# MEDICINE:

**Dr. Senad Begic, spec. epidemiology**

Senad Begic, MD, is an epidemiologist currently working as Senior Health Consultant for United Nations Children Fund – UNICEF.

He received his medical degree from University of Montenegro, completed Residency in Epidemiology at the University of Belgrade, Serbia, and also completed his Field Epidemiology Training Program (FETP) fellowship as part of the MediPIET – Mediterranean Programme for Intervention Epidemiology Training led by the Spanish Institute for Public Health – Carlos III and European Centre for Disease Control (ECDC). He received an extensive training in Bioethics and Ethical conduct of biomedical research and clinical trials as part of the NIH funded programme of Icahn School of Medicine at Mount Sinai, as well as education and trainings at The Imperial Colleague London, London School of Hygiene and Tropical medicine, Task Force for Global Health, Atlanta and various other international academic and professional organizations. Currently he is PhD student at the University of Montenegro.

Dr. Begic started his career in civil sector, pioneering harm reduction programme among IDUs and prevention of HIV and bloodborne infections among key and hard-to-reach populations, after which he started pursuing his professional goals within the Centre for control and prevention of communicable diseases at Montenegrin IPH with special focus on immunizations and vaccine preventable diseases. During his professional career, he has served on various positions related to vaccines and immunization programs both nationally and internationally including positions of technical advisor to WHO and UNICEF on various occasions related to vaccine procurement, logistics and effective vaccine management.

## VACCINES – YESTERDAY, TODAY, TOMORROW

**SENAD BEGIC**[1]
[1] United Nations Children Fund, UNICEF, Podgorica, Montenegro

Despite the complete (self)destructive nature of the human race and all the wars and pogroms that have been fought, nothing has marked the history of mankind and has not taken more lives than bacteria, viruses and parasites. Therefore, it is clear why all the efforts aimed at combating these plagues occupy a special place in the history and one can not over-exaggerate when trying to express importance, impact and benefits that vaccines have brought upon the human race.

History and medicine are clear: not a single medical measure and intervention throughout human history has prevented more disease and more suffering than the vaccines. Perhaps the only more significant effect on human health and well-being has been from safe drinking water, but if we take

into account that it is not exclusively a medical measure, vaccines remain at the top of the list of the most useful inventions of medicine so far. Antibiotics are a few steps behind.

Nearly three centuries have passed since their discovery and vaccines still save about 3 million children's lives annually worldwide. As developing societies struggle and make superhuman efforts to provide their children with lifesaving vaccines, at the same time, the rich and developed seem to have forgotten their importance and seem to have retreated before the onslaught of cacophony, distorted and inaccurate information on vaccine safety. In modern societies, knowledge and science suffer from a multitude of lay opinions, while the competence of science in the process of making responsible decisions is significantly reduced due to a lack of understanding of its basic postulates. Unfortunately, the opinions of opponents of vaccinations, rather than knowledge based on scientific evidence, have brought many countries and societies one step closer to the re-emergence of major epidemics that have been prevented by vaccines for decades.

And it is the great success of the vaccines that has made the dangers of non-vaccination much harder for most people to comprehend. Young parents simply do not know how frightening consequences of measles may be. Many haven’t seen polio cases even in the pictures for decades. We simply didn’t have the possibility to feel consequences of infections on "our own skin" for generations and generations. Therefore, and as there are no strong emotions related to a disease that has been kept under control due to vaccines, there are no deeply engraved memories of the dangers that these diseases bring. Psychology tells us that due to these facts, parents underestimate the possibility and consequences that their child may get sick from many diseases if not vaccinated.

Opponents of the vaccines are persistently trying to create the impression that everywhere around us, and on every single day vaccines cause serious adverse events, but that for some reason (feel free to call them conspiracy theories) these facts do not reach the public, they say. Due to such actions of anti-vaxx movements, there is a feeling among individuals and parents that vaccines lead to unfortunate outcomes, and by endless repetition on social networks, many tend to incorrectly perceive the problem as very widespread and dangerous. Forgetting is getting us closer every day to creating conditions that will enable new outbreaks of infectious diseases that will make the risks of non-vaccination even more visible and unfortunately - only then will we clearly understand all the benefits of vaccination programs and high coverages of vaccines.

Neglecting reality, distorted perceptions of risks and ignorance can pay in human lives. If we as a society are not capable and mature enough to learn from our own history, but also from the mistakes and experiences of others, we have to ask ourselves what kind of future awaits us? Listening to opponents of vaccinations, it seems that nothing makes a pediatrician more happy than seeing a sick child and we all know how far that is from the truth.

One thing is for sure - when an epidemic like the one that we are currently living, happens, there will be an increase in interest for the vaccines as the memory of the disease and its consequences will be fresh and alive. Only - for some it may be too late.

**Acc. Prof. Dr. Vasa Antunovic**

Acc. Prof. dr Vasa Antunovic is a neurosurgeon who has over 40 years of experience at he Neurosurgical Clinic, Clinical Center of Serbia (CCS) in Belgrade, Serbia. During his career at the Clinical Center of Serbia, he had various positions, such as: the Chief of the Neurosurgical Department in the Urgent Center; Chief of the Neurosurgical Clinic, Chief's Assistant at the Neurosurgical Clinic, Director of the Neurosurgical Clinic, etc. He has been the Advisor of the Director of the Clinical Center in Montenegro since June of 2015. From 1992 to 2002 he was the President of Neurosurgeon Association of Yugoslavia. In addition, he was a delegate in the Europeans and World Federation of Neurosurgical Societies. He completed medical school, as well as his specialization in neurosurgery, master's degree and PhD at the Faculty of Medicine, University of Belgrade. He has been a professor in the subject Neurosurgery the Faculties of Medicine in Podgorica, Kragujevac, Banja Luka, and Novi Pazar. He has been a visiting professor at multiple universities all over the world, including the University of Southern California and the University of Verona. He is also one of the founders of the Faculty of Medicine, at the University of Montenegro.

# SCIENCE AND ART

**Vasa Antunovic**[1]
[1]Montenegrin Academy of Science and Art, Podgorica, Montenegro

Art moves us all, causing different emotions and impressions. On the other hand, science wants to reach to us in order to awaken our will for knowledge.

Henri Poincaré, a French mathematician, once said: "The scientist does not study nature because it is useful to do so. He studies it because he takes pleasure in it, and he takes pleasure in it because it is beautiful. If nature were not beautiful it would not be worth knowing, and life would not be worth living".

In era of Leonardo da Vinci, before evolving expertise in both fields which led to extreme polarization that endures to this day, science and art simply coexisted. Technological progress and scientific refinement evoked the polarization which reigns today.

Both artists and scientists perceive reality, but they do so from different points of view, using different tools and, as a final result, they wind up in differing end-points. One of them is characterized by technical introversion, and the other by extreme expressiveness.
The fusion of the science and arts shows that art, as the supreme creation of thinking matter, cannot exist without science, therefore every scientific work is simultaneously the work of art, and vice versa. Why bother separating them, when we can bring them closer and show their resemblance?

**Mr. sc. Dr. Maja Mirocevic Rotolo**

Dr. Maja Mirocevic Rotolo completed medical school at the Faculty of Medicine, at the University of Montenegro, and her specialization in Internal Medicine and subspecialization in Cardiology at the Faculty of Medicine, at the University of Belgrade. She currently works at the Cardiology Center, at the Clinical Center of Montenegro. In addition, she is a teaching assistant for the subject Internal Medicine at the Faculty of Medicine, at the University of Montenegro. She is the President of the Montenegrin Associatoin for Heart Failure and a member of the European Society of Cardiology, European Heart Failure Association, and European Association of Cardiovascular Imaging.

**Dr. Nikola Bakic**

Dr. Nikola Bakic completed medical school and his specialization in Internal Medicine at the University of Nis Medical School. He completed his subspecialization in Hematology at the University of Belgrade Medical School. He currently works as a hematologist and frontline COVID-19 internist at the Clinic of Hematology at the Clinical Center of Montenegro in Podgorica, Montenegro. He is a member of the Advisory Board for implementation of treatment of patients with haemophilia A, as well as a member of the Advisory Board for implementation of new drugs in the treatment of multiple myeloma.

**Dr. Vladimir Jovanovic**

Dr. Vladimir Jovanovic completed medical school and his specialization in Internal Medicine at the Faculty of Medicine, at the University of Belgrade. He currently works as a pulmonologist and is the Director of the Department of Pulmonology, at Clinical Center of Montenegro in Podgorica, Montenegro.

# LONG-COVID SYNDROME

**Maja Mirocevic Rotolo[1], Vladimir Jovanovic[1], Nikola Bakic[1]**
[1]Clinical center of Montenegro, Department of internal medicine, Podgorica, Montenegro

Some people who overcame Coronavirus Disease (COVID-19) do not make a full recovery so-called “long-COVID”. The term, “post-acute COVID-19 syndrome” refers to impaired function of many organs. Although a long-COVID syndrome include breathlessness, headache, chest pain, myalgia, arthralgia, fatigue, cognitive difficulties, as well as anxiety and depression, chronically high fever, incrised value of D-dimer. The pathophysiology of long COVID has not yet been researched. There are research related to long term tissue damage and tissue inflammation. The described risk factors are female sex, early development of serious symptoms such as dyspnoea and specific biomarkers such as D-dimer, CRP, and lymphocyte count.

COVID-19 survivors showed significant pulmonary dysfunction characterized by around a quarter reduction of 6-min walking distances compared with healthy people. The incidence of pulmonary embolism is high and also pulmonary fibrosis is related to Long COVID Syndrome. COVID-19 causes microcirculation dysfunctions, such as endothelitis and micro-thrombosis which disrupt the function of the capillary barrier. This vascular damage is shown to be associated with cytokine storm and macrophage activating syndrome with persistently increased cytokines three months after initial infection. There are also described patients with myocarditis and hypercoagulopathy. In the therapy of patients with long COVID should be considered personalized rehabilitation training with regular monitoring of laboratory findings such as levels of leukocyte, CRP and D-dimer.

**M.Sc. biochemistry Stevo Jovandic**

Stevo Jovandic completed his M.Sc in biochemistry and has ten years of experience in the field of genetics. In addition, he is a PhD candidate in the field of immunogenetics with extensive experience in laboratory work (the introduction of new diagnostic tests in the field of genetics, human identification, sequence analysis, fragment analysis, real time PCR, RT-PCR, DNA and RNA isolation from a variety of sources (eg blood and solid tissue, buccal swabs, FFPE), electrophoresis techniques, and PCR. He is currently the Chief of laboratory for molecular food safety and Chief of the COVID laboratory at the Diretorate of National Reference Laboratories in Belgrade, Serbia. In addition, he worked at the Military Medical Academy in Belgrade, Serbia as a geneticist and researcher for ten years.

# BEYOND MOLECULAR DIAGNOSTICS OF COVID 19

**STEVO JOVANDIC**[1]
[1]Directorate for national reference laboratories, Belgrade, Serbia

SARS CoV-2, the causative agent of coronavirus disease 2019 (COVID-19), is a single-stranded RNA virus that is spread primarily via droplet transmission.

Two major categories of diagnostic assays are available for diagnostics of SARS-CoV-2. The first group of assays are based on polymerase chain reaction (PCR) or nucleic acid hybridization, while the second group are immunological assays.

Upper or lower respiratory tract samples are the recommended for SARS-CoV-2 testing. Quality of the results depends largely on the sample type and the site of collection.

Reverse transcription-polymerase chain reaction (RT-PCR), has been considered to be the gold standard method for SARS-CoV-2 diagnosis. DNA amplification is monitored in real-time using a fluorescent dye. The specific genetic regions are selected as the target in RT-PCR diagnostic assays. Assays that are targeting the E gene, have been shown to have the highest sensitivity while the RdRp, N, and S genes are also used as specific targets. RT-PCR is the most commonly used method to diagnose COVID-19 due to its high sensitivity and specificity and also to its ability to process large numbers of samples. Its use is hindered by the requirement for expensive laboratory instruments and skilled personnel.

