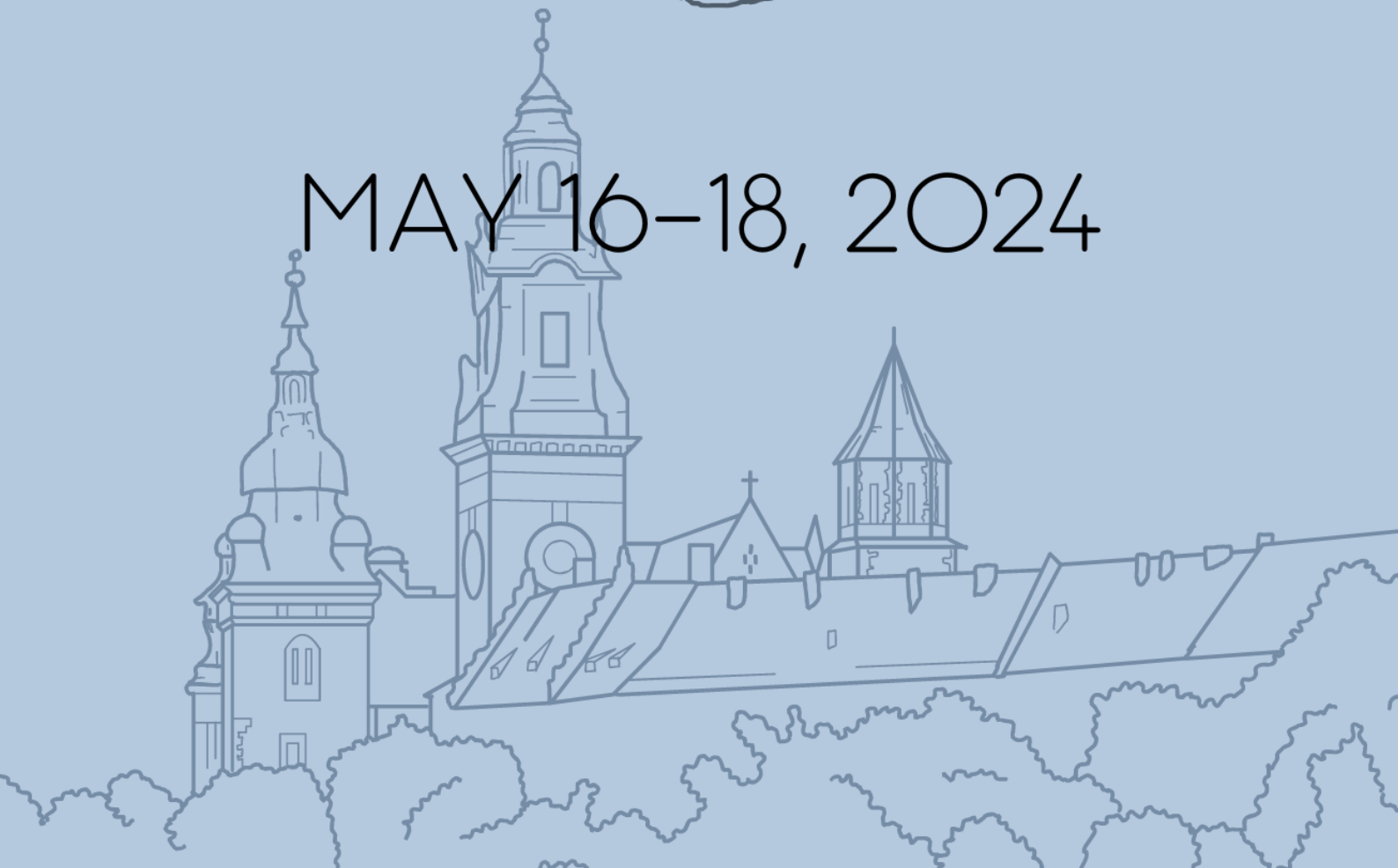
# ABSTRACT BOOK

IMSC 2024

MAY 16–18, 2024



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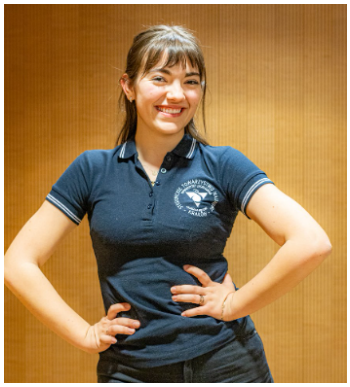
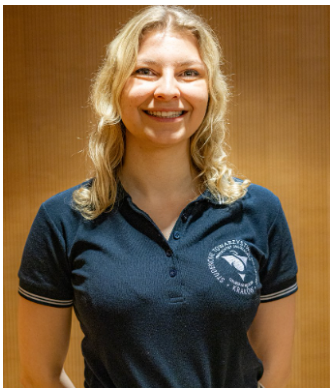


## Natalia Zamorska

Head of Organizing Committee



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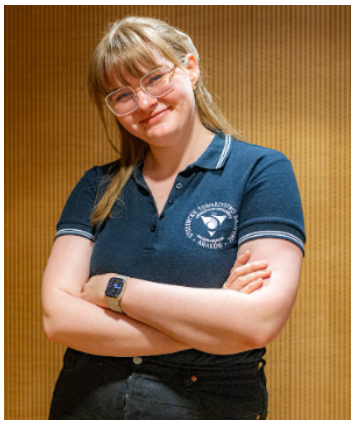

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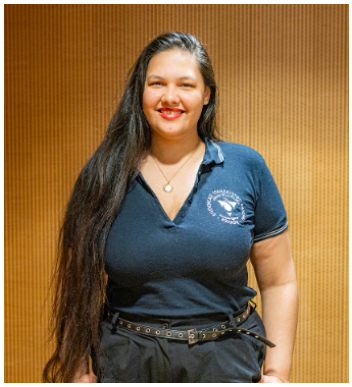

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# ORAL SESSIONS

# BASIC SCIENCE ORAL SESSION

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Jerzy Wiater, Eng, PhD

Barbara Piekarska, MD

prof. Jolanta Kaszuba-Zwoińska MD, PhD

## Sessions coordinators:

Justyna Daniek

Karolina Jałowiecka

**Title**: Pilot effect of fisetin eye drops in dogs with dry eye syndrome

**Authors:** Adriana Rašiová

**Tutors:** doc. RNDr. Vladimíra Tomečková, PhD.

**Affiliation:** Medical faculty at Pavol Jozef Šafárik University in Košice

**Introduction:** Dry eye syndrome results from decreased tear production, leaving the eye inadequately shielded against external factors. Tear fluid exhibits imbalanced lipid and protein composition, causing hyperosmolarity and triggering inflammation (upregulation of MMP-9). Hydration with artificial tears eases initial symptoms, while advanced stages require cyclosporine eye drops.

**Aim of the study:** This study aimed to experimentally apply new eye drops containing 0.1% fisetin, along with 0.2% cyclosporine, in dogs with dry eye syndrome. Seeking enhanced anti-inflammatory treatment, this pilot work investigated the additive therapeutic effect of fisetin—a flavonoid known for anti-inflammatory and neuroprotective properties—formulated in hypromellose-P eye drops.

**Materials and methods:** Tear fluid was collected from 26 eyes of 17 dogs at the Small Animal Clinic in Košice. Healthy group comprised 8 untreated dogs (16 eyes). Dogs with dry eye syndrome (9 dogs, 10 eyes) were divided into an experimental group (5 dogs) receiving 0.2% cyclosporine with 0.1% fisetin in hypromellose eye drops thrice daily for 14 days, and a control group (4 dogs) receiving hypromellose drops without fisetin. Tear fluid collected on days 1, 7, 14 by Schirmer strip underwent analysis. Strips were immersed in a proteinase inhibitor solution, centrifuged, and supernatants stored at -80°C. MMP-9 levels were assessed using ELISA, measuring absorbance at 450 nm.

**Results:** After 7 days of fisetin eye drops in hypromellose-P, tear production showed no significant increase (8.10 mm ± 1.82 mm, $p = 0.94$). Only one dry-eyed model dog exhibited a substantial tear production restoration after 14 days (20.12 mm ± 2.42 mm, $p = 0.0008$) compared to the healthy group (20.07 mm ± 2.94 mm). In some dogs, tear formation remained unrecovered after 7 and 14 days (9.40 mm ± 6.02 mm, $p = 0.47$; 9.80 mm ± 6.83 mm, $p = 0.53$). Level of MMP-9 decreased after 14 days, suggesting fisetin's impact on tear fluid dynamics.

**Conclusions:** Tear production increased significantly in one dog with dry eyes post-fisetin treatment. Initial MMP-9 elevation followed by a decrease suggests potential anti-inflammatory effects. Further research with a larger sample over an extended period can provide insights into fisetin's anti-inflammatory therapy for dry eye syndrome in dogs, allowing a personalized medical approach.

**Title**: SARS CoV-2 spike E156G/Δ157-158 mutations contribute to reduced neutralization sensitivity and increased infectivity

**Authors:** A. Reza Rezaei

**Tutors:** Tarun Mishra, PhD

**Affiliation:** Virologist & postdoctoral researcher, Carver college of medicine, University of Iowa, Iowa city, USA

**Introduction:** SARS-CoV-2 is an RNA virus that causes a disease called COVID-19. Despite the development of multiple vaccines against the virus, it is still able to cause breakthrough infections in the human population and cause large-scale deaths. Thus, it is crucial to understand how the virus circumvent the neutralization effect of antibodies generated by vaccination.

**Aim of the study:** Our study aimed to understand the evolution of the SARS-CoV-2 virus at the molecular level, which makes it resistant to the antibodies generated by vaccination.

**Materials and methods:** Serum samples were collected from breakthrough infection patients and individuals vaccinated against SARS-CoV-2 (CovishieldTM or Moderna). The SARS-CoV-2 spike gene was sequence characterized using the Sanger sequencing method. The functional impact of spike mutation was assessed using reporter pseudoviruses. The reporter viruses were cultured in the presence of serum from vaccinated individuals, and resistance against neutralization was measured by infecting HEK293T-ACE2 cells.

**Results:** We observed multiple mutations in the spike gene. One of the most significant mutations in N-terminal domain (NTD) is E156/Δ157-158 responsible for increased infectivity and reduced sensitivity to neutralizing antibodies. This change occurred due to the deletion of six nucleotides (467-472) in NTD. Notably, this mutation is found in most variants that emerged in past years.

**Conclusions:** Here, we first showed that SARS-CoV-2 evolves continuously to overcome the neutralization effect of vaccine-induced antibodies. Profiling of spike gene sequence from various variants shows the accumulation of E156/Δ157-158 mutation in upcoming variants, indicating positive selection of deletion mutation in new variants.

**Title**: Effect of butyrylcholinesterase and p38α mitogen-activated protein kinase inhibitors on improving learning and memory in mice

**Authors:** Natalia Płachtij 1, Aleksandra Manik 1, Karolina Kania 1, Dziyana Hliabovich 1, Filip Targosiński 1

**Tutors:** prof. Kinga Sałat, PhD 1 and prof. Stanislav Gobec MPharm, PhD 2

**Affiliation:** 1. Department of Pharmacodynamics, Faculty of Pharmacy, Jagiellonian University Medical College, Krakow 30-688, Poland ; 2. Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Ljubljana, Ljubljana 1000, Slovenia

**Introduction:** Alzheimer's disease (AD) is a neurodegenerative disorder leading to progressive loss of cognitive functions, including memory impairment and learning deficits. The majority of FDA-approved anti-AD drugs attenuate memory loss in mild to moderate phase of the disease, thus there is still an urgent need to develop novel, procognitive drug candidates. Two enzymes involved in neurodegeneration underlying AD can be distinguished as potential therapeutic targets for new anti-AD drugs: butyrylcholinesterase (BuChE) and p38α mitogen-activated protein kinase (p38α MAPK).

**Aim of the study:** The aim of the study was to investigate the procognitive effect of compounds GUK-1329 (a selective BuChE inhibitor), KES-19 (a selective p38α MAPK inhibitor) and KES-29 (a dually-acting BuChE/p38α MAPK inhibitor) in mouse models of amnesia induced by scopolamine or lipopolysaccharide.

**Materials and methods:** Passive avoidance (PA), novel object recognition (NOR) and Morris water maze (MWM) tasks were used to assess the activity of compounds administered intraperitoneally.

**Results:** In the scopolamine-induced model KES-29 proved to be the most active compound in the PA and NOR tasks. Furthermore, in the lipopolysaccharide-induced model the same compound was the most effective one in improving spatial learning and memory assessed in the MWM task.

None of the test compounds induced motor deficits in mice.

**Conclusions:** Seeing as how KES-29 turned out to be the most effective antiamnesic agent, it can be concluded that multi-target-directed ligands, which combine two mechanisms of action in one molecule, are a promising approach to develop novel, effective anti-AD drug candidates.

Supported by: National Science Centre (grant No. DEC-2021/43/NZ7/00342)

**Title**: Multiplanar assessment of semilunar valves' geometry

**Authors:** Jakub Garbacz (presenter), Adam Priadka

**Tutors:** Maciej Lis MD, PhD; prof. Mateusz Hołda MD, PhD, DSc

**Affiliation:** Uniwersytet Jagielloński Collegium Medicum

**Introduction:** Assessing aortic versus pulmonary valve dimensions is vital in advanced autograft surgeries, including the Ross and Ozaki procedures. Structural intricacies of semilunar valves remain underappreciated in classic anatomical descriptions of the heart, so more complex geometrical approximations are needed to apply anatomical findings to clinical practice. This study used a novel coaptation center plane (CCP) concept, identified using a custom computer script, alongside the conventional morphometric parameters for multiplanar comparison of semilunar valves.

**Aim of the study:** This study aimed to compare the dimensions of semilunar valves by calculating their cross-sectional areas at the basal ring (BR), sinotubular junction (STJ) and coaptation center plane (defined as a virtual plane created by the most inferiorly lying points within valvular commissures and the coaptation center).

**Materials and methods:** 154 human hearts (22% females; age = 48±18 years) acquired from forensic autopsies were examined for gross pathology, weighted, dissected, and fixed in paraformaldehyde solution. BR and STJ areas were derived from corresponding measured diameters using circular and elliptical approximations. CCP area was calculated from measured sinus depths, inter-commissural angles, and inter-commissural distances by a custom Python script. Data analyses were done in RStudio 2023.12.0.

**Results:** Measured mean aortic STJ and CCP areas were greater for the aortic valve (STJ: 424±166 vs. 296±111 mm2; p = 2,7e-12), (CCP: 658±205 vs. 636±189 mm2; p = 0,214), whereas the mean BR area was greater for the pulmonary valve (356±123 vs. 435±123 mm2; p = 3e-06). Mean aortic BR areas were comparable for both genders (males: 357±159 mm2; females: 352 ± 136 mm2; p = 0,8995), while the mean pulmonary BR area was significantly greater for males than females (454±117 vs. 374±125 mm2; p = 0,0086). Linear correlations between aortic and pulmonary parameters were found to be moderately strong for STJ areas (r=0,62; p < 2.2e-16) and CCP areas (r=0,52; p < 2.2e-16).

**Conclusions:** The most significant dimensional discrepancies in valves were observed for the STJ and BR planes, while the size of the CCP plane was comparable. These differences should be taken into account during the planning of cardiac surgeries involving valve replacement.

**Title**: Platelet Function and Platelet-Related Novel Biomarkers for Epigenetics of Wilson's Disease

**Authors:** Michail Koutentakis 1, Marta Skorupska 1, Zofia Wicik 1,2, Marek Postula 1, Anna Czlonkowska 3, Ceren Eyileten 1,4

**Tutors:** Ceren Eyileten, DVM, PhD, MSc

**Affiliation:** 1. Department of Experimental and Clinical Pharmacology, Medical University of Warsaw, Center for Preclinical Research and Technology CEPT, Warsaw, Poland 2. Department of Neurochemistry, Institute of Psychiatry and Neurology, Warsaw, Poland 3. 2nd Department of Neurology, Institute of Psychiatry and Neurology, 02-957 Warsaw, Poland. 4. Genomics Core Facility, Centre of New Technologies, University of Warsaw, Warsaw, Poland

**Introduction:** Wilson's Disease (WD) is an autosomal–recessive disorder of copper metabolism caused by ATP7B mutations. However, the fundamental question of why only some patients primarily manifest with liver and/or neurological disease remains elusive. We anticipate that platelets and their regulators, such as non-coding RNAs (ncRNAs) impact the hepatic and neurological manifestation of WD.

**Aim of the study:** The study aims to analyze the platelet function and platelet-related ncRNA expression changes in WD, focusing on hepatic and neurologic manifestations.

**Materials and methods:** Platelet function test (impedance aggregometry), in silico prediction, and qRT-PCR validation analysis were performed. 103 patients with Wilson's disease and 52 age, gender-matched control individuals were included.

**Results:** a) In silico prediction: Pathway enrichment analysis showed that Platelet activation, signaling, aggregation, and Platelet degradation were identified in the 3rd and 4th place in terms of significance in WD, based on gene network analysis. We identified 5 miRNAs, top targets from gene WD and Fibrosis, and ATP7B gene, 4 lncRNAs, and 9 circRNAs. The in silico results also suggest that ncRNAs play a critical role in the pathophysiology of liver fibrosis due to increased platelet activation. b) Platelet activation: Impedance aggregometry showed that patients with the hepatic form had significantly higher platelet activation than controls in both TRAP and AA-induced tests (p=0.02; p=0.03, respectively). c) qPCR: MALAT, HOTAIR, and H19 lncRNAs expressions were found significantly higher in hepatic-involved patients than in controls (p=0.003, p=0.04, p=0.001, respectively).

**Conclusions:** Pathway enrichment analysis supported our hypothesis and wet-lab analysis validated the role of platelet activity in WD pathology. For the first time, we found increased platelet activation, and platelet-related lncRNAs in WD patients with hepatic form compared to healthy individuals. Our results may provide for the first time knowledge on the molecular background of platelets reactivity along with ncRNAs interactions in contribution to clinical manifestation of WD focusing on its role in liver fibrosis processes.

**Title**: How does ER stress impact the release of IL-6 and IL-8 by microglia at different levels of severity?

**Authors:** Sebastian Gawlak-Socka, Jakub Tambor, Marta Jóźwiak-Bębenista PhD, Paulina Sokołowska PhD

**Tutors:** Prof. UM Anna Wiktorowska-Owczarek PhD

**Affiliation:** Department of Pharmacology and Toxicology

**Introduction:** Neuroinflammation and endoplasmic reticulum (ER) stress are associated with many neurodegenerative diseases and mood disorders. ER stress occurs when misfolded proteins accumulate in the endoplasmic reticulum, which activates the unfolded protein response (UPR) pathway. UPR aims to save the cell, but severe or prolonged ER stress leads to cell death. In addition, ER stress leads to the upregulation of proinflammatory cytokines such as IL-6 and IL-8.

**Aim of the study:** The aim of the study was to analyse the impact of various forms of ER stress (mild, moderate and severe) on the release of proinflammatory cytokines IL-6 and IL-8 from microglia and compare these effects to the known endotoxin – lipopolysaccharide (LPS).

**Materials and methods:** Tunicamycin (TM) at concentrations ranging from 0.01 to 10 µg/ml was used as a well-known inducer of ER stress due to its ability to hinder the formation of protein N-glycosidic linkages. IL-6 and IL-8 levels were measured with commercially available immunological tests after 24, 48 and 72 hours of incubation of microglia with TM or LPS. The intensity of ER stress was determined based on cell viability measurement using the MTT conversion method.

**Results:** Microglia stimulated with TM secreted IL-6 in a concentration-dependent manner in the range of 0.01 - 0.5 µg/ml after 48 h. The highest concentrations of TM showed cytotoxicity, which also led to a decrease in the level of the cytokine. The accumulation of IL-6 persisted after 72 hours of incubation with TM, but the effect was not statistically significant. Similarly, an increase in IL-6 was observed after incubation of cells with LPS. Interestingly, contrary effects were noted in IL-8 secretion. While microglia stimulated with TM exhibited a concentration-dependent reduction in IL-8 secretion, LPS stimulation resulted in an elevation of this cytokine's concentration.

**Conclusions:** ER stress induces inflammation in microglia through the time- and concentration-dependent buildup of pro-inflammatory IL-6. Nonetheless, unlike the inflammatory agent, TM reduced IL-8 secretion by microglia. This difference could hold importance in identifying ER stress markers as potential drug targets for treatment of neurodegenerative diseases or mood disorders, yet it requires confirmation in more complex animal studies.

**Title**: Influence of 3-nitrotyrosine administration on nitric oxide production and metabolism in the rat brain

**Authors:** Mariia Vatazhok

**Tutors:** Associate prof. Oleh Akimov, PhD

**Affiliation:** Department of Pathophysiology, Poltava State Medical University

**Introduction:** The study of the impact of 3-nitrotyrosine (3-NT) on the production and metabolism of nitric oxide in the rat brain holds great significance, as nitric oxide is a crucial mediator in neuronal signaling and vasodilation. Understanding the role of 3-NT in both normal and pathological brain states may highlight new pathogenetic mechanisms. Furthermore, comprehending the mechanisms through which 3-nitrotyrosine affects NO metabolism may aid in identifying new pathways for neuroprotection and the restoration of brain functions following injury.

**Aim of the study:** The aim of this study was to determine the impact of 3-nitrotyrosine administration on NO synthase activity, concentrations of nitrites, peroxynitrites, and nitrosothiols in the rat brain.

**Materials and methods:** The study was conducted on 12 male Wistar rats weighing 190-235 g. The animals were divided into two groups of six animals in each: the first group served as the control, while the second group was subjected to intraperitoneal injection of an aqueous solution of 3-NT at a dose of 0.4 μg/kg. In the 10% rat brain tissue homogenate, the total activity of NO synthases, and the concentrations of nitrites, peroxynitrites, and nitrosothiols were examined (Akimov O.Y., 2020). Statistical analysis was conducted using the Mann-Whitney U test. A difference between the groups was considered statistically significant at $p<0.05$.

**Results:** Intraperitoneal administration of 3-NT to rats led to a 40.6% decrease in the overall NOS activity compared to the control group. Under these conditions, the concentration of nitrites increased by 95.8%, and the concentration of peroxynitrites also increased by 76.6% compared to control group data. The concentration of nitrosothiols decreased by 60.9% compared to the control group.

**Conclusions:** The administration of 3-nitrotyrosine results in a reduction of nitric oxide production in rat brain. At the same time the main pathways of nitric oxide metabolization in rat brain under conditions of 3-nitrotyrosine administration are formation of nitrites and peroxynitrites.

**Title**: Assessing the hepatic safety of Remdesivir in COVID-19 treatment: A Prospective Analysis

**Authors:** Konrad Kaleta, Julia Krupa, Marcin Zuwała, Kamil Możdżeń, Martyna Wróblewska, Mateusz Kęska

**Tutors:** PhD Barbara Lorkowska-Zawicka, PhD Beata Bujak-Giżycka

**Affiliation:** Jagiellonian University Medical College, Students Research Association of Clinical Pharmacology

**Introduction:** Remdesivir (GS-5734), initially developed for treating hemorrhagic fevers such as Ebola and Marburg disease, emerged as a pivotal antiviral medication against COVID-19, caused by SARS-CoV-2. Despite its critical role in fighting the virus, concerns about its safety, particularly regarding hepatotoxicity, have surfaced. Observational studies have shown that 10% to 50% of patients experienced mild-to-moderate elevations in liver enzymes shortly after initiating treatment, with a small fraction exhibiting elevations above 5 times the upper limit of normal (ULN). Although these liver enzyme abnormalities generally resolved upon discontinuation of the drug, cases of acute liver failure during remdesivir treatment have also been reported.

**Aim of the study:** Given the scarcity of validated research on this subject, there is a pressing need for prospective, high-quality assessments of Remdesivir's safety profile concerning liver treatment. This need is particularly critical for patients with pre-existing liver comorbidities and those currently undergoing treatment with hepatotoxic medications

**Materials and methods:** From a broader project focusing on the multidisciplinary treatment of COVID-19 at a university hospital in Krakow, data pertaining to liver parameters of patients was extracted . This subset of data included patients treated with Remdesivir (typically undergoing a 4-day therapy regimen) and a matched control group not receiving the drug, taking into account age, gender, and disease severity. Liver function tests, specifically ALT, AST and GGTP, were collected and analyzed on the 0th, 7th, and 14th days of hospitalization. Additional analyses were conducted to compare outcomes based on combinations of medications administered in the hospital alongside Remdesivir.

**Results:** In both groups, liver parameters were elevated, likely related to the progression of COVID-19. By day 14, there was a marginal difference in ALT and GGTP levels between patients treated with Remdesivir and those not treated, with no significant difference observed in AST levels. Comparing liver values between day 0 and day 14 in the Remdesivir (-) group, there was a notable decline in ALT and GGTP levels. Conversely, in the Remdesivir (+) group, these parameters typically either stabilized or increased, while AST levels tended to decrease. Isolated cases in the Remdesivir (+) group showed a greater range of results and higher maximum values compared to the Remdesivir (-) group. Polytherapy did not significantly affect the increase in liver parameters during Remdesivir treatment.

**Conclusions:** A detailed analysis suggests that although an increase in liver parameters is observed, Remdesivir therapy does not appear to significantly disrupt liver function in patients. The findings indicate that concomitant use of multiple drugs does not contribute to the hepatotoxicity of Remdesivir. Additionally, there is considerable individual variability in response to the medication.

**Title**: In vitro study of the selective small-molecule PERK inhibitor LDN-0060609 on human retinal astrocytes as a prospective treatment for primary open-angle glaucoma.

**Authors:** Kamil Saramowicz, Zuzanna Granek, Julia Barczuk

**Tutors:** Natalia Siwecka MD, Grzegorz Galita PhD, Wioletta Rozpędek-Kamińska PhD, Prof. Ireneusz Majsterek PhD

**Affiliation:** Department of Clinical Chemistry and Biochemistry, Medical University of Lodz

**Introduction:** Primary open-angle glaucoma (POAG) is characterized by progressive loss of retinal ganglion cells (RGCs) and degeneration of the optic nerve (ON), which leads to irreversible vision loss. Human retinal astrocytes (HRAs) promote RGCs survival, while loss of HRAs precedes ON degeneration in response to glaucomatous damage. Endoplasmic reticulum (ER) stress and activation of PERK kinase induces apoptosis in HRA cells, diminishing their neuroprotective impact on the ON. Therefore, inhibition of the PERK-related pathway may protect HRAs and counteract the progression of POAG.

**Aim of the study:** This study aimed to assess the properties of the small-molecule PERK inhibitor LDN-0060609 upon ER stress conditions in HRAs in vitro.

**Materials and methods:** All experiments were conducted on the primary HRA cell line. To induce ER stress, HRAs were treated with 500 nM of thapsigargin. The properties of LDN-0060609 were evaluated at concentrations ranging from 0.75 to 50 μM (+75μM, 100μM, 50mM for cytotoxicity analysis) dissolved in 0.1% DMSO. PERK inhibitor efficacy was assessed by measuring the phosphorylation of eIF2α, the main PERK substrate, using Western Blot technique. The cytotoxicity of LDN-0060609 was evaluated using the colorimetric XTT assay, while analysis of apoptosis levels was performed by the colorimetric caspase-3 assay.

