension and the group with stable hypertension of the 1st degree ( $p=0.05$ ), as well as between the average values for the group with labile hypertension and the group with stable hypertension of the 2nd degree ( $p=0.05$ ), was statistically significant. For BMI, the median values were significantly different for all groups: in the group with Grade 1 hypertension, the BMI values (26.6 (22.4; 32.0)) kg/m<sup>2</sup> were significantly higher than in the group with labile hypertension ((22.6 (20.1; 25.6)) kg/m<sup>2</sup>, and in the group with Grade 2 hypertension, the values of BMI (31.2 (26.5; 32.1)) kg/m<sup>2</sup> were significantly higher than in the group of Grade 1 hypertension. When analyzing the lipid profile for LPLD, the median values also differed for all groups: in the group with Grade 1 hypertension, the LPLD value (2.4 (1.9; 3.0)) mmol/l was higher than in the group with labile hypertension ((2.1 (1.7; 2.8)) mmol/l, and in the group with Grade 2, the degree of LPLD value (3.1 (1.9; 3.8)) mmol/l was significantly higher than in the group of Grade 1 hypertension and in the group with labile hypertension. For cholesterol, the median values were different for all groups: in the group with Grade 1 hypertension, the cholesterol value (4.1 (3.5; 4.5)) mmol/l was higher than in the labile hypertension group ((3.9 (3.4; 4.6)) mmol/L, and in the grade 2 hypertension group, cholesterol values (4.4 (3.7; 5.2)) mmol/l were significantly higher than in the Grade 1 hypertension group and in group the with labile hypertension.

**Conclusion:** The results demonstrated that the pattern of significant differences in the groups for UA levels coincided with the pattern of differences for hypertension, age, BMI, LPLD, and cholesterol level.

**Keywords:** Children, arterial hypertension, uric acid.

# BILATERAL RENAL TUMOUR IN TWO GENERATIONS. A REVIEW OF A CLINICAL CASE

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**Background:** Malignant neoplasms demonstrate distinct etiological patterns, with approximately 75% of cases occurring sporadically due to environmental carcinogens and lifestyle factors, while 25% present as familial forms. Among hereditary cancers, pathogenic variants in proto-oncogenes or tumor suppressor genes have been well-characterized.

Renal cell carcinoma (RCC) exhibits particularly low hereditary prevalence, with only 2-8% of cases showing clear familial inheritance, though current estimates may underrepresent genetic predisposition.

**Objective:** Mapping and prediction familial inheritance Renal cell carcinoma (RCC).

**Materials and methods:** Advanced molecular genetic techniques, examinations of retroperitoneal structures, radiological and physical examinations, test interpretation.

**Clinical Presentation and Diagnosis:** Early-stage RCC typically follows an asymptomatic course, with contemporary diagnostic practices detecting up to 40% of cases incidentally during routine abdominal ultrasonography (US) or computed tomography (CT) examinations of retroperitoneal structures. Current guidelines recommend clinical intervention only for genetic variants classified as: Category IV (likely pathogenic) and Category V (pathogenic).

**Therapeutic Management:** The RCC treatment paradigm incorporates:

1. Surgical intervention (nephron-sparing when feasible)
2. Radiation modalities: Proton beam therapy; Stereotactic radiosurgery (CyberKnife)
3. Systemic therapies: Targeted molecular therapies (guided by tumor profiling); Immunotherapeutic agents; Conventional chemotherapy. While targeted therapies demonstrate superior survival benefits, their high cost creates significant healthcare disparities.

**Case Report:** A 36-year-old asymptomatic female presented to private healthcare institution, “clinical hospital” ‘Railway hospital -Medicine’ (Bataysk, Rostov Region) in February 2024 for comprehensive oncological screening, with particular emphasis on renal evaluation due to significant family

history. Her father was diagnosed with bilateral RCC at 65 years (presenting with gross hematuria), deceased after 24 months of chemotherapy. His older brother was also diagnosed with Bilateral renal malignancy at 39 years

**Results and discussion:** 1. Genetic Analysis: Comprehensive germline testing was initiated using the *Hereditary Kidney Cancer* multigene panel, which interrogates 22 clinically actionable genes: BAP1, CDC73, DICER1, FLCN, PTEN, SMARCA4, SMARCB1, TP53, TSC1, TSC2, VHL, WT1, MLH1, MSH2, MSH6, PMS2, EPCAM, FH, SDHB, SDHC, SDHD, MET.

2. Surgical Management: A staged nephron-sparing approach was selected: Stage 1 – laparoscopic retroperitoneoscopic resection of the left kidney tumour. Stage 2 – (after 2 months) laparoscopic retroperitoneoscopic resection of the right kidney tumour.

**Conclusion:** The 2-month interval between procedures allows for: recovery of renal functional reserve; interim evaluation of treatment response, adjustment of subsequent therapy based on initial histopathology.

**Keywords:** Hereditary RCC, renal tumor, hereditary RCC syndrome.

## ASSESSMENT OF AWARENESS OF DOCTORS AND UNDERGRADUATE STUDENTS OF CSMA ON THE ISSUES OF VACCINATION OF PREGNANT WOMEN

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**Portyannikova**, Senior Lecturer **N.S. Taldykina**

**Background:** According to the study conducted by Chita State Medical Academy students in 2024 among doctors and undergraduate students, was found a low level of awareness about vaccination in general and vaccination of pregnant women, in particular. That's why we were interested in studying immunization, as one of the most effective methods of preventing morbidity and mortality from infectious causes among pregnant women, and in the future for the newborn.

**Objective:** To assess the awareness of undergraduate students of the Medical Academy, as well as doctors, on the issues of mandatory vaccination of pregnant women.

**Materials and methods:** 147 respondents aged 21 to 57 years were surveyed. The questionnaire in Google Forms included specific questions about mandatory vaccination of pregnant women, the specifics of vaccination against HPV, influenza and whooping cough. The results

were processed in Jamovi 2.3.2. using Pearson's criterion  $\chi^2$  (Yates correction)

**Results and discussion:** As a result of the conducted research, no significant statistical differences were revealed, therefore, the method of descriptive statistics was applied further. The majority of respondents were women – 84% (123 people). The median age among students was 23 years, and among doctors it was 29 years. The study groups were comparable in terms of the number of respondents. Specialists with less than 5 years of work experience prevailed among doctors – 54% (26 people). 58% (26 people) work in the outpatient department. Of the 102 students surveyed, 62% (63 people) were employed. 65% (96 people) had anti-vaccinators in their environment. 18% of the respondents (26 people) had a negative attitude towards vaccination during pregnancy, while the majority of the participants (99% (145 participants) considered it necessary to vaccinate the newborn's close environment. It was found that 25% (36 people) of the respondents considered flu vaccination during pregnancy dangerous for the fetus. Among the respondents, 65% (44 people) were sure that it was impossible to give several vaccines to a pregnant woman in one visit. In addition, 31% of respondents (45 people) mistakenly believed that accidental vaccine administration, if the patient did not know about the onset of pregnancy, was an indication for its termination.

**Conclusion:** Thus, there is a lack of awareness among undergraduate students and doctors in the basic issues of immunoprophylaxis of pregnant women, which requires additional planning of measures to improve it.

**Keywords:** Vaccination, pregnant women, awareness level.

## THE ROLE OF ASSESSING WOMEN'S REPRODUCTIVE HEALTH

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**Background:** The assessment of reproductive health is a key aspect of public health, especially among women. This work presents an analysis of the results of a survey conducted from November 9th to December 1st, 2024, aimed at studying the level of awareness and practices related to maintaining reproductive health among different age and gender groups in the population. Additionally, a statistical analysis was performed on the results of dispensary evaluations of reproductive health in the Krasnodar region for the year 2024.

**Objective:** To assess the significance of evaluating women's reproductive health in the Krasnodar region and the level of public awareness regarding reproductive health issues.

**Materials and methods:** Based on the analysis of Form No. 131/o in the Krasnodar Region for 2024, a total of 304,209 participants underwent reproductive health evaluation as part of their routine check-ups, with 173,599 being women and 130,610 men. In the second stage of the screening process, 43,970 individuals were referred for further evaluation, including 33,639 women, which accounts for 14.5% of those who completed the first stage.

**Results and discussion:** Out of these referrals, 37,589 people (85.5%) completed the second stage, among which 27,885 were women. The percentage of women completing the first stage (46.5%) significantly exceeds that of men (35.0%).

**Conclusion:** The reproductive health screening has highlighted the importance of regular medical check-ups for the population. A comparative analysis of women's and men's participation shows that women are more actively involved in the screening process, which may be due to their greater awareness of the importance of preventive check-ups. However, the results also emphasize the need to increase motivation among men through primary healthcare, advocacy, and media. According to the sociological survey, the population has a fairly high level of awareness about reproductive health, but there are gaps in the use of modern contraceptive methods, regular consultations with specialists, the need for vaccination against mumps and HPV, as well as preconception preparation among the population.

**Keywords:** Check-up, reproductive health, demography, preventive medical test, public health.

## SELECTION OF THE OPTIMAL NUTRIENT MEDIUM FOR THE ISOLATION OF REPRESENTATIVES OF THE NORMOFLORA OF THE ORAL CAVITY

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**Background:** The oral cavity is saturated with a variety of microorganisms, some of which can have a significant impact on systemic health, immune response and predisposition to various diseases. It is important to identify and study these representatives. One of the main factors influencing the effectiveness of cultivation of such microorganisms is the choice of a suitable nutrient medium. The right choice of environment

ensures optimal conditions for the growth and reproduction of bacteria. The problem remains the high price of ready-made nutrient media. Especially in the context of import substitution, this issue has become more relevant.

**Objective:** Selection of the optimal nutrient medium for isolating various strains of microorganisms, representatives of the normal flora of the oral cavity.

**Materials and methods:** The study was conducted on the basis of the Laboratory of Microbiology at the NCFU Faculty of Medicine and Biology. Three nutrient media were selected for the study: milk agar, cabbage agar and milk agar with ethanol. The biomaterial was selected from 10 clinically healthy students. Sampling for isolation of isolates was carried out according to MU 4.2.2039–05. Sowing, cultivation and identification were carried out according to GOST 26670-91 and GOST 10444.11-89. The biomaterial was seeded simultaneously on all media, the number of repetitions in the experiment was 5, and the average value was taken into account in the analysis.