Digital PCR works by compartmentalizing a bulk PCR reaction into thousands of nanoliter-scale reactions, and then counting positive reactions. The advantages of digital PCR include higher precision, and less susceptibility to artifacts. Nonetheless, the complicated workflow, which requires

more expensive instruments and consumables and also longer hands-on time is a major disadvantage of this method.

Isothermal nucleic acid amplification amplifies the target sequence at a constant temperature. Detection methods include measurement of turbidity caused by magnesium pyrophosphate precipitation during the reaction or use of fluorescent dyes (reverse transcription loop-mediated isothermal amplification - RT-LAMP).

CRISPR-based platform termed as Specific High Sensitivity Enzymatic Reporter UnLOCKing (SHERLOCK), has been used in rapid diagnostic detection of infectious agents in clinical specimens.

Microarray techniques can be used to detect coronaviruses by generating cDNA from the viral RNA using reverse transcription and subsequent labeling with specific probes. It is then loaded into microarray wells coated with oligonucleotides that signal the presence of viral nucleic acid.

Next generation sequencing (NGS) allows comprehensive characterization and analysis of viral genetic material. The major advantage of NGS is that it can screen for and identify viral agents without the need for previous knowledge of the causative agent. Despite the great advantages NGS platforms are much more expensive and involve intricate sample preparation and library construction protocols that require significant expertise.

At this time, RT-PCR is the most widely used molecular assay to diagnose COVID-19. However, because these assays require the transfer of clinical specimens to a laboratory with expert staff and because of the associated costs and slow turnaround times, researchers are still working on the other molecular assays that avoid these issues. Although RT-LAMP seem attractive alternative, nonspecific amplification due to the absence of temperature gating mechanisms may lead to false-positive results, raising potential concerns over the widespread implementation of such methods.

**Mr. Sc. Brankica Dupanovic, spec. Infectious diseases, subspec. Clinical Pharmacology**

Dr. Brankica Dupanovic is an infectologist and clinical pharmacologist who completed the Faculty of Medicine and her specialization in Infectious Diseases at the University of Sarajevo. She completed her subspecialization in clinical pharmacology at the Faculty of Medicine in Novi Sad, Serbia. She currently works at the Clinic for Infectious Diseases at the Clinical Center of Montenegro, where she is also the Head of Department of HIV / AIDS. She is also a member of the National Commision on AIDS, as well as a member of the Commision for Medicines in Montenegro. Her interests are infections of the central nervous system, HIV / AIDS, modern treatment of viral hepatitis, gastrointestinal infections, infections caused by the Ebstein Barr virus and other herpes viral infections, parasitic infections, as well as antimicrobe chemotherapy.

# THE TREATMENT OF PATIENTS WITH SARS CoV-2 INFECTION

**BRANKICA DUPANOVIC[1]**
[1]Clinical center of Montenegro, Department of Infectious disease, Podgorica, Montenegro

COVID-19 is a contagious disease caused by the recently discovered coronavirus 2019-nCoV. Current estimates show that the incubation period is between 2 and 14 days. Patients stricken by this disease are the most contagious when the patient's symptoms are most prominent. However, some patients can be contagious before the symptoms occur or even if they are absent. Signs and symptoms of COVID-19 vary in the beginning, but during the infection most patients experience: fever (83-99%), cough (59-82%), fatigue (44-70%), loss of appetite (40-84%), shortness of breath (31-40%), expectoration (28-33%) and myalgia (11-35%).
The patients should be actively monitored every 12-24h during the first 7-10 days with symptoms. In accordance with clinical features we discern:

1. Easier cases - mild clinical condition not indicating pneumonia;
2. Medium cases - fever, more pronounced symptoms involving the respiratory system (cough) and RTG indicating pneumonia;
3. Severe cases - patients with at least one of the following: dyspnea, respiratory rate greater than 30 breaths per minute, resting saturation levels lower than 93%, arterial partial oxygen pressure 50% in a period of 24 to 48h;
4. Critical cases - respiratory failure which requires mechanical respiration, septic shock, and/or multiple organ dysfunction (kidney/liver etc.)

There are guidelines for treatment of different clinical presentations of this disease. Unfortunately, there is still no proven causal therapy.

**Doc. Dr. Elvir Zvrko**

Doc. Dr. Elvir Zvrko works as an otorhinolaryngologist and facial plastic surgeon at the Clinical Center of Montenegro. He was the Director of the Clinic for Otorhinolaryngology and Maxillo-facial Surgery from 2018 until 2021. He is the assistant professor at the Faculty of Medicine in Podgorica. He is a member of the Committee for Medical Research of the Montenegrin Academy of Sciences and Arts, president of the Association of Otorhinolaryngologists of Montenegro, member of the Ethics Committee of Montenegro, president of the Center of Youth Scientists of the Montenegrin Academy of Sciences and Arts, and vice president of the Council for the Scientific Research of the Ministry of Science. His main research interests are head and neck oncology, facial plastic surgery, quality of healthcare, and medical education.

# TRACHEOSTOMY IN PATIENTS WITH COVID-19

**ELVIR ZVRKO[1]**

[1] Medical faculty, University of Montenegro, Podgorica, Montenegro

The global pandemic caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has had a dramatic impact upon all areas of healthcare. Critically ill patients with COVID-19 account for 5% of all cases and one-quarter of all hospitalizations. The majority of patients admitted to intensive care units require advanced respiratory support. Tracheostomy is an important therapeutic intervention in the critically ill. Tracheostomy can benefit patients who require prolonged ventilation: enabling sedation to be reduced or stopped; enabling the removal of the trans-laryngeal tube to facilitate laryngeal rehabilitation; and offering an interface for variable invasive ventilator support without having to resort to re-sedation and tracheal re-intubation. Tracheostomy in patients with COVID-19 requires significant decision making and procedural planning. Tracheostomies can pose a risk for the patient and the staff both in terms of insertion and subsequent management and, thus, the first priority when considering optimal timing for tracheostomy is whether the procedure will benefit the patient. Optimal timing for tracheostomy remains controversial in non-COVID-19 patients and becomes more complicated in patients with COVID-19 due to the perceived risk of aerosol generation. Tracheostomy can be performed using either open surgical or percutaneous dilational techniques. Tracheostomy is an essential clinical strategy for managing patients with COVID-19 but the use of appropriate personal protective equipment is critical to reducing the risk to health care workers and best practices to minimize aerosolization should be used.

**Dr. Dusanka Novosel, spec. Pediatrics**

Dr. Dusanka Novosel is a pediatric gastroenterologist at the Institute for Children's Diseases, at the Clinical Center of Montenegro, as well as a teaching assistant in Pediatrics at the Faculty of Medicine, University of Montenegro. She completed medical school, her pediatric specialization, and subspecialization in pediatric gastroenterology at the Faculty of Medicine, University of Belgrade, in Belgrade, Serbia. She is currently a PhD candidate at the Faculty of Medicine, University of Montenegro, in Podgorica, Montenegro. In addition, she is a member of the National Coordinating Regulatory Body for Organ Transplantation – Ministry of Health, ad also a member of the Gastroenterology Association of Montenegro. She has twelve years of experience in work with children, participating in pediatric prevention programs, academic and professional experience.

# MIS-C IN MONTENEGRIN CHILDREN

**DUSANKA NOVOSEL**[1,2]

[1] Institute for Childhood Diseases, Clinical Center of Montengero, Podgorica, Montenegro
[2] University of Montenegro Faculty of Medicine, Podgorica, Montenegro, Podgorica, Montenegro

**INTRODUCTION:** The vast majority of children with coronavirus disease 2019 (COVID-19) have mild symptoms, or none at all. Multisystem inflammatory syndrome in children (MIS-C) is a rare, but potentially fatal state in children temporally associated with COVID-19. Hallmarks of this condition are fever, multiorgan dysfunctions, and inflammation.

**CASE REPORT:** We presented the clinical and laboratory features of eight Montenegrin children diagnosed with MIS-C between November 2020 and May 2021. All 8 patients (5 boys, 3 girls, with median age of 7.1years) were previously healthy children. The most consistent presenting symptom was fever (100%), with a median duration of 4 (IQR 2–8) days, followed by mucocutaneous manifestation (n = 75 %), gastrointestinal symptoms (n= 62.5 %), respiratory symptoms (n = 37.5 %), and central nervous system symptoms as irritability (n = 37.5 %). Two patients (40%) had coronary artery dilatation, and five (62.5%) had myocardial dysfunction.

**KEY MESSAGE**: As the pandemic continues to unfold, in an effort to improve outcomes in children clinicians should maintain a high index of suspicion for this rare, but novel condition.

**Dr. Branko Lutovac, spec. Pediatrics**

Dr. Branko Lutovac graduated at the Medical Faculty of the University of Montenegro. In 2018, he completed a medical specialization in Paediatrics at the Medical Faculty of the University in Belgrade. In 2017 he completed the Specialist academic studies of Immunology at the Faculty of Medicine in Belgrade, as a PhD candidate. He has been employed for the past 12 years in Institute of Children's diseases in Clinical Center of Montenegro, with work experience in PICU, Paediatric ER, and Department of Nephrology. He is currently the Head of the Paediatric Polyclinic and a Nephrology subspecialty resident at the Faculty of Medicine in Belgrade. He has been a teaching assistant at the Department of Pediatrics - Medical Faculty of the University of Montenegro since 2020. He is a member of the National regulatory body for organ transplantation at the Ministry of health of Montenegro, national representative in ESPN (European Society for Paediatric Nephrology), member of several working groups in IPNA (International Paediatric Nephrology Association), ERA-EDTA (European Renal Association-European Dialysis and Transplant Association), ERKNet (The European Rare Kidney Disease Reference Network), and EAACI (European Academy of Allergy and Clinical Immunology), etc. His fields of interests are heneral paediatrics, paediatric nephrology, kidney transplantation, renal replacement therapy, immunology, allergology, rheumatology.

# IMMUNOLOGIC RESPONSE TO SARS-COV-2 INFECTION IN CHILDREN, REVEALING THEIR SECRET. ARE CHILDREN UNREASONABLY ACCUSED OF SPREADING THE INFECTION, AND SHOULD THEY BE VACCINATED?

**BRANKO LUTOVAC**[1,2]
[1] Institute of Children's diseases, Clinical Center of Montenegro, Podgorica, Montenegro
[2] Department of Paediatrics, Medical Faculty, University of Montenegro, Podgorica, Montenegro

Data from various country-specific surveillance databases indicate that there is a broad spectrum of COVID-19 burden among those less than 18 years, varying from 1 to 23%. However, the true incidence of paediatric SARS-CoV-2 infection is unknown, because screening is predominantly symptom-based reflecting individuals diagnosed with COVID-19. It is unclear whether the lower reported incidence is because children are less likely to be tested or there is explanation of lower biologic susceptibility.

Numerous reports are indicating children have predominantly asymptomatic infection, but there is huge clinical variation in those of being symptomatic. While symptoms of COVID-19 in children were similar to those of adults, with fever, cough and sore throat being the most common, children's gastrointestinal symptomatology was prominent with anorexia (26,8%), diarrhoea (12,5%),nausea and vomiting (10,2%) and abdominal pain (9,2%). ACE2 receptors are also present in the nervous system and in skeletal muscles, explaining neuromuscular injuries with variable presentation as dizziness (16,8%), headache (13,1%), skeletal muscle injury (10,7%), but less

common with acute cerebrovascular disease (2,8%), ataxia (0,5%), seizures (0,5%) or meningoencephalitis and the Guillain-Barré syndrome. Acute kidney injury occurs in 0,5% of the patients overall, and in up to quarter of the severe cases progress to renal failure requiring renal replacement therapy. Almost one third of all paediatric cases had acute conjunctivitis. Skin lesions are unfrequently observed in COVID-19 and they are highly polymorphic such as chilblain-like skin lesions, urticarial eruptions, diffuse or disseminated erythema multiforme-like lesions, blue toe syndrome, exanthema, vesicles, and rarely acro-ischemic lesions. Postinfectious inflammatory process precipitated by prior SARS-CoV-2 infection in some children can manifest as: persistent fever with inflammation, postinfectious Kawasaki disease-like syndrome, postinfectious glomerulonephritis and rarely multisystem inflammatory syndrome in children (MIS-C). Despite generally milder disease than adults, children can be extremely ill and when requiring intensive care and invasive ventilation mortality ranged from 6% to 18%. This is evident in children with coexistence of cancer, organ transplantation, primary or secondary immunodeficiencies and COVID-19.