**Results:** LDN-0060609 exhibited the highest efficacy in ER-stressed HRA cells at a concentration of 25 μM, significantly inhibiting eIF2α phosphorylation by 49%. LDN-0060609 displayed no significant cytotoxicity towards HRA cells at any of the concentrations used, regardless of incubation time. At a concentration of 25μM, LDN-0060609 significantly increased cell viability and decreased caspase-3 activity in ER-stressed HRA cells.

**Conclusions:** LDN-0060609 demonstrated a protective effect in an in vitro HRA-based POAG model by mitigating the negative effects of ER stress, suggesting its potential as a novel POAG treatment strategy. This work was supported by National Science Centre, Poland (grant no. 2016/21/B/NZ5/01411).

**Title**: Three-dimensional anatomy of the right ventricular outflow tract (RVOT) and its variability as a basis for appropriate planning and performing electrocardiological procedures

**Authors:** Maria Kurek, Karolina Gutkowska, Sylwia Sanakiewicz, Dominika Stolarczyk, Jakub Batko, Rafał Jakiel, Marcin Jakiel, Mateusz Hołda

**Tutors:** Marcin Jakiel, MD

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**Introduction:** RVOT is frequent target of electrocardiological procedures. RVOT spatial anatomy, geometric variability and location in relation to adjacent structures may be a challenge for invasive procedure operators.

**Aim of the study:** The aim was to present in details RVOT geometry emphasizing anatomical implications for electrocardiological procedures in this area

**Materials and methods:** RVOT was assessed in 112 patients (48 female, 64 male) without structural heart diseases, using contrast-enhanced CT examinations, and analysed using semi-automatic 3D algorithms in diastolic phase.

**Results:** RVOT is irregular block with an ellipsoidal cross-section.Its dimensions decrease towards the pulmonary valve and are 33.82 (IQR 30.51-39.36), 28.82 (IQR 26.11-32.22), 27.95±4.11 (SD) for width [mm] and 33.41±6.14 (SD), 26.99±4.41 (SD), 26.91±4.00 (SD)[mm] for the depth, in the basal, central and subvalvular part respectively. In the sagittal section RVOT points upwards and slightly backwards.The anterior circumference average length is 41.96 mm and is inclined in relation to the transversal plane at an angle of 50.77° (IQR 46.53°-58.70°). In the posterior area RVOT is shorter (18.17 mm) and protrudes forward, so the inclination of the upper part of the posterior wall in relation to the transversal plane is an acute angle (opened backwards) of 44.58° (IQR 37.30°-51.25°), while in the lower part the angle is close to the right angle and its value is 94.30° ± 15.44° (SD). Moreover, thickness of RVOT wall on the posterior circumference at the base, in the middle and subvalvular area is 3.80 mm±0.88 mm(SD), 3.56 mm±0.73 mm(SD) and 3.56mm±0.65mm(SD) respectively. In the frontal section, RVOT ascends in the upper part over the interventricular septum (IVS) dividing its left circumference to septal and supraseptal parts. The inclination angles(with vertices pointing to the right) of these sections to transversal

plane are 75.5°(IQR 66.44°-81.11°) and 107.01°(IQR 99.09-115.23°)respectively, so the direction of the long axis of the RVOT changes from the left to the right side.

**Conclusions:** Analysis show that there is no single RVOT axis.Two axes can be distinguished,the one for the upper part is more recessed and left-pointed. Anterior tilts of posterior wall and its elevation above the IVS suggest that access to the subvalvular area may be difficult,emphasizing that this area is common ablation target for ventricular arrhythmias. The small thickness of RVOT posterior wall and difficult geometry, may foster its perforation.

# CARDIOLOGY & CARDIOSURGERY ORAL SESSION

prof. Agnieszka Olszanecka, MD, PhD

prof. Andrzej Surdacki, MD, PhD

Małgorzata Konieczyńska, MD, PhD

Prof. Wojciech Płazak, MD, PhD

## Sessions coordinators:

Veranika Sheshka

Konrad Gortat

Helin Savsin

**Title**: Uncontrolled hypertension and hypertensive urgency – one-year single-center emergency department experience

**Authors:** Jakub Nowicki, Wojciech Siłka

**Tutors:** Agnieszka Olszanecka MD, PhD; Aleksandra Załustowicz MD, PhD

**Affiliation:** Students' Scientific Group of 1st Department of Cardiology, Interventional Electrocardiology and Hypertension, Faculty of Medicine, Jagiellonian University Medical College, Krakow, Poland

**Introduction:** The prevalence of uncontrolled hypertension remains a significant concern in public health systems, including the daily practices of emergency departments (ED).

**Aim of the study:** To characterize patients admitted to an ED for elevated blood pressure (BP) and to evaluate factors leading to hospitalization.

**Materials and methods:** This retrospective analysis comprised all patients admitted to an ED of the tertiary hospital in 2022, due to acute BP rise with an exclusion of hypertensive emergencies.

**Results:** The studied group (n=570) constituted 1.5% of all ED visits in 2022. The median age was 67 years ([Q1:Q3])[52,75], 68.9% females. Systolic BP (200mmHg [180;212]) and diastolic BP (105 mmHg [100;115]) at home were significantly higher than during triage (173mmHg [160;190] and 95mmHg [84;103] respectively, ($p<0.0001$). Thirty-nine percent of the studied population had taken BP-lowering agents prior to admission to ED (captopril in 91.8%). In the ED nitrendipine (54.2%), captopril (38.1%), furosemide (16.3%), urapidil (10.0%), and nitroglycerine (1.9%) were administrated. Eventually, a median of 140/82 mmHg BP was reached in the median time 288 min. [202;400]. Hospitalization was necessary in 5.4% of patients. The need of furosemide or urapidil administration in ED doubled the risk of hospitalization (OR, 2.0, $p<0.01$). Prior to ED-visit only 17.0% of patients received guidelines-recommended single-pill combination therapy, and 17.6% had already visited ED for uncontrolled hypertension (median of 388 days earlier).

**Conclusions:** Elevated BP is a common reason for admission to the ED. Crucially, improvements in long-term hypertension treatment and education are needed to reduce the number of patients seeking ED care for elevated BP.

**Title**: Aortic valve morphometry in relation to anthropometric data – a novel approach

**Authors:** Adam Priadka (presenter), Jakub Garbacz

**Tutors:** prof. Mateusz Hołda MD, PhD, DSc ; Maciej Lis, MD, PhD

**Affiliation:** Jagiellonian University Medical College

**Introduction:** The relationship between the size of the aortic valve (AV) and anthropometric data has been frequently described in the literature. However, in most cases, the complex spatial structure of the valve was reduced solely to its diameter, often at the level of the Basal ring (BR) or the sinotubular junction (STJ). Investigating the extent to which an individual's anthropometric characteristics influence the spatial dimensions of AV seems crucial from the perspective of interventional cardiology and cardiac surgery.

**Aim of the study:** To explore relationship between novel morphometric parameters, incorporating the spatial valve configuration, and anthropometric features.

**Materials and methods:** 178 randomly selected autopsied human Caucasian hearts (21.9% females, age: 47.9 ± 1.3 years old, BMI: 26.8 ± 0.34 kg/m2) were included in this study. All heart specimens were collected during forensic medical autopsies and fixed in 10% paraformaldehyde solution following dissection. All linear measurements were taken using 0.03 mm precision calliper. In addition to regular morphometric parameters, cross-sectional areas were measured in three distinct planes: STJ, BR, and coaptation center plane (CCP). The latter was defined as an area limited by the most inferiorly lying points within commissures and the coaptation center, and was calculated using custom python script based on a set of linear parameters. Statistical analysis was performed using R 4.3.3.

**Results:** In males, the area and perimeter of CCP were significantly larger than females (area: 672.4 ± 201 vs. 588 ± 165.3 mm2 , p = 0.022; perimeter: 97.6 ± 15.5 vs. 91.3 ± 13.7 mm, p = 0.034). Age was positively correlated with STJ and BR areas (r = 0.48, r = 0.42; p<0.001, respectively). BMI showed positive correlation with area at CCP (r = 0.36, p<0.001). The best multiple regression models obtained from anthropometric data included only age and sex, with $R^2$ values for CCP at 29.2%, STJ at 24.8%, and BR at 15.9% (p<0.001, respectively).

**Conclusions:** Among all anthropometric data, age has the greatest impact on AV size, regardless of the anatomical location of analyzed cross-section. Anthropometric parameters have the greatest influence on the observed variability at the level of the CCP. However, it is infeasible to predict AV size based on BMI.

**Title**: Cardioprotective Effects of Empagliflozin and Modification of Sirtuins and their Non-Coding RNA Regulators in Patients with Myocardial Infarction

**Authors:** Michail Koutentakis 1, Anna Nowak 1, Zofia Wicik 1,2, Ceren Eyileten 1,3, Jolanta Siller-Matula 4, Dirk von Lewinski 5, Harald Sourij 6, Marek Postula 1

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**Introduction:** Studies have shown the direct cardioprotective effects of sodium-glucose co-transporter-2 (SGLT2) inhibitors, however, the precise mechanism of action remains unclear. Based on in silico analyses, we hypothesized that the cardioprotective effects of SGLT2 inhibitors are due to increased expression levels of Sirtuins and their regulator-micro RNAs (miRNAs).

**Aim of the study:** This study aims to investigate the molecular mechanism of cardioprotective effects of SGLT2 inhibitors through the modulation of Sirtuin expression levels and their regulatory miRNAs.

**Materials and methods:** In silico prediction analysis by computational approach: (I) identification and ranking of the most promising non-coding RNAs (ncRNAs) associated with Sirtuin (SIRT) pathways and SGLT2; (II) identification of the top miRNAs, which was performed by preparing gene lists encompassing: all SIRT genes; 1st level and 2nd level SGLT2 interactors; selection of genes based on Gene Ontology involved in inflammation, fibrosis, oxidative stress, and hypoxia-ischemia; genes involved in myocardial infarction (MI) and heart failure (HF) based on DisGeNet database. qRT-PCR validation analysis followed. Patient samples were used from the EMMY, double-blind clinical trial (NCT03087773). Each group consisted of 24 patients (empagliflozin=24; placebo=24) with plasma collected at baseline and after 12 weeks of treatment. A total of 96 longitudinal samples were used for this pilot analysis.

**Results:** a) Results of in silico analysis: 6 miRNAs targeting the highest number of SIRT1-7 genes, SGLT2, and first-level SGLT2 interactors, namely miR-34a-5p, miR-27a-3p, miR-

302a-3p, miR-146a-5p, miR-182-5p and miR-124-3p. b) qRT-PCR analysis demonstrated that 12 weeks of empagliflozin therapy led to significantly higher expression levels of miR-214, miR-34a, miR-146a, miR-182-5p, and SIRT2 compared to baseline ($p=0.015$; $p<0.001$; $p<0.001$; $p<0.001$; $p<0.00$; $p=0.005$, respectively). Furthermore, we found that patients receiving empagliflozin had significantly higher expression of SIRT6, and significantly lower expression of miR-214 and miR-302a-3p compared to those receiving placebo after the 12 weeks ($p=0.036$; $p=0.007$; $p=0.042$, respectively).

**Conclusions:** Our in silico results for the first time predicted the interaction network between ncRNAs and HF-related genes in the context of the SGLT2-Sirtuin axis. We showed that empagliflozin, an SGLT2 inhibitor, might exhibit cardioprotective effects via molecular mechanisms of SIRT2 and SIRT6, and their ncRNA regulators.

**Title**: Clinical characteristics and long term outcomes of patients with supra-normal left ventricular ejection fraction (HFsnEF) - first polish report from Lesser Poland Cracovian Heart Failure (LECRA-HF) Registry

**Authors:** Alicia del Carmen Yika, Natalia Kachnic, Aleksandra Karcińska

**Tutors:** Konrad Stępień MD, PhD

**Affiliation:** Jagiellonian University Medical College

**Introduction:** Heart failure with supra-normal left ventricular ejection fraction (HFsnEF) is a new category of HF introduced in 2019 by the European Heart Journal, with the main purpose of promoting research on this new category. Clinical characteristics and long-term outcomes of HFsnEF patients remain insufficiently elucidated.

**Aim of the study:** We sought to characterize Polish HFsnEF patients and to provide their long-term mortality in comparison to HFpEF

**Materials and methods:** Of 1186 patients enrolled in the single-center Lesser Poland Cracovian Heart Failure (LECRA-HF) Registry between 2009 and 2019 and hospitalized due to HF decompensation. Based on echocardiography, 261 (22%) of them were those with HF with normal LV ejection fraction (LVEF; ≥50 percent).
40 (15,3%) of them were classified as HFsnEF and the remaining 221 (84.7%) as HFpEF.

**Results:** HFsnEF patients were less frequently hypertensive (P=0.026) and had higher baseline left ventricular ejection fraction (LVEF, P<0.001) than HFpEF subjects. Furthermore, HFsnEF patients presented lower INR (p=0.027) and total protein level (p=0.008) on admission. The Kaplan-Meier analysis showed that all-cause mortality is higher in HFsnEF than in HFpEF (65.0% vs 55.2%, p=0.044).

**Conclusions:** Our findings indicate that every seventh Polish patient admitted with HFpEF could be classified as HFsnEF. Baseline characteristics of HFsnEF patients are different than HFpEF. Simultaneously, the HFsnEF diagnosis is associated with lower long-term survival.

**Title**: The intensity of physical exertion during marathon race affects the functional response of the right and left ventricles

**Authors:** Julia Cieśla, Marcin Schulz, Michał Krawiec, Paweł Wojciechowski, Michał Janik, Julia Skrobisz, Wiktor Wagner

**Tutors:** prof. Andrzej Tomasik, MD, PhD; prof. Tomasz Kukulski MD, PhD

**Affiliation:** Students' Scientific Group, II Department of Cardiology in Zabrze, Medical University of Silesia in Katowice

**Introduction:** In the times of the growing popularity of amateur sports it is crucial to carefully acknowledge pathological changes in myocardial function during intense physical exercise to implement subsequent countermeasures. The available data on the assessment of heart function of middle-aged runners is limited.

**Aim of the study:** The aim of the study was to assess the function of the right and left ventricles depending on the level of physical exertion during marathon running (half marathon - 21,0975km, marathon - 42,195km and ultra-marathon – 50km).

**Materials and methods:** 105 Silesia Marathon runners (21 women, 84 men), divided into two groups: half marathon finishers (group 1), marathon, and ultra-marathon finishers (group 2), were enrolled. Echocardiography with a detailed assessment of the systolic function as well as strain rate of the left ventricle and right ventricle was performed 1 to 4 days before the race and immediately after the race as well as 14 days after marathon running.

**Results:** The mean global longitudinal strain of the left ventricle (LV GLS) was for group 1 and group 2 (-19.38 ± 2.58 vs. -20.68 ± 2.40%, p =0.0320) and for the right ventricle (RV GLS) (-23.03 ± 4.66 vs. -23.37 ± 4.35%, p = 0.9657), respectively. The left ventricle ejection fraction (LVEF) did not differ significantly between examined groups before the race (56.55 ± 4.66 vs. 57.83 ± 4.58%, p=0.0831). In both groups, a statistically significant decrease was observed in LVEF (57.23 ± 4.63 vs. 55.00 ± 4.09, p=0.0001), LV GLS (-20.10 ± 2.55 vs. -19.46 ± 1.87, p=0.0242) and RV GLS (23.21 ± 4.46 vs. -21.25 ± 4.70, p=0.0055) immediately after the race, which did not differ between groups. The values of all parameters returned to the baseline values in the echocardiographic examination 14 days after the run.

**Conclusions:** In amateur runners, regardless of the distance finished, long-distance running may be associated with transient impairment of the systolic function of the right and left ventricles immediately after the run, which returns to pre-race values in the long-term follow-up.

**Title**: True and complex bifurcation treatment strategy

**Authors:** Anastasija Vasecko, Arnis Laduss, Eva Bolsteina, Evija Camane, Andrejs Erglis, Karlis Trusinskis, Gustavs Latkovskis, Dace Sondore, Inga Narbute, Kristine Dombrovska, Andis Dombrovskis, Ieva Briede, Aigars Lismanis, Ainars Rudzitis, Sanda Jegere

**Tutors:** Prof. Indulis Kumsars, MD

**Affiliation:** University of Latvia, Paul Stradins Clinical University Hospital, Latvia Center of Cardiology, Riga, Latvia

**Introduction:** Coronary bifurcation lesions pose difficult challenges in interventional cardiology due to the complex anatomy and hemodynamic considerations involved, that is why there are a common site for atherosclerotic plaques, necessitating specialized treatment strategies. Complex coronary bifurcations are rarer and more difficult to treat compared to non-complex coronary bifurcations.

**Aim of the study:** The aim of this study was to compare two groups of patients divided according to the Complex Coronary Bifurcation lesions Definition major criteria, and present the clinical description, periprocedural and intrahospital outcomes.

**Materials and methods:** This study is a retrospective analysis of the Coronary Bifurcation Treatment registry in Latvia Center of Cardiology. Patients enrolled in this study were divided into two groups by the Definition major criteria (SB stenosis greater than 90% with stenosis length greater than 10 mm): complex lesion group, who is according to the critearia and non-complex lesion group, to compare each groups periprocedural and intrahospital outcomes.

**Results:** Altogether 639 patients were divided into two groups: complex lesion group – 63 patients (9.8%), and non-complex lesion group – 576 patients (90.2%).
SB predilatation was used in 84.1% complex coronary bifurcations group vs 40.3% patients of non-complex coronary bifurcations group (n=53 vs n=232, p=0.157). Cutting balloon technique in SB was used in 14.3% complex coronary bifurcations group vs 7.5% non-complex group (n=9 vs n=43, p= 0.189). Post dilatation SB stenting was needed in 81% complex group patients vs 63.2% non-complex group (n=51, n=364).
Intraprocedural complications were follows: artery dissection – 6.3% complex coronary bifurcation group vs 5% patients of non-complex group (n=4 vs n=29, p= 0.442), periprocedural myocardial infarction – 3.2% complex group vs 4.3% non -complex group (n=2 vs n=25, p= 0.725), but SB occlusion (2.8%, n=16), cardiogenic shock (0.17%, n=1) and no-reflow (0.17 %, n=1) complications found only at non-complex coronary bifurcation group.

**Conclusions:** Based on the data received in this study we can make a conclusion that complex coronary bifurcations are found 10 times less frequently than non-complex coronary bifurcations, also this group of patients require the use of more complex techniques. In contrast to the complex group, in non-complex coronary bifurcations group intraprocedural complications observed more.

**Title**: Hyponatremia in takotsubo syndrome is associated with less in-hospital increase in left ventricular ejection fraction and higher long-term mortality. First report in the literature.

**Authors:** Maja Wojtylak, Oliwia Andrasz, Katarzyna Majka

**Tutors:** Konrad Stępień MD, PhD, prof. UJ Jarosław Zalewski MD, PhD

**Affiliation:** Student Research Group at Department of Coronary Artery Disease and Heart Failure, Jagiellonian University Medical College, Kraków, Poland

**Introduction:** Takotsubo syndrome (TTS) is an acute reversible cardiomyopathy that can be triggered by physical, emotional or combined stressors. In the literature there are several cases in which the onset of TTS was associated with hyponatremia. However, the clinical relevance and long-term mortality in a group of hyponatremic TTS patients have not been investigated yet.

**Aim of the study:** Assessment of the clinical relevance of hyponatremia and its influence on long-term mortality in a group of TTS patients.

**Materials and methods:** In the retrospective observational study among 7771 patients with acute myocardial infarction hospitalized between 2012-2019 TTS was diagnosed in 100 patients (1.3%). Hyponatremia on admission was defined as sodium level <135 mmol/L and was presented in 14 of them. We collected the data on the clinical presentation and TTS course, comorbidities, other laboratory parameters, including myocardial necrosis markers. Our main purpose was to assess the long-term all-cause mortality in both (hypo- and normonatraemic) groups.

**Results:** Admission hyponatremia occurred in 14 (14%) of TTS patients. Hyponatremic patients showed higher incidence of prior stroke (7.1 vs 0%, P=0.046) and heart failure (50 vs 12.8%, P=0.001). Moreover, they more often demonstrated ST-segment elevation myocardial infarction (78.6 vs 48.8%, P=0.033) and apical TTS type (100 vs 81.4%, P=0.021). During the index hospitalization hyponatremic TTS patients showed lower improvement in left ventricular ejection fraction (0 [0-5] vs 10 [0-20] %, P=0.039) and its lower values on discharge (40 [35-45] vs 50 [42-55] %, P=0.032). Within median observation of 53 months higher all-cause mortality was found in hyponatremic TTS patients (35.7 vs 15.1%, P=0.038). By Cox proportional hazard regression hyponatremia on admission was identified as an independent predictor of long-term mortality (P<0.001).

**Conclusions:** As demonstrated for the first time hyponatraemia in TTS patients is indicative of a worse overall outcome, including smaller left ventricular ejection fraction both during hospitalization and after discharge. Moreover, it is associated with a poor survival outcome.

**Title**: ECG model for prediction of chronic thromboembolic pulmonary hypertension in patients with pulmonary embolism

**Authors:** Klaudia Zaczyńska, Emilia Lis, Julia Hypnar

**Tutors:** Marcin Waligóra MD, PhD, Prof. Grzegorz Kopeć MD, PhD

**Affiliation:** Pulmonary Circulation Center, Jagiellonian University Medical College, Cracow, Poland

**Introduction:** When facing a therapeutic dilemma in patients with pulmonary embolism (PE), physicians must take into account the chronic burden of embolic lesions in PE, which cannot be dissolved with heparin, fibrinolysis, or evacuated percutaneously. Currently, there is insufficient evidence on how to distinguish acute from "acute on chronic" pulmonary embolism.

**Aim of the study:** We aimed to compare ECGs patterns between patients with intermediate-high risk PE, who are potential candidates for percutaneous treatment, and those with chronic thromboembolic hypertension (CTEPH), in order to assess the utility of ECG in distinguishing between these two conditions.

**Materials and methods:** We analyzed ECGs patients with PE from 2018 to 2024, as well as records of 71 patients with CTEPH from 2010 to 2022. Among the numerous ECG parameters associated with right ventricular pathology, we selected those that were clinically significant and associated with survival in PE or pulmonary arterial hypertension for the purpose of the study.

**Results:** The study group comprised 71 patients with CTEPH and 103 with PE, divided into a baseline group (the first consecutive 71 patients) and a validation group (the subsequent 32 patients). Significant variables were then integrated into logistic regression models. Based on regression results, we built a prediction model with which included right axis deviation(RAD), Sokolol-Lyon criteria, heart rate(HR) and T-wave inversions range(TWI). This resulted in a mean probability of CTEPH in the PE baseline group of 17.83±23.5%, and 83.1±23.2% in the CTEPH group. The optimal cut-off threshold was determined at a score level of -0.52 with a sensitivity of 94.4% and specificity of 84.5% (AUC 0.95, 95%CI 0.9-0.98, $p<0.0001$), indicating that CTEPH should be considered when the probability is ≥37.3%. For simplification, we rounded the values and ended up with equation:
SCORE = 0.5+(4x RAD)+(0.5x Sokolow-Lyon criteria)-(3x HR>100 )-(0.5x TWI range)
This model resulted in accurate assignment of 70.4% of patients in the validation PE group ($p=0.12$ compared with the baseline PE group), leaving 29.6% for further assessment with methods beyond ECG before making a clinical decision.

**Conclusions:** The proposed ECG model is a relatively simple tool that enables accurate assignment in over 70% of patients with acute PE, thus potentially making therapeutic decisions easier.

**Title**: Influence of catheter-directed lysis on coagulation parameters in acute pulmonary embolism

**Authors:** Patrycja Kurczyna, Weronika Chaba, Michał Karnaś

**Tutors:** Jakub Stępniewski MD, PhD

**Affiliation:** Students' Scientific Group of Pulmonary Circulation and Thromboembolic Diseases

**Introduction:** Catheter-directed lysis (CDL) is an innovative treatment approach in acute pulmonary embolism (APE), enabling targeted delivery of alteplase (rtPA) directly to pulmonary arteries. This allows for significantly lower fibrinolytic dose than continuous systemic intravenous infusion (ST), reducing risk of bleeding. Little is known however on the process of fibrinolysis in patients undergoing CDL.

**Aim of the study:** We aimed to investigate changes in coagulation parameters during CDL.

**Materials and methods:** This prospective study included 50 APE patients, treated with CDL by Pulmonary Embolism Response Team (PERT) in John Paul II Hospital in Cracow between March 2018 and February 2024. Venous blood levels of coagulation parameters, including D-dimer, fibrinogen, plasminogen and alpha2-antiplasmin (a2AP) were analysed at six time points: before, during and after procedure; on the first and the second day (12-24h and 24-48h since reperfusion onset, respectively); and at the end of hospitalization. Wilcoxon test was used to assess statistical significance.

**Results:** Out of 50 patients [59±17 years old; 27 (54%) men] enrolled, 24 underwent ultrasound-assisted CDL (total dose of 18mg rtPA during 7h infusion), while 26 received pure CDL (total dose of 20mg rtPA during 10h infusion).
D-dimer levels exhibited dynamic surge to 541% of the baseline value (BV) during infusion, peaking at 835% BV post-procedure. Subsequently decreased to 302% BV on the first day, returned to BV on the second day and further dropped to -62% below BV ($p<0.001$).
During infusion, fibrinogen concentration declined -8% of its BV, reaching -11% BV post-procedure. Within 12-24h, it rebounded to -10% BV and returned to BV on the second post-procedural day ($p<0.001$).
The a2AP, plasmin inhibitor, underwent depletion to -28% and -43% BV intra- and post-procedurally, respectively. It gradually recovered, reaching -39% BV within 12-24h and eventually returned to BV ($p<0.001$).
Plasminogen level showed no significant change periprocedural, however finally it reached 109% BV ($p=0.006$).

**Conclusions:** Changes in coagulation parameters show, that CDL affects the dynamics of fibrinolysis in PE patients undergoing this procedure. Lack of peripheral blood plasminogen depletion implies localised action of rtPA with only minor impact on the systemic fibrinolysis.

**Title**: Do left ventricular dilatation and right ventricular dysfunction worsen the prognosis of cardiomyopathy patients?

**Authors:** Norbert Kapczyński, Jarosław Gąsiorek, Maja Płazak, Vladyslav Kyslyi

**Tutors:** prof. UJ, dr n. med. Paweł Rubiś, dr n. med. Ewa Dziewięcka

**Affiliation:** SSG of Heart Failure at the Department of Heart and Vascular Diseases of the Institute of Cardiology UJ CM at the John Paul II Specialist Hospital in Cracow

**Introduction:** Until recently, all patients with cardiomyopathy and reduced left ventricular (LV) contractility were classified as dilated cardiomyopathy (DCM), regardless of the presence of LV dilation. Currently, apart from DCM, a new category called "non-dilated LV cardiomyopathy" (NDLVC) has been defined. In both DCM and NDLVC some patients also exhibit hypokinesia of the right ventricle (RV). However, the prognostic significance of RV dysfunction is uncertain in DCM, and it has not been studied in the newly defined NDLVC.

