RESEARCHERS AND SCIENTISTS AGAINST WAR

Editors

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ABSTRACT BOOK

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Different types of post-COVID-19 complications

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COVID-19 infection has rapidly expanded across the world causing millions of cases worldwide. Despite acute illness, both – transient and long-term complications of infection with SARSCoV-2 requires more and more attention. COVID-19 illness produces numerous long-term complications involving practically all organs and biological systems: respiratory, cardiovascular, neurological, digestive and others. The aim of this paper was to describe some widely occurred complications in post-COVID period. Knowledge and awareness about post-COVID complications should be increased among patients and health care professionals in order to provide proper prevention and management of the complications declared after SARS-CoV-2 infection. Digestive system complications such as diarrhea nausea, vomiting, and acute liver failure are among those, that can last even up to 3 months. Secondary infections in post-COVID period can affect clinical outcome and convalescence of the patient. Immunological dysregulation and immunosuppression precedes multi-organ damage and hyper inflammatory acute response. Secondary infections are not assessed to be reason for permanent organ dysfunction though. Endocrine glands - pancreas, hypothalamus and pituitary, thyroid, adrenal glands, testes, and ovaries have been found to express ACE2 and TMPRSS2. Various publications concentred on the aggravation of preexisting endocrine diseases by COVID-19 infection. Hyperglycemia can directly rise glucose concentrations in airway secretion. Glycaemic control has appeared to be essential to avoid long hospital stays. Morbidity and mortality due to COVID-19 infection are increased by the presence of diabetes in infected patients.

Association of inherited thrombophilia with miscarriages and stillbirth: study of Georgian population

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Inherited thrombophilia increases the risk of not only VTE during pregnancy but also placenta-mediated pregnancy complications, including miscarriages and stillbirth. Association between thrombophilias and placental-mediated pregnancy complications has been controversial in different retrospective case-control and prospective cohort studies. It is evident that placental vascular thrombosis, resulting in abnormal placentation, is at least partly responsible for these pregnancy complications. Our retrospective case control study involved patients with pregnancy complications (miscarriages, stillbirth) as well as healthy controls. Prevalence of factor V Leiden mutation was statistically significantly increased in women with miscarriages (420 patients; 4.8%; p=0.026) or stillbirth (120 patients; 9.8%; p=0.001). Prevalence of MTHFR C677T homozygote mutation was statistically significantly increased in women with miscarriages (420 patients; 7.6%; p=0.015) and was weak in patients with stillbirth (120 patients; 4.9%; p=0.102). Prevalence of MTHFR mutation in patients with only two miscarriages (205 patients) was significant (7.8%; p=0.015). We found weak to no relationship between Prothrombin

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G20210A mutation and miscarriages (420 patients; 3.8%; p=0.156) or stillbirth (120 patients; 2%; p=0.572). Based on our data women with FVL and MTHFR mutation are at increased risk of developing miscarriages or/and stillbirth. Prothrombin gene mutation has weak to no relationship with studied pregnancy complications.

EEG study to HPT in patients with NS pathology using EEG database "EEGHUB.GE"

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Nowadays Hyperventilation is a provocation tool used during the electroencephalogram (EEG) registration to detect epileptiform activity. Even in cases where there are no typical manifestations on EEG during hyperventilation, the analysis of the shows a variety of responses, changes, and combinations. EEG data of patients from "EEGHUB.GE" was used. Big Data EEG collected in Georgia have been and integrated and uploaded to the European Open Science Cloud (EOSC). The aim of study is determined the pattern to hyperventilation based on time of onset EEG and age of patients 2186 patients, 1139 females and 1047 males aged 3 to 51years was studded. In 1201 patients EEG reaction/response to hyperventilation was within the normal while those with pathological EEG reaction to hyperventilation (PERH) were 985. The patients were split into the following age groups: 3-6, 7-12, 13-18, 19-30, 31-50. Pathological EEG responses revealed of 3 types. During ongoing/current study pathological EEG-reactions

to hyperventilation (I, II, and III) has been classified according to two parameters: time of manifestation (first, second, and third minutes) and age (3-6, 7-12, 13-18, 19-30, 31-50, 51and above) of the patient. The results have shown three types of pathological reactions of EEG and detected the time of manifestation – at the first, second and third minutes of hyperventilation: I type reaction on EEG 74.2% $p<0001$; II type reaction in 22.6% and III type reaction in the first minute - in 3.2% patients. The data of patients are valid by age and type of reaction due to the first type of reaction prevailed in all age categories $p<0,002$, $\chi2(10)x(10)2=28.2$. The distribution of patients by pathological reaction to Hyperventilation by age: EEG to hyperventilation revealed in 853 patients (86.6%) $p <0.0001$; $\chi2(2)=689,791$ in the first minute. in in 95 patients (9.6%) $p<0.0001$ at the second minutes. The prevailed type I reaction on EEG in 64, 2%. II type reaction was in 29. 4%. III type reaction 6.3% patients Types EEG Reaction to Hyperventilation concerning age is not reliable to third minute of Hyperventilation. Three types of EEG reaction to hyperventilation were revealed in all age-groups of patients with various CNS dysfunctions: In all age groups the disorganization of basic EEG rhythm in the first, second and third minutes of hyperventilation. In the first minute of hyperventilation between all types of EEG reaction and age (3-6, 7-12, 13-18, 19-30, 31-50) a significant ratio was revealed, which was not observed in the second and third minutes. EEG-response to hyperventilation based on ages of patients should be taken account for scientific and clinical study.

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Case report: bilateral ovarian clear-cell carcinoma

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To report the case of ovarian clear cell carcinoma with involvement of both ovaries and the uterus. A 66 years old female presented with persistent deaf pain in small pelvis, enlarging abdominal and periodic dysuria. She had a past gynecological history of endometriosis. According to the results of transvaginal ultrasonography, small pelvis CT and the check-test answers of OC oncomarker CA125, clinical diagnosis of unknown origin ovarian cancer was offered. The patient underwent an exploratory laparothomy, total abdominal hysterectomy, bilateral salpingo-oophorectomy and omentectomy. An intra-operative frozen section of the pelvic mass was positive for OC. During the post-operative examination of ovaries and uterus, in addition of solid ovarian tumor a cut surface of uterus showed a whorled intramural nodule. A microscopic feature on cytology examination of ascetic fluid was negative for malignant cells. Microscopically, both ovaries showed typical features of CCC. Apart from this, according to the additional IHC analysis the diagnosis of bilateral ovarian clear cell carcinoma was confirmed. Ovarian clear cell carcinoma is a rare subtype of epithelial ovarian cancer and comprises about 5-10% of ovarian carcinomas. To elucidate of molecular mechanisms

underlying the malignant transformation of ovaries and investigate its relationship with past-history of endometriosis or chronic pelvic inflammation, it is essential to observe the genetic pathways such a ARID1A-loss mutation role in genesis of OCCC, as well as, specific immunohystochemical markers by which OCCC is characterized to differentiate CCC from other types of OCs for an early diagnosis in clinical practice. Furthermore, greater understanding of molecular pathways of OCCC provide opportunities to develop alternative treatment strategies with the aim of improving survival chances of patients with OCCC, also for an early diagnosis of OCs to introduce and implement a screening program, which despite many attempts, remains a significant challenge in oncology.

Acute type A aortic dissection in a hemodialysis patient in the early period after COVID-19 infection

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The novel coronavirus spread all over the world in 2019 and became a serious international health concern of this century. Coronavirus disease 2019 (COVID-19) had a wide range of clinical manifestations; mostly affecting the respiratory system, but cardiovascular involvement has also been reported, including acute coronary syndromes, thromboembolic events and one of the deadly complication named aortic dissection. Among other cardiovascular complications of COVID-19, aortic dissection has been a significant yet underrated problem. Herein, we report a type A aortic dissection in a hemodialysis patient in the early period after COVID-19 infection.