**Results and discussion:** The results of the experiment showed that cabbage agar is the most suitable medium for isolating and cultivating microorganisms of the oral cavity. The average amount of CFU on this medium was 108 CFU/ml, while on dairy medium it was 80 CFU/ml, and on ethanol medium it was 53 CFU/ml. It is possible to note a greater variety of microorganisms that differ morphologically.

**Conclusion:** Cabbage agar has pronounced growth-stimulating properties compared to dairy and ethanol media. In the future, it is advisable to continue research on optimizing the composition of nutrient media for the cultivation of various probiotic strains of microorganisms.

**Keywords:** Oral cavity, microorganisms, probiotics, cultivation, nutrient medium.

## ASYMPTOMATIC BACTERIURIA IN PREGNANT WOMEN IS A NORMAL CONDITION FOR A HEALTHY WOMAN

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**Background:** Researches of the last 20 years have refuted the paradigm of urine sterility. An expanded set of nutrient media made it possible to detect a wide range of microbiota in the urine, which was not associated with symptoms or laboratory data of urinary tract infection. In this regard, it is necessary to reconsider the validity of the term asymptomatic

bacteriuria, which is especially acute in pregnant women. After all, well-organized randomized clinical trials have not confirmed the benefits of treating asymptomatic bacteriuria.

**Objective:** To study the dynamics of the microbiota of a freshly isolated average portion of urine in primiparous women during three trimesters until delivery.

**Materials and methods:** A single-center prospective observational cohort study was conducted with a sequential recruitment of 30 women at different gestation periods: 8-12 weeks, 22-24 weeks, 30-32 weeks. Bacteriological examination of an average portion of urine was performed using standard nutrient media and additional 10 nutrient media for cultivating the widest possible range of microorganisms. Cultivation was carried out at a temperature of 37°C in aerobic (24-48 hours) and anaerobic (48-72 hours) conditions. The positive culture was considered to be the determination of 10<sup>1</sup>-10<sup>2</sup> CFU/ml of one or more microorganisms.

**Results and discussion:** The average portion of urine in all 30 cases in the I-III trimesters of pregnancy contains aerobic-anaerobic associations of 25 species of bacteria and fungi. The dominant taxa are *Staphylococcus spp.*, *Enterococcus spp.*, *Corynebacterium spp.*, *Lactobacillus spp.* and *Eubacterium spp.* The average values of bacteriuria for most bacteria are initially in the range of 10<sup>2</sup>-10<sup>3</sup> CFU/ml and this level remains stable until the end of pregnancy.

**Conclusion:** The urine microbiota of pregnant women during pregnancy is wide in spectrum and stable until delivery. Such bacteriuria can be considered asymptomatic, but it is a manifestation of health, not disease and its predictor. The term asymptomatic bacteriuria is not acceptable as a factor suggesting a risk of urinary tract infection in pregnant women. Most likely, dysbiosis of the urine microbiota is a pathological factor, but its characteristics require new research.

**Keywords:** Asymptomatic bacteriuria, pregnant women, urine microbiota.

## INTESTINAL MICROBIOTA IN CHILDREN WITH URINARY TRACT INFECTIONS WITHIN THE VESICoureTERAL REFLUX

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**Background:** Vesicoureteral reflux (VUR) relates to an anomaly of children urinary system. It is often accompanied by a urinary tract infection (UTI), which is treated by long-term courses of antibacterial therapy (ABT) and prophylaxis (ABP) can damage the intestinal microbiota.

**Objective:** To study the intestinal microbiota in children who received ABT and ABP for the therapy of UTI episodes before the surgical treatment of VUR.

**Materials and methods:** The study included 72 children aged 28 [Q<sub>1</sub>; Q<sub>3</sub>] [12; 72,5] months, who were divided into 4 groups: I (n=12) boys, II (n=28) girls with VUR and chronic UTI, III (n=18) and IV (n=14) boys and girls, respectively, of the 1st health group. Microbiological study of feces was conducted on an expanded set of nutrient media for the cultivation of aerobic and anaerobic microbiota. Statistical calculations were performed using the statistical package SPSS version 23.

**Results and discussion:** In the faeces of group patients I it was revealed the excretion of *Klebsiella spp.*, *P. vulgaris* and *P. aeruginosa* in comparison with group II, a significant (p=0.015) increase in the detection rates of *S. aureus*, the number of *E. faecalis* (p=0.10), *E. coli*, (p=0.048), *Lactobacillus spp.* (p<0.001), *Eubacterium spp.* (p=0.001), *Bacteroides spp.* (p=0.021). *Klebsiella spp.*, *P. aeruginosa* were recorded in the faeces of group II patients similarly to the patients of group I. Compared with healthy girls, in group II there was a significant decrease in the detection rates of *S. saprophyticus*, *Propionibacterium spp.* (p=0.041), *Eubacterium spp.* (p=0.040), *Bacteroides spp.* (p <0.001) and quantitative characteristics for *S. saprophyticus* (p=0.028), *S. aureus* (p=0.047), *E. faecium* (p=0.019) and a decrease for *E. coli* (p=0.001), *Lactobacillus spp.* and *Eubacterium spp.* (p <0.001).

**Conclusion:** Dysbiosis in the intestinal microbiota was detected in the faeces of all 40 patients with VUR. The intestinal microbial variety in children who obtained ABT / ABP was highly different from the value of healthy children. The appearance of *Klebsiella spp.* and *P. aeruginosa* and a decrease in the main symbionts – *E. coli*, *Lactobacillus spp.*, *Eubacterium spp.* and *Bacteroides spp.* was detected in the biotope of such patients. So long-term courses of ABT and ABP lead to dysbiotic disorders of the intestinal microbiota. Therefore, children with VUR and UTI need to have intestinal dysbiosis corrected before the surgery for VUR.

**Keywords:** Vesicoureteral reflux; microbiota; intestines; children.

## PREVENTION OF CARDIOVASCULAR DISEASES IN THE STUDENT POPULATION

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**Background:** Cardiovascular diseases today continue to lead among the causes of mortality. Prevention of cardiovascular diseases should not

be ignored in the student population. The time of study is a time of great mental loads, sedentary lifestyle, stress, irregular and improper nutrition, etc.

**Objective:** To analyze the key risks of cardiovascular diseases among students, underlying the prevention of heart and blood vessel diseases.

**Materials and methods:** Online survey of students of medical and non-medical specialties of Chita universities.

**Results and discussion:** The results of the sociological research showed that almost half of the surveyed youth (46%) declared deterioration of their own health over the past 2 years. The main reasons for the decline in students' health, according to the respondents, were stress caused by studies and exams (55.1%), unfavorable environmental conditions (27.6%), and neglecting illnesses (20%). Medical students, among the causes of health deterioration, also highlighted a lack of care for their own health (22.8%). Only half of the young people surveyed (51.1%) regularly participated in physical education and sports activities. In their free time, the interviewed respondents preferred to sleep (76.1%). Sleep and rest are essential components of a healthy lifestyle and play a significant role in preventing negative consequences, particularly for the cardiovascular system. At the same time, the survey revealed that 57.1% of the respondents dedicate their free time to using gadgets. It is natural that in today's world, where information technology plays a significant role, we cannot do without gadgets. However, according to cardiologists, excessive use of gadgets can lead to an increased risk of heart and vascular diseases, especially arterial hypertension. Irregular and unbalanced diets were demonstrated by 77.3% of the young people surveyed, with 84.7% indicating a preference for fast food. Therefore, the analysis of the findings indicated that during their period of higher education, young people faced various risk factors for cardiovascular disease, and some of these factors could even exacerbate the manifestation of such conditions.

**Conclusion:** Any health disorder, including cardiovascular disease, is always better to prevent than to treat. There are a variety of preventive measures available, both medical and non-medical. Medical measures include regular medical examinations, while non-medical measures involve maintaining a healthy lifestyle and avoiding bad habits. It is important to start prevention as early as possible, and students should make every effort to reduce their risk of developing cardiovascular disease.

**Keywords:** Prevention, students, cardiovascular diseases.

# GENETIC PREDISPOSITION TO DEVELOPING CERVICAL CANCER IN WOMEN AFTER 40 YEARS

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**Background:** Cervical cancer represents one of the most common cancers in women after 40 years all over the world. According to Russian statistics, 16356 patients with cervical malignancies were identified in 2023. The main etiologic agent of cervical cancer is human papillomavirus. According to the results of a meta-analysis, which included data on more than 30000 patients all over the world, the proportion of HPV-positive tumors is constantly increasing. The increase in this indicator is a reflection of the increased sensitivity of HPV diagnostic methods. It is estimated that the risk of developing invasive cervical cancer remains low, between 0.028% and 0.042%, if dysplasia is not detected and treated for 15-20 years. Data from whole-genome studies suggest a high significance of genetic predisposition in the development of cervical cancer.

According to the theory of self-regulation of parasitic systems developed by Academician Belyakov, in the process of interaction “parasite-host” both interacting parties have heterogeneity of properties. The parasite population is heterogeneous in terms of pathogenicity, and the host population is heterogeneous in terms of susceptibility.

**Objective:** Genetic predisposition is a major factor in the development of cervical cancer based on the use of risk-based genetic testing.

**Materials and methods:** Epidemiologic, including retrospective descriptive and case-control studies and regulatory analysis. Molecular biological techniques, including real-time PCR, pyrosequencing, direct Sanger sequencing and statistical, including a set of methods for prediction, clustering and comparison of indicators, probability calculation and genetic risk assessment.

The cases of cervical cancer in the population and deaths from this pathology were analyzed. Statistical forms, statistical bulletins on the population of the Russian Federation in the total number of more than 40 documents were analyzed as a part of the work on the development and validation of a set of molecular biological techniques to identify risk groups for cervical pathologies. 1310 DNA samples extracted from whole venous blood of patients and scrapings from the cervical mucosa were tested.

**Results and discussion:** The long-term dynamics of cervical cancer incidence in the Russian Federation from 2007 to 2022 was characterized

by steady moderate growth with periods of decline in incidence. Analysis of the age structure of the morbid population showed that 47% of all cases of RSM were diagnosed in women of reproductive age, with a tendency to decrease the age of newly diagnosed patients. The dynamics of the mortality rate from this pathology had a wavy character with a tendency to decrease in recent years which emphasizes the effectiveness and necessity of strengthening measures for early detection and prevention of this disease. To develop the methods, 9 genetic polymorphisms were selected using two methods: meta-analysis and analysis of full-genome association search studies analyzing a European population. PCR-based techniques included primers and probes to identify risk alleles associated with cervical cancer. The results of the comparative analysis with the reference method showed that the techniques detected alleles of selected genetic polymorphisms with 100% accuracy and specificity.