**Aim of the study:** To assess the prognostic impact of LV dilatation and RV dysfunction in DCM and NDLVC patients.

**Materials and methods:** We retrospectively analysed DCM and NDLVC patients managed in 2010–2022 and divided them based on the presence of RV systolic dysfunction (RVSD, TAPSE <17mm) or the presence of LV dilatation (LVD, LV end-diastolic diameter >52mm in women and >58mm in men). After a mean of 39.5±27.3 months, the clinical status and composite endpoint [all-cause mortality, heart transplant (HTX) or left ventricle assist device implantation (LVAD)] were assessed.

**Results:** 546 patients with complete data were included in the study (51.0±12.8 years old, 80% male, LVEF 26.9%±10.6%, NYHA 2.4±0.9). 448 (82.1%) patients had DCM with LVD, 175 (32.1%) had RVSD and 145 (26.6%) had both.
During observation, the composite endpoint occurred in 97 (17.8%) patients: 79 (14.5%) patients died, 13 (2.4%) had HTX, and 15 (2.8%) had LVAD.
There were 86 (19.2%) composite endpoints in the DCM group and 11 (11.2%) in the NDLVC group (p=0.08), with no impact of LVD on prognosis (HR 1.61, 95%CI 0.86–3.02, p=0.14).
However, there were more composite endpoints in the RVSD group [39 (22.3%) vs. 58 (15.6%), p=0.07], and RVSD was associated with an increased risk of unfavourable outcome (HR 1.71, 95%CI 1.13–2.57, p=0.01).

**Conclusions:** The majority of patients with reduced LVEF also had LV dilatation and were diagnosed with DCM; however, nearly one-in-five patients with LV systolic dysfunction

were diagnosed with NDLVC. Moreover, DCM and NDLVC patients had similar prognosis. However, RVSD presence was found to significantly worsen the prognosis.

**Title**: Predictors of slow flow and no reflow phenomenon after rotational atherectomy

**Authors:** Michał Błaszkiewicz, Kamila Florek, Maja Kübler, Bernadetta Nowak, Kinga Brawańska, Szymon Buras

**Tutors:** Wojciech Zimoch, MD, PhD

**Affiliation:** Students' Scientific Group of Invasive Cardiology, Institute of Heart Diseases, Wroclaw Medical University, 50-369 Wroclaw, Poland

**Introduction:** Rotational atherectomy (RA) is one of techniques available for modification of calcified coronary artery lesions. Slow flow or no reflow are complications which may occur during RA procedure and worsen a patient's prognosis. In addition, they can lead to more severe complications such as periprocedural myocardial infarction.

**Aim of the study:** The aim of this study is to evaluate frequency and predictive factors of slow flow or no reflow occurring after RA procedures.

**Materials and methods:** This was a retrospective observational study. We revised the data of 534 consecutive patients who underwent RA in two major centers. No/slow flow was defined as angiographic TIMI grade flow ≤ 1 after burr passage.

**Results:** The majority of patients who underwent RA procedure were males 358 (67%) with a mean age of 72±9 years. No/slow flow occurred in 10 patients (2%), all of whom were males. Patients with the no/slow flow phenomenon had significantly lower systolic blood pressure before the procedure (125 (105;130) vs 130 (120; 143), p=0,04), they more frequently had heart failure (70% vs 32%, p=0.01), higher median glucose levels at admission (145 vs 108 mg%, p=0.04) and EuroScore II were noted (8.9 vs 2.42, p=0.01). Moreover, ejection fraction < 50% was more common among these group (70% vs 63%, p=0.035). Procedural characteristics of patients with no/slow flow phenomenon showed higher contrast volume during PCI (360 vs 201 ml, p=0.02), more frequent post-dilatation (90% vs 93%, p=0.02) and angulation before the modified lesion (70% vs 33%, p=0.01). Significantly longer lesions were observed in this group as well (49 (40;55) vs 25 (25;40), p<0.001). We included all parameters with p-value <0.05 to univariable logistic regression model. In multivariable logistic regression model angulation before the modified lesion and EuroScore II were independent predictors of no/slow flow phenomenon occurrence.

**Conclusions:** Slow flow or no reflow occurred in 2% of patients and it was associated with unmodifiable factors such as high EuroScore II and angulation before the modified lesion. Identifying and comprehending these predictors is crucial for assessing the risk, maximizing the efficacy of RA procedures and mitigating the likelihood of more severe complications.

# DENTISTRY ORAL SESSION

prof. Grażyna Wyszyńska-Pawelec, DMD, PhD
prof. Katarzyna Szczeklik, MD, PhD
Magdalena Orczykowska, DMD, PhD
prof. Małgorzata Pihut, DMD, PhD

## Sessions coordinators:

Aleksandra Szewczyk

Mariana Markiv

Arta Ghasemi

**Title**: Coexistence of stomatognathic disorders and lower back pain

**Authors:** Aleksandra Skorupa-Strojna

**Tutors:** Prof. Magdalena Wilk-Frańczuk, PhD

**Affiliation:** Institute of Physiotherapy, Department of Health Sciences, Jagiellonian University Medical College

**Introduction:** Currently, an increasingly well-understood concept in medicine is the holistic perception of the patient, according to which various abnormalities of the body can influence each other. Civilization diseases, such as temporomandibular disorders (TMD) and lower back pain (LBP), turned out to be a challenge for specialists. Scientific research shows that TMD can occur simultaneously with other systemic problems like depression, postural abnormalities, or spinal pain. It has also been documented that LBP significantly increases the likelihood of dysfunction in the stomatognathic system.

**Aim of the study:** The purpose of the study was to assess the co-occurrence of TMD in patients diagnosed with LBP.

**Materials and methods:** The research group included 30 patients aged between 40 and 65 and diagnosed with LBP at the Ortopedicum Hospital in Krakow. The study was divided into four parts. First part contained a survey regarding the occurrence of TMD symptoms. Second part consisted of the PHQ-9 questionnaire, assessing the presence of depression, which is a risk factor for TMD. Third part was based on posture examination, and fourth part involved palpation of head and neck muscles. For comparison, parts A and B were also conducted on a control group consisting of 30 individuals of the same age, without a diagnosis of LBP. The results were tabulated and statistically analyzed.

**Results:** Preliminary studies have shown that the study group exhibited significantly more parafunctional symptoms of the masticatory system, as well as a higher level of depression, compared to the control group. Additionally, a large number of patients with LBP showed postural abnormalities and tenderness of the masticatory muscles.

**Conclusions:** The presence of LBP increases the likelihood of developing TMD and related risk factors. The subject needs further studies.

**Title**: The impact of nutritional and hygiene factors on the formation of erosive tooth wear in a group of young adults Poles – cross sectional study

**Authors:** Weronika Ciszek, Damian Buczek

**Tutors:** PhD Błaszczyk-Bębenek Ewa, PhD Piórecka Beata

**Affiliation:** Jagiellonian University Collegium Medicum, Cracov, Institute of Public Health

**Introduction:** The development of erosive tooth wear lesions may depend on internal factors (the state of health, the structure of the tooth and other),as well as on external factors, mainly eating and drinking behaviour and dental hygiene.

**Aim of the study:** The study aimed to assess the impact of eating behaviour and dental hygiene habits on the development of erosive tooth wear in a group of 18-30 years old adults.

**Materials and methods:** This cross-sectional survey was conducted in April 2020 using the Computer-Assisted Web Interview method (CAWI). Respondents self-declared the occurrence (ETW) or non-occurrence (NETW) of erosive tooth wear. The research tool was an anonymous survey questionnaire on dietary habits (using Food Frequency Questionnaire), health status and selected health behaviours. Difference between the study groups were assessed using the chi-square test and the non-parametric Mann- Whitney U test at the assumed significance level of $\alpha \leq 0.05$.

**Results:** The study involved 250 people mean aged 20.38 ± 2.13 years, most of whom were women (90%). The majority of respondents had primary education (71%) and were urban residents (70%), with an average financial situation (69%) and low physical activity (42%). There were no differences in socio-demographic characteristics between the groups of people with ETW and NETW ($p>0.05$). The occurrence of erosive tooth wear was self-reported by 13.2% of the total number studied. There were no statistically significant differences in selected eating behaviours between the groups with ETW and NETW ($p>0.05$). Oral hygiene products such as mouthwash were used more frequently by NETW (49.3%) than those with ETW (30.3%; $p=0.0415$). The most frequently reported health condition was eating disorders which occurred significantly more often in people with ETW (27.3%) than NETW

(13.4%,$p = 0.0381$). More than half of the respondents overall (54.5%) had tooth sensitivity that was more common in the group with ETW (84.8%) than in NETW (49.8%,$p< 0.0001$).

**Conclusions:** Respondents did not differ significantly in selected dietary and hygiene behaviours regardless of the presence or absence of erosive tooth wear.

**Title**: Comparative Evaluation of the Prevalence of Pulp Stone Association with Direct Restorations and Caries in the Under 18-Year-Old Polish Subpopulation

**Authors:** Parham Motamedi[1], Anna Pogorzelska[2]

**Tutors:** Anna Pogorzelska DMD

**Affiliation:** 1) Dental student at Medical University of Warsaw, Warsaw, Poland. 2) Assistant Professor, Department of Dental and Maxillofacial Radiology, Faculty of Dentistry, Medical University of Warsaw, Warsaw, Poland.

**Introduction:** Pulp stones, calcified foci within dental pulp, are often associated with diverse dental pathologies, yet their precise etiology remains elusive. Factors such as pulp degeneration and chronic inflammation are implicated. Clinically, they present challenges during dental procedures, necessitating tailored management. Radiographic imaging limitations hinder accurate prevalence assessment. A comprehensive understanding of pulp stones is essential for optimal dental care.

**Aim of the study:** This study aimed to determine the prevalence of pulp stones in posterior teeth among under 18-year-old individuals in Poland using orthopantomography. Additionally, it sought to explore associations between pulp stones and variables such as sex, tooth type, dental arch, side, and age, as well as correlations with caries and restorative procedures. A comparative analysis with existing literature was conducted.

**Materials and methods:** A retrospective analysis of 451 panoramic radiographs from individuals under 18 years old was performed to identify pulp stones in permanent and primary molars and premolars. Radiographs, obtained from the Department of Dental and Maxillofacial Radiology at the Medical University of Warsaw between January and July 2018, underwent double evaluation for reliability. Pulp stones were identified as radiopaque masses within specific teeth, with assessments made regarding caries and restorations.

**Results:** The study identified 288 instances of pulp stones, predominantly in permanent teeth, with higher prevalence among females and the 7-13 age group. First molars in permanent teeth and second molars in deciduous teeth exhibited the highest prevalence. Significant differences were noted between maxillary and mandibular teeth and between permanent and primary dentition within each jaw. Interestingly, no significant correlation was found between restorations/caries depth/classification and pulp stone presence, although teeth with fillings showed a tendency towards higher prevalence.

**Conclusions:** This study highlights the prevalence and associated factors of pulp stones in the under 18-year-old Polish population. While their exact etiology remains uncertain, factors such as pulp degeneration and chronic dental irritants are implicated. Pulp stones can impede canal

access during endodontic treatment, emphasizing the importance of understanding their prevalence across primary and permanent dentition to optimize root canal therapy and mitigate potential endodontic complications.

**Title**: The assessment of the oral health condition and oral hygiene among patients from the Pediatric Hematology and Oncology Department.

**Authors:** Hanna Paszkiewicz, Julia Blacharska, Magdalena Górecka, Magda Kudłacik, Marysia Ochman, Ola Soboń, Sonia Krzykawska, Weronika Skorus, Zuzanna Hucała

**Tutors:** lek. dent. Małgorzata Jamka-Kasprzyk, dr hab. n. med. Anna Jurczak, lek. dent. Tsimur Lyskou

**Affiliation:** SKN Stomatologii Dziecięcej przy Poradni Stomatologii Dziecięcej

**Introduction:** The oncological treatment of children is an especially difficult faculty of medicine, significantly influencing dental status and quality of the adult life. The epidemiological study was conducted in the Pediatric Hematology and Oncology Department at The Children's University Hospital in Cracow. The evaluation of the oral hygiene and oral health status exposed the necessity of the more insightful emphasis on the dental treatment among the oncological patients.

**Aim of the study:** The assessment of the oral hygiene, oral health status and treatment needs among children in the Pediatric Hematology and Oncology Department at The Children's University Hospital in Cracow.

**Materials and methods:** The study involved participants aged 3-18 years old. The clinical examination was conducted with a dental probe, the periodontal WHO probe and a dental mirror. For the analysis, following indicators were used: dmft (mean number of decayed, missing and filled milk teeth), DMFT (mean number of decayed, missing and filled permanent teeth), dt (mean number of decayed milk teeth), dt/(ft+dt) (an index for restorative treatment of milk teeth), DT/(FT+DT) (in index for restorative treatment of permanent teeth), CPI (Community Periodontal Index) and OHI (Oral Hygiene Index). Collected results/data will be taken into statistical analysis.

**Results:** Examining patients is a part of a project that stems from the cooperation between the Oncology and Pediatric Dentistry Departments, based on assessing treatment needs and treating oncological patients. Evaluated results are part of the conducted studies and final data will be presented directly at the conference.

**Conclusions:** Various oral health statuses were reported in the examined group of patients from The Pediatric Hematology and Oncology Department, considering treatment needs, especially caries.

**Title**: Diagnostic Accuracy of Fine-Needle Aspiration Biopsy in Salivary Gland Tumors: A Retrospective Study

**Authors:** Karolina Markusiewicz, Bartłomiej Wiśniewski

**Tutors:** Marcin Łaśko DDS, Karolina Bieńkowska-Pluta MD

**Affiliation:** Maria Skłodowska – Curie Institute of Oncology, Medical University of Warsaw

**Introduction:** Salivary gland tumors are rare and often asymptomatic. They can originate from any of the salivary glands, with the most common locations being the parotid, sublingual, and submandibular glands. While the majority of these lesions are benign, some may be malignant.

The pivotal aspect of the diagnostic process involves determining the nature of the tumor and distinguishing between benign and malignant lesions. Techniques such as fine-needle aspiration biopsy (FNAB), thick-needle biopsy, and tru-cut biopsy are utilized before surgery to differentiate between lesion types. Surgical removal remains the gold standard procedure for managing various salivary gland neoplasms, often supplemented by other treatments.

**Aim of the study:** This study aimed to evaluate the efficacy and accuracy of FNAB and compare its results with histopathological findings from samples obtained during surgical removal.

**Materials and methods:** We conducted a retrospective examination of patients who underwent parotidectomy between 2018 and 2022 due to salivary gland tumors. Only patients with both pre-operative FNAB results and post-operative surgical pathologies were included. Biopsy and pathology results were categorized as benign or malignant. Comparing those two values allowed for the calculation of sensitivity, specificity, accuracy, and positive / negative likelihood ratio of the results basen on FNAB.

**Results:** Out of 177 cases evaluated, 124 patients were included in the study due to missing or unavailable biopsy results. Out of these, 70 patients were female (56%), and 54 were male (44%). The most common benign tumor was Whartin's tumor, while mucoepidermoid carcinoma was the most frequent malignant lesion. The prevalence of the malignant tumors in this cohort was 25.8%. The diagnostic accuracy of FNAB for detecting malignancy was 88.04%, with sensitivity and specificity values of 75.00% and 88.04%, respectively. The positive likelihood ratio was 6.27 and the negative likelihood ratio was 0.28.

**Conclusions:** FNAB serves as a crucial diagnostic tool for evaluating salivary gland tumors, demonstrating higher accuracy in detecting benign lesions. When combined with clinical and radiological evaluations, FNAB may aid in reducing false-positive and false-negative results.

# DOCTORAL ORAL SESSION

prof. Bożena Muszyńska, MD, PhD

Aleksander Siniarski, MD

dr hab. Marcin Wnuk, MD, PhD

## Sessions coordinators:

Julianna Dąbrowa

Agnieszka Czapska

**Title**: The awareness and perception of remote health care services in Poland: a qualitative study

**Authors:** Paulina Smoła, MPH

**Tutors:** Mariusz Duplaga, MD, PhD

**Affiliation:** Department of Health Promotion and e-Health, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Cracow

**Introduction:** The use of telemedicine and e-health services increased significantly during the COVID-19 pandemic. Remote phone-based physician visits became particularly popular.

**Aim of the study:** This study's main aim was to assess the knowledge of participants of in-depth interviews about telemedicine and e-health. The participants were also asked about their perception of facilitators and barriers to the use of remote services.

**Materials and methods:** Ten in-depth interviews were conducted from November 2023 to December 2023. The interviewees were recruited initially by convenience, and the snowball technique was used in the next stage. The interviews were conducted according to the structured guide. All interviews were transcribed and analyzed using MAXQDA Analytics Pro 2024. Thematic Analysis (TA) was applied according to recommendations in the literature.

**Results:** Three main thematic areas were identified: knowledge of telemedicine and e-health, experience with e-health services, and attitudes toward remote physician visits. The mean age (standard deviation, SD) of the interviewees was 47.30 (9.95). Only a few interviewees used the Internet Patient Account to access e-prescription, mainly due to the lack of knowledge about such solutions or the reluctance to use new digital solutions. An analysis of attitudes towards teleconsultation revealed that interviewees were inclined to use remote services due to savings of time and money, the ability to contact specialists from another city, and avoiding the risk of contracting infection. Among barriers they identified the fear of being misdiagnosed, the lack of direct contact with the physician, and technical problems. It turned out that interviewees are most likely to use remote services when they need a prescription renewal or a physician's advice in case of a banal infection. Moreover, all interviewees stressed that they would not be willing to use remote services in case of suspected serious disease, the illness of their child or the need for assessing the vaccination indications.

**Conclusions:** Despite the common use of remote health services during the COVID-19 pandemic, the interviewees are not fully convinced about their feasibility. They tend to accept such services in case of need for simple or routine interactions with healthcare providers.

**Title**: Cyberchondria, e- health literacy and on-line activity in population of young adult Internet users.

**Authors:** Mateusz Kobryn

**Tutors:** dr hab. Mariusz Duplaga prof. UJ

**Affiliation:** Department of Health Promotion and e Health, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland

**Introduction:** The Internet is increasingly becoming the primary source of health-related information, leading to self-diagnosis and symptoms of cyberchondria (CYB). These phenomena may pose a significant burden on public health, yet little is known about their determinants and prevention.

**Aim of the study:** The aim of presented analysis was to examine the severity and determinants of CYB among young adult (aged 18-24) Internet users in Poland. It sought to explore the relationship between CYB, health anxiety (HANX), online activity, health literacy (HL) and e-health literacy (e-HL).

**Materials and methods:** The study was conducted on a group of 1,613 individuals. However, the analysis presented here focuses on a subcategory of young adult internet users aged between 18 and 24 years old. The questionnaire included the Cyberchondria Severity Scale (CSS-PL-33), Short Health Anxiety Inventory, eHEALS scale, encompassing Illness Likelihood (HANX_IL) and Illness Negative Consequences (HANX_NC), and HLS-EU-Q16 questionnaire, along with demographic and online behaviour assessment. A linear regression model was developed to assess the relationships between the analysed variances.

**Results:** No demographic or health status determinants of CYB were observed in the analysis. HANX_IL (B=1.11; 95%CI: 0.71—1.52; p<.001) was a significant predictors of higher CYB severity. Surprisingly neither e-HL nor HL was related to the severity of CYB.

Among the variables related to online activity, the time spent on search of health-related information (SHRI) was a predictor of CYB. The CYB score was lower among respondents who does not spent time searching for health related information (B-11.91; 95%CI: -17.46—-6.36; p<.001) than for respondents who used to do it for maximum one hour a day. Respondents who were using Internet forum to receive health advice (HAdv Forum) had significantly higher CYB scores (B=10.10; 95%CI: -16.90—-3.31; p=.004) those who never used it for that purpose.

**Conclusions:** The hypothesis on the preventive potential of eHL along with HL for CYB severity has been confirmed. In turns this analysis confirmed that higher HANX_NC predicted more severe CYB in the young Internet user group. More intensive searching on websites as well as usage of Internet Forums receive health advice was associated with higher CYB scores.

**Title**: Diversity of genetic profile of pediatric patients with autism spectrum disorder in next-generation sequencing – analysis of patients' results

**Authors:** Gabriela Ręka MD, Katarzyna Wojciechowska MD, PhD, Monika Lejman PhD, Professor

**Tutors:** Monika Lejman PhD, Professor

**Affiliation:** Independent Laboratory of Genetic Diagnostics of the Second Department of Pediatrics, Medical University of Lublin

**Introduction:** Autism spectrum disorder (ASD) is a group of complex impairment in three areas of human functioning: deficits in social communication, maintaining relationships, and presence of restricted and repetitive behaviors. The prevalence worldwide is about 1%, mainly in boys. The causes of autism are not fully investigated. Prenatal, perinatal, environmental, genetic, neurobiological, or gastrointestinal factors are mentioned to be a reason of autism. The literature suggests that every child with ASD should receive genetic testing, including, depending on indications, karyotyping, fragile X syndrome testing, chromosomal microarray, and next-generation sequencing (NGS).

**Aim of the study:** The study aims to analyze mutations found in NGS in pediatric patients with ASD.

**Materials and methods:** NGS results came from children diagnosed from 2017 to 2023 in Genetic Outpatient Clinic from University Children's Hospital in Lublin. Overall, 73 individuals with diagnosis of ASD were enrolled into the study. Mean age of patients was 8 years 6 months, with a predominance of boys (78.08%). NGS was conducted as a whole-exome sequencing (26.03%) or NGS panels with genes connected with ASD and other disorders in particular patients (73.97%).

**Results:** In the research group, pathogenic variants in NGS associated with the phenotype was diagnosed in 27.4% of patients. Pathogenic variants associated to ASD were found in 54.41% of all pathogenic variants in the following genes: KCNC2, CHD1, MEF2C, NLGN4X, BICRA, CAMK2A, ZMYND11, KCNQ5 (2 patients), CHD7, IL1RAPL1, DHCR7, SETBP1, CLCN4, DYNC1H1 (2 patients), AUTS2, MAGEL2, NEXMIF, CC2D1A, DNMT3A, SMARCA4, FOXG1, SETD5 (2 patients), MED12L, SMARCA2, PAH, ARID1B, POGZ, TRIP12, HIVEP2, KMT2D, USH2A, TANC2, DDX23, HUWE1. Almost all pathogenic lesions in the studied group of patients were point mutations – substitutions. Deletions, duplications, nonsense mutations, and frameshifts were also present. In the research group neither of the patients' parents had autism spectrum disorders. Siblings of 9.59% of patients had ASD.

**Conclusions:** The study indicated that there are many different genes connected with ASD and showed the heterogeneity of pathogenic variants found in NGS of pediatric patients with autism.

More than every second pathogenic variant was associated to ASD. All patients with ASD should have NGS testing performed.

**Title**: PhD Programme in Biomedical Sciences

**Authors:** Beril Anita Yiğit, Alex Matsuda, Agata Barzowska, Barbara Pucelik

**Tutors:** dr Anna Czarna

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**Introduction:** Diabetes is a chronic disorder characterised by insufficient insulin production or impaired insulin action due to functional loss of pancreatic β-cells. This functional loss is mostly caused by the dual-specificity tyrosine-regulated kinase-1A (DYRK1A) activity, which inhibits the replication of β-cells. [1] Therefore, DYRK1A inhibitors are considered to be promising therapeutic agents for the management of diabetes by promoting β-cell proliferation and functionality, which can lead to increased insulin levels in individuals with diabetes.

**Aim of the study:** The purpose of this study was to test novel small-molecule DYRK1A inhibitors that are derivatives of the lead compound AC27 [2], for their potential for glucose-stimulated insulin production and their effects on β-cell proliferation.

**Materials and methods:** MIN6 cells were treated with DYRK1A inhibitors at the concentration of 2.5 μM for 24 hours, which was followed by glucose-stimulated insulin production assay. Immunofluorescence staining was performed 72 hours after the treatment with the compounds by using antibodies against insulin and Ki67 (a marker for proliferation), and cell nuclei were stained by Hoechst 33342 for imaging in confocal microscopy. Total insulin production quantitation analysis was performed by using the ELISA method. Additionally, cytotoxicity evaluation of the investigated compounds was done by using the Alamar Blue assay, which was performed 72 hours after the treatment with the compounds.

**Results:** - All tested compounds showed moderate to low toxicity in the MIN6 cell line.

- The compounds that bound and inhibited DYRK1A kinase increased β-cell proliferation and insulin production.

- The results showed that our selected inhibitors demonstrated a similar or higher insulin response compared to Harmine, which is the most effective small-molecule inhibitor in DYRK1A studies; and a similar insulin response compared to AC27.

- For further evaluation, we have selected the non-toxic inhibitors with the best observed insulin production and β-cell proliferation.

**Conclusions:** Our results have shown that DYRK1A inhibitors have therapeutic potential for targeting diabetes by enabling the restoration of functional insulin-producing β-cells.

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[2] Barzowska A, Pucelik B, Pustelny K, Matsuda A, Martyniak A, Stępniewski J, Maksymiuk A, Dawidowski M, Rothweiler U, Dulak J, Dubin G, Czarna A. DYRK1A Kinase Inhibitors Promote β-Cell Survival and Insulin Homeostasis. Cells. 2021 Aug 31;10(9):2263. doi:

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**Title**: Towards therapeutic solutions for diabetes: Development of a novel small-molecule inhibitors targeting DYRK1A

**Authors:** Alicja Bis, Katarzyna Pustelny, Przemysław Grygier, Anna Czarna

**Tutors:** Dr Anna Czarna

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**Introduction:** Dual-specificity tyrosine-regulated kinases (DYRK) are a family of protein kinases that exhibit phosphorylation activity on both tyrosine and serine/threonine residues. DYRK1A plays a critical role in various cellular processes and its dysregulation has been linked to diabetes and neurodevelopmental disorders. Consequently, targeting DYRK1A with selective inhibitors holds therapeutic promise, driving intensive research efforts.

**Aim of the study:** Identification and development of an ideal inhibitor targeting DYRK1A, emphasizing specificity and pharmacokinetic properties. Structural elucidation studies and optimization strategies are explored to advance inhibitor development.

**Materials and methods:** The study involved screening of 2.2 million lead-like compounds from the ZINC database using in silico screening techniques. Subsequently, selected compounds were evaluated for activity against DYRK1A in biochemical and cellular assays. The most promising inhibitors were then crystallized in complex with DYRK1A, and further optimization was carried out based on structure-activity relationship (SAR) data.

**Results:** Virtual screening and subsequent activity assays led to the identification of a hit compound exhibiting inhibitory potency at the low micromolar level. Due to the additional optimizations of its chemical scaffold, the activity of this potential inhibitor was improved to the nanomolar range. Analysis of the crystal structure revealed key interactions contributing to enhanced activity. Cellular assays confirmed DYRK1A inhibition and assessed potential antidiabetic activity.

**Conclusions:** This newly developed DYRK1A inhibitor scaffold, characterized by unique activity profiles, presents a promising avenue for further optimization as a novel therapeutic agent for diabetes. This study underscores the importance of selective and potent inhibitors in advancing our understanding of DYRK1A's role in diabetes and offers potential therapeutic avenues for exploration.