There is several hypothesis trying to explain the mild disease expression of COVID-19 in children including: frequent contact to seasonal coronaviruses and, as a result, the presence of cross-reactive antibodies; trained immunity and a constitutional high lymphocyte count; predominant innate immunologic response; higher levels of ACE2 in the circulation binding with SARS-CoV-2 that reduce the number of viruses able to bind with ACE2 receptors, also limiting inflammation and reduce the risk of severe disease because of its involvement in anti-inflammatory signalling. Further potential age-related factors include recent vaccinations and associated heterologous immune responses, and a more diverse memory T cell repertoire when compared to the elderly. By analogy to influenza, for which children are known to be major transmitters, there was initial concern regarding the potential role of children as “silent spreaders” of SARS-CoV-2 and occasional early studies supported this perspective. Recent data suggest that children acquire their infection from an adult contact, with minimal secondary transmission from children. A recent modelling study demonstrated that susceptibility to SARSCoV-2 infection in people under the age of 20 years is around half that of adults. Additionally, only 21% of infections are symptomatic in adolescents (aged 10–19 years), compared to 69% in older adults. As a result, transmission-based interventions aimed at children, including school closures, are projected to have a relatively small impact of SARS-CoV-2 transmission dynamics. Indeed, there are now data from many geographic settings across Europe, Asia and America confirming that the proportion of children infected with SARS-CoV-2 in the community is low (varying from 1% in young children to 6% in older children).

Despite the weight of evidence suggesting children are not major drivers of transmission at a population level, children have been subject to the same social isolation rules as adults, including widespread school closures. These policies have significant repercussions for education, development and wellbeing. Long-term effects of COVID-19 on psychosocial and physical health of children remain to be closely monitored and cannot be assessed yet.

Following phase 3 of trial data so far only Pfizer-BioNTech’s mRNA vaccine showed to be effective, immunogenic and safe in children aged 12–18 years. Several countries have authorised the use of the vaccine in this age group. The goal of childhood vaccination is not only to reduce transmission, but also to reduce rate of severe cases particularly in risk groups, hospitalization rate and postinfectious sequelae such as MIS-C and possible death prevention. However, whether at present the children should be prioritised for vaccination over vulnerable adults in low- and middle-income countries which are struggling with the challenge of vaccine shortages is a matter for serious ethical and practical debate.

**KEYWORDS**: COVID-19, children, immunobiology response, transmission, vaccination.

**Dr. Vladimir Djuric, spec. Psychiatry**

Dr. Vladimir Djuric is a psychiatrist and psychotherapist at the Center for Psychological Education in Belgrade, Serbia. He completed medical school and his specialization at the Faculty of Medicine, University of Belgrade. He is currently finishing his PhD at the Faculty of Medicine, University of Kragujevac, as well as his education in Rational Emotional Behavioral Therapy at the REBT Affiliating Training Center of the Albert Ellis Institute in Belgrade. He has completed and participated in numerous courses, seminars, and congresses in the European region.

# HOW CAN RATIONALITY HELP US FIGHT EVEN CORONA?

**VLADIMIR DJURIC**[1]
[1]Educational Centre Djuric, Belgrade, Serbia

Corona pandemic has completely changed our lifestyle in a way. Some things we took for granted are not available any longer and the other ones we certainly thought we would never have to do have become totally normal. Different people respond to new circumstances in different ways. Some of them have sunk to the bottom while the others have continued their lives unaffected and strangely enough they have made their lives much better. Such trichotomy perfectly fits into basic premises of Rational emotive behaviour therapy (REBT) which I nothing but fully respect and feel privileged to use it in everyday work practice with my clients and patients. The basic principle of REBT is that people are never disturbed by life events as such but they are always primarily affected in a disturbing way by their own point of view i.e. the way of thinking. People who have an irrational way of thinking (unhealthy, illogical, destructive) will most commonly develop unhealthy and negative emotions after experiencing some negative life events which inevitably leads to being unable to establish the most constructive behaviour that sooner or later results in ending up in one of very bad life positions. On the other hand, those who think in a rational way (healthy, logical, constructive) will definitely manage to keep healthy emotions even after experiencing some negative life events although such events are inevitable part of life and they are able to establish a constructive behaviour which will help them find the way out of new circumstances or at least find the best possible way to live in such situations. The basic principle we, REBT psychotherapist deal with is analysing the way of thinking, identifying irrational ones and trying to convert them into rational ways of thinking which consequently leads to changes in emotions and behaviour and finally to positions in life.

I strongly believe it is possible to achieve the same even in the situation with corona pandemic especially with the population of young talented people at the beginning of their careers which I will talk about more in the lecture.

**Keywords:** REBT, psychotherapy, corona

# PHARMACY:

**Prof. Dr. Katarina Smilkov**

Dr. Katarina Smilkov is Associated professor of Biopharmacy and Biotechnology at the Department of Applied Pharmacy, Division of Pharmacy, Faculty of Medical Sciences, Goce Delčev University, Republic of North Macedonia. She graduated and completed her master's degree at the Faculty of Pharmacy, and her PhD at the Faculty of Natural Sciences and Mathematics at the Ss. Cyril and Methodius University in Skopje, North Macedonia. She is a member of the Pharmaceutical Chamber of Macedonia and UNGAP (Understanding Gastrointestinal Absorption-Related Processes) professional network. She is a Management Committee member from North Macedonia to several COST Actions. Her research interests are drug design and formulation, particularly of proteins, nutraceuticals, and probiotics.

## DESIGN AND FORMULATION ASPECTS OF MONOCLONAL ANTIBODIES FOR SARS-COV-2 TREATMENT

**KATARINA SMILKOV [1]**
[1] Division of Pharmacy, Faculty of Medical Sciences, Goce Delčev University - Štip, Republic of North Macedonia

The occurrence of SARS-CoV-2 virus at the end of 2019 and the quick progress of the infection to pandemic dimensions, has triggered a major response of (bio)pharmaceutical industries all around the world, aimed at development of vaccines on one side, but also development of specific treatments on the other. Today, almost 2 years later, we count several different types of vaccines, polyclonal, monoclonal, and cocktail antibodies that have been tested and approved for use, with many others entering different clinical stages. Apart from the vaccines, aimed at prevention of the infection and development of severe Coronavirus disease (COVID-19), therapies including monoclonal antibodies can play an important part in COVID-19 treatment.

Monoclonal antibodies (mAbs) are a growing class of biologicals that have the ability to specifically bind and neutralize specific antigen, in this case the virus. Since the introduction of the first generation of monoclonal antibodies 35 years ago, the science and technology development has greatly speeded their development and improvement, thus providing valuable therapeutic alternative for many diseases. However, the interest of designing therapeutic antibodies for treatment of infectious diseases was not in the scientific focus until recently. The large number of therapeutic mAbs that are being developed against SARS-CoV-2 virus are thus paving the way for other experience in the treatment of both viral and bacterial infections. MAbs that target SARS-CoV-2 virus can be derived from the B cells of convalescent patients or humanized mice, and processed using recombinant technology, and can be used as a type of passive immunotherapy, that adds to the therapeutic alternatives in COVID-19 treatment. Among the antibodies that are approved for

emergency use in USA, the anti-SARS-CoV-2 treatments include bamlanivimab as a monotherapy, and bamlanivimab together with etesevimab, or casirivimab with imdevimab (REGEN-COV) as a combination therapy for treatment of non-hospitalized patients with mild-to-moderate COVID-19, as well as sotrovimab as latest addition to this group. On the other hand, EMA has bamlanivimab and etesevimab, regdanvimab, casirivimab and imdevimab (REGN-COV2) and sotrovimab under rolling review to date.

This work outlines the most important techniques to obtain mAbs, delivers the available information of the mAbs that are currently approved for use in SARS-CoV-2 virus infection, and discusses the formulation and stability aspects of these protein formulations.

**KEYWORDS:** monoclonal antibodies, anti-SARS-CoV-2 treatment, anti-COVID 19, design and formulation.

**Dr. pharm Nemanja Turkovic**

Dr. Nemanja Turkovic graduated at the Faculty of Pharmacy, University of Montenegro, in Podgorica in 2013, with the average grade A (10.00). In 2021, he defended his PhD dissertation „Design, synthesis and in vitro testing of propiophenone derivatives as potential inhibitors of the enzyme HIV-1 protease“ at the Faculty of Pharmacy, University of Belgrade. He was winner of several awards and scholarships, most importantly: the Plaque of the University of Montenegro for the best student in the field of technical, natural-mathematical and medical sciences for 2013/2014, Student award of the capital of Podgorica for the best students in 2009, “Ljubica and Tomo Lompar Foundation” scholarship, and Atlas Foundation scholarship for 2013. He lives in Podgorica, where he works in the Institute for Medicines and Medical Devices (CinMED). He has been engaged as a teaching assistant for the subject „Pharmaceutical chemistry I“ at the Faculty of Medicine, University of Montenegro, since 2013.

# DISCOVERY AND DEVELOPMENT OF REMDESIVIR – PATH TO AUTHORISATION OF MEDICINE

**NEMANJA TURKOVIC[1], Zorica Vujic[2]**
[1]Institute for Medicines and Medical Devices of Montenegro, Podgorica, Montenegro
[2]Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Belgrade, Belgrade, Serbia

The rapid and global spread of SARS-CoV-2 has produced an immediate urgency to discover promising targets for the treatment of COVID-19. Furthermore, a significant amount of preclinical research was reported in the search for therapeutic treatments for the related MERS and SARS. As the SARS and MERS coronavirus outbreaks did not persist, no therapeutic or vaccine development programs were completed. The consequence is that drug repositioning and repurposing has received a significant amount of attention as an attractive approach that can facilitate the drug discovery process. That implies repurposing existing pharmaceuticals to treat illnesses other than their primary indications. Approved medicines have entered clinical trials to address the current SARS-CoV-2 pandemic.
One potential therapeutic approach currently being evaluated in numerous clinical trials is the agent remdesivir, which has endured a long and winding developmental path. A successful collaboration between Gilead, the U.S. Centres for disease control and prevention and the U.S. Army medical research institute of infectious diseases resulted in discovery and development of remdesivir. Remdesivir is a nucleotide analogue prodrug that perturbs viral replication. It was originally evaluated in clinical trials as therapeutic agents for treating disease caused by RNA viruses (such as Ebola virus and the *Coronaviridae* family viruses like MERS and SARS). Subsequent evaluation by numerous virology laboratories demonstrated the ability of remdesivir to inhibit coronavirus replication, including SARS-CoV-2.
Antiviral chemotherapeutic interventions often target specific viral enzymes or attack a weak point of viral replication within the host, such as targeting the divergent RNA-dependent RNA polymerase (RdRp). Nucleoside analogues represent a class of antiviral agents that has proven

efficacious against several viruses, including hepatitis B and C as well as HIV. Generally, these fall into three general classes: mutagenic nucleosides, obligate chain terminators, or delayed chain terminators. Remdesivir, a prodrug, is metabolized within cells into an alanine metabolite, further processed into the monophosphate derivative and ultimately into the active nucleoside triphosphate derivative (NTP). As such, NTPs can be misintegrated into viral RNA by the viral RdRP. Steric interaction with the viral RdRp induces delayed chain termination.

In May 2020, after assessment of documentation on quality, efficacy and safety, the US FDA issued an emergency use authorisation for remdesivir, allowing the distribution and use of remdesivir for the treatment of adults and children with severe COVID-19. Remdesivir is also the first medicine against COVID-19 to be recommended for authorisation in the EU. In June 2020, EMA issued its conditional marketing authorisation, as one of the EU regulatory mechanisms to facilitate early access to medicines that fulfil an unmet medical need, including emergency situations in response to public health threats as the current pandemic. This type of approval allows the EMA to recommend a medicine for marketing authorisation with less complete data than normally expected, if the benefits of medicine's immediate availability to patients outweighs the risk inherent to the fact that not all the data are yet available. Data on remdesivir were assessed in an exceptionally short timeframe through a rolling review procedure, an approach used by EMA during public health emergencies to assess data as they become available.