**Conclusion:** Nine methods based on real-time PCR were developed to determine alleles of genetic polymorphisms associated with the risk of cervical cancer development. The methods allow determining alleles associated with the risk of cervical pathologies in patients with high specificity and accuracy.

**Keywords:** Genetic predisposition, cervical cancer, human papilloma-virus.

## MARKERS OF INFLAMMATORY PROCESSES AS INDICATORS OF PARKINSON'S DISEASE

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**Background:** Parkinson's disease (PD) is a multisystem neurodegenerative disease in which motor and non-motor disorders develop. Motor dysfunction occurs due to the loss of dopaminergic neurons in the compact part of the substantia nigra and a decrease in dopamine levels in the nigrostriatal pathway. Although the specific biochemical mechanism remains unclear, oxidative stress plays an undeniable role in a complex and progressive neurodegenerative cascade. The aim of the study was to evaluate the role of a complex of markers of inflammatory processes and free radical oxidation, the profile of immunoreactivity, as markers of early diagnosis of PD.

**Material and methods:** The study was conducted on the basis of

the neurological center and the Central Research Institute of the Federal State Budgetary Educational Institution of Higher Education in the period from 2018 to 2024 and included 139 patients in the main group, 31 in the control group, 11 in the comparison group with Parkinsonism syndrome. Blood sampling was performed to assess the pro- and antioxidant status of the body (OOA and OAA): determination of the activity of catalase, superoxide dismutase (SOD), malondialdehyde (MDA), in blood serum by spectrophotometric method. IgG class autoantibodies to neurotropic antigens NF-200, GFAP, S100, MBM, voltage-dependent Ca<sup>2+</sup> channel, N-cholinergic receptors, glutamate, dopamine, serotonin, opiate, GABA receptors, beta-endorphin were determined by ELISA, circulating immune complexes (CIC). The Microsoft Office Excel 2007 and Statistica 10.0 programs were used for statistical processing.

**Results and discussion:** The main manifestations of PD in the studied patients corresponded to the clinical form of the disease. Anomalies of serum immunoreactivity profiles due to the studied autoAT were found in the majority of patients (96.4%). 51.8% of patients had abnormalities in more than five auto-AT parameters. Anomalies in the content of auto-AT to the specific axon protein NF-200, S100 protein, and  $\beta$ -endorphin were detected most frequently (in 55.4, 51.8, and 48.2% of cases, respectively). At an early stage of PD, significant differences in the level of auto-AT to dopamine receptors were found compared with the control group ( $U=79.5$ ;  $p<0.01$ ). When comparing OH with KG, differences in auto-AT parameters for the S100 protein and the voltage-dependent Ca<sup>2+</sup> channel were revealed ( $U=173$ ;  $U=168$ , respectively;  $p<0.01$ ). Statistically significant differences in the profiles of neuroinflammation and endogenous intoxication in OH and GC were revealed. A comparison of PD in the early and late stages revealed significant differences in MSM260 and OAA ( $U=147.5$  and  $U=137$ , respectively;  $p<0.05$ ). When comparing the clinical characteristics of OH with the studied markers of neuroinflammation, correlations were found: the severity of motor disorders (according to the III part of the UPDRS scale) with the average CEC and OAA ( $r=0.3$  and  $r=0.3$ , respectively;  $p<0.05$ ).

**Conclusion:** The results obtained indicate a possible role of activation of the immune system and neuroinflammation in the process of neurodegeneration in PD. The autoimmune response is specific and varies progressively depending on the stage of the disease. The development of screening tests for early identification of immune system activation is promising, which will expand therapeutic possibilities in the early stages of PD.

**Keywords:** Parkinson's disease, biochemical markers, early diagnosis, oxidative stress.

# INVESTIGATION OF THE PROCESSES OF STRUCTURE FORMATION IN A MAGNETICALLY CONTROLLED EMULSION TO INCREASE THE EFFECTIVENESS OF THROMBOLYTIC AGENTS

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**Background:** Currently, mortality from cardiovascular diseases, which are directly related to thrombosis, has increased. According to Rosstat, currently 17,000 people die from this disease every year, which is 1/3 of the total number of deaths.

**Objective:** The processes of structure formation and micro-mixing can be used to intensify fluid movement in medicine, for example, to treat thrombosis.

**Materials and methods:** In this paper, we propose the use of a magnetically controlled, biologically compatible dispersed system, specifically a microemulsion, to control various processes. These micro-mixtures have the potential to enhance the effectiveness of thrombolytic agents. To study the structures that arise within this system when subjected to a rotating magnetic field, a series of experiments involving biocompatible microemulsions was conducted.

The research process consisted of several stages. First, we created a magnetic petroleum jelly-based fluid by replacing the carrier fluid with a ferromagnetic kerosene-based liquid that was stabilized with oleic acid. Next, the resulting magnetic liquid on petroleum jelly oil was emulsified in saline solution, and the resulting drops with a diameter of 1  $\mu\text{m}$  were stabilized with soy lecithin. The third stage involved placing the resulting microemulsion in a thin, flat Hele-Shaw cell. The cell was placed in a region with a uniform magnetic field, created by a set of two pairs of Helmholtz coils. These coils generated a rotating magnetic field.

**Results and discussion:** It has been discovered that microdroplets form chains and begin to rotate under the influence of a rotating magnetic field. The formation of these structures depends on the frequency of the magnetic field. It has been found that the final length of the formed chains decreases as the frequency increases, due to hydrodynamic forces acting on the chain. As the frequency of the magnetic field increases, the droplets aggregate into isotropic clusters. However, as the strength of the magnetic

field also increases, so does the length of the chains, due to an increased magnetic interaction between the droplets.

**Conclusion:** Based on the conducted research, we can conclude that it is possible to control the patterns of structure formation in magnetic system using a magnetic field. These processes can be used in medicine to enhance fluid movement and enhance the effectiveness of thrombolytic.

**Keywords:** Magnetic microemulsion, thrombolytic, magnetic field.

**EXPERIENCE OF USING PCSK9 INHIBITORS  
IN PATIENTS WITH CHRONIC HEART FAILURE WHO HAVE  
SUFFERED FROM MYOCARDIAL INFARCTION**  
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**Background:** Due to uncontrolled dyslipidemia many patients worldwide remain at risk of cardiovascular disease even after taking statins. PCSK9 inhibitors provide significant reduction in LDL levels (50-60%) and better outcomes in high-risk groups.

**Objective:** To evaluate the efficacy and safety of long-term use of PCSK9 inhibitor in patients after myocardial infarction for 18 months.

**Material and methods:** The study included 6 male patients with post-infarction atherosclerosis aged 40-61 years. All patients had CHF class III or IV (according to NYHA) and an ejection fraction of 45% or less, as well as failure to achieve target lipid levels, of which 66.7% had familial hypercholesterolemia (FH). Among them Q (+) AMI was in 83.3% of patients and Q (-) in 16.7%. Instrumental diagnostics: echocardiography, ECG monitoring. Laboratory diagnostics: clinical blood test, blood biochemistry, lipidogram, lipoprotein (a), transaminases and CPK are performed initially and after 3, 12 and 18 months. Alirocumab was also added to the treatment.

**Results and discussion:** The examined patients showed a significant decrease in lipid profile indicators by the 3rd month of targeted therapy. The TC level decreased from the initial  $5.9 \pm 0.1$  mmol/l to  $3.8 \pm 0.1$  mmol/l (by 34.3%),  $p < 0.001$  and the LDL-C level decreased from  $3.10 \pm 0.10$  mmol/l to  $1.30 \pm 0.09$  mmol/l (by 58.1%),  $p < 0.001$ . On average the decrease in LDL-C in patients after the addition of alirocumab after 6 months was by 61.7%, after 12 months by 58.1%, after 1.5 years by 61.7%. It is noteworthy that with alirocumab therapy the target values of LDL-C  $< 1.4$  mmol/l were achieved in 71.3% of patients, while the target value of LDL-C  $< 1.1$  mmol/l

was achieved in 64.3% of examined patients, indicating the high efficacy of the drug. The use of alirocumab in clinical practice is well tolerated without side effects and laboratory parameters of therapy safety remained unchanged.

**Conclusion:** Thus, the inclusion of alirocumab in the treatment regimen in the day hospital of a multidisciplinary hospital contributed to the stable course of coronary heart disease, good tolerability of therapy without side effects was noted and high lipid-lowering activity of the drug was demonstrated already in the first months of taking the drug.

**Keywords:** Chronic heart failure, myocardial infarction, PCSK9 inhibitors, alirocumab, LDL cholesterol, lipid-lowering therapy, secondary prevention, cardiovascular outcomes.

## LIFESTYLE RISK FACTORS FOR YOUNG PEOPLE AS AN ASPECT OF PUBLIC HEALTH

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**Background:** In the field of healthcare, special attention is paid to the prevention of chronic noncommunicable diseases (CKD). Hygienic prenosological diagnostics is the basis for the primary prevention of CNID.

**Objective:** To conduct a meta-analysis of modern world literature to determine the most significant lifestyle risk factors for young people.

**Materials and methods:** This study was based on a comprehensive analysis of scientific literature collected from 2015 to 2023 from the research databases CyberLeninka, MEDLINE (on the PubMed platform), the scientific electronic library eLibrary, Cochrane Library, Wiley Online Library, ScienceDirect. As a result, a database has been compiled that includes those examined using the following methods: questionnaires, anthropometry, blood biochemistry: cholesterol, glucose, HDL and LDL, functional tests: Stange, Martin, Rouffier, Genchi, Robinson index.

The data was processed using cluster analysis implemented in the STATISTICA 10 software, which made it possible to identify patterns and trends in the studied indicators.

**Results and discussion:** The meta-analysis revealed two key groups of risk factors that have a significant impact on the health of the younger generation. The first group includes insufficient physical activity and

poor nutrition, and the second group includes bad habits, among which smoking occupies a special place. Information on priority risk factors for their inclusion in the social and hygienic monitoring system (SGM) can be obtained from medical examination materials, which requires the development of statistical accounting forms harmonized with the SGM system.

**Conclusion:** The results of the study confirm the importance of taking lifestyle factors into account in the prevention of CVD among young people. In order to effectively control the spread of risk factors, it is necessary to develop statistical accounting forms corresponding to the SGM system.