**Title**: The reliability and validity of the Polish version of the Nurses' Attitudes Towards Computerization Scale instrument

**Authors:** Monika Wojcieszko

**Tutors:** dr hab. prof. UJ Mariusz Duplaga

**Affiliation:** Department of Health Promotion and e-Health, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, 31-066 Krakow, Poland

**Introduction:** Successful implementation of new technologies in the health care system largely depends on nurses' attitudes toward computers and their use in clinical practice. The Polish scientific community has not used so far a standardized tool to assess such attitudes.

**Aim of the study:** The main aim of this study was cultural adaptation and validation of the Nursing Attitudes Toward Computers tool (PL-NATC).

**Materials and methods:** The analysis was based on data from a computer-assisted telephone interview (CATI) survey in a group of 250 nurses. The NATC questionnaire was culturally adapted to the Polish language according to international guidelines. Main measures of internal consistecy and exploratory factor analysis were carried out.

**Results:** The average age of the respondents was 48.8 years and the majority (97.2%) were women. The exploratory factor analysis of NATC-PL showed a three-factor structure of the tool. The sum of squared loadings in the survey was 5.318 and accounted for 56,23% of the variance. Cronbach's alpha coefficient was 0.76, and the Guttman split-half coefficient was 0.76, supporting the internal consistency of the scale. The adequacy was ensured by the Kaiser-Meyer-Olkin test (0.91). The significant results of the Bartlett sphericity test confirmed the factorability of the correlation matrix (chi2=2258.21, $p<0.001$). Nurses in the study group had generally positive attitudes toward computerization (70.7 ± 14.5). NATC score was significantly associated with age ($H=10.15$, $p=0.038$), place of residence ($H=11.39$, $p=0.044$), and time spent using social media ($H=18.03$, $p=0.012$).

**Conclusions:** The Polish version of NATC is characterized by good internal consistency and shows a three-factor structure. The tool can be useful in assessing nurses' perception of the feasibility of information technology in medicine and in guiding educational activities in this area.

# EMERGENCY MEDICINE & ANAESTHESIOLOGY ORAL SESSION

prof. Janusz Andres, MD, PhD
Wiktoria Guzik, MD
Joanna Szydło, MD
Ewa Czunko, MD
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Anna Kotarski

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# ORIGINAL WORK

**Title**: Assessment of Nurses' Knowledge Regarding Immediate Life Support and the Impact of the In-Hospital Course about the Cardiopulmonary Resuscitation

**Authors:** [2]Lidia Stachura, [1]Julia Pieczykolan, [1]Zuzanna Tetlak

**Tutors:** Katarzyna Wojnar-Gruszka, RN, MN, PhD; Lucyna Płaszewska-Żywko, RN, MN, PhD, UJ Professor

**Affiliation:** [1]Students' Scientific Group of Intensive Care, Faculty of Health Sciences, Jagiellonian University Medical College in Cracow; [2]Department of Anaesthesiology and Intensive Care, Bochnia Hospital, Poland

**Introduction:** Sudden cardiac arrest (CA) either Out-of-Hospital (OHCA) or In-Hospital (IHCA) has a very high mortality rate. IHCA has different population characteristics, cardiac arrest mechanism and medical treatment. The first critical link in the chain of survival in the hospital are nurses, who usually identify cardiac arrest and initiate cardiopulmonary resuscitation (CPR). Hence nurses' knowledge and skills in CPR significantly affect the prognosis of patients at risk of cardiac arrest in the hospital.

**Aim of the study:** The purpose of this study was to examine nurses' knowledge of IHCA and life-saving procedures before and after taking the Basic Life Support with AED (BLS-AED) course.

**Materials and methods:** A diagnostic survey method was used in this study. The author's survey questionnaire included single- and multiple-choice close-ended questions testing knowledge of BLS-AED. The study included 423 nurses of one of the hospitals in Cracow. The Chi-square test, Fisher test, Mann-Whitney test, Kruskal-Wallis test were used for statistical analysis. A p-value of 0.05 was adopted.

**Results:** CPR knowledge was significantly higher in those in age ranges up to 40 years compared to those aged over 41 years, both before and after the BLS-AED course ($p<0.001$). Those with seniority under 10 years were characterized by better knowledge. After the BLS-AED course, the level of knowledge increased significantly in the entire study group (5.89 + 1.8 vs. 8.48 +1.31 out of 10 possible points; $p<0.001$). Scores improved on all questions, with the exception of knowledge of rhythms for defibrillation. The majority of respondents (n=295; 69.74%) had completed a CPR course for nurses, and 309 (73.05%) had previously participated in CPR training in the unit, but there was no association of completion of these CPR courses with survey results before or after the course.

**Conclusions:** The surveyed knowledge and skills of nurses working in hospital wards regarding CPR before the BLS-AED course were at an inadequate level, but significantly increased after the

course. On-the-job courses on emergencies can improve the competence of nursing staff, and consequently improve the prognosis of patients at risk of CA. However, they require systematic, periodic repetition.

**Title**: Food-induced anaphylaxis in children under 2 years old

**Authors:** Liliana Klim1, Maria Michalik1

**Tutors:** Urszula Jedynak-Wąsowicz, MD, PhD2

**Affiliation:** 1SSG at Children's Diseases Clinic, Children's University Hospital, Jagiellonian University Medical College, Cracow, Poland 2Department of Paediatrics, Children's University Hospital, Jagiellonian University Medical College, Cracow, Poland.

**Introduction:** Anaphylaxis in children is an acute, potentially life-threatening condition. It is an expression of systemic hypersensitivity reaction to a variety of factors, especially food allergens. Its increasing prevalence in the paediatric population has made it a pivotal topic in medicine. Adrenaline is the most effective first aid medicine in anaphylaxis.

**Aim of the study:** The aim of our study was to characterize severe allergic reactions in infants aged 0-2 years in terms of gender, age, types of allergen, symptoms occurrence, coexisting conditions as well as applied emergency treatment.

**Materials and methods:** A retrospective study was conducted on anaphylaxis cases in the Department of Pulmonology, Allergology and Dermatology of University Children's Hospital of Cracow. The study included infants aged 0 to 2 years old from the hospital's database. We used a statistical software - MedCalc, licensed under Jagiellonian University, to calculate the results.

**Results:** In 2014-2023 years anaphylaxis was reported in 86 cases of anaphylaxis in our hospital Department (54 of them were boys, the mean age amounted to 12.3 months, the median was 10 months, the range 4-24 months). It gave 1% of all annually hospitalized children in our Department. Timing of symptoms occurrence varied from 1 to 120 minutes since allergen consumption, making 17 minutes the average. The most frequent triggers of anaphylaxis were cow's milk (44 patients) and hen's egg protein. Mucocutaneous symptoms (urticarial, angioedema; 89% of patients) combined with respiratory symptoms were the most observed clinical presentation. Asthma and sensitivity to hen's egg protein were the risk factors of a more severe course of allergic reaction. Grade 4 of anaphylaxis severity was reported in 43,6% of patients, but only 10,5% of them received adrenaline. Glucocorticosteroids were the most frequently administered medicine by the emergency medical team - 79,3%.

**Conclusions:** Anaphylaxis is a multiform condition among infants, posing a threat to their lives. The assessment of anaphylaxis severity may pose diagnostic difficulties. Our study confirms the insufficient use of adrenaline in the treatment of the most severe allergic reactions in youngest children.

**Title**: Platelet Indices as Diagnostic Biomarkers for Early Detection of Bacterial Infections in Children Aged 5 to 12 Years Presenting to Pediatric Emergency Settings

**Authors:** Dominyka Žukaitė, Ainas Beinakaraitis, Rita Vainorytė, Giedrius Šulskus, Lina Jankauskaitė

**Tutors:** prof. Lina Jankauskaitė MD, PhD

**Affiliation:** Lithuanian University of Health Sciences, Medical Faculty

**Introduction:** Early identification of serious bacterial infection is critical. Current diagnostic tools, including Leucocyte (Leu) and neutrophil (Neu) counts, C-reactive protein (CRP), together with clinical assessment, exhibit limited sensitivity and specificity. More specific biomarkers to discern bacterial from viral infections are needed.

**Aim of the study:** We aimed to determine specific platelet (PLT) biomarker diagnostic accuracy in differentiating bacterial versus viral infection in pediatric emergency department (PED).

**Materials and methods:** Retrospective data analysis was conducted in our university hospital. All case-records of full-term previously healthy children aged 28d-18yrs presenting up to 24h after initial fever to PED 1st January-31st December 2023 were analyzed. Exclusion: chronic diseases, cancer, immunodeficiency, late arrival (>24h post fever), neonates, preterm, recent antibacterial therapy. Demographic data, signs, symptoms on arrival, laboratory data (Leu, Neu, PLT, CRP, platelet indices (MPV, PDW, PCT), instrumental test data, outcomes were analyzed. Data were subdivided into bacterial and other groups, grouped according to age (28d-12mo, 12mo-2y, 2-5y, 5-12y, >12y), time of arrival (<12h or 12-24h post fever). Statistical analysis was performed with SPSS 29.0. P-value <0.05 was considered significant.

**Results:** 277 children were included (median age 4.26 (3.75-4.78), 49.8% female). 5-12yrs age group was analysed, comprising 70 children, 40%-female; median age 7.02 (5.91-9.18). 72.9% arrived 12-24h from the onset of fever. 26 patients were classified as having bacterial infections. Significant difference in PLT and plateletcrit (PCT) was observed when differentiating between bacterial and other infections (282.14+/-61.96 vs 224.37+/-55.30 respectively, p<0.01; 0.22+/-0.04 vs 0.18+/-0.04 respectively, p=0.003). In multivariate logistic regression, PLT and PDW with OR of 1.05 and 5.54 respectively, were found to be significant in distinguishing bacterial and other infections in 5-12yr-olds (p=0.014, p=0.047 respectively). Combinations of markers were analysed to segregate bacterial and non-bacterial infections. PLT+Leu, and PCT+Leu, exhibited significant differences in distinguishing bacterial from other infections (p=0.01 and p=0.006 respectively). PDW+Leu and PDW+CRP were significant in distinguishing bacterial and other infections (p<0.001).

**Conclusions:** Our analysis indicates that PCT, PDW, PLT, and their combination could serve as potential diagnostic biomarkers in early acute bacterial infection for children aged 5 to 12 years. Nevertheless, its diagnostic capability may extend to other pediatric groups.

**Title**: Current challenges in management of patients with catastrophic and non-catastrophic high-risk pulmonary embolism

**Authors:** Michał Karnaś, Patrycja Kurczyna, Weronika Chaba

**Tutors:** Jakub Stępniewski MD, PhD

**Affiliation:** Students' Scientific Group of Pulmonary Circulation and Thromboembolic Diseases

**Introduction:** High-risk (HR) pulmonary embolism (PE) has been associated with a 30-50% risk of early death. Despite immediate threat of life, less than a half of HR patients receive guideline-recommended reperfusion therapy, defined as systemic thrombolysis (ST), transcatheter interventions or surgical embolectomy. The HR-PE patients represent a heterogenous group, which may present with cardiac arrest, obstructive shock or persistent hypotension. The differences in the management and outcomes between HR phenotypes have been less well understood.

**Aim of the study:** The study aimed to investigate the management strategies and clinical outcomes between phenotypes of HR-PE patients.

**Materials and methods:** We evaluated medical records of HR-PE patients from a prospectively conducted consultations register of the Pulmonary Embolism Response Team (PERT) of the Saint John Paul II Hospital in Cracow, Poland. Patients presenting with cardiac arrest were identified as catastrophic PE, and those with shock or hypotension as non-catastrophic.Clinical characteristics, treatment and outcomes defined as in-hospital mortality were compared.

**Results:** There were 56 HR-PE patients consulted by PERT between January-2018 and December-2023. Their mean age was 64±16.4 and women constituted 51.8% of the study group. The catastrophic HR-PE was observed in 15 (26.8%) patients. Saddle pulmonary embolism on computed tomography of pulmonary artery was observed more frequently among non-catastrophic patients, however without statistical significance (26.7% vs 41.5%, p=0.36). Absolute (13.3% vs 19.5%, p=0.71) or relative (40.0% vs 2.4%, p<0.001) contraindications to systemic thrombolysis were identified in patients with catastrophic or non-catastrophic PE, respectively. A significant percentage of patients with catastrophic HR-PE did not have reperfusion treatment implemented in comparison to non-catastrophic individuals (53.3% vs 17.1%, p=0.014). In both groups, a similar proportion of patients received ST (40.0% vs 34.2%, p=0.76) whereas transcatheter interventions were more frequently implemented among patients with non-catastrophic PE (6.7% vs 43.9%, p=0.01). The in-hospital mortality rate was higher in catastrophic HR-PE patients (63.6% vs 25.0%, p=0.03).

**Conclusions:** Sudden cardiac arrest associated with pulmonary embolism was a factor which impeded implementation of reperfusion therapy and worsened the early prognosis. ST remained the most commonly used method of reperfusion treatment in catastrophic HR-PE patients whereas transcatheter interventions came into prominence among non-catastrophic individuals.

**Title**: Postoperative stapedoplasty complication correlation between local and general anesthesia in patients with otosclerosis

**Authors:** Karīna Elza Stiģe

**Tutors:** Svetlana Koņuhova MD

**Affiliation**: Student

**Introduction:** Otosclerosis is a common cause of conductive hearing loss. The disease is characterized by abnormal bone remodulation of otic capsule, causing stapes fixation. Stapedoplasty is the preferred treatment option, during which fixated stapes is replaced by synthetic prothesis. The operation can be done under local or general anesthesia.

**Aim of the study:** The aim of this study was to assess stapedoplasty complication correlation between local and general anesthesia in patients with otosclerosis.

**Materials and methods:** This retrospective study was conducted at Private clinic of Otorhinolaryngology HEADLINE and Pauls Stradiņš Clinical University Hospital from January 1st, 2015, to December 31st, 2023. We reviewed all audiograms before and after surgery, operation descriptions and patient complaints after surgery. Data was processed using IBM SPSS Statistics 22.

**Results:** The study included 154 patients; 46 (29,9%) were males and 108 (70,1%) were females. The mean age was 46,35 years (SD=10,982), male:female ratio 1:2,3. Out of all stapedoplasties 55 (35,7%) were under local anesthesia, but 99 (64,3%) were under general anesthesia. The total of complications was 48 (31.16%). Complications were seen in 13(23,6%) out of 55 local anesthesia operations, but after general anesthesia – 35 (35,4%) of total 99. Pearson's Chi-Square Test was used to assess complication correlation between the two types of anesthesia. The results showed no correlation between complication incidence and the type of anesthesia used. The outcome data was not statistically significant (p= >0,05).

**Conclusions:** There is no statistically significant correlation between postoperative stapedoplasty complications and local or general anesthesia.

**Title**: Validation of the Polish version of the Quality of Recovery-15: prospective, multicenter, observational study (QoR-15-PL).

**Authors:** Antoni Cierniak, Wojciech Skupnik

**Tutors:** Marcelina Czok, MD, Prof. Wojciech Szczeklik, MD, PhD

**Affiliation**: Student Scientific Club of Intensive Care and Perioperative Medicine Center, Jagiellonian University Medical College

**Introduction:** Improvement of postoperative recovery after surgery is one of the main goals of modern perioperative medicine. The evaluation of postoperative convalescence requires incorporating a patient-perceived assessment of the quality of recovery. A widely used, reliable tool is the self-reported survey Quality of Recovery-15 (QoR-15), which so far has not been validated in the Polish language.

**Aim of the study:** The aim of the study was to validate the Quality of Recovery-15 questionnaire in the Polish population.

**Materials and methods:** QoR-15 questionnaire was translated into the Polish language by the two independent translators. Patients aged over 18 years undergoing surgical procedure with planned general anesthesia were considered eligible for the study. Participants were asked to complete QoR-15PL twice: preoperatively and one day post-surgery. The Euro-QoL 100-mm Visual Analog Scale (EQ-VAS) was also collected. Patients' data regarding clinical characteristics, surgical procedure, ASA status, Clinical Frailty Scale and postoperative complications were obtained. Statistical analysis was performed using RStudio (version 1.3.1093).

**Results:** 426 patients at five clinical centers were prospectively enrolled to the study. 342 patients' (52,6% females aged 51.8±15 years old) filled both questionnaires and were included in the final analysis. QoR-15-PL total score preoperatively was 132 (IQR 121-143) and decreased postoperatively to 113 (IQR 95-129; $p<0.001$). The Cronbach's alpha values for inter-dimension reliability for preoperative and postoperative questionnaires were 0.85 and 0.86, respectively. The test–retest reliability (Intraclass Correlation Coefficient) was 0.91 (95%CI:0.85-0.94, $p<0.01$) for total score, based on a sample size of 76 patients. Cohen's effect size of QoR-15-PL was 0.78 (95%CI: 0.62-0.93). The significant correlations between the preoperative and postoperative QoR-15-PL scores and the corresponding VAS scores were observed ($r=0.58$, $p<0.001$; $r=0.6$, $p<0.001$ respectively). No significant relationship between postoperative QoR-15 score and age, ASA physical score or complications was found.

**Conclusions:** QoR-15-PL was shown to be a reliable tool to assess the quality of recovery among Polish surgical patients.

# CASE REPORT

**Title:** What to Do When Your Patient is Bleeding from the GI Tract? Unveiling Strategies Based on the Latest Guidelines – A Case Report

**Author:** Zuzanna Ostrowicz

**Tutor:** M.D. Anna Woś-Zaniewska

**Affiliation:** Students Scientific Association of Gastroenterology, University of Warmia and Mazury in Olsztyn, Department of Medicine, Collegium Medicum

**Introduction:** Introduction: In September 2022, the new guideline for the endoscopic diagnosis and management of esophagogastric variceal haemorrhage was published by the European Society of Gastrointestinal Endoscopy (ESGE). It contains valid data and important recommendations. One of the main recommendations is that "patients with compensated advanced chronic liver disease (due to viruses, alcohol, and/or non obese [BMI < 30 kg/m2] nonalcoholic steatohepatitis) and clinically significant portal hypertension (hepatic venous pressure gradient [HVPG] > 10 mmHg and/or liver stiffness by transient elastography > 25 kPa) should receive, if no contraindications exist, nonselective beta-blocker therapy to prevent the development of variceal bleeding." This case report will present the new management strategies for esophagogastric variceal haemorrhage based on these guidelines.

**Case presentation:** Case presentation: A 56-year-old patient was admitted to the emergency ward due to suspected upper gastrointestinal bleeding (UGIB). In the medical history, the patient reported weakness, tarry stools, vomiting and nausea, epigastric pain, abdominal enlargement, alcohol abuse, and liver cirrhosis. The patient had a history of bleeding episodes from oesophageal varices that were successfully treated. An urgent gastrointestinal endoscopy was performed, revealing oesophageal varices, and endoscopic variceal ligation (EVL) was carried out. Another EVL procedure was planned for future hospitalisation. The patient was discharged with instructions and prescriptions.

**Conclusions:** Conclusion: UGIB is a very common condition, occurring in approximately 80% of all hospitalisations for gastrointestinal bleeding. For this reason, it is crucial for doctors from every specialty to learn how to proceed to help our patients.

**Title:** Effective Treatment of Acinetobacter Baumannii Ventriculitis with Interventricular Colistin: A Case Report

**Authors:** Kamelia Hassan, Ithamar Cheyne, Tjard Dunkel, Marcin Sota

**Tutors:** Łukasz Wróblewski MD;The II Clinic of Anesthesiology and Intensive Care, Medical University of Warsaw. Małgorzata Mikaszewska- Sokolewicz MD PhD DEAA; Head of The Clinic of Anesthesiology and Intensive Care, The Children's Memorial Health Institute Warsaw.

**Affiliation:** Medical University of Warsaw

**Introduction:** Cerebrospinal fluid (CSF) shunts serve as the primary treatment for hydrocephalus. Nevertheless, prolonged usage of external ventricular drains (EVD) can lead to central nervous system (CNS) infections such as ventriculitis. In the intensive care unit (ICU) setting, nosocomial infections with gram-negative, multi-drug resistant (MDR) organisms such as Acinetobacter baumannii (AB) prevail, leading to poor outcomes. Notably, infections caused by AB pose a formidable challenge due to their remarkable genetic drug resistance.

Colistin was re-introduced into clinical practice in the use against Gram-negative MDR pathogens. However, its efficacy is tempered by pharmacokinetic limitations, particularly in its ability to penetrate the CNS when administered intravenously (IV). Consequently, intraventricular (IVT) or intrathecal (ITH) administration of colistin is warranted to enhance its therapeutic reach within the CNS.

**Case presentation:** We present a 22-year-old male admitted to the emergency department after an electric scooter accident with extensive head trauma and hydrocephalus. An EVD was inserted and later complicated by nosocomial neuroinfection. Empiric IV therapy was intiated with meropenem and vancomycin. For several weeks the symptoms persisted and no causative pathogen was identified, until the perioperative removal of a lumbar drain, revealing AB susceptible only to Colistin. IV Colistin was added to meropenem and for several weeks showed no significant improvement. The addition of IVT Colistin to the current regimen made a significant neurological improvement and a reduction in the inflammatory markers, without adverse effects. After multiple nosocomial complications not related to the IVT Colistin treatment, the patient was discharged in good condition to the rehabilitation department.

**Conclusions:** In this case, IVT Colistin was effective and safe, causing clinical improvement, suggesting that IVT colistin may be the preferred option over IV Colistin. EVDs impose devastating complications, therefore, medical staff should be informed about correct prevention and care of EVD-associated infections.

**Title: Angioedema Caused By C1 Esterase Inhibitor Deficiency – A Case Report**

**Authors:** Gabija Liaudanskytė, Silvija Radzevičiūtė

**Tutors:** Vilma Traškaitė- Juškevičienė MD

**Affiliation:** Faculty of Medicine, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania; Department of Anaesthesiology, Faculty of Medicine, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania

**Introduction:** C1 esterase inhibitor deficiency, also referred to as hereditary angioedema (HAE), leads to uncontrolled production of the vasodilator bradykinin, affecting approximately 1 in 50,000 individuals globally. Despite various reported triggers, such as stress, the exact mechanisms initiating an attack remain elusive. The heightened risk of asphyxiation and mortality among undiagnosed patients underscores the importance of urging all relatives of an index patient to undergo testing.

**Case presentation:** A 47-year-old male presented at the hospital with severe dyspnoea. Initial treatment by the ambulance paramedics included administration of nebulized adrenaline and salbutamol. Despite being conscious and alert in the Emergency department, he was unable to communicate verbally due to his condition. Upon admission to the hospital, the patient received further treatment consisting of salbutamol inhalations, intravenous infusion of Ringer's solution with tranexamic acid and intravenous dexamethasone. An otolaryngologist examination revealed laryngeal oedema and indicated an urge to perform intubation for airway patency.

The patient's medical history indicated a diagnosis of C1 esterase inhibitor deficiency since 2013, although he had neglected his treatment regimen. The patient reported experiencing recurrent cutaneous angioedema and frequent gastrointestinal symptoms such as pain and bloating, with this episode marking the first occurrence of laryngeal swelling. Additionally, the patient's mother had died to an angioedema attack due to C1 esterase inhibitor deficiency. Given the severity of the condition, an immunologist recommended intravenous administration of C1 esterase inhibitor (Cynrize 1000 TV) as specific treatment for HAE. Although symptoms subsided, the patient had been transferred to the intensive care unit for further monitoring and possible requirement of airway management manoeuvres should the airway patency becomes compromised. Upon stabilization, he had been transferred to the rheumatology department, where he received further immunologist review and was prescribed with Cynrize 1000 TV as prophylaxis for future angioedema attacks before discharge.

**Conclusions:** This detailed case report highlights the imperative for healthcare professionals to maintain awareness of and promptly manage this rare disease. It emphasizes the importance of patient and family education, regular medical follow-ups, adherence to prescribed medications, and awareness of their genetic predisposition.

**Title:** Acute lower left limb ischemia due to thrombosis of the left lower limb arteries in a patient with a severe aortic stenosis and thrombus in the left ventricle.

**Authors:** Ewa Kwiatkowska, Michał Okarski

**Tutor:** prof. Paweł Kleczyński, PhD

**Affiliation:** Students' Scientific Group of Modern Cardiac Therapy at the Department of Interventional Cardiology, Institute of Cardiology, Jagiellonian University Medical College St. John Paul II Hospital, Krakow, Poland

**Introduction:** Acute limb ischemia (ALI) is a vascular emergency condition associated with a high risk for limb loss and death. One of its well-known sources is cardioembolic. Embolic events result from thrombus in the cardiac chambers mainly occur as a sequela of atrial fibrillation, recent myocardial infarction, endocarditis and prosthetic valve leaflet thrombosis from suboptimal anticoagulation but might appear due to severe left ventricular dysfunction and aortic stenosis.

**Case presentation:** A 55-year-old patient was admitted to the hospital due to acute ischemia of the left lower extremity. The patient was hemodynamically and respiratorily stable. He presented pallor of the left extremity with no palpable pulse in its distal part.

In the echocardiography, the entire heart was enlarged. The ascending aorta and the main pulmonary artery were dilated. Generalized contractility disorders and impaired systolic function of the right ventricle were noted. Left ventricular ejection fraction (LVEF) was 18-20%. Examination revealed a severe, complex bicuspid aortic valve stenosis with moderate regurgitation. In the apex, a hyperechoic, heterogeneous, ballooning thrombus 0.9x1cm was found.

Thromboembolectomy was performed under local anaesthesia of the left groin. Large amounts of thromboembolic material were removed from the common femoral artery (CFA), superficial femoral artery (SFA), and profunda femoris artery (PFA). The extracted elements were sent for bacteriological examination.

Due to a life-threatening condition, the patient has undergone aortic valve replacement (AVR). Upon operation, a heavily calcified, anatomically tricuspid aortic valve was encountered. A bioprosthetic Medtronic Avalus 23A aortic valve was implanted. The left ventricle was revised, but the thrombus was not found in the apex of the heart, which was confirmed by intraoperative transesophageal echocardiography (TEE).

The postoperative course was uneventful. The patient was discharged in good general condition.

**Conclusions:** The risk factors for developing intracardiac thrombi while in sinus rhythm include the presence of left atrium spontaneous echo contrast, which is believed to represent erythrocyte aggregation in low shear rate conditions. The scene of a “smoke-like” echo, frequently accompanies the thrombus and may be helpful in the differentiation of a thrombus from a tumour or normal anatomy.

**Title:** Dangerous effects of self-medication - a case report

**Authors:** Joanna Chajec, Julia Siek

**Tutor:** assoc. prof. Michał Borys, MD PhD

**Affiliation:** The Student Research Group of the Second Department of Anesthesiology and Intensive Therapy

**Introduction:** Self-medication is characterized as the use of medications by people to treat self-recognized or self-diagnosed conditions or symptoms. It is known as unsafe, especially when used by unauthorized persons. Inaccurate self-diagnosis, delaying seeking medical attention when necessary, rare but severe adverse reactions, hazardous drug interactions, improper dosage and administration techniques, abuse risk and even death are some of the possible risks associated with self-medication practices.

**Case presentation:** A 34-year-old male patient without previous medical history was found unconscious on the street by a bystander, who called the ambulance. At the admission to the Emergency Department, the patient was intubated, ventilated mechanically and GCS 3. The patient was found with a blister of modafinil and a bag of round green pills with the imprint "OC 80", so a urine test was performed, which revealed CBD and benzodiazepines. The patient's condition stabilized and another assessment was GCS 15. The same day the patient was transferred to the Intensive Care Unit with suspected Mendelson's syndrome, which was excluded after admission. The laboratory tests showed no significant pathology. Overnight the patient's condition improved and extubation was performed. The patient was conscious with logical contact, although he didn't remember what happened and he claimed that he took medication due to back pain. Later the patient revealed that the medications were bought from the internet, without a prescription and from an unknown source.