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Participation of vitamin D in menopause Management strategies

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The health of the population is one of the key factors in economic development and, at the same time, an objective indicator of the quality of life. Public health policy in the world follows the path of large-scale financing of healthy lifestyle projects. The health of women was very relevant, because in a viewpoint of material and technical progress, an equal role has been assigned to men and women. Menopause and the climacteric state of women is a special issue in the health care of any prosperous European country. It is very important to approach the issue on a large scale, but this requires regional studies. Our interest fell on women with menopause living in Kvemo Kartli. In order to review and further transform the data for the Kvemo Kartli region of Georgia, we analyzed the literature on the advisability of using vitamin D as a factor that improves the quality of life of women in the menopausal period. We searched for peer-reviewed new and recent publications in order to write this review. A wide range of biological properties of vitamin D, which is involved in the regulation of many important physiological functions, is described here. The negative impact of vitamin D deficiency not only on the development of cancer, cardiovascular diseases, but also on the increase in the severity of climacteric syndrome is represented. The multiple beneficial effects of vitamin D have led to a detailed planning of the studies that the research team will carry out the next 12 months.

Post-COVID-19 symptoms; a case report and review

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COVID-19 causes a number of symptoms associated with olfactory disorders and these clinical symptoms are widely reported in the current Literature. But more and more patients suffering from this disease turn to laryngologists with complaints of prolonged nasal obstruction in post-infection period. There is unclear connection between the nasal obstruction and the coronavirus disease 2019 (COVID-19). The study was performed in a clinic, among patients who had suffered from COVID-19 and which had complaints of nasal obstruction after recovery. The evaluation of the treatment results was carried out taking into account the anamnesis (subjective data) and the rhinoscopic picture (objective data). The case presentation is followed by a review of the potential causes and pathogenesis of nasal obstruction after COVID-19.

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Comparative characteristics of healthy pregnant women and pregnant women with a new coronavirus infection

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We carried out a systematic search by using a literature about the issue of our interest in the PubMed and Scopus search databases. We systematically searched the literature published from December 1, 2019 to July 30, 2021 across multiple databases including PubMed, WebofScience, GoogleScholar and the WHO COVID-19 database using the following keywords: "COVID-19" and " pregnancy". Filter by date: March 1, 2020-until March 1, 2021. We have made a review of the literature on the issue of our interest in the PubMed and Scopus search databases. Based on our understanding, we want to present a small literary review. Changes in the cardiorespiratory and immune systems during pregnancy increase woman's susceptibility to severe infection and hypoxic compromise, but at the same time they may also delay diagnosis and source control in those who have only mild upper respiratory symptoms such as sore throat and nasal congestion; the latter are observed in 5% of patients with COVID-19. With gestational rhinitis, it should also be noted that in pregnant women the content of estrogen, β-estradiol increases, which increases the reactivity of the immune system. Therefore, the intensity of seizures during gestation can increase significantly. However, a high concentration of estrogen disrupts vascular motility, causing vasomotor rhinitis during pregnancy, usually affects a fifth of healthy women in late pregnancy and

leads to severe nasal congestion and rhinorrhea; these signs can mask the symptoms of COVID-19, leading to uncontrolled viral shedding and transmission. Dyspneaoccurs in 18% of patients with COVID-19.

Correlation between blood pressure response to sub maximal exercise and left ventricular hypertrophy

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There is currently no consensus on the definition of normal BP (blood pressure) increase during physical activity and thus of the exaggerated BP response to exercise. A hypertensive response to exercise (HRE) is frequently observed in individuals without hypertension or other cardiovascular disease. However, mechanisms and clinical implication of HRE is not fully explained. Endothelial dysfunction and increased after load contribute to development of HRE from neurohormonal aspects. Studies showed that excess stimulation of sympathetic nervous system and augmented rise of angiotensin II seems to be important mechanism in HRE. However, evidences for efficacy and outcomes of treatment of HRE to submaximal exertion in individuals without hypertension or low grade hypertension is scarce and therefore warrants further studies. Presents small cohort of patients a total of 38 women and 46 men, aged 52±8 years, without evidence of cardiovascular disease, with a

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mean resting BP of 142±7/75±7 mmHg had their BP measured at rest and during submaximal treadmill exercise. LV mass was measured using trans thoracic echocardiography. For the majority of the subjects on the initial evaluation we discovered echocardiographic evidence of concentric hypertrophy. Among the resting and exercise BP indices, sub maximal SBP was the strongest correlate of LV mass ($r=0.40$, $P<0.04$). In multivariate analysis, maximal SBP was independently associated with LV mass a concentric LV hypertrophy, after adjustment for lean body mass and gender. Subaximal exercise SBP is a modest but still independent predictor of LV remodeling (grade and type of LV geometry) in population with prehypertension, I and II grade hypertension. These results raise the possibility that the SBP response.

On the perspectives of the study of the anxiolytic effect of plant species, endemic to caucasus

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Present article is aimed to welcome colleagues, interested in phytomedicine, to the collaborative study of the anxiolytic effects of the extracts of some plant species, endemic to Caucasus. Rat grooming, as well as rat behavior in Elevated plus maze, Forced

swimming test, Open field test, Light and dark box test and Punished conflict test, are suggested animal models of anxiety for the study of anxiolytic effects of endemic plant extracts. Earlier reports from the World Health Organization suggested that anxiety and related disorders will become the second leading cause of disability in both developed and developing countries by the year 2020. Present situation (War in Ukraine) represents an immediate cause of elevation in the level of anxiety with subsequent negative effect on human wellbeing. Taking into account the widespread use of plant extracts and their effectiveness in treating anxiety, as well as polyvalent treating capacity, absence of side effects and relatively low costs as compared to the use of prescription drugs, present article is aimed at promoting the study of the role of officinal plant species in treating anxiety in human beings. In particular, we would like to invite colleagues, interested in phytomedicine, to the collaborative study of the anti-anxious effects of the extracts of some plant species, endemic to Caucasus and to Georgia in particular.

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An Infected coronary artery stent, complicated by stent thrombosis followed by coronary artery perforation

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Approximately 5 million percutaneous coronary interventions (PCIs) are performed worldwide annually. Stent-related complications occur at a fairly low rate. The presented case describes a rare infection-related complex complications of PCI. An 46-year old non-diabetic mail developed a fever of unknown origin after six days from the initial Percutaneous Coronary Intervention (PCI) and was treated empirically with antibiotic therapy without suspicion on any iatrogenic infection. After two weeks from initial PCI a patient complained chest pain and with ST segment elevation myocardial infarction (STEMI) diagnoses was readmitted at our hospital. Early stent thrombosis was diagnosed by coronary angiography followed by second PCI. After some hours from the second angioplasty procedure acute stent thrombosis was developed. Coronary angiography revealed multiple extravasations on the site of thrombosis complicated with cardiac tamponade. A patient was urgently transferred to a cardiac operation theater. A Pseudomonas Aeruginosa (multirresistent) - was positive after coronary wall tissue histomorphological examination. The fever manifestation must be considered in the differential diagnosis during one or two weeks after initial PCI. Diagnosis is based on positive blood cultures and is helpful to manage treatment strategy.