**Keywords:** Risk factors, health, young people, physical inactivity, smoking, poor nutrition.

## **APPLICATION OF CHITOSAN-BASED WOUND COVERS FOR THE TREATMENT OF MILITARY TRAUMA OF THE EXTREMITIES**

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**Background:** Due to technical difficulties in evacuating the wounded from the zone of active combat operations, the problem of timely medical care is extremely urgent. A possible solution, in our opinion, is the use, including as a means of self-help, of universal wound coatings with a complex therapeutic effect, availability and ease of use.

**Objective:** Based on the results of experimental studies of the properties of wound coatings to assess the prospects of their application for the treatment of combat wounds of the extremities.

**Material and methods:** The most promising wound dressings of different types according to the results of screening tests were studied: Ch-S, Ch-S-PVP, Ch-H, Ch-H-GA. The study of sorption, drainage, haemostatic, anti-inflammatory, antibacterial and complex wound-healing abilities coatings was carried out on 120 male rats, among which 4 experimental groups (n=30) were formed. According to our own method standardized contaminated wounds were modelled in the muscle mass of the interscapular region in animals. In control time the following evaluation procedures were performed.

**Results and discussion:** Ch-S samples in the wound had pronounced sorption and haemostatic effects, quickly transformed into adhesive

hydrogel, evenly filled the wound cavity, thus protecting it from secondary contamination. When Ch-S-PVP samples were implanted into the wound early and in an effective concentration, the antiseptic was desorbed, which made it possible to realize early treatment and prevention of wound infection. Ch-H and Ch-H-GA samples were characterized by well-defined frame properties, prolonged sorption effect, and ensured the absence of wound edge recession while performing a long-term drainage function. Besides, the introduction of such frame-type coatings into the wound allowed to maintain sufficient aeration of the wound zone for a long time, throughout the whole experimental time, thus preventing the development of severe forms of anaerobic infection of soft tissues.

**Conclusion:** Due to the optimal terms of biodegradation the investigated RPs on the basis of chitosan can be implanted into the wound one-stage and for a long period of time (up to 7-14 days) without the necessity of repeated dressings, thus providing continuous complex therapeutic effect in the wound that will allow to postpone surgical treatment for the time of the wounded person evacuation without the risk of complications development.

**Keywords:** Wound, chitosan, military trauma, haemostasis.

## PROSPECTS OF CHEMICAL STABILISATION OF CHITOSAN BIOPOLYMER FOR WOUND COATINGS

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**Background:** It is known that the use of polymeric wound coatings can provide a comprehensive and directed approach to the treatment of severe wound defects according to the phases of the wound process.

**Objective:** To study in vivo the peculiarities of action of wound coatings based on chitosan (Ch) depending on the stabilisation of polymer fibre with glutaric aldehyde (GA).

**Material and methods:** Coatings based on unstabilised chitosan Ch-S (soft, loose) and Ch-H (hard, frame) and on chitosan stabilised by chemical cross-linking of polymer fibre GA at the synthesis stage were studied: Ch-S-GA and Ch-H-GA. The study was carried out on 100 male rats, among which 4 experimental groups (n=25) were formed. According

to our own method standardised purulent wounds were modelled in the muscle mass of the interscapular region in animals. The studied wound coatings were injected into the formed models, the wounds were loosely sutured without leaving drainage. At the control points we evaluated the dynamics of in situ ultrastructure of samples, their mechanical strength and frame characteristics, determined the regularities of polymer fibre biodegradation processes in the wound environment (scanning electron microscopy, histomorphological study).

**Results and discussion:** Unstabilised Ch-S and Ch-H were completely biodegraded in early terms (up to 7-14 days). Early deformation of the framework porous ultrastructure and its transformation to a homogeneous gel-like structure for Ch-S, to a granular gel-like structure for Ch-H were observed in microscopic examination. The described effects are associated with significant hydrophilicity of unstabilised chitosan and pronounced sorption capacity of the polymer fibre, while the stabilisation of GA chitosan allowed levelling these effects and obtaining a polymer fibre with high threshold values of moisture absorption, resistant to deformation in the wound environment. Due to this, Ch-S-GA and Ch-H-GA coatings preserved the framework and porosity of the structure for a long time, while the sorption effect was well pronounced and was provided due to the preserved pore diameter rather than due to the sorption capacity of the fibres.

**Conclusion:** chemical stabilisation of GA chitosan without changing its unique wavy-porous structure resulted in the synthesis of wound coatings with increased mechanical strength, stability in the wound environment, prolonged biodegradation time and prolonged sorption effect.

**Keywords:** Wound, chitosan, glutaric aldehyde, biodegradation.

## **DETERMINATION OF STUDENTS' SUSCEPTIBILITY TO INTERNET ADDICTION AT KUBGMU**

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**Background:** The term "internet addiction" was first used in 1996 by psychiatrist Ivan Goldberg, who defined it as a pathological, unjustified, and prolonged presence in virtual space.

**Objective:** The aim of this study is to determine the susceptibility of medical students to internet addiction and to identify ways to prevent and combat this dependency.

**Materials and methods:** The research method chosen was anonymous surveying through random sampling. The respondents were students of KubSMU aged between 21 and 30 years. The survey results were processed and presented in percentages.

**Results and discussion:** Thus, 67% of students were at risk of Internet addiction, 19% were found to have reached the second stage, and 1% were in the first stage. The remaining 13% of students are not at risk of Internet addiction. The most popular social media platforms among students are VKontakte (33%), Instagram (38%), WhatsApp (15%), and Telegram (12%).

When asked, “How often do you feel pleasure while being online?” 55% of the respondents answered “rarely”; 29% – “often”; 7% – “very often”; and 9% – “never.” 65% of the respondents do not monitor the amount of time spent on social media. More than half of the respondents (55%) reported experiencing negative neuropsychiatric reactions (nervousness, mood decline, irritability) when they were unable to access their accounts, 30% reported rare cases of irritation and nervousness. 15% were calm about it.

Responses to the question about the frequency of online activity as a potential danger factor for losing friends and/or family relations, changes in financial stability and academic success led to the formation of four groups: never – 75%; rarely – 20%; often – 3%; and very often – 2%. The majority (55%) of respondents noted that social media had a negative impact on their sleep patterns, shortening and reducing their mental capacity. 56% of students acknowledged their dependence on social media.

Thus, with the increasing scale of the internet addiction phenomenon, society needs to take measures to prevent and combat this progressive disorder.

**Conclusion:** Preventive measures should be taken when the risk is identified. As preventive measures, the following should be applied: self-monitoring, group educational sessions or trainings conducted by psychiatrists, and the promotion of leisure activities beyond virtual spaces. Educational institutions can play an important role in combating internet addiction by conducting preventative conversations with students and showing them the mental and physical effects of internet addiction. Additionally, educational institutions can reduce young people’s interest in virtual space by creating a variety of leisure centers.

**Keywords:** Internet addiction, medical students, KubSMU, prevention.

# THE INFLUENCE OF INORGANIC AND ORGANIC SELENIUM ON THE GROWTH OF CANDIDA FUNGI

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**Background:** Fungi of the genus *Candida* are recognized by the World Health Organization (WHO) as one of the most dangerous mycoses (WHO, 2022). The data on the role of selenium in the vital activity of fungi are contradictory (H. Sun and al., 2023).

**Objectives:** The purpose of the work is to study the influence of inorganic and organic selenium on the growth of *Candida* fungi in vitro.

**Materials and methods:** Colonies of fungi of the genus *Candida*, obtained by the culture method (lawn sowing) on the Saburo culture in the amount of 32 strains were studied; 95% (30) of the identified cultures were *Candida albicans*. Discs impregnated with solutions “Neosel plus”, “Neosel plus neutral”, probiotic “Trilact” were applied using the sterile tweezers. Garlic juice was added as selenomethionine with the optimal set of 6 forms of organic selenium. Statistical processing was carried out using the program IBM SPSS Statistic 25.

**Results and discussion:** There were completely no lysis zones (100% of sowings) around the discs with neutral inorganic selenium at the first day of sowing. After a seven-day observation period, inorganic selenium was added to the discs again. Subsequent observations revealed the active movement of the fungi intensive growth zone directly to the discs treated with inorganic selenium, both acidic and neutral. The fungal lysis zone under the influence of sour selenium was preserved only in two colonies of *Candida*, and in three colonies of *Candida* with the interaction of fungi with probiotic strains of “Trilacta”. The number of fungal colonies around discs with neutral selenium in most crops was not countable (20), the growth was continuous (62.8%); around the discs with acid selenium continuous growth was found on 13 crops, which amounted to 10.6%. In case of fungi contact with lactobacteria, continuous growth of fungi was detected when sowings for the fourth time (12.5%). The microbial number was: neutral selenium –  $6.3 \pm 0.4$ ; acidic selenium –  $5.2 \pm 0.8$ ; “Trilact” –  $0.75 \pm 0.1$  ( $p < 0.001$ ). The addition of selenomethionine to fungi sowings did not cause changes.

**Conclusion:** Inorganic selenium with a neutral pH stimulated the growth of *Candida*. Lysis zones were observed around discs with acidic selenium, which indicates a possible effect of the pH of the selenium solution on the growth of *Candida* fungi. The adaptation of seven-day period allowed strengthening the resistance of fungi to sour selenium and lactobacilli. Lactobacteria limited the growth of fungal colonies, but did not have an antagonistic effect on fungi, as well as organic selenium. Selenomethionin as an organic selenium did not cause the growth and reproduction of fungi.

**Keywords:** *Candida*, Selenium, *Lactobacillus*.

**THEORY AND PRACTICE OF ANCIENT EGYPTIAN HEALING  
AS RELIABLE INFORMATION-COGNITIVE BASIS  
OF PREVENTIVE MEDICINE (A MODERN DOCTOR'S VIEW  
OF THE POPYRI "THE CHAPTERS OF COMING FORTH BY DAY")**

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**Background:** "The chapters of coming forth by day" ("Book of the Dead" (BD)) is not only a mystical guide to the performance of religious funeral rituals, as the Egyptologists of the past imagined, but also a collection of moral, ethical and medical-social standards of behavior and a description of the consequences of their violation, i.e. a detailed preventive presentation of facts with medical implications, obtained from direct carriers of specific diagnoses and pathological conditions.

**Objective:** Finding out what preventive medicine has to do with "Book of the Dead".

**Materials and methods:** Data for medical aspects of BD were extracted from The Book of the Dead, The Papyrus of Ani in the British Museum. Translation, introduction, etc. by Ernest Alfred Thompson Wallis Budge.