**Dr. Vera Dabanovic**

Dr. Vera Dabanovic is the head of the Montefarm warehouse, as well as a teaching assistant in the subjects Dietetics and Toxicological Chemistry with Analytics, as well as Pharmacognosy, Introduction to Pharmacy, and the Basics of Pharmaceutical Management at the Faculty of Medicine, at the University of Montenegro. She is also an honorary professor for pharmaceutical subjects (Pharmacognosy, Pharmacology, Pharmaceutical Technology, Pharmaceutical Chemistry, and Cosmetology) at the Seconday Vocational Medical School in Podgorica, Montenegro. She completed her education in pharmacy at the University of Sarajevo, and her specialization in Pharmacoeconomy and Pharmaceutical Legislature at the University of Belgrade. She completed her Master's at the University of Sarajevo, and her PhD at the Faculty of Medical Sciences, at the University of Kragujevac.

# PHYTOESTROGENS AS NATURAL HORMONE THERAPY

**VERA DABANOVIC**[1]
[1]Health Institution Pharmacy of Montenegro Montefarm, Podgorica, Montenegro

Phytoestrogens are natural, polyphenolic, non-steroidal compounds, products of secondary metabolism of plants, which have structural and / or functional similarity with endogenous mammalian estrogens or with their active metabolites. The biological activity of phytoestrogens is based on their binding to estrogen receptors, where they can act as endogenous estrogens (estrogen agonists) or exert anti-estrogenic effects, by competitive binding to estrogen receptors, preventing the binding of endogenous estrogens or their metabolites (estrogen antagonists). Different bioactivity of phytoestrogens depends on the number and type of estrogen receptors in tissues, interaction with genes encoding different isoforms of estrogen receptors, presence of co-factors, levels of endogenous estrogens, applied dose and form of phytoestrogens, presence of other pharmacologically active compounds and other factors. In relation to the chemical structure, phytoestrogens are divided into four groups - isoflavonoids (isoflavones, kumestans), prenylated flavonoids (flavones, flavanones, chalcones), stilbene (resveratrol) and lignans. The most important sources of isoflavones are soybean seeds, red clover herb and cimicifuge rhizome. Prenylated flavonoids are most common in hop cones, stilbenes in red grapes and peanut seeds, and lignans in flax seeds. In addition to their role in the development of the reproductive system, phytoestrogens also have an effect on the lipid status of the organism (lower the level of LDL cholesterol and triglycerides and increase the level of HDL cholesterol) by preventing the occurrence of atherosclerosis and CVD. The role of phytoestrogens in increasing bone density is also very important, which is a consequence of the reduction of calcium loss in urine, a positive effect on osteoblasts and an effect on the secretion of calcitonin, which prevents the resorption of bone tissue. The results of experimental and clinical studies have confirmed that the use of phytoestrogens can

have a protective effect and significantly reduce the incidence of diseases and conditions caused by estrogen imbalance. Taking into account the effects of phytoestrogens as an alternative to hormone replacement therapy, there is great interest in their use in menopause to relieve symptoms (hot flashes, night sweats, mental tension, ...) as well as prevention and alleviation of complications (osteoporosis, hyperlipidemia, hypertension ...). As for side effects, phytoestrogens have a relatively safe profile with moderately increased gastrointestinal problems. An increase in isoflavones has been reported in infants consuming soy milk. Phytoestrogens can modify the metabolism of sex hormones, and cases of feminization in males have been reported. In animals, they can lead to infertility and reproductive disorders, and the effect on thyroid hormones has been observed experimentally. Despite significant research, the role of phytoestrogens in breast cancer remains controversial.

# DENTISTRY:

**Dr. Mirko Mikic**

Dr. Mirko Mikic completed the dentistry program as well as his doctorate at the Faculty of Medicine at the University of Montenegro in 2012, and 2020, respectively. He completed his specialization in Parodontology and Oral Medicine in 2021. He is a professor for the subjects Parodontology I, Parodontology II, and Oral Medicine at the Faculty of Medicine at the University of Montenegro. In addition, he is a teaching assistant for the subjects Radiology Emergencies in Dentistry. He also currently works in the dental office „Family Dent“ in Podgorica, Montenegro. He has participated in numerous local and international congresses.

## CBCT (CONE BEAN COMPUTER TOMOGRAPHY) IN DENTAL PRACTICE

**MIRKO MIKIC**[1]
[1] University of Montenegro, Medical faculty Podgorica, Podgorica, Montenegro

Cone Beam Computer Tomography (CBCT) representing specially designed dental X-ray device that uses conically directed X-rays and a two-dimensional detector, as well as various software capabilities for computer image processing. With hardware and software development, the CBCT system has become widely available since its introduction in the late 1990s and has found application in almost all branches of dentistry.
At the lecture will be discussion about the principle of CBCT operation and the quality of CBCT images.
Advantages and limitations of CBCT.The application of CBCT in everyday dental practice will be presented. Importance of CBCT application in the preimplantology phase, software analysis of bone quality and quantity and virtual positioning of dental implants. Case reports of CBCT application in endodontics, jaw orthopedics, oral surgery and other branches of dentistry.

**Dr. Almina Muric**

Dr. Almina Muric completed her dentistry degree at the Faculty of Medicine, at the University of Montenegro. She is also completed her PhD at the School of Dentistry, Department of Prosthetics at Istanbul University. She has worked as a teaching and research assistant at the Department of Maxillofacial Prosthetics, at the Istanbul School of Dentisty, as well as a lecturer and assistant professor in the Department of Dental Prosthetics, at Istanbul Aydin University School of Dentistry.

# CHALLENGES OF DENTAL PROSTHODONTIC PRACTICE DURING CORONAVIRUS DISEASE- 19 (COVID 19)

**ALMINA MURIC**[1]
[1] White Smile Dental Clinic, Podgorica, Montenegro

The emergence and rapid spread of the new Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), which resulted in a wide-scale pandemic that led to the deaths of over a million people around the world, has significantly global impact on every aspect of life and therefore the dental health system. Dental practice has faced economic challenges and a major exposé of the spread of infection both among staff and patients.

In dental practice, especially in prosthodontic practice, for years one of the biggest challenges preventing the spread of cross infection, has taken on a completely different dimension after the World Health Organization issued a warning about the possibility of transmitting COVID-19 through the air because droplets and aerosols. Prosthodontic professionals and patients can be directly exposed to infections due to aerosol-generating dental equipment (high-speed rotation burs, air-water syringes) or indirectly through contact with possibly contaminated surfaces such as impressions, dental stone casts and prosthetic restorations (removable or fixed). In addition this branch of dentistry provide services for the most vulnerability group geriatric patients therefore there is a great need for adequate protocol for protection both patients and staff.

In last two years scientists relived a few protocols that will provide safer conditions for both medical staff and patients. The aim of this lecture is to provide explanation of challenges in Prosthodontics during Coronavirus disease 19 and to review proposed protocols for dental clinics.

**Dr. Filip Sukovic**

Dr. Filip Sukovic is general dentist who was born in 1992 in Cetinje, Montenegro. He finished his elementary school in OS Sutjeska, Podgorica, high school in St Clares college in Oxford, England. He completed his pre-med studies at the Birkbeck University in London, England. He obtained his dental degree at the University Cardenal Herrera in Valencia, Spain. He currently works in private practice in Podgorica, focusing on restorative dentistry.

# ABSOLUTE ISOLATION IN COMMON CLINICAL SITUATIONS- A CLINICAL REVIEW

**FILIP SUKOVIC[1]**

[1]Specialized hospital Ars Medica , Department of Dentistry , Podgorica , Montenegro

**INTRODUCTION:** Absolute isolation has been introduced to the practice of dentistry 150 years ago. Since then it has been regarded as the gold standard for clinical practice in the fields of restorative dentistry, endodontics and prosthodontics. The technique involves the use of rubber sheet that isolates the operative field from the remaining structures in the oral cavity. Despite the clinical value of absolute isolation, dental distributers data suggest that only 8% of dentists use absolute isolation in their daily practice. This clinical review outlines major advantages and disadvantages of absolute isolation use in most common clinical situations, from composite fillings and endodontic treatments to crown cementations.

**METHODS:** Cochrane and Pubmed databases searched for relevant systematic reviews and randomised control trials. Personal in-practice database used for clinical perspective.

**RESULTS:** Studies identified that the most important benefits derived from absolute isolation use are excellent moisture control, improved visibility and patient safety.

**CONCLUSION:** Existing studies provide weak evidence in favour of absolute isolation. More well design randomised control trials needed to assess statistical and clinical significance of absolute isolation use.

**Dr. Slobodan Jovanovic**

Dr. Slobodan Jovanovic completed his education in Dentistry at the Faculty of Medicine, at the University of Pristina-Kosovska Mitrovica. He completed his specialization in Tooth Disease and Endodontics at the Faculty of Medicine, at the University of Belgrade. He is currently a PhD candidate at the University of Pristina-Kosovska Mitrovica. He currently works at the dental office Winner Smile in Belgrade, Serbia.

# INTRODUCTION TO MODERN ENDODONTICS

**SLOBODAN JOVANOVIC[1]**
[1] Winner Smile, Belgrade, Serbia

In recent years, the interest of both dentists and patients in preserving tooth roots has been growing. "Treatment of the root canal" is a complex micro-surgical procedure that removes vital or infected pulp tissue, performs chemo-mechanical treatment and hermetic obturation of the root canal. Knowledge of the morphology of the access cavity and the root canal is essential for the success of endodontic therapy. With the adequate use of modern techniques of tooth root canal preparation and modern chemical preparations, this micro-surgical procedure can be performed in the best possible way. The preparation of the root canal can be performed with hand instruments where there is direct contact of the therapist's hand with the instrument and machine indirect contact through the drill.

The advantages of Nickel-titanium (Ni-Ti) canal instruments are superelasticity that accompanies the canal anatomy, minimal danger of transport, step preparation and perforation of the canal, corrosion resistance and biocompatibility. Machine instruments can have full and reciprocal rotations, as well as vertical movements and combined-alternative movements. Adequate obstruction of the root canal is also important for the success of endodontic treatment. For permanent obturation of the root canal, it is necessary to optimally process the canal, which must be percutaneously insensitive, dry and without the presence of fluoride. Three-dimensional hermetic sealing must be apical, lateral and coronal, which aims to separate the endodontic from the periodontium, return the tooth to biological function, as well as nutrition through the cementum of the tooth root. The role of permanent canal obstruction is the blockade of all communications between the cavity and peri-apical tissue, prevention of the passage of tissue fluid from the periapex with residual microorganisms to the root canal of the tooth (apical ramifications), as well as preventing the survival of bacteria achieved by their blockage in the dentinal tubules. After obturation, in order to prevent tooth discoloration in the crown part, it is necessary to prevent permeability by applying glass-ionomer cements. The crown filling can be restored with a composite augmentation, and if more than 2/3 of the tooth substance is missing, it is necessary to prosthetically take care of the crown part of the tooth.

With successful endodontic therapy and later coronary restoration, it is possible to prolong the life of the tooth and ensure the smile of the patient.

**Dr. Miljan Micunovic**

Dr. Miljan Micunovic graduated in Faculty of Dentistry Pancevo, University of Novi Sad, Serbia. He specialized in Oral Surgery at the Military Medical Academy (VMA) in Belgrade, and completed his post-graduate Master's in implantology 2nd at the University Guglielmo Marconi, in Rome, Italy. He is currently enrolled as Opinion and Development leader for Trate AG, Switzerland-implant system ROOTT. He contributed to working on a new series of implants for highly deficient bone tissue and high risk patients (zygomatic, pterygoid and nasal wall and septum implants).Since 2014, he has been promoted as an Implantologyst of excellence by Sweden & Martina spa., Padova, Italy and as a regional brand leader for JDental care implants in Modena, Italy. In addition, he is the owner of the Micunovic medical private clinic in Podgorica and coowner in dental practice "Makeover" in Split, Croatia

# ULTIMATE CHALLENGES IN IMPLANTOLOGY – NEW TRENDS

**MILJAN MICUNOVIC**[1]
[1] Micunovic medical, Podgorica, Montenegro

Implantology is an efficient and scientifically based discipline of oral surgery in our country. Although Implantology is considered a young science, its beginnings can be found in distant history. The first skeleton finds were attempts to somehow compensate teeth. The first skeleton finds were attempts to somehow compensate for teeth. This dates back to 5000 BC from the time of Mayan, ancient Egyptian, and Etruscan civilizations.