Speech audiometry in the noise can be considered like gold standard for diagnostic of hidden hearing loss. Radiation measurements in dentistry

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When patients undergo X-ray examinations, millions of photons pass through their bodies. In dental radiography, the part of the head that receives the greatest dose is the skin in the area where the X-rays enter, including brain, salivary gland and thyroid. The effective usage of radiation in dental practice has been studied for many years and several guidelines have been proposed. While not high doses of radiation are associated with dental radiography in the field of using radiation in dentistry practice it is the most important to provide periodical radiation measurements for radiographs used in dental clinics, to measure such main X-rays specifications, as Kilovoltage Peak (kVp), Dose/Exposure, Dose/ Exposure Rate, Exposure Time - Radiographic Modes, Elapsed Time - Fluoro Modes, Average Pulse Rate - Pulsed Fluoro, Average Pulse Width - Pulsed Fluoro and Half-value Layer HVL. Besides these parameters of mAs spesifications da DoseMate specifications also must be measured. Quality control of radiological devices is very important. So, we plan periodical radiation measurements in more than 50 dental clinics in Georgia and hope that results of these measurements will be successful, encouraging. After the measurements, the results will be known to all stakeholders. We will also talk about them in our next publications.

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Biomechanical modelling of the lumbar vertebromotor segment L4-L5: The elastic model

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Pain in the lumbar spine is a disease that affects a significant part of society and has an important impact on the life quality and working capacity of the world's population. Osteoporosis, herniated disc, kidney disease in most cases are the first cause of low back pain. It is well known that the intervertebral disc L4-L5 is a weak link in the lumbar spine, so the need and relevance of the modelling problem of the lumbar vertebromotor segment already exists. The research aim is to evaluate, in the first approximation, the biomechanical behavior of the vertebromotor segment L4-L5 and the subluxation appearance of the facet joints. A mathematical formulation of the problem in a mixed form (combination of elastic task and ideal fluid task) for the vertebromotor segment L4-L5 is described. As a first approximation, it is permissible to use the elasticity theory for a rough assessment of the model functioning. The problem statement simulates the instantaneous traumatic loading of the vertebromotor segment L4-L5, in which the facet joints subluxation of the lumbar region immediately manifests itself. As an assumption, synovial fluid is assumed to be an ideal fluid. Distributions of displacements, stresses and deformations are obtained. The model results clearly show the subluxation existence of facet joints, but only qualitatively.

The importance of event marketing on the example of higher education institutions in Georgia

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The event marketing approach today is an independent industry. Many leading companies use this type of marketing. But the event marketing approach to education is a comparative innovation. Authors monitored universities for marketing approaches to capture the target market. Authors received information about the workload of universities and their status from official websites. The information about the marketing activities in the universities we collected on the basis of oral interviews with the administration and students and filling in questionnaires. In modern Georgia, the Education sector in Georgia is one of the well-developed structures, which is logically intertwined with the business sector. There are 86 Universities in the territory of Georgia some of them are LEPL, and the other parts are LTD and NNLE. It turned out that all metropolitan universities, especially the universities of the LTD and NNLE formation, resort to active marketing activities. Regional universities spend less money and time on these events. This is reflected in the prestige of the universities. It must be said that those universities in Georgia, where the event marketing plan is part of the organization's annual development work plan, can make great strides in terms of involving applicants, as well as in attracting students through mobility from other universities in the country.

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Speech audiometry indicators for diagnosis of hidden hearing loss in MP3 player users

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Study was conducted on the basis of the National Center of Audiology and S. Khechinashvili University Clinic. A population of 18 to 30 years of age was included in the study - 40 subjects and 15 individuals in the age group (50 to 55 years) were selected based on their willingness to participate in the study based on non-random complaint complaints at the clinic. The main group included 22 (40%) MP3 users, while the control group included 18 (33%) non-users and 15 (27%) persons in the middle age group. Of these, 37 (67%) were female and 18 (33%) were male. Auditory thresholds were measured monaurally by the pure tone audiometer within the band of 0.125-16 kHz frequencies. At the principal speech frequency link, 1-8 kHz, the thresholds in player music users did not differ from those in non-users. At higher frequencies from 9-16 kHz, however, the player music fans possessed greater thresholds more than 25 dB. In a noisy environment, speech audiometry in noise was performed to test the ability to correctly distinguish words. By examining the results of speech audiometry, it was found that out of 100 words and then they repeat them. Mp3 player users had worse result than adult group, higher understanding results had non-users. The process of hearing disturbances along with a group-systematic character seemed thus to own an individual-sensitive quality also. Systematic audiometrical inspection of personal music player

followers is recommended for an in-time disclosure of a hearing disorder and an immediate start then of corresponding treatment and preventive means. The hearing testing has to include high tone frequencies, 9-16 kHz.

The Impact of Vaccination on COVID-19

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The coronavirus disease 2019 (COVID-19) pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) became a challenge globally by affecting millions of people worldwide. COVID-19 vaccination is an effective option to stop disease outbreak. COVID-19 vaccines are fully approved or currently authorized for use through Emergency Use Authorization (EUA) from the Food and Drug Administration(FAD) are essential for controlling the COVID-19 pandemic. Despite COVID-19 vaccines are effective; some fully vaccinated persons can be infected with SARS-CoV-2 called breakthrough infection. Observing COVID-19 results in populations by vaccination status is simplified through dependable correlation of COVID-19 case surveillance and vaccination data. The incidence of SARS-CoV-2 infection, hospitalization, and death is elevated in unvaccinated than vaccinated persons, and the incidence rate ratios are related to vaccine effectiveness. We conducted a retrospective analysis of medical reports of 169 patients with confirmed COVID-19.

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We assessed vaccine effectiveness against COVID-19 and against hospitalization with COVID-19 in the Infectious Disease, AIDS and Clinical Immunology Research Centre, Georgia from April 1 through October 31, 2021. Our study indicates the vaccine effectiveness against COVID-19. Hospitalization rate were higher in unvaccinated patients compared with vaccinated patients. Vaccination is considered to be one of the most important advances in public health. There are many people who are not vaccinated. It is important to create the awareness about COVID-19 vaccines and educate people about the importance of vaccine and its effectiveness.

Protective Role of SARS-CoV-2 Vaccine against severe disease and mortality in hospitalized patients with COVID-19

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Vaccination is the major source of specific prevention of COVID-19. It is important to assess its efficacy in terms of protecting infected patients from complicated disease and death. We aimed to study the protective role of the vaccine in hospitalized patients diagnosed with COVID-19 to assess its efficacy in decreasing the need of prolonged stationed care, impact on the disease severity and mortality. We conducted a retrospective randomized cross-sectional study on the patients of the First University Clinic of Tbilisi State Medical University. Only 17.5% of randomly chosen 325 hospitalized patients were found to be vaccinated. About half of

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this vaccinated patients had not received second dose. The duration of hospitalization period was 1.2 times longer in fully vaccinated patients compared to unvaccinated ones. Mortality rate was 3.73% in unvaccinated patients, while the same value equals 0 in the patients that received at list one dose of any vaccine. Unvaccinated patients are at relatively higher risk for getting severe infection and being hospitalized. During the hospitalization period positive history of vaccination was associated with decreased prevalence of various complications, the need of intensive care and mortality.