**Conclusions:** Pain management should be consulted with a doctor and administered according to the pain ladder. In connection with the case report, it is also important to mention that we should always buy medications in authorized places, such as pharmacies. Self-medication can lead to dangerous effects or even death.

**Title:** Management of hypertensive crisis during the surgery of paraganglioma: A case report

**Authors:** Ignas Kraujutis, Silvija Radzevičiūtė

**Tutors:** Vaiva Skaraitė MD, Andrius Macas PhD

**Affiliation:** Lithuanian University of Health Sciences

**Introduction:** Paraganglioma is rare neuroendocrine tumor that stores catecholamines. Although surgical tumor excision is the gold standard of care, it is crucial to avoid potentially fatal cardiovascular issues. Preventing a hypertensive crisis during surgery is the primary concern and perioperative management should consist of hypertensive control, blood volume, and tachycardia corrections.

**Case presentation:** A 73-year-old woman presented complaining of non-controlable hypertension and frequent hyperglycemia. An abdomen ultrasound was performed and showed non-hemogenic vascular mass below the pancreas and additional tests were performed to confirm the diagnosis. Following chest, abdomen, and pelvis computed tomography (CT) revealed 5,8x4,4x6,1cm right adrenal gland tumor, the biopsy confirmed the diagnosis of Paraganglioma, and the patient was admitted for surgical treatment of the tumor. The perioperative management included a high-sodium diet, 8 mg of doxazosin, and 10 mg of bisoprolol twice a day. ASA class IV was assigned to the patient. Blood pressure (BP) of 100/60 mmHg was considered hypertensive control; nevertheless, on the operating table, the BP increased to 179/100 mmHg. Fentanyl, propofol, and atracurium were used for induction, and vena jugular and arteria radialis were catheterized for invasive blood pressure monitoring. During the first ten minutes of the surgery, BP started rising to 300, and to treat hypertensive crisis enalapril, metoprolol, nitroglycerin, naniprus, and remiphentanyli were used. BP dropped but when surgical actions renewed it rose over 300 mmHg and the surgery was pulled off. Higher doses of antihypertensive drugs were prescribed and MIBG scintigraphy was performed which confirmed paraganglioma diagnosis. After one month and the patient being hemodynamically stable second surgery was performed. BP range was 300/140 – 70/35 mmHg in the background of antihypertensive drugs but normalized as soon as the tumor was removed. During the postoperative period, small doses of metoprolol and hydrocortisone were prescribed for BP control, no complications arose and the patient was discharged.

**Conclusions:** Perioperative management is crucial to avoid life-threatening complications during surgery. This case demonstrates the preoperative assessment of the patient‘s arterial blood pressure variability, comorbidities, tumour extension, localisation and surgical accessibility is important for appropriate preoperative preparation, anaesthesia and surgical management.

# ENDOCRINOLOGY ORAL SESSION

prof. Alicja Hubalewska-Dydejczyk, MD, PhD

prof. Aleksander Konturek, MD, PhD

Monika Buziak-Bereza, MD

Marta Opalińska, MD, PhD

## Sessions coordinators:

Gabriela Kolka

Dominika Kowaluk

# ORIGINAL WORK

**Title**: Impact of Prolonged Risperidone Use on Biochemical Indices in Wistar Albino Rats: Hormonal Disruption, Hepatic Alterations, and Renal Effects

**Authors:** Ikokwu Prosper Onyedikachi, Francis Mmesoma Mary(Presenter)

**Tutors:** Prof. Anacletus Francis, PhD (He supervised the overall research work, guiding both the laboratory and literature aspects)

**Affiliation:** Francis Mmesoma Mary Is A Student At Kiev Medical University, Poland, Who Oversaw The Collation Of All The Laboratory Work Into Literture. Ikokwu Prosper Onyedikachi Was Directly Concerned With The Laboratory Work And Indices, Workign With The Wistar Albino Rats And Overseeing The Experiment Over The Span Of A Total Of 28 Days.

**Introduction:** Risperidone, a second-generation antipsychotic drug, is widely used in the treatment of various mental health disorders. However, its prolonged use has been associated with potential adverse effects on hormonal balance, hepatic function, and renal health. This study aimed to investigate the effects of risperidone on testosterone, progesterone, liver function markers (alanine aminotransferase [ALT], aspartate aminotransferase [AST], alkaline phosphatase [ALP], and albumin), and renal health markers (urea and creatinine) in Wistar albino rats which exhibit similar physiological properties to human beings.

**Aim of the study:** The objective was to assess the impact of prolonged risperidone administration on hormonal balance, liver function, and renal health markers in male and female Wistar albino rats over a 28-day period.

**Materials and methods:** Wistar albino rats were divided into treatment and control groups. Rats were administered risperidone at 5mg/kg/day for 14 or 28 days. Blood samples were collected for biochemical analysis of testosterone, progesterone, liver function markers, and renal health markers.

**Results:** Risperidone treatment led to significant alterations in hormonal balance, liver function, and renal health markers. In males, risperidone administration resulted in suppressed testosterone levels and elevated liver enzymes (ALT, AST, and ALP) at both 14 and 28 days. Females exhibited significantly higher progesterone levels and non-significant changes in liver enzymes. Additionally, risperidone caused gender-specific variations in renal health markers, with treated males showing increased urea and creatinine levels compared to minimal changes in females.

**Conclusions:** Prolonged risperidone administration disrupts hormonal balance, hepatic function, and renal health in Wistar albino rats. These findings underscore the importance of monitoring hormonal and biochemical indices during risperidone therapy, with potential implications for personalized treatment considerations and enhanced health monitoring in clinical settings. Further research is warranted to elucidate the underlying mechanisms and long-term health consequences of risperidone-induced alterations in biochemical indices.

**Title**: The anatomical and visual outcomes after pars plana vitrectomy with epiretinal membrane peeling in patients with and without diabetes mielitus

**Authors:** Daria Medvedeva

**Tutors:** Assoc. Prof. Kristīne Baumane

**Affiliation:** Faculty of Medicine, University of Latvia; Riga East Clinical University Hospital

**Introduction:** Epiretinal membrane (ERM) is a thin, transparent membrane, that proliferates on the inner surface of the retina, leading to various levels of macular dysfunction.

ERMs are quite prevalent, occurring in approximately 20% of patients over 75 years. The ERM can be also secondary to the diabetic retinopathy; moreover, diabetic retinopathy is a risk factor for the development of secondary ERMs.

**Aim of the study:** To compare the anatomical and visual outcomes of pars plana vitrectomy (PPV) with ERM peeling in patients with and without diabetes.

**Materials and methods:** This retrospective analysis included the review of case records of patients who underwent PPV with ERM peeling. Patients were divided into two groups: with and without diabetes. Visual acuity (VA) and central retinal thickness (CRT) measured by optical coherence tomography (OCT) were evaluated before surgery and 3 months postoperatively.

**Results:** The records of 50 patient eyes were examined, 25 with diabetes and 25 without diabetes undergoing PPV with ERM peeling. The obtained results show that the CRT before surgery is higher in the group of patients with diabetes ($M = 524.7$, $SD = 91.0$) compared to patients in the without diabetes group ($M = 464.8$, $SD = 68.7$), and these differences are statistically significant ($t = 2.63$, $p = 0.012$). Statistically significant differences in CRT after surgery between patients in the group with diabetes ($M = 380.5$, $SD = 50.0$) and the group without diabetes ($M = 367.2$, $SD = 46.4$) were not observed. Statistically significant differences in VA before surgery between patients in the group with diabetes ($M= 0{,}27$ D, $SD=0{,}12$) and the group without ($M= 0{,}33$ D, $SD=0{,}21$) diabetes were not found ($U = 241.00$, $p > 0.05$). Both age groups show an improvement in VA after surgery. The postoperative VA for patients without diabetes is higher ($M= 0.64$, $SD =0.21$) compared to patients with diabetes ($M=0.52$, $SD=0.18$).

**Conclusions:** The PPV with ILM peeling procedure is associated with a significant improvement in VA postoperatively, along with improvements in anatomical outcomes indicated by a decrease in CRT as measured by OCT. In turn, the group with diabetes demonstrated worse results in both analyzed aspects compared to the group without diabetes.

# CASE REPORT

**Title:** Cyclic Cushing Syndrome in a patient with a recurrent atypical carcinoid

**Author:** Agnieszka Czapska

**Tutor:** Grzegorz Sokołowski, MD

**Affiliation:** Students' Scientific Group of Endocrinology

**Introduction:** Cyclic Cushing syndrome used to be associated with pituitary adenoma, but according to the recent studies its etiology is variable. Periods of hipercortisolemia interspersed by normocortisolemia have a span of days to months rendering diagnostics challenging.

**Case presentation:** 45-year-old man with a history of atypical carcinoid excreting ACTH/CRH and upper lobectomy of the right lung was admitted to the hospital with suspected recurrence. From 2022 he has been presenting symptoms of hipercortisolemia. Laboratory tests revealed abnormal daily rhythm of cortisol and pathologic results of CRH suppression and stimulation. The patient required pharmacological intervention and multiple diagnostic hospitalizations within several months. During this time, he twice experienced biochemical and clinical remission that resulted in modification of the therapy - discontinuation or reduction of metopirone. Pituitary MRI and whole body CT scan were performed, but no recurrence was noticed. PET revealed some pathological expression in the tail of pancreas (Krenning score 3/4) - lesion was undetectable on MRI, with weak enhancement in the control CT (04.2023). Subsequent chest CT visualized nodule in a right lung, which was confirmed in PET-CT. PET with FDG denied any metabolic activity. In 4R lymph node metastases of carcinoid were confirmed. Rethoracotomy was performed (07.2023) with excision of nodules and mediastinal lymph nodes. Pathology report confirmed metastases NET G2 in lymph nodes with strong and moderate SSTR2 expression. However, lung sections were free of the neoplasm. After the operation normalization of cortisol level and return to its physiological rhythm were observed, although ACTH remained within its upper limits or above. EUS of the pancreatic lesion was carried out. Cytological specimen was obtained and recognized as the pancreatic neuroendocrine tumor. As a result, therapy with a Octreotide LAR was initiated and patient is under observation.

**Conclusions:** In this case it is difficult to determine whether the relief of the symptoms was associated with the remission of the disease or with the transient normalization of the hormone excretion.

The case highlights the importance of the meticulous diagnostics that allows to fight the cause of the illness, not only the symptoms.

**Title:** Itraconazole's impact on cortisol rhythms and blood pressure in patient with burnout syndrome: a case study

**Authors:** Trifon T. Popov1, Svetlana H. Hristova2

**Tutor:** Chief Assis. Svetlana H. Hristova, PhD

**Affiliation:** 1 Student of Medicine, Medical Faculty, Medical University – Sofia, Sofia, Bulgaria 2 Department of Medical Physics and Biophysics, Medical University – Sofia, Sofia, Bulgaria

**Introduction:** Burnout, a syndrome becoming more common nowadays, is marked by raised morning plasma cortisol levels, while evening levels tend to stay consistent. This hormonal change is linked to symptoms such as increased blood pressure, weight gain, muscle weakening, and lowered immune response. The case study investigates the unusual effect of the antifungal drug itraconazole on the circadian rhythm of plasma cortisol levels and blood pressure in an individual suffering from burnout syndrome.

**Case presentation:** A 40-year-old female, who reports a significant weight increase of 15 kg over 10 months, especially in the abdominal and facial regions, without notable changes in her diet or exercise and experiencing reduced working capacity because of the chronic stress at work, presents with raised morning cortisol levels as well as elevated arterial blood pressure. Following the development of a fungal infection caused by Trichophyton rubrum, she began a month-long treatment with the oral antifungal itraconazole. Remarkably, a week after completing the treatment, the skin lesions had resolved and reductions in both plasma cortisol levels and blood pressure were observed. The decrease in blood cortisol concentration varied across the day. It is more pronounced in the morning cortisol (from 833.1 nmol/L to 524.1 nmol/L - approximately 37%) than in the evening cortisol (from 110 nmol/L to 90.7 nmol/L - around 17%). Notably, the circadian rhythm of this hormone remains unchanged. Similarly, the decrease in blood pressure is also not at the same degree, with a more significant reduction observed in the diastolic (approximately 27%) blood pressure compared to the systolic (17%).

The diagnosis of burnout syndrome was confirmed through the Burnout Assessment Tool (BAS), where the patient scored a high burnout level score of 86% (142 out of 165 points). The antifungal drug itraconazole acts by blocking crucial enzymes involved in the adrenal cortex's glucocorticoid synthesis (such as 11-β-hydroxylase and 21-α-hydroxylase), leading to a reduction in plasma cortisol levels and thereby blood pressure.

**Conclusions:** In summary, administering the antifungal medication itraconazole for one month in a patient diagnosed with burnout syndrome notably lowered the plasma cortisol levels (more so in the morning than in the evening) and blood pressure (with a more pronounced effect on diastolic than systolic pressure).

**Title:** Multiple meningiomas in a 74-year-old female with acromegaly – The management of a rare event

**Authors:** Mateiuc Daria, Matei Paula-Cristina

**Tutor:** prof. Popa-Ilie Ioana MD

**Affiliation:** 1 Endocrinology Department of Cluj County Emergency Hospital 2 "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca

**Introduction:** Acromegaly is an acquired condition characterized by excessive secretion of growth hormone (GH) and is most commonly caused by a pituitary adenoma. As far as meningiomas are concerned, they are among the most common primarily benign tumours affecting the central nervous system. Despite this, neither pituitary adenomas nor meningiomas are encountered with a high frequency and their concomitant occurrence without a history of radiotherapy is extremely rare.

**Case presentation:** 74-year-old female with no history of prior malignancy or irradiation is under regular endocrine monitoring after being diagnosed with acromegaly ten years ago, when a MRI scan was performed due to characteristic compressive effects of the tumor, such as bitemporal hemianopsia and persistent headaches. The scan showed a large sellar tumor compressing and displacing the optic chiasm with encasement of the right and left internal carotid artery. Post contrast, the paramagnetic substance was inhomogeneously distributed, revealing a difference of density between the cranial, hyperdense segment, most likely a meningioma and the caudal, hypodense segment of the mass, a macroadenoma. Moreover, at the level of the left temporal lobe, multiple hypercapturing formations were identified, also suggestive of meningiomas. The mass was managed through resection via a left supraorbital approach and the patient was initiated on octreotide acetate (Sandostatin). At the pathological examination, the tumoral tissue proved to be a fibroblastic meningioma. Postoperative, the goal of obtaining decompression of the optic chiasm and neighbouring tissues has not been completely achieved and a residual mass was identified on a subsequent MRI, which is why Gamma-Knife radiotherapy was started. Thus, the reduction of GH and IGF-1 levels was not accomplished, thereby Pegvisomant and Cabergoline were associated to Sandostatin. Surgical re-intervention was decided, adequate decompression of the sellar tumour was performed and the visual fields were restored. Biochemical control of acromegaly was achieved.

**Conclusions:** The coexistence of a pituitary adenoma and multiple intracranial meningiomas is a rare event and even rarer in those who have not received radiotherapy, though in a recent study the incidence of intracranial meningiomas in patients with acromegaly was found to be increased comparing to the general population.

**Title:** An eventful sleeve gastrectomy – a case report

**Authors:** Zofia Sorysz, Maksymilian Bednarek, Stanisław Szpakowski

**Tutors:** Krzysztof Wyszomirski MD, prof. Maciej Walędziak MD PhD, prof. Anna Różańska-Walędziak MD PhD

**Affiliation:** Faculty of Medicine, Collegium Medicum, Cardinal Stefan Wyszyński University in Warsaw

**Introduction:** Introduction: Sleeve gastrectomy is the most common bariatric procedure in Poland. The surgery leads to reduction of stomach volume by 85%, allowing the intake of food consumed of approximately 150 ml. The complication rate is usually low as it is one of the least invasive bariatric procedures with a short recovery pathway.

**Case presentation:** Results: A 35-year-old male with a history of bipolar disorder and Body Mass Index of 46 kg/m2 underwent a sleeve gastrectomy in a regional center. Due to anastomosis leakage diagnosed in the postoperative period the patient was transferred to a referral institution. The patient had a laparotomy with a self expandable metal stent introduced. After the revision surgery, the patient complained of stomach pain and left shoulder pain and gastroduodenal fistula was diagnosed. Vacuum wound therapy was started and a pigtail drain was implanted into fistula. However, even though the therapy was repeated several times, the patient suffered from recurrent thoracic empyema and finally an anastomosis was created between the esophagus and ileum.

**Conclusions:** Conclusion: Bariatric surgery is the mainstay of treatment of obesity as the only method with long-term results measured by excess weight loss and remission of comorbidities. However, complications may occur, including bleeding or staple line leaks, when referral to specialist bariatric center should be recommended.

**Title:** Cardiogenic shock in a patient with hypocalcemic cardiomyopathy.

**Authors:** Maksymilian Ziętek, Maja Płazak

**Tutors:** Prof. Wojciech Płazak MD PhD; Leszek Drabik MD PhD

**Affiliation:** Doctors Faculty, Collegium Medicum, Jagiellonian University

**Introduction:** A normal level of calcium significantly affects the proper functioning of the heart. It is essential for the proper contraction of the muscle. When an electrical impulse reaches the heart muscle, calcium enters the muscle cells, causing contraction of these cells. This process occurs cyclically, enabling the heart to beat regularly with appropriate force.

**Case presentation:** A 58-year-old female patient with paroxysmal atrial fibrillation, post myocardial infarction type 2 (2020), thyroidectomy due to papillary thyroid carcinoma (2007), hypoparathyroidism after thyroidectomy (2007), with a history of tetany episodes and myotonic dystrophy type 1 was brought to the Intensive Care Unit of the John Paul II Specialist Hospital in Krakow by the emergency medical team after successful cardioversion of monomorphic ventricular tachycardia with wide QRS complexes in the hospital in Limanowa with suspected acute Coronary Syndrome.

The patient reported, starting the day before admission, squeezing chest pain, shortness of breath, palpitations, and hypotension.

During admission, the patient was in a severe general condition, in cardiogenic shock.

Echocardiographic examination revealed significantly impaired left ventricular systolic function with an ejection fraction (LVEF) of 15-20%, hypo/akinesia of the left ventricular apical segments, and low cardiac output.

Laboratory tests showed elevated cardiac muscle necrosis enzymes (CKMB 142 U/L, CK 1535 U/L, Troponin hsT 0.121 ng/mL), heart failure (NT-proBNP 16647 pg/mL), hypocalcemia (ionized calcium 0.76 mmol/L), hyperphosphatemia (1.72 mmol/L), vitamin D3 deficiency (16.3), hypothyroidism (FT3 1.16 pmol/L, FT4 9.60 pmol/L, TSH 73.840 uIU/mL), and decreased parathyroid hormone level (6.4 pg/mL).

For the treatment of acute heart failure, loop diuretics, catecholamine amines, BiPAP, levothyroxine at a dose of 175 µg/day were used, calcium was administered intravenously and orally, and ceftriaxone was started to combat inflammation (CRP 41.4).

After treatment, the patient's condition significantly improved, with no recurrence of ventricular arrhythmias or ischemic symptoms observed. In the follow-up echocardiographic examination after correction of metabolic disorders, a significant improvement in left ventricular contractility was observed, with LVEF 51% and regression of segmental contractility disorders.

In the follow-up examinations, the level of calcium, phosphorus, and cardiac necrotic markers normalized (CK decreased from 1535 U/L to 382 U/L, CKMB decreased from 142 U/L to 14 U/L), and NTpro-BNP decreased from 16647 pg/mL to 437 pg/mL.

The patient was diagnosed with acute heart failure due to hypocalcemia and referred to the Clinical Endocrinology Department of the University Hospital in Krakow.

**Conclusions:** The blood calcium level can affect not only the blood clotting process, the functioning of the nervous system, muscles, or hormone secretion but also the cardiovascular system. Hypocalcemia causes, among other things, QT interval prolongation, which can lead to serious rhythm disturbances. Hypocalcemia can also cause a decrease in cardiac contractility, a decrease in ejection fraction, and lead to the development of severe heart failure. To prevent this, in the treatment of coronary syndromes, the blood calcium level should always be determined.

**Title:** Lymph node management in metastatic papillary thyroid carcinoma in a 29-year-old - a case report

**Authors:** Elisa Marziali, Ștefan Agoșton, Daria Mateiuc

**Tutors:** Assistant Professor Maximilian Dindelegan, MD PhD

**Affiliation:** ”Iuliu Hațieganu” University of Medicine and Pharmacy Cluj-Napoca

**Introduction:** Follicular and papillary carcinomas comprise 95% of thyroid cancers. Neck lymph node metastases are frequent in differentiated thyroid cancer (DTC). However, removing only metastatic lymph nodes does not significantly affect DTC survival and recurrence. Therefore, a systematic cervical dissection is the preferred approach.

**Case presentation:** This case report provides an overview of the treatment of a 29-year-old woman with Hashimoto's thyroiditis. She visited the endocrinology department after noticing an enlargement in her neck region. The ultrasound showed no nodules and an enlarged thyroid with heterogeneous structure. Two calcified spots in the left lobe that indicated a high probability of malignancy were present. Bilateral neck examination revealed numerous suspicious lymph nodes, prompting a native cervico-thoracic CT scan, confirming a significantly enlarged thyroid with multiple calcifications, and verifying the presence of cervical lymphadenopathy, which also exhibits calcifications. A total thyroidectomy is performed, with the specimen sent for immediate histopathological examination. The result confirms papillary carcinoma, and the procedure continues with a modified cervical lymphadenectomy in levels III, IV, VI bilaterally, and V on the left. The biopsy specimen revealed that a high percentage of the excised nodes were metastatic. The subsequent ultrasound confirms the presence of residual metastatic lymph nodes, leading to a surgical re-intervention for a modified radical cervical lymphadenectomy in stations II-V, followed by radioactive iodine therapy to eliminate residual thyroid tissue. Over the past decades, lymph node dissection for papillary thyroid cancer has been a subject of research, remaining controversial. Despite this, various scientific societies emphasize that, while not linked to increased morbidity in expert hands, it should be selectively indicated.

**Conclusions:** This case report underscores the significance of timely intervention and thorough management in metastatic papillary thyroid cancer. After surgery, the use of radioactive iodine proves crucial in addressing residual tissue. Multidisciplinary strategies, combining surgery and targeted therapies, showcase evolving approaches for effective treatment.

**Title:** Familial Mysteries Unraveled: MEN1 and the Intricacies of Gonosomal Mosaicism

**Author:** Rafał Fyda

**Tutors:** Małgorzata Trofimiuk-Müldner MD, PhD

**Affiliation:** Students' Scientific Group of Endocrinology Jagiellonian University Medical College

**Introduction:** Multiple endocrine neoplasia–type 1 (MEN1) is an autosomal dominant familial cancer syndrome, characterised by the co-occurrence of tumours in at least two of the following three endocrine tissues: parathyroid, endocrine pancreas and anterior pituitary. Possibly MEN1 mutations may exhibit a unique pattern known as mosaicism, resulting in atypical inheritance patterns within families. Here we present a family with gonosomal mosaicism in MEN1.

**Case presentation:** A 43-year-old male, with a family history of MEN1, was presented with suspected NET metastasis to cervical and mediastinal lymph nodes, accompanied by neck enlargement sensation. Physical examination revealed fibromas and lipomas. Laboratory tests indicated primary hyperparathyroidism. Elevated FSH levels were observed, alongside normal LH, testosterone, prolactin, and cortisol levels. Isotope measurements showed elevated IGF 1, chromogranin A, and slightly elevated calcitonin levels. Imaging revealed necrotic lymph node bundles, chest masses consistent with malignancy, and pancreatic lesions. A surgical biopsy confirmed a neuroendocrine tumour in the cervical lymph node, originating from the thymus. Genetic analysis identified a pathogenic MEN1 gene variant. The patient's sister had a history of hyperprolactinemia, hypogonadal axis failure, hypothyroidism, and primary hyperparathyroidism. She also had been diagnosed with a

mutation in the MEN1 gene. Considering the presence of MEN1 gene mutation in both siblings, first-degree relatives underwent follow-up examinations. The mutation was not found in the genetic material obtained from the blood of either parent.

**Conclusions:** Therefore, it was hypothesized that one of the parents harbors genetic mosaicism. Given the absence of any symptoms in the parents, it was postulated that this mosaicism is most likely gonadal. An attempt was made to verify this assumption by analyzing DNA obtained from eyebrow hair follicles and cheek swabs (as these represent a different embryonic lineage than blood cells).In the father of the patient, the strongest signal was detected from the hair follicles (approximately 25% of cells), while the signal from the cheek swab was around 10%. The test result indicated the presence of gonosomal mosaicism, where the genetic variant occurs in both germline and somatic cells. Therefore, the father of the patient should undergo periodic endocrinological monitoring to screen for tumours within the MEN1 spectrum.

**Title:** Pituitary macroadenoma with rare complications.

**Authors:** Elizabeth Yohanes Mbilinyi, Bisma Mehmood, Najma Khalid Abdulrazak.

**Tutor:** Dr .Lufunyo Edson Lihweuli MD, PhD.

**Affiliation:** Benjamin Mkapa Hospital.

**Introduction:** Pituitary adenoma (PA) are non cancerous tumors of pituitary gland,normally do not spread beyond the skull. PA are common intracranial lesions.They can be functional or nonfunctional (30%) and are often asymptomatic with slow progression.Pituitary adenomas are benign but often arise with complications. We present a case of a 33 year old female experiencing chronic amenorrhea, presented with severe vomiting and tonic clonic seizures and a negative pregnancy.

**Case presentation:** Patient presents with a history of amenorrhea for 18 years, beginning 3 years post-menarche, initially presenting as oligomenorrhea progressing to missed periods, along with reduced libido, facial and chest papules, and hirsutism. Additionally, experiences recurrent convulsions with eye deviation, urine incontinence, loss of consciousness, hemiparesis, throbbing headaches exacerbated by forward bending, projectile vomiting, and low-grade fever no known medical history, She has a normal eating pattern and works as a petty trader. Family history of infertility in second-degree relatives.On examination, everything is normal except for obesity BMI: 32.2 kg/m2 neurological examination reveals meningeal irritation and upper motor neuron lesion with impaired gait and balance. Cranial nerve function is intact except for CN XI , is unable to raise shoulder against resistance. All the remaining systems examinations are normal.Elevated prolactin, decrease FSH and LH are noted. MRI reveals sphenoid sinus mucosal thickening. Laboratory results are normal except for high chloride and low creatinine levels.Treatment consists of IV dexamethasone, oral carbamazepine,cabergoline, and Surgical removal of the abscess and antibiotic therapy. with physiotherapy result in improvement and leading to resolution of symptoms. Long-term management plan involves controlling prolactin levels and regular MRI monitoring.