In the nearly 20th century, especially in its second half, many authors stood out with the work they enabled and created the foundations for Implantology as it is today. A special place must be occupied by Per-Ingvar Branemark, along with associates from the University of Gothenburg. He was the first to describe and explain the phenomenon of osteointegration, i.e. direct anchoring of foreign material to the bone. We should not forget the Italian school of bicortical "screws" which is still today to a lesser extent current, and whose path has been trodden by Implantologists such as Formidjini, Garbacio, and Tramonte.

Implantology has reached its full flowering in the last twenty years, especially with the development of new one's imaging techniques (CBCT), imprinting (new digital approach), as well as with surgical techniques. In everyday practice, the problem is no longer to install an implant and replace a tooth. It is to enable predictability implant work in the decades to come and solve cases that have not been possible so far treated with standard implant methods.

Through this lecture, I will try to bring you two completely different approaches to therapies like these patients, through standard bone augmentation procedures (GBR or Autologous), or "Graftless" implants in the basal cortical bones. It will be about procedures such as raising the floor of the

maxillary sinus (lateral or crestal approach), osteodensification, watery bone regeneration, horizontal or vertical augmentation of the ridge, use of dentin as bone deputies, bone autotransplants, etc.

On the other hand, we must especially emphasize the techniques performed by a very small number of surgeons in the world of Zygomatic Implants (ZAGA centers), Pterygoid Implants in the Sphenoid bone extension, Transsinus, and Transnasal Implants.

It is especially important that cases from practice with a complete prosthesis will be presented rehabilitation, which in some cases performed 72 hours after surgery fixed by permanent work.

In the end, the important message of my story is that all of us, as health professionals, must strive to follow new trends and techniques, to be a part of the world, and to enable each of our patients the best possible treatment.

# ACTIVE PARTICIPANTS:

# CUT-OFF VALUES OF RESISTANCE TO ORGAN INJURY IN FALLS FROM A HEIGHT

**ANDREA JOVOVIC[2], Nemanja Radojevic[1,2], Batric Vukcevic[1,2], Dragana Cukic[1,2]**
[1]Clinical Center of Montenegro, Podgorica, Montenegro
[2] University of Montenegro, Faculty of Medicine, Podgorica, Montenegro

**INTRODUCTION:** Falls from a height and their outcomes depend on a large number of factors. The most important of these are: the type of surface, the orientation of the body at the moment of impact, and the height of the fall. The outcome of a fall or a jump is also affected by organ weight and body weight. By taking into account these factors, it is possible to determine the height limit of a fall above which, with a certain degree of probability, an injury to a certain organ will occur, regardless of the orientation of the body at the moment of impact and the type of surface.

**AIM:** The aim of this paper is to determine the cut-off values of specific organ resistance to injury depending on the organ's kinetic energy.

**MATERIALS AND METHODS:** The study includes 30 cases of falls from a height. Standard statistical protocols were applied using the t-test and ANOVA test, and probability values (cut-off values) were calculated by ROC curves.

**RESULTS:** Recalculating from the obtained kinetic energy the limits for average organ weight, we get a high risk of lung injury when falling from a height of more than 10 metres, heart injury from more than 14 metres, liver injury from more than 8 metres, spleen injury from more than 13 metres, and kidney injury from more than 14 metres.

**CONCLUSION:** The data from this paper can be of importance for determining the height from which a fall has occurred based on the injuries to the organs found at an autopsy. In some cases it can lead to a different opinion about an origin of death than that which was initially presented at a crime scene (i.e. post–mortem transfer of the body).

**KEYWORDS:** fall from a height, injuries, trauma score, cut-off value

# VITAMINS AND THEIR ROLE IN COVID-19 TREATMENT

**JELENA CUKOVIC[1], Jovana Perovic[2], Vera Dabanovic[3]**
[1] University of Montenegro, Pharmacy, Podgorica, Montenegro
[2] University of Montenegro, Pharmacy, Podgorica, Montenegro
[3] Montefarm, Warehouse management, Podgorica, Montenegro

**INTRODUCTION:** Coronavirus has been a hot topic since it‘s outbreak at the end of 2019. This poster aims to highlight the importance of the use of vitamins against COVID-19 infection, as well as to bring attention to natural sources of these biomolecules, especially nowadays when people are increasingly turning to the use of synthetic pharmaceutical products that are beneficial as supplements, but not as a main source of vitamins.

**CASE PRESENTATION:** Northwestern University led the research to determine the correlation between the mortality rate of COVID-19 and vitamin D. Studies observed the common occurrence of vitamin D deficiency in severely ill patients with COVID-19. Therefore, vitamin D deficiency indicates a higher risk for the immune system to overreact and develop a cytokine storm. Vitamin D can reduce the production of proinflammatory cytokines such as Tumor Necrosis Factor alpha and Interferon gamma. Simultaneously, the application of vitamin D increases the expression of anti-inflammatory cytokines by the macrophages. As a modulator of adaptive immunity, it suppresses responses mediated by T helper cells, and production of inflammatory cytokines IL-2 and IFN gamma. It further promotes the induction of T-regulatory cells thereby inhibiting inflammatory processes. In another study, a seven-month treatment with intravenous vitamin C, hydrocortisone, and thiamine significantly reduced the hospital mortality of patients with COVID induced sepsis. Moreover, there was no progressive organ destruction in the study group due to infection. This clinical trial was conducted from March to September of 2020 at the Zhongnan Hospital of Wuhan University, in China.

**CONCLUSION:** Vitamins cannot cure Coronavirus patients, neither can they prevent contracting the infection, but proper use and dosage play a major role in easing clinical presentation of COVID-19 and reducing mortality rates all over the world.

**KEYWORDS:** vitamin D; vitamin C; COVID-19; cytokine storm

# BREAST CANCER IN THE POPULATION OF MULTIPLE SCLEROSIS PATIENTS IN BELGRADE REGION

**JOVANA MARICIC**[1]
[1] Institute of Epidemiology, Medicine Faculty, University of Belgrade, Belgrade, Serbia

**INTRODUCTION:** Based on the Multiple Sclerosis (MS) Atlas 2020 data, there are 2.8 million people that are living with MS worldwide, and more than 700,000 people in Europe suffer from MS. An increased risk of some specific cancers like breast cancer (BC) was suggested in the previous studies in the MS population.

**AIM:** The aim of the present study was to describe main demographic and clinical characteristics of the MS patients with BC in Belgrade, Serbia.

**MATERIALS AND METHODS:** A descriptive study was based on the data from the Belgrade population MS Registry. Variables observed included current age, gender, age at MS diagnosis, Expanded Disability Status Scale (EDSS), MS phenotype, disease duration, family history of MS and data on treatment with DMTs, age at BC diagnosis and data on whether it was diagnosed prior to MS or following MS.

**RESULTS:** A total of 16 MS patients with BC were registered in the Belgrade population MS Registry, yielding a prevalence of 0.84%. They were all females with an average current age of 63.6 ± 9.6 years. In 11 women (68.2%) diagnosis of BC was made following MS diagnosis and the mean age at BC diagnosis was 50.3 ± 11.7 years. In comparison with MS cancer-free cohort, MS patients with BC were significantly older (63.6 ± 9.6 years), older at the moment of MS onset ($t=-3.648$, $p<0.001$), had greater level of disability ($t=-4.434$, $p<0.001$) and significantly lower proportion of relapsing-remitting MS phenotype (Chi-square=7.278, $p=0.007$).

**CONCLUSION:** Given the high prevalence of BC and that in majority of MS patients with BC diagnosis of cancer was made after MS onset, more attention should be paid on regular check-ups and early detection of all comorbidities in this population, including malignant diseases, especially those for which there are screening tests and that are highly curable in its early phase, such as BC.

**KEYWORDS:** malignant comorbidity, prevalence, screening, registry

# DIABETIC RETINOPATHY AS A FIRST SIGN OF DIABETES

**KSENIJA ZECEVIC[1], Antoaneta Adzic Zecevic[1,2]**
[1] University of Montenegro, Faculty of Medicine, Podgorica, Montenegro
[2] Eye clinic, Clinical Center of Montenegro, Podgorica, Montenegro

**INTRODUCTION:** Diabetes is a chronic, metabolic disease characterized by elevated levels of blood glucose which leads to serious damage to the heart, blood vessels, eyes, kidneys, and nerves. It is one of the biggest health challenges of the twenty first century, and according to the World Health Organization (WHO) 422 million people worldwide have diabetes and 1.6 million deaths are directly attributed to diabetes each year. The most common early symptoms of diabetes type 2 are polydipsia, polyphagia and polyuria. Nevertheless, these symptoms can be inapparent or overlooked and as a consequence of that, diabetes presents in advanced stages with its complications. Diabetic retinopathy is a common chronic microvascular complication of diabetes and it is a first sign of diabetes type 2 in 4% patients with this diagnosis.

**CASE PRESENTATION:** We present a case of 42 year old male patient with a chief complaint of bilateral visual impairment and blurred vision. On eye examination VOD was 0,1 and cc 0,7. VOS was 0,2 and cc 0,75. TOU was within normal range. Biomicroscopic examination showed normal finding. Fundus exam showed neovascularization and proliferative tissue in temporal arcades in both eyes and partial haemophthalmus in the left eye. Other than ophthalmic pathology, patient denied any other symptoms and considered himself generally healthy. In spite of that, considering the findings on ophthalmic examination which indicated diabetic proliferative retinopathy, we decided to run blood tests. Fasting blood glucose level was 16mmol/l, which confirmed the diagnosis of diabetes type 2. The patient was referred to endocrinologist who prescribed him insulin. On follow up ophthalmic examination patient underwent Argon laser photocoagulation treatment in both eyes.

**CONCLUSION:** Patients who complain of blurred and impaired vision should be examined thoroughly, due to the fact that these symptoms can be first symptoms of many systemic diseases, including diabetes mellitus.

**KEYWORDS:** diabetic retinopathy, blurred vision, vision impairment, diabetes mellitus

# LINEAR GROWTH RETARDATION AS A FIRST SIGN OF CROHN'S DISEASE

**KSENIJA ZECEVIC[1], Veselinka Djurisic[2], Oleg Cmiljanic[2], Dunja Vlahovic[2], Dusanka Novosel [1,2]**

[1] University of Montenegro, Faculty of Medicine, Podgorica, Montenegro

[2] Institute for Childhood Diseases, Clinical Center of Montenegro, Podgorica, Montenegro

**INTRODUCTION:** Inflammatory bowel diseases (IBD) are an important clinical entity in the pediatric population. IBD in children are mostly manifested by gastrointestinal symptoms. However, extraintestinal manifestations (linear growth retardation, weight loss, mucocutaneous lesions, arthritis, eye lesions, etc.) can occur in early stages of the disease, and sometimes may precede gastrointestinal manifestations for a longer period of time.

**CASE PRESENTATION:** We present a case of 12 year old boy who was referred to the gastroenterology department with a history of 20 days of persistent diarrhoea and occasional abdominal pain. Physical examination showed that his height (136 cm) was below 3rd percentile and Body Mass Index (14,6 kg/m²) was on 3rd percentile. His parents reported to notice growth delay in their child for the past 2 years. The patient's skin was pale, with a visible venous pattern on his forehead, poor turgor, and his hair was brittle and weak. An abdominal examination showed tenderness below his left rib cage and the presence of an anal fissure. Blood tests showed anemia, thrombocytosis, high inflammatory markers, and fecal calprotectin was extremely elevated. Endoscopy findings suggested a severe grade of ileocolic form of Crohn's disease which was confirmed by pathohistology.