Association of hepatitis-c with liver cirrhosis and hepatocellular carcinoma - a case study

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Hepatitis-C virus infection (HCV) is endemic in many countries of the world including Georgia. Georgia has a high burden of HCV infection with an estimated 5.4% of adult population (1,50,000) people have identified with HCV. According to NCDC (National Centre for Disease Control and Public Health from May 2015 national HCV programme have been launched, supported by the American company “Gi lead” and the government of Georgia. Our main goal is to investigate and manage the hepatocellular carcinoma. According to the study done from the patient at Infectious Disease AIIDS and clinical immunology scientific research centre it has been found that in 57-year-old male patient

who was chronically infected with HCV, cirrhosis, the virus has been directly associated with the development of hepatocellular carcinoma. He was diagnosed as chronic hepatitis-c and liver cirrhosis (genotype 3a). Treatment with pegylated interferon and DAA (direct acting antivirals) for 6 months was continued. Treatment finished without side effects but after 6 months HCV RNA was detectable or patient relapsed. In 2015, the patient was switched in elimination programme and antiviral treatment combined with interferon for 12 weeks. Sustained viral response developed 6 months after termination of therapy. The alpha-fetoprotein is important tumour marker and was elevated around 583 μ/l. Ultrasound didn't reveal any lesion but after MRI scan 3rd grade hepatocellular carcinoma was confirmed. Following 2015 every month patient has been assessed for liver function tests, total bilirubin, complete blood count, alpha-fetoprotein and ultrasound investigation and as a result liver enzyme found to be elevated. It's crucial for every patient (end stage of liver disease) to undergo ultrasound investigations, liver function test for further follow up.

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Electromagnetic field, conduct cross in the open field and neurochemical correlate blood and urine on the background of the supply of oils of grape seeds

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The influence of an electromagnetic field (EMF) - network frequency causes minimal CNS dysfunction in Wistar rats in ontogenesis, which is expressed by a decrease of the levels of glutamate and aspartate, methionine and serine, in the blood - lysine, taurine, tyrosine, catecholamine and serotonin, an increase GABA and glycine in the blood, proline and cysteine in the urine. The ratio of excitatory/inhibitory mediator amino acids is significantly reduced. The ratio of essential/non-essential amino acids and the total level of amino acids also decrease in the blood. Against the background of taking the herbal preparation (grape seed oil), the identified changes disappear or smooth out, which is manifested in the behavior of rats in the open field - the animals are characterized by a smaller number of urinations and boluses, an increase in the total time of grooming and a small number of translocations.

New study of pulmonary hypertension

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Pulmonary hypertension (PH) is a group of diseases characterized by a progressive increase in pulmonary vascular resistance. Increased pulmonary resistance causes right ventricular heart failure and premature death of patients. The prevalence of pulmonary hypertension in the general population can be as high as 20-50 per 100,000 populations. Idiopathic pulmonary hypertension develops in young women between the ages of 20 and 40. In men, this disease is less common. Secondary PH develops in various chronic lung diseases and diseases accompanied by hypoxemia, as well as in the pathology of the left heart, chronic pulmonary embolism and other pathological processes accompanied by a violation in the pulmonary vascular bed. In recent years, considerable attention has been paid to the study of this issue, and the problem of timely and effective diagnosis and treatment of pulmonary hypertension is very relevant. It is necessary to highlight the following areas in order for the diagnosis, treatment and prevention of pulmonary hypertension to be successful. In the article we will analyze what is Definition Pulmonary hypertension. The definition of PH is an increase in mean pressure in the pulmonary artery of more than 25 mm Hg. Art. at rest and more than 30 mm Hg. during physical exertion. Specialists of various fields (cardiologists, pulmonologists, rheumatologists, etc.) in the world use the terms "primary or secondary PH" instead of the term pulmonary hypertension. This term refers to an increase in pressure in the pulmonary circulation. We often use the term LS, which defines changes in the right ventricle (hypertrophy and / or dilatation), which are caused by an increase in pressure in the pulmonary circulation.

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Rheological Disorders in juvenile rheumatoid arthritis and rheumatoid arthritis in adults

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We conducted a comparative analysis of the rheological properties of blood in juvenile rheumatoid arthritis and rheumatoid arthritis in adults. In order to determine the rheological properties, we examined the aggregability of erythrocytes and the deformability of erythrocyte membranes in all patients using original methods. The article presents preliminary research data at the initial level. A multidisciplinary team consists of clinical rheologists, internists, rheumatologists, pediatricians, epidemiologists, health professionals, the compliance of research methods is encouraging that by the end of the project it will be possible to reveal new pathophysiological aspects of juvenile rheumatoid arthritis and rheumatoid arthritis in adults, which will favorably affect the treatment and personification of patients.

The dimensionalization of schizophrenia (overview)

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This article shows some different fundamental and practical approaches in modern psychiatry. Still, the understanding of the real nature of schizophrenia remains obscure. Limitations of approaches to conceptualizing and classifying schizophrenia based on a priori assumptions and expert consensus led to new efforts to classify schizophrenia quantitatively. This article is devoted to these and other issues. Since the first descriptions of schizophrenia, our understanding of its real nature remains obscure. The special status of schizophrenia, whether it is a "discrete categorical entity" or "continuous dimensional phenomena", is still unclear. Whether schizophrenia is best conceptualized and classified in categorical or dimensional terms is a contradictory issue and is still widely debated. The category versus dimension debate is dramatically increasing with the growing recognition of traditional categorical taxonomies' limitations. The significant restrictions concern inadequate validity, marked within-diagnosis heterogeneity, arbitrary diagnostic thresholds, excessive comorbidity, and limited clinical utility of categorical diagnosis. The criticism of diagnostic categories contributed to developing alternative and complementary perspectives towards improved classification models. Now and then, the question was whether the categorical construct of schizophrenia should be abandoned in favour of dimensional one or whether additional variables can complement it. Those who recognize the

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category/dimension dualism in schizophrenia, like wave/particle dualism in quantum mechanics, consider changing the debate's focus. They suggest thinking "category and dimension" instead of "category or dimension". The integration of dimensional elements into the official classification systems such as DSM/ICD is a long-standing scientific effort to address the shortcomings and conceptual ambiguity, as mentioned above, and move toward empirically-based psychopathology. The present review aims to explore the trajectory of gradual dimensionalization of schizophrenia, which has significant implications for both research and clinical practice.

Computed tomography guided percutaneous transdiscal splanchnic nerve block for cancer pain treatment. Case report

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Two cases of percutaneous transdiscal splanchnic nerve block for cancer pain treatment presented. Case 1. 50 years old man with pancreatic head and trunk cancer T4N1M0. Patient's condition: intractable pain in upper abdomen during last two weeks,

dysphagia, weight loss. Cholecysto-entero, gastro-entero and entero-entero anastomoses performed under epidural+general anesthesia. During 7 postoperative days pain relieved by continuous epidural anesthesia (0.2% ropivacain 5ml/hour). On postoperative day 8 epidural catheter removed due to dislodgement. Morphine sulphate 10 mg iv injections with 4 hour intervals and cox-2 pathway inhibitors was not sufficient for pain relief (pain score - 6-8 VAS). Splanchnic neurolysis performed on postoperative day 14. Patient laid in prone position on the computed tomography table. After marking of injection sites, definition of needles traces and deep local infiltration with 1% lidocain, two 22 gauge 20 cm Chiba needles had been inserted transdiscally on the level of T12/ L1. Pain relieved after injection of 4 ml 2% lidocaine on each side10 ml 10% aqueous phenol had been injected on each side for neurolytic block 0.1 g cefazolin injected intradiscally Patient had complete pain relief until day 5, when he felt severe continuous pain on his upper right abdomen. After two weeks of follow-up incomplete right splanchnic block diagnosed and to perform of repeated right side splanchnic neurolysis had been decided. On day 14 after 1-st neurolysis, a 3½ inch 25 gauge Quincke needle had been inserted in right retrocrural space on the level of L1. After contrast and 4ml 2% lidocaine injection, 15 ml 95% alcohol injected Pain relieved completely. No additional analgesia requirements lifetime (10 weeks). Case 2. 62 years old male with gastric cancer. Cancer recurrence after partial gastrectomy and severe intractable abdominal pain. 120 mg morphine hydrochloride daily, pain score 6-8 VAS. T12-L1 computed tomography guided transdiscal splanchnic nerve block performed in patient prone position. After marking of injection site at left side from vertebral column and deep infiltration with 1% lidocaine, a 22G 20 cm Chiba needle had been inserted. 0.1g cefazolin injected intradiscally. Intervertebral

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disk penetrated centrally and contrast spread was equal on both sides between aorta and L1 vertebra. Pain relieved after injection of 5 ml 2% lidocaine and 15 ml 95% alcohol. After procedure pain score - 3-4, patient was needed in 10 mg morphine hydrochloride and 150 mg lyrica daily. Computed tomography guided transdiscal splanchnic neurolysis is a safe and effective treatment tool for upper abdomen cancer pain relief. In cases of incomplete neurolysis repeated neurolytic block may be helpful.