**Conclusions:** This case highlights the importance of multidisciplinary teams involvement in managing the patient as the initial symptoms were pointing toward hormonal disbalance related amenorrhea. However further compelling symptoms of projectile vomiting with tonic clonic seizures, not being able to raise shoulder against resistance indicated toward a neural involvement. Main complaints stemmed from anterior pituitary malfunction. It is important to consider the complications which can arise alongside benign conditions which can present themselves with serious clinical manifestations requiring a combination of management approaches.

**Title:** Unexpected diagnosis in a patient with oncological background - adrenocortical carcinoma misdiagnosed with general metastatic disease

**Authors:** Paulina Kalman, Paweł Szajewski

**Tutor:** Agnieszka Żyłka MD, PhD

**Affiliation:** Department of Oncological Endocrinology and Nucelar Medicine, National Oncology Institute, Warsaw, Poland

**Introduction:** Adrenocortical carcinoma (ACC) is an aggressive cancer originating in the cortex of the adrenal gland. It is a rare tumor, with an annual incidence of one to two cases per million population, and the majority of cases are hormone-secreting. Surgical removal of the tumors is the most promising treatment option, although many cases are non-operative.

**Case presentation:** The case involves a 74-year-old patient with a significant oncological history. In 2020, the patient underwent a Transurethral Resection of Bladder Tumor due to urothelial carcinoma, followed by neoadjuvant pembrolizumab therapy as part of a clinical trial. Several months later, surgeons performed a radical cystoprostatectomy. During subsequent follow-up, a lesion was detected in the left adrenal gland, initially suspected to be metastatic, although lymph node involvement was not suspected. Abdominal cavity magnetic resonance imaging (MRI) revealed that the lesion's size continued to increase compared to its size in the previous scan, displaying signs of restricted diffusion and heterogeneous contrast enhancement. Fluorodeoxyglucose positron emission tomography-computed tomography (FDG PET/CT) confirmed the tumor's metabolic activity and detected a lesion in the right adrenal gland with low FDG uptake. A left-sided adrenalectomy was performed, revealing ACC upon histopathological examination. Hormone level studies were conducted, yielding results within the normal range. Four months after the last imaging test, the right adrenal gland tumor was not suspected to be a malignant neoplasm, and the patient was qualified for adjuvant mitotane treatment for ACC. The patient discontinued pembrolizumab treatment during therapy, and shortly afterward, ceased mitotane due to side effects. During follow-up, a lesion in the right adrenal gland exhibited changes in morphology on MRI and was suspected of being a pheochromocytoma, which was ruled out after hormone studies. Subsequently, the patient underwent a right-sided adrenalectomy.

**Conclusions:** Initially, a tumor in the left adrenal gland was suspected to be metastatic, potentially leading to a delay in diagnosis. Regional lymph nodes were also overlooked; however, according to guidelines, local regional lymphadenectomy appears to result in a favorable oncological outcome. Moreover, pembrolizumab may have influenced the ACC in this case, as it is also considered a third-line treatment for this cancer.

# FORENSIC MEDICINE & PATHOLOGY ORAL SESSION

prof. Grzegorz Dyduch, MD, PhD
prof. Dariusz Adamek, MD, PhD
Ewa Rzepecka-Woźniak MD, PhD
Filip Bolechała, MD, PhD

## Sessions coordinators:

Julia Staniszewska

Michał Ziobro

**Title**: Analysis of death causes among homeless population in Poland from 2017 to 2022

**Authors:** Jadwiga Duda, Igor Popiela, Karolina Dudzik, Aleksandra Adamus, Andrzej Kościsz, Maciek Przygoda

**Tutors:** dr. hab. Tomasz Konopka MD, PhD

**Affiliation:** Jagiellonian University Medical College Students' Scientific Group of Forensic Medicine

**Introduction:** Homelessness is a severe problem that affects every country in the world. According to the Supreme Chamber of Control in Poland in 2019 there were almost 30 thousand homeless people. Although it is a concerning phenomenon, there is a dearth of studies on this topic. We have decided to fill this gap and provide important epidemiological information about this issue in Poland.

**Aim of the study:** The aim of our study is to emphasize the issue of homelessness and describe its certain aspects, primarily the most common causes of death, location of the found bodies, organ changes and blood alcohol level

**Materials and methods:** In our study, we used documentation provided by the Department of Forensic Medicine in Cracow. The included postmortem came from years 2017-2022 counting up to 273 cases. Our inclusive criteria were the lack of housing as well as other characteristics directly indicative of homelessness, such as living in vacant building, poor personal hygiene etc

**Results:** The bodies were most commonly found in public places (bus stop, road, sidewalk) and vacant buildings. At the time of death 53% of victims were under the influence of alcohol and 75% had liver steatosis, which may indicate chronic alcohol abuse. From established causes of death 41 people died because of pneumonia, 33 from acute ethyl alcohol poisoning and 19 from hypothermia. A significant proportion of a postmortem (74) did not indicate a clear cause of death. It is suspected that alcohol-related epilepsy constitutes a substantial part of them. Additionally, there was a decrease in head lice infestations between 2021-2022 compared to the years 2017-2019.

**Conclusions:** Summarizing, from 2017 to 2022 the most common causes of death among homeless individuals were death of pneumonia, acute ethyl alcohol poisoning and hypothermia. In comparison, the leading causes of death among Poles were cardiovascular diseases and various types of cancers. This significant difference may be due to poorer living conditions and a higher prevalence of alcohol abuse.

**Title**: Wischnewsky spots: an indication of fatal hypothermia or a non-specific finding? A retrospective study – years 2013 - 2023

**Authors:** Magda Wojarska, Kateryna Shtohryn, Julia Suchcicka, Lidia Ziobro, Oliwia Boruta

**Tutors:** Tomasz Konopka MD, PhD

**Affiliation:** Students' Scientific Group of Forensic Medicine, Jagiellonian University Medical College in Cracow

**Introduction:** Wischnewsky spots are dark or black, oval-shaped lesions on stomach mucosa which cannot be scraped off. Although the pathophysiology of Wischnewsky spots is multifactorial, they can often be observed in bodies where hypothermia caused or contributed to the death. Several findings of these haemorrhagic gastric erosions in the stomach during autopsies of persons who did not die in cold temperature conditions, such as in the stomach of a male who hanged himself in a heated room led our team to search for more atypical cases, where these spots were present.

**Aim of the study:** To verify the incidence of Wischnewsky spots in bodies found between October and April, to examine which death causes are related to their occurrence and to assess common features of deaths in which they are found.

**Materials and methods:** Autopsy protocols dated between October-April, 2013-2023 at the Department of Forensic Medicine of the Jagiellonian University were analysed. 2566 cases were selected after excluding heat-related deaths. Only dark-coloured spots were included. All hypothermia-associated cases were considered which resulted in a total of 133 cases.

**Results:** Dark, oval-shaped, non-scrapable spots were found in 117 cases. Out of those 54 deaths were hypothermia-related, whereas in 58 cold temperature conditions were not the cause nor contributed to the death of the person. 16 deaths which were induced by hypothermia did not exhibit Wischnewsky spots. Presence of alcohol in blood and urine was detected in 70 cases. Dark non-scrapable lesions were also found in 5 cases, where hanging was the cause of death.

**Conclusions:** Appearance of the Wischnewsky spots is not specific to victims of hypothermia, prolonged suffering, subarachnoid haemorrhage, or exsanguination. They could also be observed in cases, where the mechanism of death was sudden, such as in hangings or drownings. It can therefore be concluded that a more detailed analysis is needed to fully explain the pathogenesis of Wischnewsky spots. Deaths which took place in spring and summer months should also be considered in future investigations. Furthermore, it is necessary to undertake histological examinations to compare petechiae and Wischnewsky spots to determine whether petechiae are the initial step of formation of Wischnewsky spots.

**Title**: The trends in psychoactive substances abuse among motor vehicle drivers in the Slovak Republic during the years 2022-2023

**Authors:** Michal Vyparina

**Tutors:** Veronika Rybárová, MD, PhD

**Affiliation:** Department of Forensic Medicine and Medicolegal Expertise, Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava, University Hospital in Martin, Slovak Republic

**Introduction:** DUI (Driving under the influence) remains a critical issue in ensuring road safety, motivating this study to examine prominent trends in psychoactive substance abuse among motor vehicle drivers in Slovakia from 2022 to 2023.

**Aim of the study:** The study aims to spotlight pertinent DUI data (excluding alcohol) and identify flaws in the recognition process.

**Materials and methods:** A retrospective analysis was based on data obtained from the Department of Toxicology at the Healthcare Surveillance Authority in Martin (Slovakia) in cooperation with the Department of Forensic Medicine and Medicolegal Expertise, Jessenius Faculty of Medicine in Martin. For data collection, spreadsheets were created and utilized to organize the dataset. The total number of positive toxicological analyses was 481 drivers. Qualitative analyses covered blood and urine samples, while quantitative analysis focused solely on blood.

**Results:** The average age of apprehended individuals was 31, with women comprising 9.6% of the cohort. Blood and urine samples were collected from 58.2% of drivers, 41.4% provided blood samples only, and urine samples exclusively were provided by 0.4% of the sample.

Substituted amphetamines were prevalent, with 81% testing positive in blood and 80% in urine. Methamphetamine emerged as the dominant substance: 15 drivers tested below the cut-off concentration of 20 ng/mL, 115 drivers showed concentrations of 20-150 ng/mL, and 257 drivers exceeded the concentration of 150 ng/mL. The highest recorded concentration was 890 ng/mL.

Cannabinoids exhibited a prevalence of 53% in blood, 61% in urine, with THC being the only illegal one: 5 drivers tested below the cut-off concentration of 1 ng/mL, 56 drivers showed concentrations of 1-10 ng/mL, and 10 drivers exceeded the concentration of 10 ng/mL.

Benzodiazepines were sporadic (2.7% in blood, 3.9% in urine), and opioids were even less prevalent (1.5% in blood, 2.1% in urine). Cocaine was rarely detected (1% in blood, 0.7% in urine).

**Conclusions:** These findings underscore the dominance of methamphetamine and the need for improvement in the DUI recognition process. Inconsistencies between police and medical data, as well as delays between sample collection and toxicological analysis, point out the necessity for process optimization.

**Title**: Comparison of peptic ulcer disease cases in years 1980, 1986 and 2020-2021

**Authors:** Zuzanna Kozłowska, Karol Kaczmarczyk, Maciej Morawski, Mikołaj Moskwa, Stefan Paruch, Dominik Szymczuk

**Tutors:** Tomasz Konopka MD, PhD

**Affiliation:** Students' Scientific Group of Forensic Medicine, Jagiellonian University Medical College in Cracow

**Introduction:** Peptic ulcer disease, often caused by H. pylori, is an uncommon cause of death despite its prevalence in the Polish population. In spite of the dangerous nature of this condition, especially in its later stages when perforation is possible, ulcers can now be effectively treated, which wasn't the case in the early 1980s. However, their life-threatening side can still be observed during forensic sections, which enables comparison of the number of peptic ulcer disease cases recorded in the autopsies in different time periods – before and after the introduction of the triple therapy against H. pylori in Poland.

**Aim of the study:** The study aimed to compare the frequency of peptic ulcer disease and deaths caused by it among people autopsied in the Department of Forensic Medicine in Cracow.

**Materials and methods:** Retrospective examination of all autopsy protocols found in the Department of Forensic Medicine in Cracow from years 1980, 1986 and 2020-2021 has been performed. Data from both time periods has been compared and analysed.

**Results:** In years 1980 and 1986 there were 23 recorded cases of peptic ulcer disease, 2 of them being a direct cause of death (8,7%). 15 of the cases were ulcers found in the stomach, 9 in the duodenum.

In years 2020-2021 there were 21 recorded cases of peptic ulcer disease, 9 of them being a direct cause of death (42,9%). 10 of the cases were ulcers found in stomach, 11 in the duodenum.

In both cases the total number of autopsies performed during those years was similar, being 2072 in the 1980, 1986 and 1935 in the 2020-2021.

**Conclusions:** The comparison of those two time periods reveals little variation in the number of peptic ulcer disease cases. Despite the current possibility of effective treatment, the number of fatal cases has increased in recent days. The possible causes of this phenomenon may include complications from now asymptomatic cases or limited access to healthcare during the COVID-19 pandemic.

**Title**: Bizzare behaviours in hangings

**Authors:** Mateusz Zajączkowski, Aleksandra Misztal, Jakub Staszkiewicz, Zofia Rerutkiewicz, Stanisław Rerutkiewicz, Aleksandra Witkowska

**Tutors:** Tomasz Konopka MD, PhD

**Affiliation:** Jagiellonian University Medical College Students' Scientific Group of Forensic Medicine

**Introduction:** Hanging is a form of ligature strangulation in which the force applied to the neck is derived from the gravitational force of the total or partial weight of the body and is generally suicidal. Hanging is the most common method of suicide. The use of certain precautionary measures is very unique. There are only several scientific reports describing cases of taping the mouth, tying hands behind the body, and swallowing unusual objects. This type of atypical suicidal behavior can be mistaken for homicide, which are extremely rare. Examining anomalous behaviours in hanging suicides and its association with mental illness can aid in accurately ascertaining the causation of mortality.

**Aim of the study:** The study aimed to collect and analyze cases of bizarre behavior and its correlation to mental illness in suicides by hanging.

**Materials and methods:** An analysis of autopsy reports and photographic documentation from the Department of Forensic Medicine JUMC from the years 2008-2023 was conducted. A total of 1972 ( 131.5 per year) hangings were evaluated, of which bizarre behavior was observed in 38 (2.5 per year) cases. Furthermore, we collected information on the occurrence of mental illnesses in the group of patients included in the research. Mental disorders were confirmed in 13 of them.

**Results:** 38 cases of strange actions in suicides by hanging were noted during 15 year period. The most cases (6) happened in 2023, while the least (1) occurred in 2015. On average 3 cases of strange actions occur yearly. Men committed more bizarre actions than women while committing suicide. The most often cases were: cuffing hands (14 cases), writing on the body (5 cases), taped mouth (4 cases). In the study group, 34,2% were people with mental disorders. Among the deceased with writing on the body 80% were having symptoms of mental disorder.

**Conclusions:** Bizarre behaviour is extremely unique case in hangings. Certain precautionary actions may be taken to either not abandon the act of suicide or the fear of discovering by surrounding people while attempting to commit suicide. The analysis performed shows, mental disorders cannot be linked to atypical actions.

**Title**: Suicide by falling from heights as a household method used by women: comparative analysis of periods 2011-2020 and 1972-1981.

**Authors:** Aleksandra Stolarz, Gabriela Tęcza, Katarzyna Mularska, Gabriela Kapral, Julianna Chmiel, Aleksandra Młodawska

**Tutors:** Tomasz Konopka MD, PhD

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**Introduction:** Statistically, women commit suicide significantly less often compared to men and choose different methods. They are also associated with household ways to commit suicide, especially by carbon monoxide intoxication as it was easily accessible in gas stoves (in Cracow until the 1980s) or nowadays more often by falling from the heights.

**Aim of the study:** Analyze cases of suicides by falling from heights and carbon monoxide intoxication using the gas stoves focusing mainly on women, having regard to overall statistics of suicides throughout those years. Determine the correlation between the frequency of jumping and withdrawal of coal gas in kitchens.

**Materials and methods:** Autopsy records kept by Department of Forensic Medicine in Cracow. Confirmation of suicidal intentions in case of carbon monoxide intoxication was provided by autopsy protocols, which include circumstances of death.

**Results:** In 1971-1982 there were about 340 female and 1300 male suicide cases. 57 (16,76%) female suicides opted to jump from heights while 45 (13,24%) intoxicated themselves with carbon monoxide. Correspondingly, 91 (7,00%) and 53 (4,08%) of male suicides. Moreover, women constituted almost half of all suicide cases of carbon monoxide intoxication (45,92% or 47,52% including the cases where intensions of the act were impossible to prove).

In 2011-2020 there were around 350 female and 1360 male suicide cases. 71 (20,29%) female suicides opted to jump from heights. Correspondingly, 158 (11,62%) of male suicides.

**Conclusions:** The study shows that suicides by falling from the heights are more common method in female (1 in 5 suicides) than male. Increased frequency of suicides by falling from the heights is observed after the year 1982 when Cracow fully stopped using the coal gas in gas stoves and replaced it with natural gas.

**Title**: Fatal Falls from Own Height - Analysis of Cranial Fractures in a Forensic Medicine Centre in Cracow, Poland

**Authors:** Natalia Rogowicz Garay, Marcin Zuwała, Zuzanna Buś, Katarzyna Klimaszewska, Julia Radzikowska, Tomasz Szabliński

**Tutors:** Tomasz Konopka MD, PhD

**Affiliation:** Students' Scientific Group of Forensic Medicine, Jagiellonian University Medical College in Cracow

**Introduction:** Cranial fractures are common injuries that may have fatal consequences. Although most hospitalized patients with such injuries come from traffic accidents or high-altitude falls, low-energy incidents may also elicit cranial fractures. This is the case in falls from own height, for which alcohol abuse and epilepsy are meaningful risk factors. Despite much research being done to investigate this problem, the course of cranial fractures in patients experiencing falls from their own height remains misunderstood.

**Aim of the study:** To collect falls from one's own height cases from autopsy records of a forensic medicine centre and analyse the course of cranial fracture fissures; to aid differentiating fracture etiologies under ambiguous injury circumstances.

**Materials and methods:** Autopsy books from years 2000–2009 were screened for cases meeting the inclusion criteria. Autopsy protocols were assessed for qualified patients, all of whom sustained cranial injuries due to falls from own height, and data about type and mechanism of injury, along with detailed descriptions of the fracture fissures, were collected. The course of cranial fractures was systematised and statistical analysis was performed.

**Results:** 272 subjects were included in the study. Out of those, 181 (66.54%) had a fracture of the cranium. Fractures of the posterior cranial fossa were the most frequent (26.52%), followed by isolated fractures of the cranial roof (21.55%) and cranial roof fractures descending to cranial fossae (20.44%). In 11 subjects (6.08%), there were fractures of the eye socket contralateral to the primary fracture. Similarly, in 6 subjects (3.31%), fractures of fossae contralateral to the impact site were present.

**Conclusions:** Contrary to some earlier reports, fractures resulting from falls from own height are not limited to singular linear fractures of the cranial base. In over 60% of the cases, the cranial roof was also involved, and in approximately 33%, there were multiple or branching fractures. It is worth noting that in almost 10% of the cases there is a fracture contralateral to the original impact area. Therefore, to precisely assess falling from one's own height as the cause of death requires careful exclusion of other injury causes.

**Title**: Non-coronary out-of-hospital sudden death causes in autopsy-egzamined cases – retrospective analysis

**Authors:** Sylwia Kolano, Zofia Golińska, Mikołaj Dubiel, Anna Sarosiek, Jakub Jelito, Michał Kulik

**Tutors:** Tomasz Konopka MD, PhD

**Affiliation:** Students' Scientific Group of Forensic Medicine, Jagiellonian University Medical College in Cracow

**Introduction:** Sudden death is defined as an abrupt unexpected death, which is not connected to violent causes, of a person whose health status does not threaten a sudden outcome. Non-coronary death refers to death caused by factors other than coronary artery and heart diseases.

Coronary heart disease complications account for the majority of natural, sudden unexpected deaths. Other causes, such as: intracerebral hemorrhage, rupture aortic aneurysm or pulmonary thromboembolism are much less common.

**Aim of the study:** The aim of the study was to analyze the most common causes of non-coronary sudden deaths and factors related to the matter.

**Materials and methods:** Autopsy protocols from the Department of Forensic Medicine of Jagiellonian University in Cracow between the years 2021-2022 were analyzed.

**Results:** 336 sudden death cases were collected from 2021-2022 autopsy books. The most common were non-coronary sudden death (177 cases) and ambiguous sudden death (117 cases). Coronary sudden death was observed in 42 cases. The average age of the deceased was 57 years. Among the genders, we observed a dominance of the male gender (275) over the female gender (61). In the ambiguous category, we recorded 109 deaths due to acute circulatory failure (93%) and 8 deaths due to cirrhosis and hepatic steatosis (7%).

Amid non-coronary sudden deaths, we recorded a variety of causes. The most common were pneumonia in 61 cases (34%), gastrointestinal bleeding in 23 cases (13%), cardiac tamponade in 15 cases (8%), pulmonary thromboembolism in 13 cases (7%), complications in cirrhosis 12 (7%) and epileptic seizure 10 (5.5%). Causes below 5% include intracerebral hemorrhage (6), acute infection (5), myocarditis (5), subarachnoid hemorrhage (4), subdural hematoma (4), peritonitis (3), rupture aortic aneurysm (3), acute pancreatitis (3), asthma attack (2) and acute hepatic disease (2). Isolated cases of cerebral palsy, electrolyte disturbances, psychomotor agitation, meningitis, intestinal obstruction and hepatorrhexis have also been reported.

**Conclusions:** In 2021-2022, the main cause of sudden death was, as predicted, acute circulatory failure. Pneumonia and gastrointestinal bleeding also rank prominently. In view of this data, importance ought to be placed on the matter and the situation should be examined thoroughly.

**Title**: 'White autopsies': an overview of cases with inconclusive results of post-mortem examinations in Małopolskie Voivodeship

**Authors:** Zofia Zwierzewicz, Agnieszka Szpakowska, Dominika Bistroń, Gabriela Dziedzic, Katarzyna Leśniak

**Tutors:** Tomasz Konopka MD, PhD

**Affiliation:** Students' Scientific Group of Forensic Medicine, Jagiellonian University Medical College in Cracow

**Introduction:** 'White autopsies' are defined as autopsies that do not reveal morphological changes sufficient to ascertain the cause of death, nor are they supplemented with satisfactory results of further forensic examinations. Hitherto, the incidence of such cases at our center has been estimated at <5 per year.

**Aim of the study:** The aim of the study was to accurately determine the incidence of white autopsies and evaluate the problem.

**Materials and methods:** We searched autopsy reports from the Department of Forensic Medicine (Jagiellonian University, Medical College) from years 2009-2022 for cases of sudden death in young people. Inclusion criteria were: death at age <40, not caused by trauma or obvious external factors. Exclusion criteria involved: subject at an advanced stage of decomposition, infants, in-hospital death, autopsy not performed.

**Results:** A review of 909 included cases yielded a total of 87 cases in which the post-mortem examinations did not disclose the cause of death, although only in 16 of those cases all diagnostic measures, including toxicology examination, were used. We also analyzed the reported causes of death to identify the most frequent ones, especially such that might not provide any morphological alterations in autopsy; such as: non-ethanol poisonings (144), death due to epileptic seizure, not caused by seizure-connected trauma or aspiration of gastric contents into the respiratory tract (39), myocarditis (35). We observed a considerable number of reports that stated acute circulatory/respiratory failure as the cause of death, although the autopsy yielded no findings indicating an underlying condition (39 cases).

**Conclusions:** Our findings suggest that the scale of the phenomenon had hitherto been underestimated, partly due to the lack of regulations regarding diagnostic terminology used in autopsy reports. It seems vital that certain regulations be introduced, especially for cases in which the post-mortem examinations do not yield definitive results. Another conclusion concerns the necessity to conduct additional examinations (toxicology and histopathology) in cases of autopsy failure; it is justified by the frequent occurrence of deaths from intoxication and myocarditis. Applying these measures might allow forensic medicine practitioners to filter and reduce the incidence of cases with truly inconclusive results.

# GYNAECOLOGY & OBSTERICS ORAL SESSION

prof. Robert Jach, MD, PhD
prof. Inga Ludwin, MD, PhD
Małgorzata Swornik, MD

## Sessions coordinators:

Dyjhana Ali

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# ORIGINAL WORK

**Title**: Obesity and Pregnancy: Exploring the Relationship Between Maternal Weight and Pregnancy-Related Complications Among First-Time Mothers

**Authors:** Danielė Berulė

**Tutors:** Justina Kačerauskienė MD, PhD

**Affiliation:** Hospital of Lithuanian university of health sciences Kauno klinikos, department of Obstetrics and Gynaecology, Kaunas, Lithuania

**Introduction:** In the last three decades, there has been a consistent and concerning rise in obesity rates, with the current estimate surpassing 1 billion individuals. This escalating trend poses significant health challenges, particularly during pregnancy, where obesity is identified as a notable risk factor for various pregnancy-related conditions, including an increased likelihood of Caesarean Sections (CS).

**Aim of the study:** To determine if obesity is associated with pregnancy complications and higher incidence of CS.

**Materials and methods:** A retrospective analysis of 2679 primiparous women who had given birth at Kauno klinikos in 2021 - 2022 was conducted. We analysed body mass index (BMI), mode of delivery, episiotomies, intrauterine growth retardation (IUGR), fetal macrosomia, gestational diabetes, gestational hypertension and preeclampsia. Statistical analysis was conducted with IBM SPSS and MS excel.

**Results:** Among 2679 primiparas, 301 women (11.23%, BMI >30 kg/m$^2$) were identified as obese. A total of 799 CS (29,82 %) were performed and operative mode of delivery was statistically significantly more often among obese women ($p = 0,015$). Interestingly, episiotomies were more frequently required for non-obese than obese patients (41,25 % and 31,56 % respectively, $p = 0,001$). Pregnancy associated hypertension was also more prevalent among obese primiparas (28,24 % obese vs. 9,76 % non-obese, $p < 0,0001$) as well as gestational diabetes (60,80 % obese vs. 30,32 % non-obese, $p < 0,0001$). There was no significant impact on IUGR, but fetal macrosomia was more frequent among obese patients (11 % obese vs. 7 % non-obese, $p = 0,004$).

**Conclusions:** Obese patients in our study exhibited a strong association with an elevated rate of CS, along with a heightened incidence of pregnancy-related hypertension, gestational diabetes, and fetal macrosomia.

**Title**: Epidemiology and Risk Factors Associated with Preterm Births in Multiple Pregnancies: A Retrospective Cohort Study

**Authors:** Emilia Piotrkowicz, Melania Majewska

**Tutors:** dr hab. n. med. i n. o zdr. Monika Szpotańska – Sikorska

**Affiliation:** Medical University of Warsaw

**Introduction:** The increase in the number of multiple pregnancies in recent decades makes this issue an increasingly important area of medical research due to the increased risk of complications both during pregnancy and in the perinatal period.

**Aim of the study:** The aim of the study was to analyze obstetric outcomes in women with multiple pregnancies, with particular focus on the risk factors associated with preterm birth.

**Materials and methods:** A retrospective review of medical documentation of pregnant women with multiple pregnancies, who gave birth at the 1st Department of Obstetrics and Gynecology of the Medical University Of Warsaw (MUW) from January 1, 2020, to March 8, 2024. Only pregnancies lasting longer than 22 weeks were analyzed in which all data could be collected.

**Results:** Out of a total of 6814 births, 414 cases (6.1%) involved twin pregnancies, among which 356 (86%) resulted in preterm births (<37 weeks of pregnancy). Vaginal delivery occurred in 63 (15.2%) cases of twin pregnancies, of which 42 (66.7%) were preterm births.

Among the analyzed births, 210 (50.7%) were identified as monochorionic twin pregnancies, while 204 (49.3%) were categorized as dichorionic twin pregnancies.