**CONCLUSION:** In each patient with growth stunting, evaluation in the direction of IBD should be performed.

**KEYWORDS:** linear growth retardation, Crohn's disease

# MERMAID SYNDROME (SIRENOMELIA) - PRESENTATION OF A RARE MALFORMATION

**LUKA MILOVIC[1], Janja Raonic[1,2], Jelena Amidzic[3], Ljiljana Vuckovic[1,2]**
[1] Faculty of Medicine, University of Montenegro, Podgorica, Montenegro
[2] Center for Pathology, Clinical Center of Montenegro, Podgorica, Montenegro
[3] Faculty of Medicine, University of Novi Sad, Novi Sad, Serbia

**INTRODUCTION:** Sirenomelia is a rare malformation that is characterized by fusion of the lower extremities, and thus gives the appearance of a mermaid's tail, which explains the name of the syndrome. So far, only 300 cases have been reported worldwide. Although its cause is unknown, maternal diabetes is considered as one of the main risk factors. Stocker and Heifetz gave a classification of sirenomelia into seven subtypes based on the presence/absence of individual lower extremity bones. Sirenomelia is often accompanied by other malformations, especially urogenital and gastrointestinal, as well as neural tube defects. The aim of this paper is to describe this rare malformation and a set of associated anomalies through a case report.

**CASE PRESENTATION:** A 30 cm long fetus, weighing 640 g (corresponding to VI lunar months of gestation) was autopsied, after a deliberate termination of pregnancy under the diagnoses: oligoamnion and Potter syndrome. External examination revealed Potter's facies (prominent epichantal folds, low-set ears, flattened nose, and recessed chin). The small pelvis was shallow and wide without external genitalia, external opening of the urethra and anus. Lower extremities were fused, fin-like, with no feet. Lower extremity consisted of a fused femur, forming a joint with small pelvis proximally and a single lower leg bone distally in the midline, which corresponds to type VI sirenomelia. In addition, the following were found: pulmonary hypoplasia, ventricular septal defect, colonic atresia, and bilateral renal dysplasia. The internal genitals corresponded to the female sex.

**CONCLUSION:** Sirenomelia is a rare and most commonly lethal malformation. The finding of fusion of the lower extremities to the perinatologist should suggest the presence of other, usually multiple internal anomalies.

**KEYWORDS**: mermaid syndrome, sirenomelia, Potter syndrome, malformation

# KNOWLEDGE AND ATTITUDES OF MONTENEGRIN STUDENTS' POPULATION ABOUT COVID-19 VIRUS

**MARIJA JEKNIC[1], Stefan Martinovic[2], Kana Ljaljevic[1], Agima Ljaljevic[3]**
[1] Medical Faculty, University of Montenegro, Podgorica, Montenegro
[2] Primary Health Care Center Podgorica, Podgorica, Montenegro
[3]Institute for Public Health, Podgorica, Montenegro

**INTRODUCTION:** The COVID-19 pandemic is a major global problem from a health, social, economic, and cultural point of view that has not bypassed Montenegro. Until 17.09.2021. there was a total of 125,128 cases of infection in Montenegro, of which 1,832 have ended fatally.

**AIM:** The aim of this research is to present values, beliefs, attitudes as well as behavior among Montenegrin students related to the COVID-19 virus and available preventive measures.

**MATERIALS AND METHODS:** The research was conducted, according to the type of cross-sectional study, in January and February of 2021. A specially prepared survey was used as a research instrument. The survey consisted of 26 closed-ended questions, distributed as a Google Form Survey. Respondents had the opportunity to freely access the survey as well as to answer with guaranteed anonymity.

**RESULTS:** The largest number of respondents (87.2%) stated that they were informed about the COVID-19 virus via Social Networks. They consider that the most common symptoms are: fever (99.1%), loss of sense of taste (99.1%), loss of sense of smell (97.9%), general malaise (90.6%), joint and muscle pain (84.3%), and cough (84.3 %). A total of 130 respondents think that masks are partially protective. Just 10 of them believe that maintaining a 2m distance is not an effective measure against infection. Less than a half (43%) were COVID-19 tested, and 28.9% were COVID-19 positive. The majority (86.4%) had a milder form of the disease. Cigarette consumers stated that they smoked more than usual in quarantine. One-third of the respondents felt anxious. A total of 54.5% of respondents do not want to be vaccinated.

**CONCLUSION:** This presented research shows that students recognize basic symptoms, but they use uncertain sources of information about the COVID-19 virus. In the upcoming period, it is necessary to increase the collective awareness of preventive measures, primarily the vaccination of young people.

**KEYWORDS**: COVID-19, students, pandemic, knowledge, attitudes

# ACUTE ESOPHAGEAL NECROSIS “BLACK ESOPHAGUS” - CASE REPORT

**MILENA BOZINOVIC[1], Goran Tukic[2], Boris Pejic[1]**
[1] Medical Faculty Foca, Department of Forensic Medicine, Foca, Bosnia and Herzegovina
[2] General Hospital, Department of Pathology, Prijedor, Bosnia and Herzegovina

**INTRODUCTION:** Acute esophageal necrosis, necrotizing esophagitis, or "black esophagus" are terms that refer to a very rare condition whose pathoanatomical feature is necrosis of the esophagus, mucosa and submucosa. The macroscopic expression is dominated by the black color, which explains the medical term "Black esophagus". The localization of necrosis is most often on the distal part of the esophagus, and it can also spread to it‘s proximal segments. The most common clinical manifestation of this rare condition is gastrointestinal bleeding. Risk factors include cardiovascular diseases and conditions of cardiogenic shock, hypoxemia, gastric outlet obstruction, renal failure, trauma, malnutrition, alcohol intake, etc.

**CASE PRESENTATION:** A female, 61 year old, obese corpse was found in the Institute of Forensic Medicine by court order, and it was found in a public area (in the city park next to the bench). At the time of the autopsy, the body was in a state of initial post-mortem changes. An autopsy, among other things, indicated necrosis of a distinctly black color on the distal two-thirds of the esophagus to the cardia. Toxicological analysis ruled out alcoholism, poisoning with caustic and other poisons. The tissue of the oral cavity and the surroundings of the mouth, tongue, pharynx and the initial part of the esophagus were without signs of damage. The cardiac finding included mild left ventricular wall hypertrophy (15 mm) with signs of moderate to severe atherosclerotic changes in the coronary arteries and aorta. The kidneys had signs of nephrosclerosis. We did not have heteroanamnestic or any medical data. After the autopsy, it was concluded that the death related to acute esophageal necrosis most likely occurred as a complication of existing diseases of vascular origin.

**CONCLUSION:** Acute esophageal necrosis must be recognized early and managed aggressively to improve clinical outcomes and thus decrease the mortality associated with the underlying disease.

**KEYWORDS:** Acute esophageal necrosis, Black esophagus, Autopsy

# BEHAVIORAL THERAPY IN FUNCTIONAL FECAL INCONTINENCE

**OLEG CMILJANIC[1], Veselinka Djurisic[1], Velibor Bulatovic[1] , Jelena Stankovic[2], Dusanka Novosel [1,3]**

[1] Institute for Childhood Diseases, Clinical Centre of Montenegro, Podgorica, Montenegro
[2] Primary Health Care Center in Podgorica, Montenegro, Podgorica, Montenegro
[3] University of Montenegro Faculty oF Medicine, Podgorica, Montenegro

**INTRODUCTION:** Functional non-retentative fecal incontinence (FNRFI) is distressing problem in children, that results in upsetting quality of life and presents in 10-20% of all children with fecal incontinence (FI). Patients present with incontinency as a single symptom without an organic cause found and no signs of constipation. Behavioral therapy consisting of toilet training and keeping a bowel diary together with education and system of rewards is the cornerstone of FNRFI treatment.

**CASE REPORT:** We presented case series of four children that fulfilled criteria for FNRFI and that were treated with behavioral therapy. Previously, laxative therapy was ineffective in two children, and in the other two the symptoms were worsened. The follow up during behavioral therapy was over a 12-week period. Significant improvement in soiling frequency was observed in all children in the first 4 weeks after starting therapy. After 12 weeks one child did not soil the laundry at all, three other reduced the frequency of soiling to less than once a week.

**CONCLUSION:** Behavioral training program is considered a successful treatment of FNRFI in children. Thus, motivation to adhere to this intensive program is very important.

**KEYWORDS**: FNRFI, behavioral therapy

# RECURRENT CHOLANGITIS AS A MANIFESTATION OF THE INTRAHEPATIC FORM OF PRIMARY SCLEROSING CHOLANGITIS WITHIN COMMON VARIABLE IMMUNODEFIENCY

**SEJLA MURIC[1], Veselinka Djurisic[2], Oleg Cmiljanic[2], Jelena Stankovic[1], Dusanka Novosel[2,3]**
[1] Primary Health Care Center Podgorica, Podgorica, Montenegro
[2] Institute for Children's Diseases, Clinical Centre of Montenegro, Podgorica, Montenegro
[3] University of Montenegro, Faculty of Medicine, Podgorica, Montenegro

**INTRODUCTION**: Common variable immune deficiency (CVID) is the most common primary immunodeficiency in childhood and is associated with many others autoimmune conditions such as hemolytic anemia, immune thrombocytopenia, rheumatoid arthritis, and multiple autoimmune liver conditions. Primary sclerosing cholangitis (PSC) is slowly progressive autoimmune liver disease characterized by chronic inflammation, destruction and fibrosis of the bile ducts that lead to cholestasis, liver fibrosis, and liver failure.

**CASE PRESENTATION:** We present a case of 11 years old girl with CVID who has been on regular intravenous immunoglobulin (IVIG) replacement therapy since February 2016. Together with CVID, she also developed autoimmune hemolytic anemia and chronic suppurative lung disease. Cartilage-hair hypoplasia syndrome (CHH) has been suspected due to disproportionately low growth and bialellic mutation in the RMRP gene. A few months ago she undergone complete hepatological evaluation for laboratory-verified biliary hepatitis. Meanwhile, on several occasions, she was hospitalized due to recurrent cholangitis which was manifested fever, abdominal pain and a jump in the bilirubin fraction, with ultrasound signs of dilated bile ducts. Apart from mild detection of antinuclear antibodies (ANA), the other immunoserological profile was negative. Magnetic resonance cholangiopancreatography (MRCP) was performed and showed signs of cholangitis, but no clear signs pf PSC (multifocal duct strictures and dilatation). Liver biopsy showed fibro-obliterative cholangitis and diagnosis ,,Small duct variant" of PSC was made.

**CONCLUSION:** Vancomycin and ursodeoxycholic acid have been shown to be successful treatments. Partial biochemical remission was achieved, with no recurrent cholangitis. In our knowledge so far, in the literature two cases of the connection between CVID and PSC in adults have been described, in children this connection is first presented in our work.

**KEYWORDS:** common variable immune deficiency, primary sclerosing cholangitis, recurrent cholangitis

# TYPE 2 DIABETES MELLITUS AND THYROID HEALTH

**STEFAN JANICIC[1],Tijana Icin[1]**
[1] Faculty of Medicine, University of Novi Sad, Department of Internal Medicine, Novi Sad, Serbia

**INTRODUCTION:** Thyroid diseases and type 2 diabetes mellitus (T2DM) are the most common conditions in endocrinology. Their mutual association can have a huge impact on diagnosis, therapy, and possible complications.

**AIM:** The aim of our study was to examine the incidence and to analyze thyroid diseases in patients with T2DM, as well as to examine the effect of renal failure on the level of thyroid hormone and thyroid-stimulating hormone (TSH).

**MATERIALS AND METHODS:** The study retrospectively included 100 patients, both sexes, with T2DM, treated and monitored at the Department of the Day Hospital of the Clinic for Endocrinology, Diabetes and Metabolic Diseases of the Clinical Center of Vojvodina. Demographic and laboratory-clinical data included in the research were obtained from medical histories, and then statistically processed.

**RESULTS:** 31% of the examinees included in the research had been diagnosed with thyroid disease, 61% of the patients were female and 39% male. The most common group of diseases are thyroid dysfunction present in 24% of subjects, and the rarest one is nodular disease present in 3% of subjects in the study. A growth trend of TSH and thyroxine was observed with a decrease in glomerular filtration rate but without statistical significance ($p > 0.05$).

**CONCLUSION:** Thyroid diseases are more common in patients with T2DM than in the general population, the most common being functional disorders. Additional research is needed to assess the impact of impaired renal function, as one of the most important complications of T2DM, on thyroid diseases.