Application of computational fluid dynamics (CFD) and fluid-structure interaction (FSI) in biofluids simulation to solve actual surgery tasks

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Computational fluid dynamics (CFD) is a dynamically developing tool in mechanical engineering and interdisciplinary research. Medicine is one of the areas, where the application of current computational methods is extremely necessary. This study presents the results of using computational fluid dynamics methods to solve actual problems of surgery (modeling of blood flow in the patient-specific aorta of a child with congenital heart disease during bypass surgery; modeling of the flow of bile in the biliary system to predict cholecystectomy outcome; modeling of the chime flow in the colon). Simulation of blood flow in the aorta during shunting. Cardiovascular diseases are most common in the population and cause the prevailing part of premature mortality

and disability in both adults and children. Blalock-Taussig shunting is mainly used to eliminate pathological changes in children. However, this procedure is carried out empirically: surgeons use their own experience. FSI enabled to numerically evaluate the shunt parameters and its location for proper lung development in children with congenital heart disease after shunt installation. Biomechanical analysis of the bile flow in healthy state, pathology, and after cholecystectomy. Cholecystectomy (removal of the surgical gallbladder) is usually taken to treat patients suffering from gallbladder disease and gallbladder pain. However, it should be noted that the results of the operation are not always successful. The biomechanical patient-specific model was created to assess the cholecystectomy outcome. Study of the chyme flow features in the colon. The large intestine is a long hollow muscle tube of complex shape, which digests and absorbs nutrients and water from food (which is commonly called chyme in medicine). The goal is to create a patient-specific model of the chyme and feces flow in the colon in the healthy state and pathology. Clinical applications of this model can be expressed in the description and understanding of the causes of the disorders as well as drug efficiency assessment to reduce the number of patient.

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Rheological parameters as prognostic factors in blood loss

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The aim of the work was to study the rheological status in experimental blood loss of varying severity. The experiments were carried out on out bred male rats. Depending on the severity of blood loss, the animals were divided into subgroups. In each subgroup, the erythrocyte aggregation index, erythrocyte membrane deformability index, and blood plasma viscosity were measured. As a result of statistical data processing, it was found that in case of blood loss of any severity, erythrocyte aggregation plays a leading role, followed by the blood viscosity parameter, and changes in membrane deformability are significant only in the decompensatory phase. Thus, it is once again emphasized that with blood loss, the presence of a persistent, starting from the first stage, changes in the rheological status, which mainly depends on

the profile of erythrocyte aggregation. These experimental data, coupled with changes in the viscosity and membrane deformability of erythrocytes in the later stages of blood loss, lead to the idea of a careful use of the mass of erythrocytes for the treatment of critical conditions caused by blood loss. Continuation of experimental studies and translation of their findings into clinical medicine will most likely improve treatment tactics and increase its effectiveness in the treatment of patients with hemorrhagic shock. In recent years, the death rate of the world's population has exceeded the birth rate. The increase in the mortality rate of the population is primarily due to the pandemic caused by the new corona virus. Pneumonia, heart attacks, strokes, diabetic commas, tumor processes against the background of corona virus caused even more deaths than in previous years. In the leading role of the list hemorrhagic shock. Hemorrhagic shock against the background of urbanization, man-made disasters caused by the increased armament of the planet, wars, natural disasters is the cornerstone of resuscitation and critical care medicine. Despite the well-known algorithm of replacement infusion therapy, the rate of disability and mortality in this pathology remains high. This is a complex pathophysiological process with an unexplored mechanism. Against the background of microcirculatory and metabolic disorders with blood loss, hypovolemic shock is formed. In some cases, treatment with blood-substituting solutions, donor blood has a positive effect, but often gives complications associated with the irrational use and incorrect tactics of treatment with these substances.

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Study of crazing technology in apply rheology

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Crazing is the development phenomenon of fine cracks on the surface. Crazing frequently precedes fracture in some glassy thermoplastic polymers. Theoretical rheology helps for numbering this process. Polymer crazing is a relatively new, efficient, and high-tech approach to creating nanocomposite polymer materials. Crazing helps incorporate targeted additives into polymer films and fibers. This provides the fiber or film with new useful properties: incombustibility, bactericidal activity, etc. Using crazing, we can continuously give polymer films and fibers a transverse relief, which is fundamentally impossible to create with the traditional method of manufacturing synthetic fibers (using the traditional method, you can create only a longitudinal relief). Crazing technology is fully linked to rheology issues. The detail study in crazing of different solutions is an innovative approach. Our work continues in the direction of practical rheology, in which our Georgian colleagues help us, a lot.

Methodological property for study of resistive arteries resistance as diagnostic method in arterial hypertension

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The article draws on resistive vessels (vessels of resistance), which include precapillary (small arteries, arterioles, precapillary sphincters) and postcapillary (venules and small veins) vessels. The article discusses a new non-invasive method for studying resistive arteries. The article considers their diagnostic role in arterial hypertension. In the section of the new recommendations of the European Societies of Cardiology and Arterial Hypertension (2018 ESC/ESH Guidelines for the management of arterial hypertension) on instrumental methods for the treatment of arterial hypertension - "Bevice-Based-Treatment" (DBT) it is recommended to measure systolic central aortic pressure for accurate differentiation of false-positive hypertension, for the diagnosis of isolated systolic arterial hypertension in young people. In this cohort, increased pulse pressure amplification is observed, as a result of which systolic blood pressure, measured by manometers, often does not correspond to

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central aortic pressure. Central aortic pressure measurements will make it possible to avoid diagnostic inaccuracies, reduce the use of hypertensive drugs, which will positively affect the occupational health of the younger generation.

Some aspects of research on interpersonal relationships and motivations of healthcare professionals

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The modern theory and practice of medicine, as well as a number of other methological (helping) disciplines and practices, have been supplemented by a very productive area called "evidence-based medicine". Its occurrence is associated with a large number of bioethical problems, including the problem of the conflict of interests between a doctor and a patient. A conflict of interest is born as a result of conflicting motives of relationships and interactions between the activities of a medical worker. The contradiction of interests and motives of activity is manifested in the phenomena of professional psychological burnout and professional deformations. The article highlights the main motives contributing to the conflict of interest, as well as ways of preventing and correcting conflicts of interest in connection with the implementation of these motives. Among the main motives, one can name the motives associated with the unresolved personal and interpersonal problems of a specialist: his need for power and control, for confirmation and for belonging.