**Results and discussion:** Life, illness and death in BD are reflected in the same way as in modern history of case, the cause-and-effect relationships of real diseases of real people are shown in BD from the beginning (the stage of committing sins), through the clinical picture (complaints), to the post-mortem autopsy and assessment of modifications of internal organs (a complete analogue of modern pathological examination). The creators of BD were predominantly men, because they perceived sleep not so much as a means of good rest (a temporary transition to a better world, as a conditional return to childhood, merging with mother earth), but rather as a

tool of cognition that frustrates, forcing us to see and to understand dreams as an integral part of real life and part of beginning death. The description of hell is not fiction because it is formed from the real feelings of real patients. Modern ideas about the structure of hell (terrible beasts, a flaming lake, etc.) appeared in the Abrahamic religions thanks to the presence of written sources from Ancient Egypt, in which priestly healers accurately recorded the dreams of sinners dying of heart failure.

**Conclusion:** The oral creativity of people of pre-class society and the surviving works of scribes of the first civilizations are an objective reflection of the reality of the past and can be successfully used as reliable information-cognitive basis for preventive medicine and medico-social reconstructions.

**Keywords:** Healers of Ancient Egypt, preventive focus, clinical interpretation of patients' dreams, The Chapters of Coming Forth by Day.

## **ANTHRAX BURIAL PRACTICES IN ZABAYKALSKY KRAI**

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**Background:** Anthrax is a severe infectious disease affecting both domestic and wild animals as well as humans, characterized by damage to the lymphatic system, fever, and intoxication. It occurs in four forms: intestinal, pulmonary, cutaneous, and septic. The causative agent is typically found in soil.

**Objective:** To investigate the issue of anthrax burial practices in Zabaykalsky region.

**Materials and methods:** Analysis of archival records, library and media materials, academic literature, governmental and legislative documents.

**Results and discussion:** According to archival records, anthrax has been documented in the territory of Zabaykalsky region since 1893 and the last case was recorded in 2002. In Zabaykalsky region, there are 420 live-stock burial grounds for animals that have died from non-contagious diseases, of which only 140 comply with the necessary requirements. Of these burial grounds, 63 are biothermal pits that do not meet veterinary and sanitary regulations, and 34 are septic ulcer burial sites that also do not meet these standards.

Due to the presence of soil anthrax pathogens and deficiencies in

the organization of anthrax control measures, the epidemiological and epizootiological situation in Zabaykalsky region remains tense.

**Conclusion:** Zabaykalsky region is a territory that has a significant epidemiological disadvantage in terms of anthrax, and it is located in an area with a high risk of infection with the causal agent of this disease. Natural social factors have been identified that determine the risk of anthrax in humans and animals in Zabaykalsky region.

**Keywords:** Anthrax, animal burial grounds, prevention.

## **VENOUS DRAINAGE CHANGES IN LIVER CIRRHOSIS**

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**Background:** In liver cirrhosis, there is a hemodynamic blockade of intrahepatic blood circulation, peripheral vasodilation, increased vascular resistance in the liver parenchyma, which leads to significant disruptions in portal hemodynamics. Changes occur not only in central and portal hemodynamics, but also in peripheral hemodynamics, there is an expressed disruption of venous circulation in the abdominal cavity, pelvic cavity and lower extremities. Such changes must be taken into attention in the complex treatment of patients with liver cirrhosis.

**Objective:** To determine the degree of venous blood flow disturbance in the liver and lower extremities depending on the compensation phase to improve diagnosis and treatment of this category of patients.

**Materials and methods:** The study of venous circulation of the liver and lower extremities was conducted in 165 patients with liver cirrhosis (Child A – 53, Child B – 55, Child C – 57). The control group consisted of 50 people without liver and venous system pathology. Doppler sonography of the portal vein branches, radioisotope study of the liver, rheographic study of hepatic drainage were conducted, hemodynamics in the femoral veins was studied using the color duplex scanning method.

**Results and discussion:** With increasing degree of cirrhotic changes in liver parenchyma, venous drainage from intrahepatic tributaries of inferior vena cava becomes more depleted, this process is directly proportional to the functional class of liver cirrhosis according to Child. With minimal activity, pressure in the portal vein is close to normal parameters, with moderate activity pressure increases to 148.0 – 181.0 mm H<sub>2</sub>O, with high activity it ranged from 188.0 to 204.0 mm H<sub>2</sub>O, blood flow velocity in

the portal vein decreased from 20.0 cm/sec to 15.0 cm/sec. The condition of the veins of the lower extremities in group Child A is not disturbed, Child B – transient nature of venous hemodynamic disorders was revealed, Child C – there is dilation of the superficial femoral veins, an increase in volume and a decrease in linear drainage velocities in them.

**Conclusion:** Thus, in patients with liver cirrhosis in the sub- and decompensation stages (with the presence of free fluid in the abdominal cavity), there is a violation of venous circulation in the liver and lower extremities, manifested mainly in the form of venous congestion.

**Keywords:** Venous drainage, liver cirrhosis, liver hemodynamics.

## **GROUND BEETLES OF THE AGRICULTURAL LANDSCAPE**

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**Background:** The beetle family (Carabidae) is one of the most famous and extensive families with more than 20,000 described species. Beetles are of great importance in ecological studies, they react sensitively to changes in microclimatic and soil conditions, and therefore they are often used as convenient bioindicators of the state of the environment.

**Objectives:** To study the biological diversity of ground beetles within the agricultural landscape; to identify the species composition and distribution of ground beetles at the exact area; to collect samples of ground beetles; to analyze the collected data.

**Materials and methods:** We used soil traps and manual harvesting methods for ground beetles. Soil traps consisted of plastic cups placed at a distance of 1 meter from each other in an amount of 10. The traps were checked every five days. Research on the fauna and ecology of ground beetles was conducted in the Yeravninsky district of the Republic of Buryatia from June to July 2024. We collected 57 specimens of beetles belonging to 7 species from 7 genera of ground beetle families. The area of this work was the south of the Vitim plateau, and 400 square meters of it were studied.

**Results and discussion:** Data on the ecology and population of ground beetles in agricultural landscapes yielded the following results: 1. The species composition of ground beetles in the agricultural landscape were identified. We collected 57 specimens of ground beetles belonging to

seven species from seven genera of the ground beetle family. There were eight ground beetles per square meter. 2. Ground beetle collections were compiled. 3. The most abundant genus of ground beetle was *Carabus*, with four species. The remaining six genera each had only one species: *Poecilus fortipes* – 35, *Carabus granulatus* – 9, *Pterostichus eximius* – 8, *Carabus kruberi* – 2, *Carabus canaliculatus* – 1, *Carabus latreillei* – 1, *Elaphrus sibiricus* – 1 ground beetles.

**Conclusion:** The area of the agricultural landscape was 400 square meters, there were 8 ground beetles per square meter, and the agricultural landscape was protected from pests.

**Keywords:** Ground beetle, ecological studies, biological diversity.

## COMPARATIVE ANALYSIS OF ACCURACY OF PLASTER AND STEREOLITHOGRAPHIC MODELS

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**Background:** Modern technologies are being actively introduced into the clinical practice of dentists. One of the most widespread innovations of the last decade is intraoral scanning. 3D scanning is widely used in orthopedic, surgical dentistry and orthodontics, gradually replacing analog work protocols. This method has attracted the attention of specialists due to its convenience, fast data transfer and improved communication with dental laboratories. However, the question remains whether intraoral scanning has sufficient accuracy for clinicians to fully transition to a digital protocol.

**Objective:** To perform a comparative analysis of the accuracy of optical impressions and analog impressions obtained using type A and type C silicones.

**Materials and methods:** During the work our team used various methods of scientific research: 1) Collecting and analyzing Russian and English language scientific literature from ELibrary, Pubmed, ResearchGate databases for the last 10 years; 2) Conducting a laboratory experiment using and a clinical study PrimeScan and Medit-i700 intraoral scanners and impression materials (type A and type C silicones).

**Results and discussion:** A literature review identified Trios 3, CEREC PrimeScan, and Medit i700 as the best intraoral scanners (IOS) for accurate impressions. Some studies noted higher local deviations in digital systems across the dental arch. Research emphasized the importance

of scanning methodology, particularly a five-direction approach, which enhanced overall arch scanning accuracy within a 100 µm range. Models made via 3D printing demonstrated comparable precision to those from traditional methods using Class 4 supergypsum. Significant deviations occurred at specific areas in the upper jaw, attributed to its semi-elliptical arch shape.

**Conclusion:** Scanning strategies, operator skills, and external factors influence digital impression accuracy. Marginal accuracy exists between IOS and traditional techniques, with errors increasing with larger dental arches. Further studies are needed to reduce deviations considering individual clinical situations.

**Keywords:** Intraoral scanners, scanning accuracy, accuracy analysis, comparison of intraoral scanners, stereolithographic models.

## **IMPLEMENTATION OF DIGITAL PROTOCOLS IN ORTHODONTIC PRACTICE: TREATMENT PLANNING OPPORTUNITIES WITH ALIGNERS**

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**Background:** Modern dentistry is rapidly evolving and integrating digital technologies, fundamentally transforming approaches to diagnosis, treatment planning, and patient care. One of the key areas of development is the use of digital protocols in orthodontics, which offer new possibilities for improving treatment accuracy and efficiency.

**Objective:** To explore the application of 3D technologies for diagnosis, treatment planning, monitoring, and evaluation of patient outcomes using aligners, as well as to assess their impact on treatment quality and interdisciplinary communication among specialists.

**Materials and methods:** A review of scientific literature from the past five years was conducted using the eLibrary and PubMed databases. Additionally, a clinical study was performed.

**Results and discussion:** In the clinical study, 20 patients underwent treatment with aligners. Positive changes were observed in 18 out of 20 patients, with over 80% of tooth movements matching the pre-set treatment plan, confirming the high efficiency of the method. The use of 3D modeling allowed orthodontists to precisely plan treatment, predict outcomes, and minimize errors at each stage of correction. Our clinical

findings align with both Russian and international studies, confirming the success of aligners and 3D technologies in orthodontics. However, treatment effectiveness is also influenced by individual patient factors, such as the severity of malocclusion, age, and strict adherence to aligner wear and follow-up visits. Furthermore, our clinical cases demonstrated the successful implementation of aligners within an interdisciplinary approach. The use of 3D modeling and digital technologies enables specialists from different fields to coordinate their actions effectively, discuss predicted outcomes, and develop personalized treatment strategies for each patient. This enhances treatment safety and comfort while increasing patient confidence in the process.