**KEYWORDS:** Thyroid gland; type 2 diabetes; glomerular filtration

# KNOWLEDGE, ATTITUDES AND PRACTICE (KAP) REGARDING DEPRESSIVE PHENOMENOLOGY IN HIGH SCHOOL SENIORS ON THE NORTH AND THE SOUTH OF MONTENEGRO

**Sucro Madzgalj[1], DAVID VUKOVIC[1], Aleksandra Sekulovic[2], Anja Strugar [3], Jovan Mirkovic [4]**

[1] University of Belgrade, Faculty of Medicine, Belgrade, Serbia
[2] University of Debrecen, Faculty of Science and Technology, Debrecen, Hungary
[3] Marangoni Fashion Institute, Fashion Design, Milan, Italy
[4] University of Montenegro, Faculty of Sciences and Mathematics, Montenegrin Science Promotion Foundation (PRONA) Podgorica, Montenegro

**INTRODUCTION:** Depression, as an illness of chronic mood disorder, occurs with the greatest prevalence in the era of modern medicine and is a disease of modern age. Despite the fact that it is the most frequent disease, knowledge and awareness of this disease are insufficient, and attitudes about depressive phenomenology are still constantly affected by stigma, conservative and mystical beliefs, which often creates an unrealistic picture that further complicates the diagnosis and treatment of patients with this disease.

**AIM:** Determining the level of knowledge, identifying attitudes, and evaluating practical skills in pupils of high schools in Rozaje and Cetinje, Montenegro.

**MATERIALS AND METHODS**: 41 high school students in Cetinje and 71 in Rozaje, with an average age of 17.5 and 17.7 years respectively, were given questionnaires about Knowledge, Attitudes and Practice (KAP) about depressive phenomenology, andserved as a sample in this study. The data was processed statistically, using descriptive and analytical statistical methods.

**RESULTS:** Considering only correct answers, the level of knowledge presented in almost all of the questions in both samples does not exceed 50%. The situation with attitudes is even more prominent, due to the fact that appropriate attitudes about depression do not exceed 50% regarding any question. Practical skills are somewhat better, however the real possibility of adequate implementation of practical skills comes under question due to the low level of knowledge about depression.

**CONCLUSION:** A low level of knowledge, limited attitudes, and a modest level of practical skills in dealing with a depressed person, as well as a low level of awareness, were demonstrated. This creates ideal conditions for promising intervention efforts in this area.

**KEYWORDS:** depression; knowledge; attitudes; practice

# FUSIFORM CYST OF CHOLEDOCHUS AS A CAUSE OF ASYMPTOMATIC CHOLESTASIS AFTER OVERCOMING EBSTEIN BARR VIRUS INFECTION

**VUKASIN STOJANOVIC[1], Dragana Pekovic [2], Oleg Cmiljanic[2], Jelena Stankovic [3], Dusanka Novosel [1,2]**

[1] University of Montenegro, Faculty of Medicine, Podgorica, Montenegro
[2] Institute for Childhood Diseases, Clinical Center of Montenegro, Montenegro
[3] Primary Health Care Center Podgorica, Montenegro

**INTRODUCTION:** Choledochal cysts are rare congenital anomalies of the bile ducts and characterised as an abnormal, cystic dilatation of the biliary duct. There are five types of choledochal cysts. Type I cysts are the most common type, seen in 75–85% of cases, further classified as cystic (IA), focal (IB), or fusiform (IC). A vast majority of patients are diagnosed in the first year of life, however a proportion of them present in the later course of life. Diagnosis is made using laboratory tests, ultrasound (US), magnetic resonance cholangiopancreatography (MRCP), and endoscopic retrograde cholangiopancreatography (ERCP).

**CASE PRESENTATION:** We present a case of a 14-year-old boy with jaundice and itching, who had been treated with cephalosporins for a sore throat one month earlier. On presentation liver function tests were slightly elevated, with a normal pancreatic panel, and pronounced conjugated hyperbilirubinemia. Additional hepatological evaluation (iron, ferritin, transferrin, ceruloplasmin, alpha 1 antitrypsin), as well as immunoserological tests (ANA, pANCA, ASMA, C3, C4, LKM1, LKM2), were in reference range. Viral serology showed increased EBV IgM and IgG (reactive) with low avidity, indicating near-acquired EBV infection. MRCP showed splenomegaly, sludge in the gallbladder and fusiform dilatation of extrahepatic biliary tree. He underwent Roux-en-Y hepatico-jejunostomy with complete cysts excision, after which biliary drainage wass established. Splenomegaly was most likely the result of the recent EBV infection. Sludge in the gallbladder, which was most likely due to the use of cepholsporins, was a trigger for the cysts‘ manifestation.

**CONCLUSION**: In any asymptomatic cholestasis, bile duct abnormalities should be considered, regardless of age.

**KEYWORDS:** choledochal cyst, cholestasis, EBV infection

# PERFORATED MECKEL'S DIVERTICULUM IN A NEWBORN – A RARE CASE

**ZOHAR ALONY [1], Timm Neumann [1], Malgozata Bielinska [1], Marek Wolski [1]**
[1] Medical University of Warsaw, Pediatric Surgery, Warsaw, Poland

**INTRODUCTION:** Neonatal gastrointestinal perforation is a rare condition, usually associated with low birth weight and gestational age. Most commonly this is associated with necrotizing enterocolitis (NEC) followed by localized/spontaneous intestinal perforation (SIP). Meckel's diverticulum (MD) is remarkably uncommon to be the site of perforation. MD is the most common congenital anomaly of the gastrointestinal tract, found in about 2% of the population, but 85-95% of patients are asymptomatic. Symptomatic cases, present as intestinal obstruction, gastrointestinal hemorrhage, diverticulitis, and perforation amongst others. In newborns, perforation is rare.

**CASE PRESENTATION:** A 2080g boy, was delivered at 32+5/7 weeks of gestation by cesarean section for breech presentation and spinal hemangioma. Apgar scores were 8/8/9/9. Breathing support by CPAP was necessary. The patient was sent to the NICU in stable condition with continued ventilatory support. After initial feeding intolerance TPN was initiated, and a central venous catheter was placed. For placement control an X-ray was performed and pneumoperitoneum was found. Physical examination showed no evidence of peritonitis. An ultrasound was performed with similar findings indicative of urgent surgical exploration. The patient was referred to the surgical department for excision and repair of the perforation. After an epigastric incision, an inflamed perforation of the Meckel's diverticulum (MD) was found under a mass of centered loops of the small intestine with adhesions. Resection within healthy margins and anastomosis was performed. Recovery was good and total enteral feeding was reached on the 15th-day post-op. Differential diagnoses of gastrointestinal tract perforation in the neonate include necrotizing enterocolitis (NEC), atresias, intestinal malrotation, or spontaneous intestinal perforation (SIP) amongst others. Although the finding of pneumoperitoneum is a strong indication for NEC, the benign clinical presentation and the surgical findings lead to a diagnosis of Meckel's diverticulitis with perforation. The extensive inflammation might indicate diverticulitis that might have started already in utero.

**KEYWORDS:** Meckel's diverticulum, Perforation, Neonate, Pediatric Surgery

# ACUTE AORTIC THROMBOSIS COMPLICATED WITH ACUTE ABDOMEN IN A COVID 19 PATIENT

**MISIMI SHQIPE[1], Andrej Nikolovski[2]**
[1] University "Sv.Kiril and Methody", General Medicine, Skopje, North Macedonia
[2] University Surgery Clinic "Sv. Naum Ohridski", Skopje, North Macedonia

**INTRODUCTION:** There are thousands reports of acute aortic thrombosis as complication of Covid 19 with a reported mortality of 34-62 %. One of the acute arterial events in these patients is occlusive mesenteric ischemia. This condition is rare and only single cases are reported.

**CASE PRESENTATION:** A 72 year old female patient presented in our emergency department with acute abdomen. She was Covid 19 positive and was treated at home during the previous ten days by her family doctor. Prior to admission she had pO2 of 80% with an oxygen mask. A contrast enhanced CT scan of the thorax and abdomen revealed bilateral pneumonia, aortic arch thrombosis, and free thrombus in the abdominal aorta. After admission, her saturation dropped to 20% pO2, and she was reanimated and intubated. The family refused the offered exploratory laparatomy. The general condition of the patient gradually worsened in the next three days and she died.

**CONCLUSION:** Acute abdomen is a serious condition and when left untreated can result in death. One of the causes of acute abdomen is acute mesenteric ischemia. In our case, due to the lack of exploratory laparotomy and autopsy, the occlusive mesenteric ischemia was not proven. However, the clinical presentation of acute abdomen, the presence of a free thrombus in the abdominal aorta, and the absence of other surgical conditions on the CT scan led us to clinical conclusion of acute mesenteric ischemia.

**KEYWORDS:** acute aortic thrombosis, Covid 19, mesenteric occlusion

# THE INFLUENCE OF PROSTHETIC WORKS ON FACIAL AESTHETICS

**NIKOLINA POPADIC [1], Nemanja Mitrovic [1], Mihael Stanojevic[1]**
[1] Department of Dental Prosthetics, Faculty of Medicine Foča, University of East Sarajevo,Bosnia and Herzegovina

**INTRODUCTION:** Today, in everyday dental practice, we meet patients for whom aesthetics come first. Aesthetic dentistry is a multidisciplinary branch of dentistry because in addition to beautiful, healthy, white, and properly spaced teeth, it also requires a healthy periodontium, a healthy gingiva. Patients are increasingly demanding pink aesthetics, that is, soft tissue aesthetics. If our teeth and soft tissues are the image we create with our work, then the lips are the frame of that part and round off the complete look.

**CASE REPORT:** The patient comes to the Specialist Center in Foča due to dissatisfaction with the condition in the oral cavity and pronounced protrusion. Clinical examination revealed extensive damage to the front and pronounced protrusion. After examination and analysis of the X-ray, a therapeutic approach is planned. The patient was offered a fixed job. After accepting our proposal, we ground our teeth in the front and dilated the root canal, then took an impression. A cast augmentation is a metal peg with a modeled tooth stump that is placed and centered in the canal of a dead tooth, and it is necessary to strengthen it and compensate for the part of the tooth destroyed by caries so that it can carry the crown. We first performed temporary endo-crowns on the patient until the final handover. The definitive surrender of the work were metal-ceramic crowns. Metal-ceramic crowns are traditional crowns that are often used to improve the aesthetics of a tooth.

**CONCLUSION:** Today in dental practice, by prosthetic work we can influence not only the changes in the oral cavity but also the general appearance of the patient. With this work we were able to satisfy the patient, both in terms of aesthetics and functional irregularities.

**KEYWORDS**: endo crowns, aesthetics, fixed operation.

# COVID-19 COMPLICATIONS AMONG RESIDENTS OF POLAND

**ZUZANNA CZUDY[1], Zuzanna Wardega[1], Marta Donderska[1], Milena Matuszczak[1] Sylwia Andrzejczak-Grzadko[2]**

[1] Collegium Medicum, University of Zielona Góra, Zielona Góra, Poland

[2] University of Zielona Góra, Faculty of Biological Science, Department of Biotechnology, Zielona Góra, Poland

**INTRODUCTION:** Complications after the COVID-19 disease vary greatly from person to person and appear in the respiratory, cardiovascular, nervous, endocrine and mental systems. The occurrence of any of the symptoms depends on the age, gender or health condition of the patient, but there are also complications that appear independently. Presently, occurrence of many complications after COVID-19 was proven. Better understanding of COVID-19-related complications can improve preparing the health care system for the long-term consequences of the current pandemic.

**MATERIALS AND METHODS:** An online survey was conducted among people who had suffered from COVID-19. The respondents were asked about the course of the disease (severe, mild, asymptomatic), the symptoms that occurred and the presence of the reinfection. Complications after the COVID-19 disease were divided into the 5 categories affecting respiratory, cardiovascular, neurological system and mental disturbances.