Theoretical issues of health improvement

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Healthcare is a dynamic-functional system of society. The functioning of this system during the pandemic and the post-pandemic period has taken new forms. The development and refinement of healthcare at every step is essential to the introduction of complex measures aimed at each individual, ultimately enabling the maintenance and continuous improvement of the health of the whole community. In such an important and ongoing process, there is a list of problems that need to be addressed by consolidating specialists in many areas. One of the major problems in Georgia is the implementation of measures to improve the primary health care system. Despite many attempts and sufficient financial support from both international donors and the Georgian government, the reorganization is not being carried out at a sufficient pace, sometimes the problem itself is deep and difficult to eliminate. This can be evidenced by the negative assessments of the population as well as the medical staff employed in the primary health care facility and distrust towards the primary health care system. This is facilitated by the creation of numerous alternative services. There is no doubt about the advantages of setting up diagnostic centers, family medicine centers, and emergency centers. For example, financial contributions increase in the employment rate of doctors and so on. However, often such institutions fail to meet requirements such as access to the primary health care system, patient satisfaction (adequacy and high quality of medical care provided). Meanwhile,

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a so-called Vicious circle is developed. The state, foreign donors, and the medical community, despite many attempts, have failed to ensure a perfect management of material base and resources. One of the goals of the structural-organizational changes of the system may have been to reform the primary health care institution into family medicine centers. Today, trained family doctors working in family medicine centers are well able to realize the acquired qualifications. The Municipal Social Insurance Program has long proven the superiority of family physicians over district therapists and pediatricians. Data from the World Health Organization confirm this. According to the pre-pandemic period, considering the purchasing power parity of the population of Georgia, the share of own funds spent by one patient is much higher compared to most countries in Europe and Asia. Currently, under pandemic conditions, this difference is maintained. A comprehensive analysis of the socio-economic effects of primary health care will enable us to develop and expose scientifically sound recommendations based on the results obtained.

Work from home. Reality in a pandemic situation

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The Coronavirus (COVID-19) pandemic has led to the biggest number of employees globally bound to work remotely. The people working from home required awareness and knowledge of phishing scams, the fastest growing type of cybercrime, many of which are now playing on fears of the Coronavirus. Employees from organizations of all sizes and types now have minimal cyber

security resources, if any, compared to what is normally available to them. Organizations are required to ensure any endpoints that an employee is using are fully protected. As the Absolute 2019 Global Endpoint Security Trend Report showed, 42 per cent of endpoints are unprotected at any given time. As home-working becomes the new normal, criminals are seeking to capitalise on the widespread panic - and succeeding, alas. New coronavirus-themed phishing scams are leveraging fear, hooking vulnerable people and taking advantage of workplace disruption. Therefore, the people working from home should immediately get educated about their cyber privacy and cyber security failing which the global cybercrime damage may costs as much as double by the end of this yearnal health perspective angle (RP).

Effects of the COVID-19 pandemic on care of out-of-hospital cardiac arrest in Detroit

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March 10th, 2020 marked the first positive case of SARS-CoV-2 in Detroit. EMS protocol changes were implemented by March 25th, 2020 in response to the virus. These modifications restricted intubation and allowed medical control to terminate resuscitation in cases of suspected COVID-19 after 10 minutes of CPR without ROSC. Due to global changes in pre-hospital cardiac arrest care caused by COVID-19, we conducted an analysis to determine OHCA characteristics of patients and fatality rates in the COVID-19

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era. CARES data was analyzed between March 10th, 2019 - April 30th, 2019 and March 10th, 2020 - April 30th, 2020 for comparison before and during the pandemic. Patient demographics, location of arrest, initial rhythms, bystander CPR, EMS interventions and field termination were compared between the two time points. No major factors occurred in 2019 that would potentially skew that data. Descriptive statistics were utilized. A total of 475 CARES patients were included during the study period. Total arrests surged in the COVID-19 era from 180 to 295. OHCA for individuals greater than 50 increased from 130 to 243. An initial rhythm of PEA tripled (10 to 30) during COVID-19, possibly due to hypoxia. The percentage of patients with a shockable rhythm declined (7.8 to 5.1). Bystander CPR decreased from 28.9% (52) to 18.3% (54), secondary to an increase of arrests being in non-public places and concern about disease transmission. Nursing home cardiac arrests increased during COVID from 19 to 73, from the previous year. Placement of an endotracheal tube or supraglottic airway by a basic or advanced unit decreased from 68.3% (123) in the pre-COVID-19 era to 37.0% (109) in the current state of the pandemic. Termination of resuscitation in the field occurred over 3-fold from the previous year, an absolute increase from 64 to 204.There was a 61% increase in cardiac arrests during COVID-19 in Detroit. The pandemic and subsequent protocol changes greatly altered practice. COVID-19 has likely directly and indirectly, due to fear of going to the hospital, affected the number of out-of-hospital cardiac arrests (RP).

Applied rheology in the food industry

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Some technological processes in the food industry are associated with mechanical stress on a product in a viscoplastic state. In the bakery industry, this is dough kneading, dough division, and molding of dough pieces. In the production of confectionery, it is mass plasticization and molding, extrusion, cutting, etc. Of great importance is also the interoperational transportation of the semi-finished product through pipes on various conveyors. In all these cases, the choice of technological equipment, the determination of the mode of its operation is determined by the physical and mechanical properties of the product and rheological properties of processed or transported food masses. It is necessary to study the whole complex of physical and mechanical properties. These properties characterize the behavior of food masses under the action of mechanical loads from the working bodies of machines. An objective assessment of the quality of food and semi-finished products is of great importance in the food industry. Creation and application of methods for objective quality control, provides not only the replacement of organoleptic control, but also creates the prerequisites for the development of automatic control systems for technological processes of food production. Currently, the food industry has a fairly large and varied arsenal of technical means for determining and studying the physical and mechanical properties of food materials on various preparation stages: from raw material to finished product. To study these properties, serve rheological methods. In our study, it turned out that streamlining the rheological properties of food products has a positive effect on the usefulness of the finished product.

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Polymer architectures of polymer melts

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The investigate of viscoelastic properties of complex, entangled polymer architectures, study of the molecular origin of their relaxation processes and in particular, their constraint release mechanisms are very important. The study of viscoelastic response of polymer melts or concentrated solutions, we have developed a general coarse-grained approach based on the tube model, that we are now using as a predictive tool in order to investigate the viscoelastic properties of complex, entangled polymer architectures. We have extended this approach to describe the complex rheology of entangled macromolecular self- assemblies built from sticky polymers, and use our model as a new tool for an in-depth analysis of their viscoelastic properties. In particular, we have investigated the dynamics of a series of model telechelic linear and star polymers which create a reversible network through metal-ligand association, and study the effect of blending different architectures on the network relaxation. We also we have investigated the behavior of entangled polymers bearing stickers along their backbone. Our studies showed the dynamics of these associating polymers strongly depends on the ratio between entanglements and stickers density, as well as on the ratio between their association and disentanglement times, leading to a large variety of viscoelastic responses. Understanding and tailoring the viscoelastic response of polymer melts or concentrated solutions from the knowledge of their molecular structure (architecture) represents a formidable challenge and remains a prime field of soft matter research. This is one of very significant direction of theoretical and practical rheology.

New approaches of medical tourism

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General medical tourism can be defined as the process of traveling outside the country of residence for the purpose of receiving medical care. Recently, however, medical tourism has become an economic direction and together with healthcare is a powerful body providing services in the field of diagnostics, treatment, rehabilitation, disease prevention. In medical tourism, as well as in tourism, in general, there are foreign and domestic directions. If we consider a country as a host country, this is regulated by different laws compared to when our tourist leaves for another country. All these differences and patterns are reinforced when the issue is related to medical tourism. Plus, the importance of the question increases in order to formulate the tourist's habit of visiting a certain clinic. In medical tourism, as well as in tourism, in general, there are foreign and domestic directions. If we consider a country as a host country, this is regulated by different laws compared to when our tourist leaves for another country. All these differences and patterns are reinforced when the issue is related to medical tourism. Plus, the importance of the question increases in order to formulate the tourist's habit of visiting a certain clinic. Georgia is not yet a leader in this direction. However, certification, licensing of clinics and laboratories in Georgia is being actively pursued. The increase in the volume of patients from other countries to the hospital sector in Georgia will strengthen our economy. However, the development of this direction requires continuous research and monitoring (RP).