Preterm births were significantly more common in monochorionic twins (205; 97.6%) compared to dichorionic pregnancies (110; 53.9%), $p<0.000001$. The analysis of neonatal outcomes showed that 76 infants (18.4%) had a birth weight less than 1500 g, and there were 18 perinatal deaths (4.3%). Perinatal asphyxia, defined as ≤7 points on the Apgar scale, was found in 32 monochorionic twins (7.8%) and 19 dichorionic twins (4.7%), $p=0.03$.

**Conclusions:** More than half of twin pregnancies are premature births, which are associated with a significantly higher risk of neonatal complications. This phenomenon applies especially to monochorionic pregnancies, where the incidence of premature births reaches almost 100%.

**Title**: Incidence of patients with ovarian cancer: a retrospective single-center analysis

**Authors:** Rimkus Dora

**Tutors:** Hasnere Sigita, MD

**Affiliation:** -

**Introduction:** Ovarian cancer is one of the most aggressive and fatal cancers in women. In Latvia, women with ovarian cancer have the highest incidence and mortality rates in Europe, possibly due to delayed cancer diagnosis.

**Aim of the study:** To study the most frequently diagnosed stage, histological subtype, and grade of ovarian cancer in latvian population.

**Materials and methods:** A retrospective study was conducted with 70 patients who underwent treatment at Pauls Stradiņš Clinical University Hospital Oncology Clinic from 2017 to 2022. Patients enrolled in the study were diagnosed with ovarian cancer. TNM classification, grade, and histological subtype were studied. Microsoft Excel 2016 was used for data registry. Statistical analysis was performed using the Analysis ToolPak

**Results:** A total of 70 patients with ovarian malignancy were included. The mean age of ovarian cancer patients was 62.6 years ± 12.5 years. 22.9% (n = 16) of patients were diagnosed with stage I, 5.7% (n = 4) with stage II, 35.7% (n = 25) with stage III, and 35.7% (n = 25) with stage IV. Of all 70 patients, 70% (n = 49) had ovarian epithelial tumors, 2.9% (n = 2) had stromal tumors, and 27.1% (n = 19) had no histologically classified tumor subtype. Grade 1 was diagnosed in 10% (n = 7) of all patients, Grade 2 in 10% (n = 7), and Grade 3 in 80% (n = 56) of all patients.

**Conclusions:** The study showed that in most cases, ovarian cancer is diagnosed in advanced stages. The prevalence of epithelial tumors is high in the Latvian population, and ovarian cancer is most often diagnosed with Grade 3 histological classification, which is typically more aggressive and fast-growing cancer.

## CASE REPORT

**Title:** Massive Blood Loss After Cesarian Delivery With Placenta Previa Resulting In Hysterectomy: Case Report

**Authors:** Karlina Ieva Gasina

**Tutor:** MD Paula Zviedre

**Affiliation:** Riga Stradins University

**Introduction:** Placenta previa is a concerning condition that can lead to major hemorrhage after caesarean section. Globally this is a major cause of maternal morbidity and mortality. Blood loss after delivery grater than 1500ml is considered as severe post-partum hemorrhage.

**Case presentation:** A 28-year-old woman (gravida III, partus maturus II) was admitted to hospital for planed caesarean delivery. Caesarean section is performed, and healthy neonate being delivered. After delivery complications are encountered – uterine atony and hemorrhage. To minimize uterine bleeding Bakri balloon was inserted. Initial technique was not successful. Patient loses 5000ml of blood and is rushed to uterine artery embolization. She received massive blood transfusions. Uterine artery embolization was effective, and decision was made to perform laparotomy with hysterectomy. The patient was admitted to intensive care unit.

Summary: Despite early diagnostics of placenta previa it still is a known risk factor for post-partum complications such as uterine atony leading to massive hemorrhage. Blood loss must be evaluated immediately and fluid administration to avoid haemorrhagic shock. Blood type and resus factor must be determined before surgery. A team of highly experienced staff including gynaecologists and anaesthesiologists is necessary. Fast decision making and experienced team plays key role in positive outcome.

**Conclusions:** This case highlights the importance of assessment of the risk factors of high-risk situation and potential risks during Cesarian section. Preparation for this kind of situation is important in good outcome. This case may rise discussion whether Bakri balloon insertion and uterine artery embolization is a waste of time during such a massive blood loss.

**Title:** Only 115 Documented Cases of Accessory Cavitated Uterine Mass (ACUM) Worldwide: A Diagnostic Odyssey for Women and Uncharted Territory for Doctors

**Authors:** Nicole Akpang, Jakub Kwiatkowski

**Tutors:** Łucja Zaborowska MD, PhD; prof. Artur Ludwin MD, PhD

**Affiliation:** University Centre for Women and Newborn Health (UCWNH), 1st Department of Obstetrics and Gynecology, Medical University of Warsaw (MUW), Poland

**Introduction:** Accessory Cavitated Uterine Mass is a rare uterine defect whose etiology is explained by duplication or persistence of Muller's ducts or dysfunction of the gubernaculum during embryonic development. This anomaly has a uterus-like appearance – it contains a non-communicating cavity lined with endometrium surrounded by a myometrial mantle, usually located within the lateral uterine wall. This hormone-dependent endometrium cyclically sheds and blood trapped inside the cavity increases its volume pressing on surrounding tissues and causing pain. ACUM is often confused with a non-communicating rudimentary horn of a unicornuate uterus, adenomyosis or degenerating leiomyomas.

**Case presentation:** In November 2023, a 25-year-old woman appeared at UCWNH MUW for further evaluation of a suspected uterine anomaly. She had menarche at 13 and underwent uterine cavity curettage after a miscarriage. Since 2020 the woman experienced heavy, painful periods and lower abdominal pain refractory to analgesics. It took the involvement of eight gynaecologists, three hospital admissions, consideration of five preliminary diagnoses, and even one inconclusive laparoscopy to remove a presumed rudimentary uterine horn before she received an appropriate diagnosis and treatment. Finally, at UCWNH, a 30 mm x 28 mm cavitated oval lesion near the right uterine horn with ground glass echogenicity and a smooth internal lining, indicating a bloody filling and functional endometrium, was identified with a 3D transvaginal ultrasound. The body of uterus was connected to both normal horns, ruling out the hypothesis of a rudimentary horn and confirming ACUM. ACUM was excised laparoscopically without complications and the symptoms resolved.

**Conclusions:** ACUM is underdiagnosed, despite improving trends evidenced by a doubling of reported cases in the past 3 years. While awareness of the issue is increasing, it remains insufficient. Nonspecific symptoms and ambiguous results of imaging studies contribute to underdiagnosis. ACUM should be differentiated from a rudimentary horn or Robert’s uterus. The essential feature for the diagnosis of ACUM is the visualization of both developed uterine horns on imaging studies. It must be remembered that ACUM as an extra mass compresses the uterus and changes its normal anatomy, which can be misleading. It takes a lot of experience and insight to successfully differentiate these rare uterine anomalies.

**Title:** Stroke in Twin Pregnancy: A Rare Case of Acute Ischemic Stroke Management

**Author:** Aleksandra Pawłucka

**Tutor:** Andrzej Jaworowski, PhD

**Affiliation:** Jagiellonian University Medical College, Department of Obstetrics and Perinatology, 23 Kopernika Street, 31-501 Kraków, Poland

**Introduction:** The existing literature reveals a gap in knowledge regarding stroke and its management in multiple pregnancies. Although strokes during pregnancy are predominantly of a hemorrhagic nature due to hypertensive disorders, Acute Ischemic Stroke (AIS) in this demographic, though infrequent, significantly endangers maternal and fetal well-being. This case report delineates the management of AIS in a 35-year-old patient amidst a dichorionic diamniotic twin pregnancy, underscoring the intricacies and critical considerations inherent in such sophisticated clinical scenarios.

**Case presentation:** The patient was admitted at 33 weeks of gestation exhibiting symptoms indicative of AIS. Her medical history included hypothyroidism, gestational hypertension, and a mild infection of COVID-19. Neuroimaging verified the presence of an acute ischemic stroke in the territory of the left posterior cerebral artery. The therapeutic approach comprised intravenous administration of alteplase, continuous fetal surveillance and collaborative multidisciplinary care. The patient underwent cesarean delivery at 37 weeks of gestation, resulting in the birth of healthy neonates. The post-stroke recovery trajectory was notable for neurological improvement, although some deficits remained.

**Conclusions:** AIS in the context of pregnancy, especially within the complexity of multiple gestations, necessitates a customized management strategy that carefully weighs the distinct physiological alterations and risk factors present. This case underscores the imperative for more comprehensive guidelines and further investigative endeavours aimed at enhancing the therapeutic modalities available for managing AIS in pregnant patients. It serves to emphasize that, with careful consideration and appropriate case selection, the utilization of thrombolysis with alteplase can be a viable and safe treatment option for thrombotic events in pregnant individuals. This approach warrants consideration to ensure optimal outcomes for both the mother and offspring.

**Title:** Challenges and Management of Severe Endometriosis During Pregnancy: A Case Study

**Author:** Maksymilian Nowak

**Tutor:** Andrzej Jaworowski MD, PhD

**Affiliation:** Students' Scientific Group of Obstetrics and Perinatology, Jagiellonian University Medical College in Cracow

**Introduction:** Endometriosis, a chronic pathology, is characterized by the presence of endometrium-like epithelium and/or stroma outside the uterine endometrium and myometrium. It is critical to acknowledge that endometriosis does not uniformly regress during pregnancy. This persistent state can precipitate various complications such as spontaneous intraabdominal hemorrhage, uterine rupture, bowel perforation, rupture of endometriosis cysts, and ovarian torsion. Moreover, endometriosis can escalate the risk of adverse pregnancy outcomes, including an increased incidence of miscarriage, preterm birth, placenta previa, and placental abruption.

**Case presentation:** This case report details the clinical journey of a 35-year-old patient with a significant history of endometriosis, classified as stage IV according to the American Society for Reproductive Medicine criteria. Diagnostic imaging revealed extensive endometriotic lesions throughout the abdominal cavity. Notably, a lesion measuring 3 cm in diameter was located between the anterior wall of the urinary bladder and the posterior wall of the uterine body and cervix, infiltrating both structures and penetrating the bladder. The patient initially presented with infertility, dysmenorrhea, frequent urination and urinary urgency. A first-line treatment regimen was initiated, comprising dienogest and transurethral resection of the urinary bladder tumor was performed, ameliorating the symptoms. At 39 weeks of gestation, the primigravida patient was admitted to the hospital for planned delivery. Considering the gestational age and the presence of gestational diabetes mellitus, a decision was made to initiate labor preinduction. However, due to stalled labor progress and signs of fetal distress, an emergency cesarean section was deemed necessary. During the cesarean section, extensive endometrial lesions covering the anterior and posterior walls of the uterus and the recto-uterine pouch were noted. A healthy male infant was delivered. An attempt to excise the endometrial lesion beneath the urinary bladder was not pursued due to the potential risk of bladder injury and bleeding. The patient's postoperative period and subsequent hospital stay were uncomplicated.

**Conclusions:** This case illustrates the challenges in managing severe endometriosis during pregnancy. Contrary to the belief that pregnancy mitigates endometriosis, this patient’s condition remained active. While vaginal delivery is generally safer in endometriosis to reduce surgical risks like bleeding, the emergency caesarean section was necessary due to labour complications.

# INTERNAL MEDICINE ORIGINAL WORK ORAL SESSION

prof. Grzegorz Kopeć, MD, PhD
prof. Grażyna Bochenek, MD, PhD
prof. Katarzyna Krzanowska, MD, PhD
lek. Anna Rudzińska
Kamil Skowron, MD

## Sessions coordinators:

Aleksandra Karcińska

Maria Kurek

**Title**: Lp-PLA2 as a marker of vascular dysfunction in COVID-19 convalescents.

**Authors:** Aleksandra Kijak

**Tutors:** dr Marzena Iwanowska

**Affiliation:** Students Scientific Group of Laboratory Medicine

**Introduction:** COVID-19 is a disease caused by SARS-CoV-2 virus. Previous studies have shown that the most common comorbidities in patients with COVID-19 are cardiovascular diseases. Lp-PLA2 circulates in the blood and its pro-inflammatory role has been suggested in many vascular diseases. Lp-PLA2 has already been recommended for the assessment of risk of certain cardiovascular conditions in otherwise seemingly healthy individuals, which adds to its validity as a biomarker in COVID-19.

**Aim of the study:** The aim of this study was to analyze if COVID-19 convalescents have increased concentration of soluble Lp-PLA2, vascular dysfunction marker.

**Materials and methods:** The study included 294 adults. 147 of them declared previous mild to moderate SARS-CoV-2 infection at least 6 months before blood donation, and other 147 declared no infection. After anti-N SARS-CoV-2 antibodies assessment, previous contact with SARS-CoV-2 was confirmed in 68 subject from group of declared as non-infected. Thus finally, the study group consisted of 215 and the control group of 79 subjects. The material for analysis was the serum of blood samples purchased at the Regional Center of Blood Donation and Blood Treatment in Warsaw. The concentration of soluble - Lp- PLA2 was measured with enzyme-linked immunosorbent assay (ELISA) kit. The statistical analysis was performed with GraphPad Prism 9 software.

**Results:** As a marker of vascular dysfunction, Lp-PLA2 concentration was significantly lower in convalescents than subjects who have never suffered from SARS-CoV-2 infection. The mean concentration of Lp-PLA2 in convalescents was 15.26 ng/ml and in non-infected was 17.81 ng/ml (reference value <200 ng/ml). The differences was statistically significant, p=0.028.

**Conclusions:** Previous infection with SARS-CoV-2 does not contribute to increased cardiovascular risk. Moreover, lower Lp-PLA2 concentration in convalescents may indicate lower immune system activity which resulted in SARS-CoV-2 infection.

**Title**: Unmasking colorectal cancer risk factors in inflammatory bowel disease patients using artificial intelligence

**Authors:** Faezeh hassanikarmozdi, Mykola Khaytovych

**Tutors:** Dr, Mykola Khaytovych

**Affiliation:** Bogomolets national medical university

**Introduction:** Colorectal cancer (CRC) poses a significant risk for patients with inflammatory bowel disease (IBD), including Crohn's disease and ulcerative colitis. Accurate risk assessment is crucial for timely intervention and prevention.

**Aim of the study:** This study employs advanced feature engineering and explainable AI (XAI) techniques to identify critical risk factors for CRC in IBD patients.

**Materials and methods:** A comprehensive dataset of 300 IBD patients was analyzed, incorporating clinical and laboratory data, colonoscopy findings, and histological scores. Novel features were extracted from this diverse data pool, encompassing temporal patterns of inflammation, colonoscopy-derived parameters, and dysplasia presence and severity. An ensemble model comprising deep neural networks, XGBoost, and support vector machines was utilized to predict CRC risk.

**Results:** The ensemble model demonstrated remarkable accuracy, achieving an outstanding 92% accuracy on the test set, accompanied by a sensitivity of 88% and a specificity of 89%. Feature engineering revealed that dysplasia severity was the strongest predictor of CRC risk, surpassing inflammation severity. Moreover, colonoscopy-derived features, particularly those reflecting mucosal inflammation extent and severity, played a significant role in risk prediction. Dysplasia severity, mucosal inflammation extent and severity, and the number and histology of polyps emerged as the most critical colonoscopy-derived factors associated with CRC risk in IBD patients each with a p-value<0.1 in the final model.

**Conclusions:** This study highlights the effectiveness of advanced feature engineering and XAI techniques in uncovering crucial risk determinants for CRC in IBD patients. These findings support the potential of advanced data analysis and explainable AI in improving CRC risk prediction for IBD patients, paving the way for more effective preventive strategies and personalized treatment plans.

**Title**: Quantitative analysis of Intracerebral Haemorrhage appearance on computer tomography: associations with 30-day mortality

**Authors:** Antoni Cierniak

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**Introduction:** Spontaneous intracerebral haemorrhage (ICH) is a devastating condition with 30-day mortality reaching up to 55%. Many clinical and radiological features describing ICH were shown to be associated with mortality after ICH, including the Glasgow Coma Scale (GCS), age, ICH volume or intraventricular blood presence. Appliance of computational analysis of computer tomography scans (CT) among patients with ICH can be helpful in determining prognosis.

**Aim of the study:** The aim of the study was to perform computational analysis of ICH appearance on CT and analyse its correlation with 30-day mortality.

**Materials and methods:** Patients with radiologically confirmed ICH were retrospectively included to the study. Complete medical history for each patient was collected, including parameters such as the GCS score upon admission, ICH location and volume and laboratory tests results. Based on the obtained CT images, taken <4 hours after hospital admission, ICH appearance was analysed using software written in Python. First, the contour and image of ICH were extracted semi-manually. For extracted contour parameters such as Compactess, Fractal Dimension, and Circle Factor were analysed. For images of intracerebral haemorrhage factors related to density distribution (mean, coefficient of variance, skewness and kurtosis) and texture (Energy, Entropy, Contrast and Homogeneity) were calculated. 30-day mortality was assessed for the study group. Finally, logistic regression model was created to distinguish factors independently associated with 30-day mortality.

**Results:** A total of 433 patients' (34,87% females) aged 71.97±16.16 (mean±SD) were included to the study. 126 patients' (29.09%) died within first 30 days of hospitalization. In the multivariate logistic regression model, several radiomics features were independently associated with 30-day mortality: ICH contour Fractal Dimension (OR:1.230; 95%CI:1.026–1.501; p=0.036), ICH image Energy (OR:1.264; 95%CI:1.138-1.478; p<0.001) and Entropy (OR:0.848; 95%CI:0.753-0.923; p=0.001). Based on the same model GCS score, ICH volume, age, intraventricular haemorrhage, subtentorial ICH location and glucose level upon admission were also found to be independently correlated with the 30-day mortality.

**Conclusions:** Quantitative CT analysis seems to be a useful tool for predicting ICH mortality. The analysis process can be performed in a fully automated manner. Hence, the presented parameters of radiomics ICH analysis could be implemented into clinical practice with minimal effort.

**Title**: Comparison Of Allen and Siriraj Stroke Scores' Potential in Distinguishing Ischemic from Hemorrhagic Stroke

**Authors:** Asal Ebrahimian(presenter), Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran. Afshin Moradi. Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran. Amirreza Naseri . Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran.

**Tutors:** Alireza Ala Professor of Emergency Medicine, Tabriz University of Medical Sciences

**Affiliation:** Student Research Committee, Tabriz University of Medical Sciences, Tabriz, Iran. Professor of Emergency Medicine, Tabriz University of Medical Sciences

**Introduction:** The Siriraj Stroke Score (SSS) and Allen Stroke Score (ASS) are essential tools for quickly assessing stroke severity based on clinical features like consciousness level, motor function, and language ability. They guide treatment decisions, predict outcomes, and ensure timely interventions, ultimately improving patient care and reducing long-term disability.

**Aim of the study:** This study aims to compare the efficacy of the Allen Stroke Score (ASS) and the Siriraj Stroke Score (SSS) in distinguishing between ischemic and hemorrhagic strokes. By evaluating their performance, we aim to assess their effectiveness in clinical settings, potentially improving diagnostic accuracy and treatment decisions for stroke patients.

**Materials and methods:** This cross-sectional analytical study adhered to the STROBE guidelines and was conducted at the Emergency Department of Imam Reza Hospital between March and September 2021. Participants included all patients diagnosed with stroke whose neurological deficits persisted for more than 24 hours and were confirmed through CT scans as either ischemic or hemorrhagic strokes. Exclusion criteria encompassed patients with strokes due to causes such as tuberculosis, tumors, or trauma, those lacking sufficient information for score calculation, and those with subarachnoid hemorrhage. Data on patient demographics, medical history, and clinical symptoms were collected. Both Allen Stroke Score (ASS) and Siriraj Stroke Score (SSS) were calculated based on predefined cutoffs. Sensitivity, specificity, positive predictive value, and negative predictive value for detecting hemorrhage were determined by comparing score results with CT scan findings. Descriptive statistics and correlation analyses were performed using SPSS version 21, with significance set at $p < 0.05$. Additionally, ROC curves were plotted for each scoring system to calculate the Area Under the Curve (AUC) and assess diagnostic accuracy.

**Results:** The study comprised 401 stroke patients, with 68.57% diagnosed with ischemic stroke and 31.43% with hemorrhagic stroke. The mean age was 66.89 years, with a male predominance (58.1%). Comorbidity analysis revealed hypertension (79.3%) and diabetes (38.9%) as prevalent conditions. For the Siriraj Stroke Score, which diagnosed infarction (<-1), hemorrhage (>1), and

uncertainty (-1<, <1), a sensitivity of 94.15% and specificity of 100% were found for ischemic stroke diagnosis. The positive predictive value was 100%, and the negative predictive value was 94.59%. Conversely, the Allen Stroke Score showed 100% sensitivity but 0% specificity for ischemic stroke diagnosis. The positive predictive value for Allen score was 85.71%. A significant correlation was observed between Allen and Siriraj scores ($p<0.001$), with moderate correlation coefficients. However, the Allen score had an area under the ROC of 0.728, while Siriraj score showed 0.780, indicating better diagnostic performance for the latter.

**Conclusions:** In this study comparing the diagnostic performance of the Allen Stroke Score (ASS) and the Siriraj Stroke Score (SSS) in distinguishing ischemic from hemorrhagic strokes, several key findings emerged. The Siriraj Stroke Score demonstrated high sensitivity (94.15%) and specificity (100%) for diagnosing ischemic stroke, with strong positive and negative predictive values. Conversely, the ASS exhibited perfect sensitivity but lacked specificity, indicating limitations in accurately differentiating between stroke subtypes. The correlation analysis revealed moderate associations between both scoring systems and patient outcomes. Additionally, the area under the ROC curve favored the Siriraj Stroke Score, suggesting superior diagnostic accuracy compared to the Allen Stroke Score. These results highlight the potential clinical utility of the Siriraj Stroke Score as a reliable tool for accurately identifying ischemic stroke, thus aiding in prompt and appropriate treatment decisions. However, further validation studies and prospective investigations are warranted to confirm these findings and enhance the understanding of these scoring systems in stroke diagnosis and management.

**Title**: Insight into Sarcopenia Frequency Among Inflammatory Bowel Disease Patients – Preliminary Study

**Authors:** Magdalena Olczyk, Agnieszka Dąbek

**Tutors:** Olga Kaczmarczyk, PhD, MD ; Full Prof. Małgorzata Zwolińska-Wcisło, MD

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**Introduction:** Sarcopenia, characterized by progressive loss of muscle mass and skeletal muscle function, poses a significant challenge in the care of patients with inflammatory bowel diseases (IBD), including Crohn's disease (CD) and ulcerative colitis (UC). Chronic inflammation of the gastrointestinal tract and multifactorial increased risk of malnutrition contribute to the development of sarcopenia, which worsens the course of the disease and the results of treatment.

**Aim of the study:** The aim of the study was to assess the prevalence of sarcopenia among IBD patients by employing various diagnostic methods, with particular attention to disease activity and the type of IBD.

**Materials and methods:** The study encompassed 41 IBD patients: 20 patients with UC (12 men and 8 women; median age: 36 years) and 21 with CD (14 men and 7 women; median age: 34 years). In total, 11 patients were in remission phase (2 UC, 9 CD), whereas 30 (18 UC, 12 CD) were in active disease phase. To diagnose and verify the presence of sarcopenia the following methods were used: the SARC-F Questionnaire, the 5-times sit-to-stand test, and the calculation of the Fat-Free Mass Index (FFMI) through Bioelectrical Impedance Analysis.

**Results:** A decreased muscle mass assessed by FFMI was observed in 39% of patients (8 women, 8 men; 50% CD, 50% UC) and 24% of patients had a BMI classified as undernourished (<18.5 kg/m2). Sarcopenia was identified in 11 out of 41 patients (27%) according to the SARC-F Questionnaire (6 women, 5 men; 54,5% CD, 45,5% UC), and in 10 out of 41 patients (24%) based the 5-times sit-to-stand test (5 women, 5 men; 50% CD, 50% UC). No sarcopenia was observed in the group of patients in remission, regardless of the method used.

**Conclusions:** The study revealed that sarcopenia affected approximately one-quarter of IBD patients, regardless of the method used. Sarcopenia occurred irrespective of disease type but was observed only in patients with active disease. The main drawback of the study is the small group of patients, so we are conducting further research in this area. Determining the prevalence and risk factors for sarcopenia in IBD patients is important for improving disease outcomes and patient quality of life.

**Title**: Metabolome changes in saliva in healthy volunteers and in patients with GERD

**Authors:** Jana Vnučáková

**Tutors:** MUDr. Martin Ďuriček, PhD., Ing. Eva Baranovičova

**Affiliation:** Clinic of Gastroenterological Internal Medicine, JFM in Martin, CU in Bratislava

**Introduction:** Various symptoms, such as cough, throat clearing, globus sensation as well as chronic inflammatory conditions of upper airways are often attributed to gastroesophageal reflux disease (GERD). As they are nonspecific and could often reflect other diseases, one struggles to establish causal relationship linking symptoms and reflux, which precludes initiation of reflux treatment. Metabolomic analyses of saliva may offer the identification of biomarkers for the diagnosis and characterization of extraoesophageal symptoms of GERD. Recent studies have identified biomarkers of airway inflammation and lung injury in GERD patients exhibiting extraoesophageal symptoms.

**Aim of the study:** We hypothesized differences of saliva metabolome in healthy volunteers and in patients with extraesophageal symptoms of GERD

**Materials and methods:** We collected saliva from 13 healthy volunteers and 11 patients with extraesophageal symptoms of GERD. Both healthy volunteers and patients did not have any respiratory disease for 3 months and were non-smokers. GERD patients had extraesophageal reflux episodes confirmed by 24-hour pH/impedance monitoring and positive reflux symptom index with the score more than 13 (RSI>13). Samples were stored at −80°C and analyzed using the Bruker Avance III 600 MHz NMR spectrometer. We compared the differences of nuclear magnetic resonance (NMR) metabolomics analysis to find differences between the group of patients and control group.

**Results:** After the application of normalization tests the following differences in the saliva metabolome were observed in extraesophageal GERD patients compared to healthy controls: increase of succinate, decrease of acetate , decrease of trimethylamine and increase of glutamine.

**Conclusions:** Significant differences of several metabolites were observed between healthy volunteers and extraesophageal GERD patients. Salivary metabolomics might provide new insights into understanding physiological and pathophysiological processes in patients with extraesophageal symptoms of GERD.

# INTERNAL MEDICINE CASE REPORT ORAL SESSION

Dorota Cibor, MD, PhD
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## Sessions coordinators:

Anastasiia Slobodyan

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**Title:** Pseudoaneurysm of the left ventricle (LV) in a male with sarcoidosis and diabetes after experiencing a silent myocardial infarction (MI).

**Authors:** Ewa Kwiatkowska, Szymon Król

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**Affiliation:** Students' Scientific Group of Modern Cardiac Therapy at the Department of Interventional Cardiology, Institute of Cardiology, Jagiellonian University Medical College St. John Paul II Hospital, Krakow, Poland

**Introduction:** Pseudoneurysms of the heart most commonly occur as a result of MI or vascular interventions. While true aneurysms usually involve the anterior wall, false aneurysms are commonly located on the posterior wall of the LV. They represent only 2% of postinfarction aneurysms.

**Case presentation:** A 65-year-old asymptomatic male with sarcoidosis and type 2 diabetes on insulin therapy was admitted to the hospital due to a suspicion of a lung tumour. Control chest X-ray exposed a round shadow 7 x 6 cm in size in the lower field of the right lung, partially obscured by the silhouette of the heart.