**RESULTS:** The questionnaire was completed by 508 people, 386 of them were females (76,0%). The age of the respondents varied between <18 and >70 years old. The majority of them were in the range of 18-25 years old (50,0%). 82,3% of the respondents declared the mild course of illness (fever, cough, dyspnoea, loss of taste and smell). Only 6,3% of the respondents claimed the asymptomatic course of COVID-19. The complications of COVID-19 disease were reported in 284 of the research participants (55,9%), 55 of them were males (19,37%). The most common complications among the respondents were: chronic fatigue (66.9%), deterioration of the physical shape (59.9%), concentration impairment (58.8%), shortness of breath (55%), difficulty in falling asleep (49.3%), loss of smell (48.9%), memory deterioration (48.2%), headache and dizziness (47.2%), negative mood states (44.0%), weakening of muscle strength (39.1%), dry cough (35.2%), thrombosis of the blood vessels (35.2%), edema (30.6%), dyspnoea (28.2%), tachycardia (27.8%).

**CONCLUSION:** Complications after the COVID-19 disease will continue long after the pandemic ends. We do not know if we will discover any other late complications of this disease in the future. The awareness of these will be crucial for clinical doctors and further treatment.

# FIRST CASE OF MULTISYSTEM INFLAMMATORY SYNDROME IN CHILDREN IN MONTENEGRO

**SLADJANA KUC [1], Tamara Zivkovic[2], Velibor Bulatovic[2], Mina Rudanovic Popovic[2], Dusanka Novosel [2,3]**

[1] Primary Health Care Center, Podgorica, Montenegro
[2] Institute for Childhood Diseases, Clinical Center of Montenegro, Podgorica, Montenegro
[3] University of Montenegro, Faculty of Medicine, Podgorica, Montenegro

**INTRODUCTION:** The multisystem inflammatory syndrome in children (MIS-C) is a hyperinflammatory complication of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) infection seen in children below 19 year of age and is characterized by fever, signs of inflammation, and multisystem organ involvement.

**CASE PRESENTATION:** A 9-year-old girl was presented with fever (37.8), intense ileocecal pain, and high inflammatory markers. Due to suspected appendicitis, an appendectomy was performed. Postoperatively, she was febrile (38.6) and third day after appendectomy CRP level increased (356.6 mg/L). In further course patient general condition deteriorated, she was transferred to an intensive care unit with shortness of breath, dehydration, tachycardia (167/min), tachypnea (40/min), and fever (37.8). Laboratory tests showed further elevation of inflammatory markers with anemia, thrombocytopenia, lymphocytopenia, hypoalbuminemia and high levels of pro-BNP. Serology on SARS-CoV2 was positive. Chest CT revealed changes corresponding to pulmonary edema. Echocardiography showed reduced left ventricular contractility, a trace of mitral regurgitation and minor pericardial effusion. Diagnosis of MIS-C after asymptomatic SARS-CoV-2 infection was made. The patient was successfully treated with intravenous immunoglobulin therapy, methylprednisolone with gastroprotection, acetylsalicylic acid with enoxaparin in prophylactic doses and parenteral meropenem. Digoxin, spironolactone and furosemide were prescribed at the suggestion of a cardiologist. Oxygen therapy and albumin transfusions were used until reference values were reached. Previously described changes showed regression.

**CONCLUSION:** In each patient with fever, sings of inflammation and multiorgan dysfunction even in absence COVID-19 exposure or SARS-CoV-2 positivity, MIS-C should be considered.

**KEYWORDS:** MIS-C, SARS-CoV-2, immunoglobulin therapy

# EXAMINATION OF THE MENTAL, PHYSICAL, AND SOCIO-ECONOMIC CONDITION OF STUDENTS DURING THE COVID-19 PANDEMIC

**NIKOLINA GAJIC[1], Tamara Drobnjak[1], Ivana Milanovic[1,] Marija Burgic Radmanovic[1,2]**
[1] Faculty of Medicine, University of Banja Luka, Banja Luka, Bosnia and Herzegovina
[2] Department of Psychiatry, University Clinical Centre of the Republic of Srpska, Banja Luka, Bosnia and Herzegovina.

**INTRODUCTION:** Surveys completed by students gave insight into the overall changes and deterioration of mental health, which increased the incidence of somatic disorders and diseases. Most of the conditions detected in students were related to the enormously increased stress they have experienced since the introduction of quarantine, restraining order and restricted movement.

**AIM:** The assessment of the mental state of students at the University of Banja Luka, during the COVID-19 pandemic;

**MATERIALS AND METHODS:** The survey was conducted through an online questionnaire in Google Forms, from March 25 to 28, 2021 on a sample of 1452 students; the questionnaire consisted of 24 questions and the period of its completion lasted 10 minutes;

**RESULTS:** The results of the regression analysis show that a relatively high rate of students during the COVID-19 epidemic began to think more often about their mental and physical health, 42.1% about physical health, and 37.8% about mental health. The analysis showed that 42.9% of students always thought and feared about their family's health, and 40.9% often thought and feared about their family's health. Feelings of nervousness were present in 60.1% of students, and anxiety in 58.3% of them. The overall level of anxiety was 59.2%.

**CONCLUSION:** About three-fifths of students at the University of Banja Luka experienced symptoms of anxiety during the COVID-19 pandemic. Given the large number of affected students, it would be desirable to organize psychological support and assistance within the University.

**KEYWORDS:** COVID-19, students, mental health

# COVID-19 POSITIVE PREGNANCY OUTCOMES – IN MONTENEGRO AND GLOBALLY

**STEFAN MARTINOVIC[1], Katarina Popovic[2], Sasa Raicevic[3]**

[1] Primary Health Care Center, Podgorica, Montenegro

[2] Faculty of Medicine, University of Montenegro, Podgorica, Montenegro

[3] Gynecology and Obstetrics Department, Faculty of Medicine, University of Montenegro, Podgorica, Montenegro

**INTRODUCTION:** In Montenegro, 50,714 women were tested for COVID-19 up until 18.06.2021. The exact number of pregnant women tested is unknown. During 2020, there were a total of 7,000 births, including 196 COVID-19 pregnant women (3%).

**AIM:** The goal of this paper was to demonstrate the differences in pregnancy outcomes in various health-care systems using obstetric and epidemiological indicators.

**MATERIALS AND METHODS:** The data for Montenegro was collected from March to December 2020 at the Clinical Center of Montenegro (CCM), hospital Codra, and General Hospital in Berane (GHB). The data for Serbia was collected during the first wave of the COVID-19 pandemic from the 2021 Gynecological-Obstetric Section of the Serbian Medical Association. The data presented for other countries were collected from publications on Medscape, PubMed, and the British Medical Journal.

**RESULTS:** In Montenegro, there were 196 COVID-19 positive births, 59% cesarean sections (CS) and 41% vaginal births. Almost all neonates were COVID-19 negative, in good health condition, except for two neonatal deaths (1%). The maternal death rate for this sample was 0.05%. The rate for premature births in COVID-19 pregnancies was 7.1%. In Serbia, there were 586 COVID-19 positive births, 21.2% being CS, with an average gestational age of 38+6/7 weeks. The neonatal and maternal death rate were 3.4% and 0.09%, respectively. There were nine COVID-19 positive neonates. In both countries, we can see that there was a relatively high percentage of CS in comparison to the World Health Organization‘s recommended 10-15%. However, other countries around the world also demonstrated a high percentage of CS in COVID-19 positive births (36.9% in the US, 91% in Iran). Studies in Great Britain show a higher percentage of premature births in COVID-19 pregnancies (26%) in comparison to Montenegro.

**CONCLUSION:** The presented data shows a high percent of CS in COVID-19 positive births in Montenegro, Serbia, and other countries.

**KEYWORDS:** COVID-19, pregnancy, birth, cesarean section

# MELANOMA IN A TEENAGE BOY – A CASE REPORT

**STEFAN MIKIC[1], Katarina Popovic[2], Milos Bojic[3], Marinko Paunovic[3], Zoran Terzic[2,3]**
[1] Primary Healthcare Center of Podgorica, Podgorica, Montenegro
[2] University of Montenegro, Faculty of Medicine, Podgorica, Montenegro
[3] Clinical Center of Montenegro, Department of Plastic and Reconstructive Surgery, Podgorica, Montenegro

**INTRODUCTION:** Melanoma is the most aggressive form of malignant skin tumors. Childhood and adolescent melanoma are rare, making up only 1.3% of cancer in patients under the age of 20. Some authors suggest that pediatric melanoma should be a distinct biological entity due to differences in clinical presentation, risk factors, etiology, and prognosis. Risk factors include excessive ultraviolet radiation exposure, tanning beds, previous blistering sunburns, fair skin, congenital and acquired immunodeficiencies. In younger patients, it is important to consider congenital melanocytic nevi, familial atypical nevus syndrome, and genetic conditions such as Xeroderma pigmentosum. Despite the fact that adolescent melanoma is generally diagnosed in a more advanced stage, the overall survival rate is greater than in adults.

**CASE PRESENTATION:** The patient is a 16 year old boy with a pigmented skin lesion on his scalp and a palpable left cervical lymph node. He lives in the southern coastal region of Montenegro, however, other risk factors are unknown. A skin lesion excision and neck lymph node biopsy were performed. The pathohistological analysis confirmed the diagnosis Melanoma nodulare capilitii and Meta in lymphonodo colli I sin. Immunohistochemistry showed that the tumor is BRAF and Vimentin positive, but Melan A and S100 negative. A subsequent second surgery consisted of reexcision, dissection of the left side of the neck, and bilateral axillar dissection. This time, the pathohistological analysis was negative for malignant cells. The patient received treatment with BRAF and MAC inhibitors (Dabrafenib and Drametinib, respectively).

**CONCLUSION:** Although melanoma in children and adolescents is rare, it should always be considered in the case of atypical skin lesions.

**KEYWORDS:** melanoma, pediatric melanoma, lymph node dissection

# CASE REPORT OF FOUR-YEAR-OLD GIRL WITH LATE ONSET OF MULTISYSTEMIC INFLAMMATORY SYNDROME

**MILENA MIKULIC[1], Branko Lutovac[1,2]**
[1] University of Montenegro, Medical Faculty
[2] Clinical Center of Montenegro, Institute of Childrens' Disease

**INTRODUCTION:** Multisystemic inflammatory syndrome in children (MIS-C) is a complication of SARS-CoV-2, with the possibility of serious and lethal complications. The usual duration between acute infection and onset of MIS-C is two to six weeks. However, rare cases of MIS-C occurring >6 weeks after the acute infection have been reported.

**CASE PRESENTATION:** A four-year-old girl presented with two days history of abdominal pain and high fever. The next day she began vomiting and was referred to the paediatric unit. Initial laboratory evaluation showed normal complete blood count, high acute phase reactants (APR) and D-dimer. Abdominal ultrasound (US) revealed insignificant mesenteric lymphadenopathy and small amount of free fluid. Chest X-ray, troponin, and pro-BNP level were normal. Parenteral rehydration and a double antibiotic course were initiated. PCR test for SARS-CoV-2 was negative and serological test for SARS-CoV-2 revealed +IgG and -IgM. We obtained history of COVID-19 infection two months prior to admission. The following 24h she was febrile with worsening gastrointestinal symptoms. Repeated abdominal X-ray and US were without change. Control laboratory findings showed pancytopenia, elevated APR and D-dimer, hypoproteinaemia, hypoalbuminemia, hypokalaemia, and slightly elevated transaminases. Metronidazole was initiated. In the next few hours, she became oedematous, with maculopapular rash, raspberry tongue, lip hyperaemia with desquamation, and tender abdomen. Due to the poor general aspect, the girl was transferred to the PICU. On admission she was tachycardic. Antibiotic regimen was switched to meropenem. Repeated laboratory showed similar results with extremely elevated APR and proBNP. A CT scan of abdomen was performed. Echocardiography finding was normal. After excluding sepsis and Kawasaki disease, diagnosis of MIS-C was established. The patient received intravenous immunoglobulin, aspirin, enoxaparin, albumin replacement, diuretics, methylprednisolone, and gastroprotection.

**CONCLUSION:** From the fourth day of PICU admission, she was afebrile, with normal vital parameters, and a better general condition. She was discharged after fourteen days.

**KEYWORDS:** COVID-19, MIS-C, sepsis like syndrome