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Tax privileges for medical sector

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The new corona virus (COVID-19) has presented a daunting challenge and significant threat to not only the world healthcare but the economy as well. The events that unfolded in 2020 highlighted the importance of having a well-developed medical sector. Tax policy is aimed at creating an attractive and favorable tax environment for the development of the private sector and foreign investments as well as for starting up and developing businesses. Creating an attractive and favorable tax environment is important for all areas of business. Under the conditions of a market economy, undertakings operating in the healthcare system are business entities established to generate revenues and compensation. Therefore, due to the nature of their activity, business entities are subject to the regulations of the Georgian Tax Code and regarded as federal taxpayers (for income tax, profit tax, value added tax (VAT), excise, and import duty) and local taxpayers (for property tax). In 2017, Georgia introduced a profit tax reform changing the taxable object and defining for resident undertakings, instead of the difference between gross income and deductible amounts, payment of dividends to shareholders, costs incurred or other payments not related to economic activity, gratuitous delivery of goods/services or/and transfer of funds, and representative costs incurred beyond the limit set by the Georgian Tax Code. Value added tax accounts for a large chunk of the budget receipts in the Georgian State Budget. Implementing a VAT reform, starting from 2021, the Ministry of Finance of Georgia set in motion new legislative regulations focusing on tax privileges in the medical and social sector. In particular, inpatient, outpatient medical services and treatment

services as well as the provision of services directly related or ancillary to them by persons authorized by Georgian law to engage in medical practice are exempt of VAT. Medical services provided by persons authorized by Georgian law to engage in medical or/and paramedical practice are also exempt. The tax privilege applies to the supply of products manufactured in Georgia for treatment/medicinal purposes or of pharmaceuticals manufactured by a pharmaceutical company. Tax privileges also apply to the import of products intended for treatment/medicinal purposes - the import of medical X-ray films, medical diagnostic test systems, glucometers (the systems of which have been approved by The Ministry of Internally Displaced Persons from the Occupied Territories, Health, Labour and Social Affairs of Georgia) is exempt. Besides, a special tax privilege applies in relation to property tax. In particular, assets used for medical activity as well as lands attached to medical institutions and used for medical activity are tax exempt. Thus, the special tax regime provided for business entities operating in the Georgian medical sector allows re-investment and business expansion that ultimately helps strengthen the public healthcare system. All of this is tremendously important for a long-term development of the country and takes on special significance during the current pandemics caused by COVID-19 (RP).

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Some Rheological properties in patients group with and without COVID-19

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The description of the analytical clinical and experimental data has been presented for patients with COVID-19 from different countries. The article presents detailed description of the rheological situation in patients with neuropathic and cardiological problems, as well as the "COVID toes", during development of COVID-19 infection. The data was compared with results of rheological studies in analogical groups of patients without COVID-19. The disease "COVID toes" was compared with Raynaud' phenomenon). The article describes the effects of various anticoagulants on blood rheology and prevention coagulopathies after describing Protocols. In vivo and in vitro experiments evaluating a range of rheological parameters under different anticoagulants' influence, were analyzed, RBC aggregation, RBC deformability and plasma viscosity were examined with innovative measurement technologies and quantitative methods. The work presents a new scientific focus and research area, able to "transport" the newest experimental and analytical conclusions to the clinical practice - for successful management and treatment of COVID-19 Pandemic.

Cancer immunodiagnostics and the discovery of immunotherapeutic agents with peptides microarrays

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Cancer is one of the leading causes of death in the world. Early detection of cancer is critical for effective therapy. For early detection of malignant neoplasms, specific marker molecules are required. Circulating antibodies, against tumor-associated antigens, are promising markers that can be detected using non-invasive methods in the blood of patients in early stages of cancer development. We have developed microarray containing more than 300 thousand peptides with random amino acid sequences which can be used for the analysis of circulating antibodies repertoire without knowledge of specific antigens. Using these microarrays, mimotope peptides were identified that specifically interact with circulating antibodies of breast cancer (BC) patients. Moreover, peptides have been identified that specifically interact with the circulating antibodies of patients with different molecular subtypes of breast cancer (luminal A, liminal B, and basal-like). The identified peptides will be used to develop non-invasive diagnostic tests to detect breast cancer before symptoms appear. An important clinical question is what to do when cancer is detected at an asymptomatic stage,

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and there is no way to visualize its localization. Discovery of immune checkpoints of the B7 family, such as CTLA-4 (CD152), PD-1 (CD279), as well as their ligands B7-1 (CD80), B7-2 (CD86), B7-H1 (PD-L1, CD274) and B7-DC (PD-L2, CD273) opened up new possibilities for cancer immunotherapy using monoclonal antibodies (mAb). Injection of mAb against immune checkpoints can stimulate the patient's antitumor immunity and lead to tumor rejection, regardless of its location. However, mAb have several disadvantages, such as high cost, low oral bioavailability, poor tumor penetration, immune side effects, etc., which limits their clinical use. Compared to mAb, peptide immune checkpoint inhibitors have a lower molecular weight, which provides better tumor penetration and more controlled pharmacokinetic and pharmacological profiles. Accordingly, we have used peptide microarrays to discover and develop peptide-based checkpoint inhibitors as an alternative to mAb. We discovered a peptide containing 14 amino acids that specifically interacts with the CTLA-4 protein. The 3D model shows that this peptide binds to the 99MYPPPY104 loop of the CTLA-4 protein and potentially blocks contact of the CTLA-4 receptor with its ligand B7-1. Experimental data confirm the specific interaction of the synthetic peptide with CTLA-4 and its ability to partially block the binding of CTLA-4 and B7-1. The identified synthetic peptide can be used to develop new inhibitors of immune checkpoints that can block the functional activity of CTLA-4 in cancer immunotherapy (RP).

Inflammatory markers of blood serum as an early predictor of chronic diseases in the rural population of Sachkhere district in Georgia

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To identify the molecular correlates of non-communicable chronic disease risk in the territory of Upper Imereti. Practically healthy residents of the Sachkhere district were examined. In the blood serum samples of patients, the cytokines (IL-1α, IL-1β, IL-12, TNF-α, IL-6) and NOx content, as well as the total antioxidant activity of the non-enzymatic system (TAA) were determined. Study results show, that in Sareki inhabitant's blood serum levels of the IL-6, and NO increased ($p=0.004$, $p=0.05$), levels of the IL-1α tended to increase ($p=0.057$) compared to the corresponding values of the Chorvila inhabitants; in Chorvila inhabitants' indicators of blood serum TAA were lower than in Sairkhe and Sareki ($p=0.001$, $p=0.045$). The statistically significant differences in the levels of the IL-1β, IL12, and TNF-α in the blood serum of the inhabitants of Sachkhere district villages were not revealed. The alterations of the indicators of immune and oxidative status in the practically healthy populations of the Sachkhere district villages toward pro-inflammatory, and early revealed associations between population morbidity and TAA values allow us to suggest considering immune (IL6, IL-1α) and redox status deviations as markers of predisposition to chronic diseases. It should also be noted that, since each indicator

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belongs to the class of pleiotropic markers, only their complex can be considered as an early predictor of risk.