**Conclusion:** The use of aligners with digital technologies represents a promising and highly effective approach, significantly improving treatment outcomes and enhancing doctor-patient communication.

**Keywords:** Orthodontics, virtual planning, aligners, interdisciplinary collaboration.

## THE INFLUENCE OF DIFFERENT TYPES OF TOBACCO PRODUCTS ON SOME PHYSIOLOGICAL INDICATORS OF STUDENTS

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**Background:** According to FinExpertiza, the number of users of electronic smoking devices has reached 4.5 million people. At the same time, the overall proportion of smokers in Russia continues to decline. With the popularization of smoking, cases of smoking-related respiratory diseases have increased.

**Objective:** Studying the functional state of the respiratory system in the 2nd and 3rd year students of the Medical-prophylactic and Pediatric faculties of the FESMU.

**Materials and methods:** The practical part of the study included two stages: conduction of a survey using Google forms (total number of participants 316 people) and research process and evaluation of the results. The study was approved by the FESMU's Ethics committee.

For parameter measurement process we used spirometry: a mechanical dry spirometer to determine Inspiratory reserve volume (IRV) and FVC

(Forced Vital Capacity); the portable spirometer (Spirotest digital portable device-1) to determine FEV1 (Forced expiratory volume after 1 second). The volunteers were divided into 5 groups: “Healthy”, “Smokers with pathology”, “Smoking vapes” (group 1), “With pathology” (group 2), “Doing sports” (group 3). Statistical data processing was performed using the Student’s t-test.

**Results and discussion:** Almost 80% of respondents were female. In the group of smokers (36%), about half of them smoke all; smoke only cigarettes and smoke only subsystems – 20% each. The most frequent complaints about deterioration of health were in “Smoke everything” and “Smoke electronic devices” groups. When analyzing the functional test results there was an increase in IRV (1.18 ml in group 1), FEV1 in girls (106,4% in group 2, 107,7% in group 3, 106,5% in group 1), FVC of the lungs (2,7 l in group 2, 2,8 l in group 3, 2,8 l in group 1). Also, there were significant differences in the percentage of deviation of VC from required VC (16% in group 1, 19% in group 2, 17% in group 3).

**Conclusion:** There is a tendency to increase the respiratory parameters in smokers and doing sports. This is due to excessive stress on functional tissues, especially in combination with chronic diseases, will lead to deterioration of health in the shortest possible time.

**Keywords:** Smoking, vapes.

**SCIENTIFIC ABSTRACTS  
OF CONFERENCE PARTICIPANTS  
FROM THE UNIVERSITIES  
OF THE FOREIGN COUNTRIES**

## **BRAIN-DERIVED NEUROTROPHIC FACTOR AS A MARKER OF NEUROPLASTIC CHANGES**

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**Background:** Alcohol affects all levels of nervous system functioning. The neurobiological basis for the development of alcohol dependence includes degenerative changes in brain structures, as well as an imbalance of trophic factors and neurotransmitters. One of the main proteins regulating synaptic plasticity under conditions of alcohol intoxication is brain-derived neurotrophic factor (BDNF), which correlates with the characteristics of alcohol consumption (quantity, duration) and the presence of psychopathological and structural brain changes.

**Objective:** To analyze the level of BDNF as a marker of brain structure remodeling in alcohol abuse.

**Materials and methods:** The study included patients from the Minsk Regional Clinical Center “Psychiatry and Narcology” (n=41) aged 20 to 40 years (33±4 years) who are abusing alcohol. The comparison group consisted of conditionally healthy individuals (n=19, 29±6 years old) who did not consume alcohol according to their medical history. The concentration of BDNF was determined in blood plasma by the ELISA method using the Fine Test system (China). The results were recorded on a Multiskan SkyHigh spectrophotometer (Thermo Scientific, Finland). Statistical analysis was performed using Statistica 10.0.

**Results and discussion:** BDNF is synthesized in all parts of the central nervous system and is able to cross the blood-brain barrier, so its level in the bloodstream is considered an indirect indicator of its release in the brain. In patients with alcohol dependence syndrome, an increase in BDNF concentration was found compared to the group of conditionally healthy individuals: 189.20 (140.20-234.30) pg/ml vs. 132.90 (88.34-177.20) pg/ml, respectively (p=0.04). No statistically significant differences were found between the groups of patients with signs of alcohol dependence (189.20 (140.20-234.30) pg/ml) and those who consume alcohol with harmful consequences (141.80 (112.30-231.60) pg/ml) (p>0.05).

**Conclusion:** The imbalance of neurotrophic factors as a result of ethanol consumption plays a key role in the development of alcohol dependence. The established increase in BDNF in patients with alcohol dependence who are in the stage of alcohol withdrawal syndrome may indicate the activation of regulatory mechanisms that ensure neuronal

remodeling, thereby reducing the motivation to consume alcohol and pathological craving for it.

**Keywords:** Neuroinflammation, alcohol dependence, alcohol consumption, neuroplastic change.

## **ANTISEIZURE MEDICATIONS IN POSTSTROKE SEIZURES. A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS**

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**Background and objectives:** The most effective anti seizure medications (ASMs) for post stroke seizures (PSSs) remain unclear. We aimed to determine outcomes associated with ASMs in people with PSS.

**Methods:** We systematically searched electronic databases for studies on patients with PSS on ASMs. Our outcomes were seizure recurrence, adverse events, drug discontinuation rate, and mortality. We assessed the risk of bias using the Cochrane Risk of Bias tool for randomized controlled trials and Risk of Bias in Non-randomized Studies of Interventions tools. Using levetiracetam as the reference treatment, we conducted a frequentist network meta-analysis and determined the certainty of evidence using the Grading of Recommendations Assessment, Development, and Evaluation methodology.

**Results:** Our search yielded 15 studies (3 randomized, 12 nonrandomized, N = 18,676 patients (121 early and 18,547 late seizures), 60% male, mean age 69 years) comparing 13 ASMs. Three studies had moderate and 12 had high risk of bias. Seizure recurrence was 24.8%. Compared with levetiracetam, very low-certainty evidence suggested that phenytoin was associated with higher seizure recurrences (odds ratio [OR] 7.3, 95% CI 3.7–14.5) and more adverse events (OR 5.2, 95% CI 1.2–22.9). Low-certainty evidence suggested that carbamazepine (OR 1.8, 95% CI 1.5 -- 2.2) and phenytoin (OR 1.9, 95% CI 1.4 -- 2.8) were associated with high drug discontinuation rates. Moderate to high-certainty evidence suggested that valproic acid (OR 4.7, 95% CI 3.6–6.3) and phenytoin (OR 8.3, 95% CI 5.7–11.9) were associated with higher mortality rates. Considering all treatments and using the GRADE approach for treatment ranking, very low-certainty evidence suggested that eslicarbazepine, lacosamide, and levetiracetam had the fewest seizure recurrences. Low to very low-certainty evidence suggested that lamotrigine had the fewest adverse events and drug discontinuations, whereas lamotrigine and levetiracetam exhibited low mortality rates with moderate-certainty evidence.

**Conclusion and discussion:** We found that levetiracetam and

lamotrigine may be safe and tolerable ASMs for PSS. Despite ASM use, the seizure recurrence rate remains high in the PSS population. Owing to bias and confounding risks, these findings should be interpreted cautiously.

**Keywords:** Anti seizure medications, levetiracetam, seizure recurrence, lamotrigine.

## THE LEVEL OF IMMUNOGLOBULIN E IN SALIVA IN CHILDREN

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**Background:** Immunoglobulin E (IgE), which assumes a pivotal role in the etiology of allergic reactions, could also influence the onset of specific dental conditions. For instance, elevated levels of IgE might be linked to the development of inflammatory conditions in the oral cavity, such as gingivitis, stomatitis, and periodontitis. At the same time, even data on the normal level of immunoglobulin E in saliva in children are very heterogeneous and not clear. It complicates the use of salivary immunoglobulin E as a marker of oral pathology.

**Objective:** Investigating the concentration of IgE in the saliva of children.

**Materials and methods:** The study was conducted on the saliva of children aged 8 to 13 years (10 girls and 10 boys). The average age for girls is 9.38 years, and the average age for boys is 10.57 years. Saliva sampling was performed on an empty stomach without additional stimulation by placing a cotton swab in the oral cavity for 2 minutes without chewing. The saliva collection tubes were then centrifuged for 5 minutes 1000g. The isolated saliva was poured into aliquots of 500  $\mu$ l and stored at a temperature of  $-80^{\circ}\text{C}$  for  $\leq 2$  months before analysis. The enzyme-linked immunosorbent assay (ELISA) was conducted using the Fine Test ELISA kit for human IgE according to the provided instructions. The photometric analysis was performed using the Multiscan SkyHigh instrument.

**Results and discussion:** The average value of the IgE level is 25.1 ng/ml. In males, the average IgE level was 24.5 ng/ml (min = 12.5, max = 41.9). In the female, the average IgE level was 25.8 ng/ml (min = 8.8, max = 41.0). The study demonstrated that the level of IgE in the saliva of this particular group of children is not influenced by gender. There was also no significant correlation between the levels of IgE in children's saliva and their age.

**Conclusion:** The findings suggest the necessity for further investigation, considering factors such as oral health, diet, and other variables that can impact the concentration of IgE in children’s saliva, in order to gain a more thorough comprehension.

**Keywords:** Immunoglobulin E, saliva, children.

## **ATTITUDES TOWARD ARTIFICIAL INTELLIGENCE IN MEDICAL EDUCATION AND PRACTICE**

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**Background:** Artificial intelligence (AI) is significantly transforming healthcare and medical education by improving diagnostic accuracy, personalizing learning, and automating repetitive tasks. Medical students must adapt to the growing integration of AI into clinical practice and education. However, the rise of AI also raises concerns about its reliability, trustworthiness, and the potential for job displacement. Understanding how medical students perceive AI is crucial for shaping future curricula and ensuring its effective implementation in healthcare systems.

**Objective:** To investigate medical students’ attitudes toward artificial intelligence in medical education and practice.