Speech development by impact on the cerebellum

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The process of child speech development is quite complex. For correct speech he must have the necessary vocabulary for his age, must actively use these words, be able to use grammatical forms, pronounce sounds and words correctly, formulate thoughts clearly, understand the conversation of peers and adults. Despite the progress and development in all areas of the medical, the number of children with problems in peech disorders is still increasing. Speech anomaly has a negative effect on the formation of a child's normal psyche, which makes it somewhat difficult to master learning habits and knowledge. Many years of speech therapy experience have shown that most children with speech disorders have a lot of disorders, sush as disorders uditory attention, writing and reading skills (dysgraphia, dyslexia), and the ability to perform consistent actions (dyspraxia). Have behavioral disorders, autistic spectrum disorders, mental retardation and speech development, phonetic-phonological disorders. Specialists in the process of working with children we use special exercises, but over time becomes boring. To improve the results I use a set of different activities that help me get better results faster. This is the use of music, balance pads in the speech therapy process. The music helps to develop a sense of rhythm and creates a positive emotional background, while the balancing pillow stimulates the cerebellum. The cerebellum

is not only the area of the central nervous system responsible for coordination and balance, but also the key to a child's speech, intellect, and emotional development. It is possible to develop thinking and cognitive skills by performing multiple and correctly selected exercises on the balancing pad. Consider one of the exercises: the child stands on a balance and performs a rhythmic movement accompanied by music (imitation of a dough roller). Speaks words, words, counts, reads a simple poem, or completes a task assigned by a speech therapist. Verbal task is necessary in motion, ie when moving from one balance to another. It is advisable to balance 5-6 and different colors which will help to study and reinforce the naming of colors. I use these activities to work in Tbilisi 103th Kindergarden. Children have significantly improved motor skills, coordinated eye and hand movements, cognitive areas (memory, perception, speech, thinking), behavior, attention span, and in a short time the acquired sounds are reinforced in speech. These exercises can be used by anyone who communicates with children and is involved in the child's development.

Biomechanics and Virology

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There is a growing understanding in the world of science that success in the competition between the microcosm and the macrocosm requires the unification of a number of sciences: biomechanics, virology, neurology, reconstructive medicine, digital medicine and other sections. For example, hydrodynamics allows one to perform a mathematical analysis of the movement

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of biomarkers. Microfluidic technologies have had a significant impact on biomedicine since their introduction to biomedical engineering in the early 2000s. Like a motherboard for electronics, they provide a convenient platform for integrating various individual experiments and allow you to automate some laborious and time-consuming tasks. The COVID-19 pandemic has exposed the limitations of the current method of disease detection, even in the most developed regions of the world. While reliable diagnostics can be performed, there is still a need to improve the way the process is accelerated to increase the detection throughput.

Comparative assessment of macro-, micro- and molecular rheological factors in patients with ischemic stroke. (Preliminary results)

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Currently, the main cause of death in the developed countries of the world are diseases of the circulatory system, including vascular diseases of the brain. The development and implementation of new programs and methods for diagnosing, treating and preventing cerebrovascular diseases is the most important medical, social and economic task. Prioritization of

fundamental studies in the fields of neurology and angiology has been the study of pathophysiological mechanisms of ischemic stroke development, as study of rheological properties. Our goal was to study a group of patients with ischemic brain stroke. Our group was from 10 people with an average age 72±5,4 years, the control group consisted of volunteers aged 69±2,3 years (n=12). All subjects underwent the following studies 1) To monitor acrorheological factors, we examined hematocrit and plasma viscosity. For this we used HumanCounter, Germany. 2) To monitor macrorheological factors, we studied the aggregability of erythrocytes and the deformability of erythrocyte membranes. For this we used the texture analysis method and the filtration method. It turned out that in the group of patients with ischemic stroke, all parameters were changed, but the percentage of significant destruction was most observed in the direction of microrheological factors, more precisely, the aggregation of erythrocytes changed by more than 2 times compared to the control group. Our preliminary experiments have shown that erythrocyte aggregation is a necessary parameter for assessing blood rheology.

Taking into account the peculiarities of the pubertal period in the work of voice therapists

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Puberty is the period when the body changes during puberty. The result of these changes is the development of secondary sexual characteristics in the boy. Along with this, the mass and structure of organs and tissues of a teenager change. The muscles of the

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vocal folds are richer in motor receptors compared to the rest of the muscles of the larynx. Due to the uneven growth of various parts of the vocal apparatus, voice changes occur. If the voice range of girls and boys from seven to ten years is the same and is approximately equal to an octave, ten to four eleven years - a little wider, in fourteen-sixteen-year-olds, the voice range expands, it can reach two octaves. In the process of ontogenesis, the mechanism of phonation changes. From birth to 7 years of age, the falsetto mechanism of phonation predominates, with the cricothyroid muscle dominating, while other muscles are only indirectly involved. The cricothyroid muscle not only narrows the glottis, but also simultaneously but it tightens the vocal folds. These muscles play a major role in the regulation of tension, as the vocal muscle is not yet formed. The vocal muscle is formed at the age of 7 to 12 years as a result of splitting off from the thyroid arytenoid muscle, and then continues to develop until the age of 19-20 years. Gradually, the falsetto mechanism is replaced by vibrations of the vocal folds. Thus, the mechanism of phonation in a person in pubert period from the process of voice formation in an adult. It is on this difference that the work of voice therapists should be formed, and as a rule, a set of exercises and manipulations with patients in pubert period and with adult patients should be different. It is the functional anatomical differences that should underlie the logopedic personalization of the patient. Although the most effective result can only be obtained when you take the above also must into account the verbal and mental characteristics of the patient in pubert period.

Infectious complications in patients with multiple myeloma during hemopoethic stem cell transplantation

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Infectious complications were studied in 38 patients with multiple myeloma (MM) after autologous hematopoietic stem cell transplantation (auto-HSCT). Activation of cytomegalovirus infection was found in 5 (13.1%) patients. The intestinal microbiome was studied by means of bacteriological and molecular (real-time PCR) methods. Among isolated Enterobacterales from intestinal microbiome 24% produced extended spectrum β-lactamases(ESBL). They were founded also in all 3 strains, isolated from blood. It was established that colonization of the intestine by Enterobacterales with the production of ESBL is an independent predictor of the development of bacteremia caused by gram-negative bacteria. The development of intestinal dysbiosis under the influence of antibiotic therapy in patients in the period after auto-HSCT was demonstrated. Also it was shown that a significant increase in the number of E. coli in the intestinal microbiome (by 4-6 lg CFU/g feces) should be regarded as a predictor of the development of systemic E. coli bloodstream infection.

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Intestinal microbiome and bloodstream infections in patients with hemoblastosis

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Intensive cytostatic therapy used in the treatment of hemoblastosis, as well as conditioning therapy before hematopoietic stem cell transplantation (HSCT) lead to severe intestinal epithelial disorders and massive antibacterial therapy leads to profound changes in the composition of the intestinal microbiome. To study the changes in the intestinal microbiome during cytostatic therapy and HSCT in patients with hemoblastosis and their possible role in the development of systemic infections of the bloodstream**.** We studied 21 patients (8 women, 13 men, aged 54-66 years) underwent HSCT with various forms of hemoblastosis. Nineteen patients underwent autologous HSCT (auto-HSCT) and two allogenous HSCT (allo-HSCT). Colon microbiome was studied by means of PCR in a multi-primer format with real-time detection (PCR-RT) using “Colonoflor 16” Kits. A severe clinical course after allo-HSCT, which ended lethally, was observed in one patient. During the month of observation, he revealed a hundred-fold increase in the number of E. coli in the intestinal microbiome (from 10^6 to 10^9), which was regarded as a predictor of the development of a systemic infection of the bloodstream caused by bacteria of the family Enterobacteriaceae. Monitoring changes in the quantitative composition of the intestinal miobiome of the large intestine and its possible role in the development of systemic infections of the bloodstream must be carefully investigated.

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