**Materials and methods:** A total of 110 medical students participated in a structured online survey, which included both multiple-choice and Likert scale questions exploring various aspects of AI in healthcare and medical education. The survey assessed participants’ knowledge of AI applications in medicine, their familiarity with AI-based tools in clinical or research settings, and their perceptions of AI’s impact on medical education and diagnostic accuracy. It also examined their comfort levels with AI-assisted clinical decisions, concerns about job displacement, and support for incorporating AI courses into medical curricula.

**Results and discussion:** Among the respondents, 65.7% were very familiar with AI in healthcare, 24.1% had some knowledge, and 10.2% had no knowledge. 56.3% of students had encountered AI-based tools or technologies while studying or practicing medicine, while 14.6% had never encountered them, 29.1% rarely did, and the remaining respondents frequently encountered them. Regarding the potential impact of AI on medical education, 66.3% believed it could personalize learning plans, 41% thought it would be involved in simulations, 36.6% expected automated lecture summaries, 26.7% anticipated virtual tutoring or mentoring, and 9% were uncertain. 40.8% expressed confi-

dence in AI's diagnostic accuracy, while 58.3% disagreed, and 1% was unsure. 53% felt comfortable with AI handling medical duties, 44% found it acceptable, and 3% were uncertain. 41% strongly believed AI could improve medical education, 39% agreed, and 17% disagreed, while 3% were unsure. In terms of trust, 44.4% fully trusted AI, 46.5% placed more trust in human judgment, and 9.1% were uncertain. Regarding AI's impact on healthcare, 48.5% believed it would transform healthcare, 45.5% felt current procedures would remain but that AI would not replace human functions, and 6.2% foresaw more challenges than advancements. Concerning the potential for job displacement, 45.5% were extremely concerned, 46.4% moderately concerned, and 8.2% were unsure. As for interest in AI in medical education, 5% of respondents were not interested, 39% were potentially interested, and 56% were certainly interested.

**Conclusion:** The survey results indicate that medical students of Semey Medical University generally have a positive yet cautious attitude toward AI in healthcare and medical education. While many recognize AI's potential to personalize learning and assist in simulations, there remains skepticism about its ability to replace human judgment in medical diagnostics and decision-making. Concerns about AI replacing jobs are prevalent, but there is also strong interest in incorporating AI into medical education.

**Keyword:** Artificial intelligence, attitude, medical students.

## PULMONARY DYSFUNCTION IN CHILDREN WITH DYSTROPHINOPATHY: A CROSS-SECTIONAL STUDY

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**Objectives:** To observe the prevalence of impaired pulmonary function during various phases of the disease course in children aged 5–18 y with dystrophinopathy. The correlation between different parameters of pulmonary dysfunction and motor function was also studied.

**Methods:** One hundred and thirty-three confirmed cases of Duchenne muscular dystrophy (DMD), fulfilling predefined inclusion and exclusion criteria were evaluated. A pulmonary function test, the six-minute walk test (6MWT), and a functional assessment of muscular strength using the Vignos and Brooke functional scale were performed on all children. Pulmonary dysfunction was defined as <80% of the predicted forced vital capacity (FVC).

**Results:** The overall prevalence of pulmonary dysfunction was 48.12% (95% CI: 39.8-56.54). The prevalence (95% CI) of pulmonary dysfunction in age groups 5–7.5 y, 7.5–10 y, and 10–18 y was 50% (33.63–66.37),

39.29% (27.58–52.37), and 57.78% (43.3–71.03) respectively. There was a significant association of mean walk duration ( $r=0.2509$ ;  $p=0.019$ ), walk distance ( $r=0.21$ ;  $p=0.028$ ), Brooke functional score ( $r=-0.30$ ;  $p=0.0006$ ), and Vignos functional score ( $r=-0.21$ ;  $p=0.019$ ) with percentage predicted FVC. Children with deletion of R17, 18 and 19 spectrin-like repeats were found to have a significantly high proportion of pulmonary dysfunction ( $p=0.006$ ). No statistically significant differences were found between children with a deletion involving ABD or hinge region 3 and those without.

**Conclusion:** Impaired pulmonary function can be seen quite early in the disease course, and its prevalence is comparable to those of children with a long-standing disease.

**Keywords:** Dystrophinopathy, Duchenne muscular dystrophy, pulmonary dysfunction.

## THE INCIDENCE OF PEPTIC ULCER OF THE STOMACH AND DUODENUM IN CHILDREN OF THE GRODNO REGION

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**Background:** Despite the generally accepted point of view about the leading role of *H.pylori* in ulceration, there is an opinion about the overestimation of its ulcerogenic potential. The rapid urease test is a generally recognized diagnostic tool for helicobacter pylori infection in individuals undergoing endoscopic gastric examination.

**Objective:** To compare the results of a rapid urease test in children with gastric ulcer and duodenal ulcer.

**Materials and methods:** The case histories of patients treated at the Grodno Regional Children's Clinical Hospital for the period from 2019 to 2024 with a diagnosis of gastric ulcer /duodenal ulcer were analyzed. There was no indication of the use of proton pump inhibitors or antibacterial drugs during the month preceding hospitalization in the medical records. The data is given in the form of "median (lower quartile-upper quartile)". Fischer's two-way exact criterion was used to compare the shares. For fractions (%), a 95% confidence interval (95% CI) was calculated using the Klopfer–Pearson formulas. The differences were considered significant at a significance level of  $p<0.05$ .

**Results and discussion:** The age of the children was 16.0 (12.0-17.0) years. Duodenal ulcer was found in 63.1% (95% CI 58.8-67.4%). Gastric ulcer was present in 36.9% (95% CI 32.6-41.2%) of cases ( $p=0.02$ ). The

rapid urease test was positive in 36.9% (95% CI 25.1-48.6) of cases. In the presence of gastric ulcers, a rapid urease test was positive in 100.0% of cases, and in the presence of duodenal ulcer, it was also negative in 100.0% of cases (p=0.02).

**Conclusion:** Gastric ulcer in 100.0% of cases is associated with a positive result of a rapid urease test, and in duodenal ulcer, positive results of a rapid urease test were not recorded in 100.0% of cases.

**Key words:** Peptic ulcer, children, H.pylori, rapid urease test.

## **PREVALENCE AND ASSOCIATED FACTORS OF NONUNION IN OPEN TIBIAL SHAFT FRACTURE AMONG PATIENTS TREATED WITH EXTERNAL FIXATION IN TIBEBE GHION SPECIALIZED HOSPITAL**

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**Background:** The definitive treatment of open tibial shaft fractures remains challenging and nonunion after treatment of open tibial shaft fractures with external fixation complicates a significant proportion of cases. There are varying rates of occurrence of nonunion and the prevalence is not well known in Ethiopia. The objective of the study is to assess the prevalence and associated factors of nonunion in open tibial shaft fractures treated with EX FIX in TGSH.

**Materials and methods:** The study was conducted using a cross-sectional study in patients with open tibial shaft fractures who were admitted and treated with external fixation in the Tibebe Ghion Specialized Hospital orthopedics department from January 1, 2019, to January 29, 2021. The study involved 75 patients, which was the total number of cases in the study period and fulfilled the inclusion criteria. Bivariate and multiple variable logistic regression analyses were used to analyze the association between variables. The degree of association between variables was determined at the p-value of <0.05.

**Results:** The overall prevalence of nonunion in open tibial shaft fractures treated with external fixation in TGSH was 21.3%. The severity of the injury, presence of wound infection, and treatment factors affect the occurrence of nonunion. It occurs in 9 of 19 (47.4%) Gustilo-Anderson grade IIIB fractures and 6 of 48 (12.5%) Gustilo-Anderson grade IIIA fractures. A delay in soft tissue covering of Gustilo-Anderson grade IIIB fracture of 15 days or more increases the nonunion rate to 72.7%.

Nonunion occurred in 41.7% of cases with SSI and 11.8% of cases without SSI. Gustilo-Anderson grade (AOR=4.85, CI 95%: 1.31-18.01), surgical site infection (AOR=4.12, CI 95%: 1.11-15.26), and time until coverage of bone of Gustilo-Anderson grade IIIB fracture (AOR=18.23, CI 95%: 1.17-284.8) have statistically significant association with nonunion.

**Conclusion and recommendation:** External fixation use for definitive treatment of open tibial fractures should be disfavored as the prevalence of nonunion in open tibial shaft fractures treated with EX FIX is higher than other previous studies done in European and Asian countries. Gustilo-Anderson grade of injury, surgical site infection, and time from injury to bone coverage of Gustilo-Anderson grade IIIB fractures were found to be statistically significantly associated with the occurrence of nonunion. Therefore, attention should be given to early soft tissue reconstruction of exposed bones to establish a favorable environment for bone healing and to make treatment with internal fixations possible. Better management of wounds to minimize surgical site infections is required for better healing of open tibial shaft fractures. Prospective studies are also recommended on the issue.

**Keywords:** Tibial shaft fractures, Gustilo-Anderson grade.

## **A CLINICAL ULTRASOUND ALGORITHM TO IDENTIFY UTERINE SARCOMA AND SMOOTH MUSCLE TUMOURS OF UNCERTAIN MALIGNANT POTENTIAL IN PATIENTS WITH MYOMETRIUM LESIONS: THE MYOMETRIUM LESION ULTRASOUND AND MRI STUDY**

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**Background:** Differential diagnosis between benign uterine smooth muscle tumors and malignant counterpart is challenging.

**Objectives:** To evaluate the accuracy of a clinical and ultrasound based algorithm in predicting mesenchymal uterine malignancies, including smooth muscle tumors of uncertain malignant potential.

**Materials and methods:** We report the 12-month follow-up of an observational, prospective, single-center study that included women with at least 1 myometrial lesion  $\geq 3$  cm on ultrasound examination. These patients were classified according to a 3-class diagnostic algorithm, using symptoms and ultrasound features. “White” patients underwent annual telephone follow-up for 2 years, “Green” patients underwent a clinical and ultrasound follow-up at 6, 12, and 24 months and “Orange” patients

underwent surgery. We further developed a risk class system to stratify the malignancy risk.

**Results:** Two thousand two hundred sixty-eight women were included and target lesion was classified as benign in 2158 (95.1%), as other malignancies in 58 (2.6%) and as mesenchymal uterine malignancies in 52 (2.3%) patients. At multivariable analysis, age (odds ratio 1.05 [95% confidence interval 1.03–1.07]), tumor diameter >8 cm (odds ratio 5.92 [95% confidence interval 2.87–12.24]), irregular margins (odds ratio 2.34 [95% confidence interval 1.09–4.98]), color score=4 (odds ratio 2.73 [95% confidence interval 1.28–5.82]), were identified as independent risk factors for malignancies, whereas acoustic shadow resulted in an independent protective factor (odds ratio 0.39 [95% confidence interval 0.19–0.82]). The model, which included age as a continuous variable and lesion diameter as a dichotomized variable (cut-off 81 mm) provided the best area under the curve (0.87 [95% confidence interval 0.82–0.91]). A risk class system was developed, and patients were classified as low-risk (predictive model value <0.39%: 0/606 malignancies, risk 0%), intermediate risk (predictive model value 0.40%–2.2%: 9/1093 malignancies, risk 0.8%), high risk (predictive model value  $\geq$ 2.3%: 43/566 malignancies, risk 7.6%).

**Conclusion:** The preoperative 3-class diagnostic algorithm and risk class system can stratify women according to risk of malignancy. Our findings, if confirmed in a multicenter study, will permit differentiation between benign and mesenchymal uterine malignancies allowing a personalized clinical approach.

**Keywords:** Muscle tumors, malignant, mesenchymal.

## **A NOVEL METHOD OF QUANTIFYING RAMUS DIMENSIONS FOR PRECISE INSERTION OF RAMUS MINI-IMPLANT – A CONE BEAM COMPUTED TOMOGRAPHY STUDY**

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**Objective:** To determine and evaluate the dimensions of the ramus and precise angle of insertion of ramus mini-implant using novel skeletal reference planes in various skeletal malocclusions.

**Material and methods:** The Cone Beam Computerized Tomography data acquired from 150 individuals (aged between 13 and 25 years) were evaluated. Ethical. CBCT data of subjects were used to classify various skeletal malocclusion (class I class II and class III skeletal malocclusion) based on ANB angle using Dolphin software. They were further subdivided based on growth status and gender, having equal distribution. A novel method for quantifying ramus dimensions using four skeletal reference planes using Dolphin software based on the skeletal parameters were taken. Importantly precise insertion of minimplant in ramus was evaluated unlike previous studies which have taken dental Reference Planes.

**Results and conclusion:** Patients with Class III skeletal malocclusion typically exhibited significantly reduced ramus width and depth compared to Class I and Class II malocclusions. The ramus width and depth at a 4mm vertical height was considered as ideal and optimal site for ramus mini-implant insertion in all the skeletal malocclusions compared with 6mm and 8mm of vertical height, to enhance mini-implant stability with adequate bone thickness and minimizes proximity to inferior alveolar nerve bundles and proximity to the inferior alveolar nerve canal. Furthermore, ramus width and depth tend to be higher in males than females among all skeletal malocclusions. Notably, the precise insertion of minimplant into the ramus did not show any variations among various malocclusions and the details of insertion angle will be highlighted with illustrations in my presentation.

**Keywords:** Ramus width, ramus depth, insertion angle, impacted mandibular second molar, temporary skeletal anchorage device, ramus mini-implant, mandibular ramus, inferior alveolar nerve.

## **ATRASENTAN IN PATIENTS WITH IGA NEPHROPATHY**

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**Background:** Patients with IgA nephropathy and severe proteinuria have a high lifetime risk of kidney failure. The efficacy and safety of the selective endothelin type A receptor antagonist atrasentan in reducing proteinuria in patients with IgA nephropathy are incompletely understood.

**Methods:** We are conducting a phase 3, multinational, double-blind, randomized, controlled trial involving adults with biopsy-proven IgA nephropathy, a total urinary protein excretion of at least 1 g per day, and an estimated glomerular filtration rate of at least 30 ml per minute per 1.73 m<sup>2</sup> of body-surface area. Patients were randomly assigned to receive atrasentan (0.75 mg per day) or matched placebo for 132 weeks. The primary outcome, assessed at a prespecified interim analysis of data from

the first 270 patients in the main stratum, was the change in the 24-hour urinary protein-to-creatinine ratio from baseline to week 36; the change was estimated with the use of a repeated-measures model. (An exploratory stratum of patients who were receiving a sodium–glucose cotransporter 2 inhibitor was included in a separate analysis.) Safety analyses were based on adverse events across the entire main stratum.

**Results:** A total of 340 patients were recruited into the main stratum. Among the first 270 patients in the main stratum (135 per trial group) who completed the week 36 visit, the geometric mean percentage change in the urinary protein-to-creatinine ratio relative to baseline was significantly greater with atrasentan (–38.1%) than with placebo (–3.1%), with a geometric mean between-group difference of –36.1 percentage points (95% confidence interval, –44.6 to –26.4;  $P < 0.001$ ). The percentage of patients with adverse events did not differ substantially between the two groups. Fluid retention was reported by 19 of 169 patients (11.2%) in the atrasentan group and in 14 of 170 (8.2%) in the placebo group but did not lead to discontinuation of the trial regimen. No apparent cases of cardiac failure or severe edema occurred.

**Conclusions:** In this prespecified interim analysis, atrasentan resulted in a significant and clinically meaningful reduction in proteinuria as compared with placebo in patients with IgA nephropathy.

**Keywords:** Nephropathy, proteinuria.

## **MONITORING CHANGES IN THE MICROVASCULAR BED DURING RADIATION THERAPY OF TUMORS IN THE MAXILLOFACIAL REGION USING CAPILLAROSCOPY**

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**Background:** Reduction blood flow in the area conducting radiotherapy calls change in the nutrition of tissue structures of the maxillofacial region. Increase in the radiation dose calls growth of morphological transformations. Besides angiography, study of the state of the capillary systems can be used as the method of screening and monitoring of the state and volume of blood supply in the microcirculation system.

**Objective:** To investigate the potential of using the intraoperative capillaroscopy technique and to determine the extent of damage and the development of complications caused by radiation therapy.

**Materials and methods:** The study included two groups of participants. The control group consisted of 6 practically healthy individuals (4 men and 2 women) aged 25 to 45 years, with no history of cancer or oral diseases. The second group included 2 patients (men aged 58 and 62 years) with a diagnosed disease of the floor of the mouth, who received outpatient radiation therapy. The diagnosis was confirmed histologically. For both patients, fractionated radiation therapy was performed with a total radiation dose of 60 Gy. An M-70A capillaroscope was used to perform capillaroscopy.

**Results and discussion:** In the control group, the microcirculatory bed demonstrated a typical picture: uniform distribution of capillaries, their rectilinear or slightly tortuous arrangement, absence of aneurysms and pronounced deformation of the capillary walls. The blood flow velocity was high and uniform. In patients receiving radiation therapy, significant changes in microcirculation were detected already on the 10th day of observation. A decrease in capillary density, an increase in the distance between them, the appearance of avascular zones – areas completely deprived of blood supply were observed.

**Conclusion:** The method of intravital capillaroscopy has limited diagnostic value in assessing radiation reactions, especially in the early stages.

**Keywords:** Capillaroscopy method, radiation therapy, microvascular bed.

## THE IMPACT OF WATER FACTOR ON POPULATION HEALTH AS A RELEVANT PUBLIC HEALTH ISSUE

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**Background:** The quality of drinking water plays a key role in maintaining public health. In Dushanbe, water supply is ensured through surface and underground sources; however, water pollution remains a pressing issue. Major contaminants include nitrates, heavy metals, and bacterial and viral pathogens. Inadequate water purification and outdated pipelines contribute to an increase in population morbidity, especially among children.

**Objective:** To assess the quality of drinking water in various districts of Dushanbe and determine its impact on the population's morbidity rate.

**Materials and methods:** The study involved an analysis of 50 water samples from different city districts. Chemical (nitrates, heavy metals) and microbiological (*Escherichia coli* bacteria) parameters were evaluated. Statistical analysis of morbidity rates from 2019 to 2024 was conducted, along with a survey of 500 residents regarding water consumption and health status.

**Results and discussion:** Water analysis revealed:

- In 45% of cases, nitrate levels exceeded the maximum permissible concentration (MPC) by up to 1.8 times, particularly in peripheral regions.
- Heavy metals (lead, cadmium) were detected in 30% of samples at concentrations exceeding WHO standards.
- *Escherichia coli* bacteria, indicating fecal contamination, were found in 60% of samples from open sources and old pipelines.

Statistical morbidity analysis showed:

- A 35% increase in disease incidence over the past five years, especially in areas with lower water quality.
- A 28% rise in chronic gastrointestinal diseases (gastritis, ulcers).
- 72% of respondents who consume tap water reported periodic digestive problems.

**Conclusion:** The findings confirm the significant impact of water quality on the health of Dushanbe’s population. To improve the situation, it is necessary to modernize water purification systems, implement stricter water quality control measures, and conduct public awareness campaigns.

**Keywords:** Water factor, water quality, public health, Dushanbe, water supply, gastrointestinal diseases.

## **IMPACT OF SCREEN TIME ON DIGITAL WELLBEING AND EYE HEALTH AMONG FOREIGN STUDENTS AT SEMEY MEDICAL UNIVERSITY**

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**Background:** Excessive screen time, particularly among young people, has raised concerns due to its adverse effects on eye health, mental well-being, and overall development. The pandemic intensified screen dependency, leading to an increase in eye conditions like myopia. This reliance on screens, including gaming, is associated with eye strain, fatigue, headaches, and sleep issues. It’s crucial to raise awareness to protect future generations’ health.

**Objective:** To assess the effects of excessive screen time on eye health.

**Materials and methods:** A survey was conducted among 124 foreign students at Semey Medical University to assess the effects of screen time on eye health. The survey, consisting of 11 questions, explored screen usage habits and their impact on health across different age groups.

**Results and discussion:** Most participants were between 19–24 years old, with 36.4% citing online classes or work as the main reason for screen use, followed by entertainment (32.2%) and social media addiction (20.3%). A majority of respondents (33%) used screens for 2–4 hours a day, with common symptoms including eye strain (41.7%), headaches (40.9%), and dry eyes (36.5%). Sleep disturbances were reported by 23.5% and 36.2% of participants wore prescription glasses, while 35.3% wore blue light glasses. Additionally, 40% felt addicted to screens, with many acknowledging the negative impact on their daily routines and eye health.

**Conclusion:** The survey underscores widespread awareness of the harmful effects of screen time, especially on eye health and sleep. Despite this, work and entertainment continue to drive excessive screen use, highlighting the need for strategies to promote digital wellbeing.

**Keywords:** Digital wellbeing, eye health, foreign students, screen time.

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*(ABSTRACTS)*

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