Computed tomography revealed a massive false aneurysm of the posterior wall of the LV measuring 74x48x73mm, numerous nodular changes with accompanying fibrosis, and enlarged surrounding lymph nodes.

Echocardiography showed hypokinesia of the basal segment of the posterior wall of the LV, an akinetic middle segment with scar tissue, and a massive pseudoaneurysm with thrombus (2x2 cm) and visible flow into the LV cavity.

Coronarography indicated a significantly narrowed right coronary artery (RCA) by about 70%.

The patient was qualified for intraventricular LV reconstruction using a round patch (Dor procedure) with coronary artery bypass grafting (CABG) to the posterior descending artery (PDA). The pseudoaneurysm was excised, and LV was repaired.

The postoperative course and wound healing were uneventful. The patient was discharged in good general condition.

**Conclusions:** Silent heart attacks (especially among patients with diabetes) are not uncommon occurrences. According to some reports, they account for up to 45% of all heart attacks. Lack of treatment and complications increase the mortality rate of patients. In the case of untreated false aneurysms, the 5-year survival rate is less than 50%. Therefore, regular follow-up examinations of patients at risk are essential, as they can lead to the earlier detection of complications, as was the case here.

**Title:** Young onset of extremely uncommon Trigeminal Autonomic Cephalgia: A case report of episodic paroxysmal hemicrania

**Authors:** Aleksander Osiowski, Kacper Stolarz, Katarzyna Baran, Maksymilian Osiowski, Dominik Taterra

**Tutor:** Dominik Taterra MD

**Affiliation:** Jagiellonian University of Collegium Medicum, OrthoSpine Research Group

**Introduction:** Trigeminal autonomic cephalgias (TAC's) is a clearly established group of rare primary headaches with similar patterns of attacks and symptoms, containing a presentation of very high intensity and extreme trigeminal pain with an association of unilateral cranial autonomic signs, which can include lacrimation, rhinorrhea, and miosis. The International Classification of Headache Disorders 3rd Edition beta version (ICHD-III-beta) distinguishes four headaches in this group: cluster headache , hemicrania continua (HC), paroxysmal hemicrania (PH), and short-lasting unilateral neuralgiform headache attacks. The prevalence of PH is approximately 1 in 100 000 and for HC is yet unknown, with only several hundred cases described in a literature. Both PH and HC present complete and unique response to therapeutic doses of indomethacin, which distinguishes them from other headache disorders.

**Case presentation:** Twenty year old male suddenly woke up at 4:00 am with excruciating left sided ophthalmalgia with an association of strong pulsating, throbbing and stabbing pain in the temporal region. Patient described it as the worst pain ever experienced. The pain lasted for half an hour and during the headache attack patient noticed additional lacrimation, conjunctival injection, rhinorrhea and ptosis. The pain attacks later reappeared through the following days, with up to 20 times a day. The intensity and duration was always similar. Initially, patient believed that he experienced a very intense migraine attacks and the first-contact physician made the same diagnosis. Sumatriptan was prescribed, but without any effect on the headache. Only drug that improved the pain was ibuprofen, after which patient remained 6 hours free of the headache. After a period of seven days without any remission, a consultation with headache specialist was made.

**Conclusions:** Considering the current ICHD-III-beta headache criteria, Episodic Paroxysmal Hemicrania was diagnosed and a indo-test (four day indomethacin trial of 150mg/slow release/day) was prescribed. The headache completely ceased after the first dosage of indomethacin and after the period of four days, the headache was gone. Due to exceptionally uncommon prevalence of PH and and inadequate understanding, misdiagnosis can lead to delays in the search for effective treatment, oftentimes seriously impairing patients' quality of life.

**Title:** Unveiling the intrigue: A diagnostic Odyssey of lymphangioleiomyomatosis masquerading as paraganglioma

**Author:** Paulina Kalman

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**Affiliation:** Department of Oncological Endorcinology and Nucelar Medicine, National Oncology Insttute, Wasraw, Poland

**Introduction:** Lymphangioleiomyomatosis (LAM) is a rare genetic disease of young women, in which tumors and cysts form in the lungs, kidneys, and pelvic regions, causing pressure effects and symptoms. It occurs both sporadically and in association with tuberous sclerosis complex. These tumors have characteristics of low grade neoplasms, including the potential to metastasize.

**Case presentation:** A 27-year-old female was admitted to the hospital due to painless enlargement of the right inguinal lymph nodes. A computed tomography (CT) scan revealed a consolidated infiltration circumferentially around the aorta, retroperitoneally along the left perirenal and iliac spaces (90x45x150mm), and bilateral nodal masses around the right external iliac vessels (85x60x80mm). Suspecting lymphoma, a positron emission tomography-computed tomography with fluorodeoxyglocose was performed, confirming proliferative activity within the tumor-nodal masses with moderately increased metabolic activity. Pathologies within the reproductive organs were ruled out. Concurrently, an inguinal lymph node was taken, yielding a histopathological diagnosis of paraganglioma. Further investigations included plasma levels of methoxylated catecholamines, which returned negative results. Additionally, a scintigraphy using 131-I labeled MIBG was conducted, producing negative results within the observed tumor-nodal lesions. Given the uncertain clinical presentation resembling paraganglioma, a CT-guided core needle biopsy was performed. Histopathological examination of the biopsy material excluded the presence of paraganglioma but led to a new diagnosis of LAM. Due to the advanced proliferative process, surgical resection was deemed unfeasible, prompting the initiation of mTOR kinase inhibitor therapy. Genetic tests were done and they excluded mutations in TSC genes which are associated with development of LAM.

**Conclusions:** LAM is a rare genetic disease of women which mostly affects the lungs. Extrapulmonary involvement is very rare, and currently, its treatment has been ineffective. Although the efficacy of mTOR inhibitors in treating pulmonary and renal LAM is well established, very few studies have demonstrated their use in extrapulmonary abdomino-pelvic LAM tumors. This case underscores the importance of thorough diagnostic evaluation and highlights the challenges in distinguishing rare entities with overlapping clinical presentations.

**Title:** Examining Fibromuscular Dysplasia (FMD) as a Provocative Cause of Ischemic Stroke: A Case Report

**Authors:** Paweł Wrona, MD; Aleksandra Pawlicka MD; Prof. Agnieszka Słowik, PhD, MD; Helin Savsin

**Tutor:** Paweł Wrona, MD

**Affiliation:** Clinical Department of Neurology, University Hospital, Kraków; Department and Clinic of Neurology, Jagiellonian University Collegium Medicum, Kraków; Students' Scientific Group of Cerebrovascular Diseases

**Introduction:** Fibromuscular dysplasia (FMD) is a rare non-atherosclerotic and non-inflammatory disease of arteries that may lead to their narrowing, occlusion, tortuosity, dissection or aneurysmal dilatation. This process can involve any artery, but is most often observed in the renal and internal carotid vessels, followed by the vertebral, visceral and external iliac arteries. Although relatively uncommon, FMD should be considered in the differential diagnosis of younger adults presenting with ischemic stroke.

**Case presentation:** A 44-year-old female with a history of hypothyroidism, ischemic heart disease, chronic heart failure, and hypercholesterolemia presented with sudden onset left limb paresis. Neurological examination revealed partial paralysis, hemianopia, and facial nerve palsy on the left side. Imaging studies demonstrated occlusion of the right middle cerebral artery (RMCA) and the patient was qualified for mechanical thrombectomy. The procedure was successful in removing clots occluding the vessel lumen and led to complete neurological recovery within 24 hours post-intervention. However, during the intervention, the right internal carotid artery was observed to have an uneven, wavy outline of the lumen and fibromuscular dysplasia was suspected. Subsequent investigations confirmed FMD as the underlying etiology, with additional findings of thinning and akinesis of the interventricular septum and a type II atrial septal defect (ASD II).

**Conclusions:** This case enhances the importance of considering FMD as a potential etiology of ischemic stroke, particularly in young patients with multiple vascular comorbidities. Given the systemic nature of FMD, regardless of the location of vascular lesion, each patient should undergo extensive imaging diagnostics to identify other vascular areas affected by FMD (at least one CT or MR angiography imaging, including cerebral, precranial, and pelvic arteries). Regular follow-up with neurologists and vascular surgeons, combined with compliance to secondary prevention strategies including antiplatelet therapy and lifestyle modifications, are essential in lowering the risk of associated complications and optimizing the care of FMD patients. There are no clear recommendations regarding the surgical treatment of FMD by percutaneous angioplasty with stent implantation. It seems that multicenter randomized trials should be conducted to form an evidence-based guideline for optimal management of this rare vascular disorder.

**Title:** Management challenges of recurring symptoms due to cervical arteriovenous malformation - a case study

**Authors:** Marelize Vermeulen, Lara Kassandra Daum

**Tutor:** Assoc. Prof. Evija Miglāne

**Affiliation:** Riga Strandins University

**Introduction:** Arteriovenous malformation (AVM) is an abnormal connection of vasculature resulting in capillary bed bypassing, and high risk of bleeding. The infrequent intramedullary localisation of AVM in the cervical spinal cord attest to challenging management. Treatment approaches are conservative, endovascular embolisation, microsurgical and stereotactic radiosurgery.

**Case presentation:** In 2011 a 15-year-old female presented with sudden neck and arm pain and asymmetrical neurological deficits. Diagnosis of spinal cord AVM at the level of 4th spinal vertebra was confirmed by spinal digital subtraction angiography (DSA). A partial endo-vascular embolization using ONYX liquid embolization system was the treatment of choice with following conservative management. Over 9 years, apart from mild left-sided hyperesthesia the AVM remained clinically silent, ambulatory follow-ups were continued. In 2020, clinical manifestations recurred as in the previous episode with additional positive Babinski sign. MRI showed pronounced intramedullary oedema in C3-C6 segments. Due to increased nidus size, rapid AVM shunting and clinical presentation, total AVM embolization was performed successfully using PHIL liquid embolization system. Thereafter the patient developed asymmetrical tetraparesis and right sided hemitype sensory disturbances. Further ambulatory care consisted of symptomatic management, rehabilitation, and monitoring. In 2023, a third episode of pain and neurological motor and sensory deficits resulted in hospitalization. In the spinal DSA the AVM seems comparable to past results, with possible slight increase in size. The patient responds to conservative treatment with Mannitol, Dexamethasone and symptomatic therapy. Further, rehabilitation and the conservative treatment continue ambulatory. At the last follow-up in September 2023, preserved neurological deficits are: asymmetric spastic paresis, hyperesthesia, hemitype paraesthesia and episodic pain.

**Conclusions:** The rare intramedullary, cervical localisation of AVM leads to recurrent symptoms with challenging management and different treatment approaches.

**Title:** Follicular Lymphoma transformation to Myelodysplastic Syndrome

**Author:** Aleksandra Zacny

**Tutor:** Marcin Jasiński, MD

**Affiliation:** Student Scientific Association of Hematology, Department of Hematology, Transplantation and Internal Medicine, Medical University of Warsaw

**Introduction:** Follicular Lymphoma (FL) is a type of B-cell indolent non-Hodgkin lymphoma. The clinical features characterizing FL are lymphadenopathy, bone marrow involvement and splenomegaly. Typical lymphoma symptoms such as fever, night sweats and weight loss are often absent. FL might transform into a more aggressive disease, most often Diffuse Large B-cell Lymphoma. However, there are also reports on FL transdifferentiation to another cell line, such as Acute Myeloid Leukemia (AML).

**Case presentation:** 60-year-old male patient was admitted in August 2021 for excisional biopsy of enlarged lymph nodes in the head area. He had a one year history of papular lesions on his head and face and erythematous lesions on his back. The imaging studies showed generalized lymphadenopathy in the cervical, axillary, inguinal and intraabdominal regions. The patient reported weight loss, but associated with diet and fatigue associated with depression. He denied night sweats and fever.

Based on the biopsy of enlarged lymph nodes the diagnosis of Follicular lymphoma grade 3a, Lugano IVB, FLIPI 2 was made. The treatment with Obinutuzumab and CHOP regimen was started at the end of August. Therapy was well-tolerated. One course was postponed due to neutropenia. After 4 courses the treatment was stopped in November 2021 due to COVID infection, but a remission was achieved. The patient was followed-up in the Hematology Department.

In the beginning of 2023 a deterioration in blood test results was spotted, but the patient remained in good condition. Lymphadenopathy was persistent. In October 2023 the trepanobiopsy was done due to persistent leukopenia. The histopathological examination showed Myelodysplastic Syndrome (MDS) with Excess Blasts, with 15 % of blast cells.

**Conclusions:** MDS and AML might occur as complications of chemotherapy use in non-Hodgkin Lymphoma patients, for example in FL. However, these cases are very rare. Treating therapy-related AML/MDS with conventional chemotherapy gives a prognosis of approximately 6 months. Allogenic stem cell transplantation gives longer remission periods, but only in a little percentage of patients. Further investigation is needed to identify the patients with high risk efficiently and to determine the best possible course of treatment.

**Title:** BRCA2 POSITIVE CARCINOMA OF THE AMPULLA OF VATER

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**Tutor:** doc.dr.sc. Borislav Belev

**Affiliation:** University Hospital Centre Zagreb, Department of internistic oncology

**Introduction:** Carcinomas of the ampulla of Vater are rare carcinomas of the digestive system. Adenocarcinoma predominates, which is divided into 2 types: intestinal and pancreatobiliary cell types, and there are also mucinous and adenosquamous forms of carcinoma. Intestinal tumor differentiation shows a better prognosis compared to the pancreatobiliary type. Possible therapies include the Whipple procedure, adjuvant therapy, as well as chemotherapy and/or radiotherapy. Increasingly, the genomes of tumor cells are being analyzed, and BRCA2-positive metastatic pancreatic carcinomas are entering the POLO study and attempting to be treated with maintenance therapy with olaparib.

**Case presentation:** A patient born in 1951 presents for the first examination after undergoing a Whipple procedure in the 5th month of 2022. The tumor is of the ampulla of Vater, with pancreatobiliary cell type and positive lymphovascular and perineural invasion. Adjuvant therapy with capecitabine was initiated due to age. Due to disease progression after a PET CT scan and an increase in tumor markers (CEA, CA19-9), first-line therapeutic treatment (nab-paclitaxel and gemcitabine) for pancreatic cancer metastases was initiated in the 1st month of 2023. After successfully completing 3 months of therapy and finding BRCA2 mutations in FMI, maintenance therapy per the POLO study was approved. In the 8th month of 2023, several new lesions in the liver were identified, while the remaining lesions were stable. First-line treatment was reintroduced, and maintenance therapy was discontinued. By the end of 2023, progression of lesions and elevated tumor markers were observed, and second-line treatment with FOLFOX was indicated. The latest findings from March 2024 show progression of the mentioned lesions and multiple newly emerged lesions.

**Conclusions:** From this case, we see the importance of FMI genomic testing and personalized therapies depending on individual mutations. Maintenance therapy increases progression-free survival, and in this case, minor regression of lesions in the patient was also observed.

**Title:** Skin lesions – mechanical damage or autoimmune disease?

**Authors:** Shreya Nandy, Natalia Kasprzyk, Bogna Grygiel- Górniak

**Tutor:** Assoc. Prof. Bogna Grygiel- Górniak, MD, PhD.

**Affiliation:** Poznań University of Medical Sciences, Poland, Department of Rheumatology, Rehabilitation and Internal Diseases

**Introduction:** Dermatomyositis is a progressive proximal muscle weakness with a distinctive heliotrope rash. It is often associated with many systemic manifestations, including cardiac involvement. Herein, we present a case of a 56-year-old patient with dermatomyositis associated with myocardial involvement detailing the clinical presentation, diagnostic challenges, and treatment strategy.

**Case presentation:** 56-year-old patient presented in March 2023 with erythematous-papular lesions of the scalp, the dorsal surface of the hands, the extensor surface of the elbows, and erythema on the face to the rheumatology department. Initially, the patient associated the skin lesions with his job (windows installations). In April 2023, symptoms progressed to muscle weakness, joint pain and exercise intolerance. Biochemical tests showed increased inflammatory parameters and creatine kinase, and the immunological profiles proved positive ANA in the titer of 1:160 with a fine-grained cytoplasm pattern with midbody; in myositis profile, positive MDA5 (+++) and Ro52 (++) antibodies were detected. Cardiac echocardiography showed LVEF of 50% with diastolic dysfunction. In 2023, polymyositis was diagnosed, and cyclophosphamide pulses with methylprednisolone were administered, achieving clinical improvement and reduction of inflammatory parameters. Physical examination revealed erythema of face skin, neck, and upper chest, scarf's sign, Gottron's sign, Gottron's nodules on the extensor surface of the interphalangeal joints, and muscle limbs weakness (4/5 point in the Lovett scale). The patient was discharged on mycophenolate mofetil and reduced glucocorticosteroids, with plans for re-evaluation.

**Conclusions:** The case highlights the difficulty of dermatomyositis with myocardial involvement and skin lesions may suggest work-related mechanical damage requiring a multidisciplinary approach for its diagnosis and management which posed as a challenge. Treatment with immunosuppressive agents and glucocorticoids shows promising results, which indicates the need for a long-term follow-up and monitoring to prevent chronic complications.

**Title:** A Delicate Balance: Atypical Mycobacteria in Rheumatological Overlap Syndrome

**Authors:** Olga Maria Iova, Gheorghe-Eduard Marin, Stefan Negoescu

**Tutor:** prof. Simona Rednic MD

**Affiliation:** Department of Rheumatology, "Iuliu Haţieganu" University of Medicine and Pharmacy Cluj-Napoca, 400000 Cluj-Napoca, Romania.

**Introduction:** Overlap syndrome of Systemic sclerosis with Polymyositis poses formidable challenges for clinicians due to its widespread impact on various organs and systems. Lifelong immunosuppressive therapy becomes imperative to manage its manifestations and complications, albeit at the cost of heightened susceptibility to opportunistic infections and diminished quality of life. Hence, a delicate balance must be struck between mitigating the risks of the primary disease and those posed by its treatment.

**Case presentation:** We present the case of a 48-year-old female who sought evaluation at the Rheumatology department. With a history of Systemic sclerosis overlap with Polymyositis with Pm/Scl antibodies, she underwent multiple treatment regimens over the years. Attempting to stop disease progression she began treatment with Tocilizumab. The patient underwent an infectious screening, including viral hepatitis and tuberculosis prior to this. The treatment was rapidly stopped after she developed subcutaneous abscesses. Despite negative bacterial cultures, hemocultures, and urocultures, empiric antibiotics was initiated, but failed to alleviate her condition, while her inflammatory markers raised. Finally, she presented with a fluctuant mass in her left thigh, accompanied by erythema and functional impotence, highly suggestive of pyomyositis. Bacterial cultures from this collection were tested for acid-alcohol fast bacilli and came back positive for Mycobacterium avium. Specific antibiotic therapy together with surgical drainage of the thigh abscess ensued, alongside a cautious reduction, but not cessation, of immunosuppression. IRM investigations concluded that the abscesses respect the muscular fascia, and there are no bone involvement or pelvic abscesses. Eventually, her state improved, and she is now on a year-long antibiotic treatment.

**Conclusions:** Opportunistic infections increase the overall mortality and morbidity of immunosuppressed patients. The importance of infectious panels prior to initiation of immunotherapy cannot be stressed enough, considering the catastrophic possible complications. In this case, despite the insidious onset of Mycobacterium avium infection, the emergence of generalized abscesses warranted a judicious reduction in immunosuppression, thus opening a window for complications from her primary disease. Achieving pharmacological equilibrium is imperative to optimize the quality of life for such patients.

**Title: One disease with multiple mask- a diagnostic journey of patient with microscopic polyangiitis (MPA)**

**Authors:** Jacek Januszewski, Karolina Kłodnicka

**Tutor:** Jolanta Szeliga- Król, PhD

**Affiliation:** Students' Scientific Circle of Internal Medicine at the Chair and Department of Nephrology, Medical University of Lublin

**Introduction:** Microscopic polyangiitis (MPA) is an ANCA related primary systemic vasculitis linked to renal impairment, associated with small- and medium- caliber blood vessel necrotizing inflammation. Besides general, non- specific symptoms such as fever, weight loss or arthralgia, MPA may also manifest as renal, pulmonary or skin disorders, however less frequent manifestations such as central nervous system involvement can be observed.

**Case presentation:** We herein report a case of a patient with MPA that has not been diagnosed for 15 years. A 69- year- old woman with a history of hypertension, long lasting anaemia of unknown primary, weakness and perennial photosensitisation was presented to hospital due to deteriorating kidney function for several months in order to enhanced diagnostics in September 2023. Moreover, the patient observed mood deterioration and cough which lasted for 2 years, during which time she was diagnosed with bronchitis and recurring nosebleeds several times. Before hospitalization only symptomatic treatment has been implemented. Extended diagnostics including laboratory and imaging examinations, multidisciplinary consultations and renal biopsy has been deployed. CT scan of the chest and sinuses revealed typical lesions for MPA which were also confirmed in renal biopsy. Immunosuppressive treatment with Endoxan and steroids has been implemented with a good result. The patient was discharged of hospitalization at good condition. During several months of observation, many of the reported lesions have regressed.

**Conclusions:** The overview and analysis of all symptoms given by a patient and appropriate choice of diagnostic examinations is essential for correct diagnosis. Focusing on one particular symptom may interrupt the diagnostic path and lead to misdiagnosis.

**Title:** Diagnostic difficulties in connective tissue diseases - Systemic Lupus Erythematosus case study

**Authors:** Angelika Dyszy, Gabriela Małecka

**Tutor:** Anna Rostropowicz-Honka MD, PhD

**Affiliation:** Students' Scientific Association of Diabetology, Faculty of Medicine, University of Opole, Opole, Poland

**Introduction:** Systemic lupus erythematosus (SLE) is a chronic, autoimmune connective tissue disease. It is characterized by periods of illness and remissions, and it can manifest through a wide range of symptoms, causing diagnostic difficulties.

**Case presentation:** A 36-year-old woman started displaying periodical symptoms from multiple organ systems about two years ago. First signs were tachycardia, electrocardiogram changes and nonspecific chest pain, which resulted in hospitalization. Multiple tests excluded overt organic heart disease. After chronic stabilization with beta-blocker patient reported remission.

The woman has been experiencing recurring, itching skin lesions around navel and thighs since October 2022. Lesions were not photosensitive and each time resolved spontaneously.

Since March 2023, the patient has been complaining of periodical pain in the right hypochondriac, tiredness, pale stools and dark urine. The woman has been displaying jaundice with increased alkaline phosphatase and gamma-glutamyl transferase levels. The symptoms led to hospitalization to diagnose liver dysfunction.

Ultrasound examination revealed fluid in the rectouterine pouch and right pleural cavity, hepatomegaly, perihepatic fluid, dilation of inferior vena cava and hepatic veins.

Levels of natriuretic peptides were increased. Echocardiography showed dilation of both atria and slight regurgitation of all heart valves. Abnormalities found on MRCP were: dilatation of the hepatic veins and inferior vena cava, prominent features of periportal edema and mild splenomegaly. Presence of fluid in the right pleural cavity was confirmed.

Other hepatic pathologies and hepatotropic viral infections were excluded.

SLE was suspected based on the identification of diagnostic criteria elements: positive anti-ds-DNA and anti-nuclear antibodies and also large amount of peripleural fluid.

Increased level of total serum bilirubin and conjugated bilirubin level brings suspicion of coexisting Gilbert's syndrome and congestive hepatopathy secondary to the chronic heart disease.

**Conclusions:** Appearance of separate, nonspecific symptoms prolonged the diagnostic process and lowered the patient's quality of life.

Further progression of symptoms resulted in the development of previously invisible abnormalities. Practitioners should be aware that deepening the diagnostic process and comprehensive examination is crucial to correctly diagnose systemic diseases.

**Title:** Severe hypertriglyceridemia - what could it hide in the genes?

**Authors:** Laura Biskup, lek. Agnieszka Pawlos

**Tutor:** dr hab. n. med. Paulina Gorzelak-Pabiś

**Affiliation:** Medical University of Lodz

**Introduction:** Severe hypertriglyceridemia is a metabolic disorder most commonly manifested by recurrent abdominal pain or acute pancreatitis. The etiology may be influenced by environmental and genetic factors, which were considered in the clinical case presented below. However, the genotype analysis yielded unexpected results.

**Case presentation:** A 41-year-old patient was referred to the Lipid Disorders Treatment Center at the Department of Internal Medicine and Clinical Pharmacology, Medical University of Lodz, for the diagnosis of severe hypertriglyceridemia persisting for several years. The patient was also managing diabetes, which was identified at the age of 36, and had suffered an incident of severe pancreatitis in 2022. The patient had not been taking medication for a month – laboratory tests revealed extremely high total cholesterol 1198mg/dl and triglycerides 9143mg/dl, apolipoprotein B 164mg/dl, while direct LDL cholesterol was within the normal range. Numerous eruptive xanthomas were observed on the arms, elbows, forearms, and feet.

Due to the atypical lipid profile results, suspicion of a genetic origin for severe hypertriglyceridemia was raised. The clinical picture suggested a multifactorial etiology (MCS).

Genetic testing was performed, revealing a heterozygous mutation in the APOB gene: NM_000384.3:c.10580G>A (p.Arg3527Gln), which is characteristic for another, previously unsuspected disorder - familial hypercholesterolemia.

After 6 months, the patient presented for routine follow-up. According to reports, the prescribed medications were not taken. Laboratory tests showed triglyceride levels as high as 18921mg/dl. Despite the medications administered in the hospital, the triglyceride levels remained elevated. It was decided to subject the patient to plasma exchange, which resulted in a significant reduction of triglycerides to 1261mg/dl.

**Conclusions:** Hypertriglyceridemia may coexist with other lipid disorders, altering the clinical picture. Genetic testing proves to be crucial as it can significantly modify the treatment strategy.

**Title:** Cardiac arrhythmia - is it always a cardiac cause?

**Authors:** Agnieszka Mariowska

**Tutor:** MD Marta Walczak

**Affiliation:** SKN of Innovative and Traditional Internal Medicine

**Introduction:** Heart palpitations and syncope are common symptoms reported by patients. They represent symptoms that most often have a benign etiology, but can also be the first warning sign of a serious condition, so it is extremely important to distinguish benign from pathological causes.

**Case presentation:** A 19-year-old female patient was admitted to the hospital for the diagnosis of periodic palpitations and an episode of syncope. For about 2 years, she had been complaining of recurrent palpitations, with a heart rate of 140/min accompanied by stabbing chest pain and shortness of breath - the episodes occurred during normal activities, including at rest, and resolved spontaneously. The patient alternated between high and low heart rate values of 140 -> 40/min. To date, the patient has had one episode of fainting with loss of consciousness preceded by prodromal symptoms. In addition, there have been episodes of weakness in both sitting and standing positions, accompanied by the onset of cold sweats, a feeling of darkness in front of the eyes, and low blood glucose values of about 70mg/dl, which resolve after taking glucose. In addition, the patient has Horton's syndrome. . Patient's second hour OGTT - glucose 232mg/dl, despite normal daily glycemic profile and glycated hemoglobin. In addition, abdominal CT scan revealed the presence of angiomyolipoma of the right kidney. Due to the suspicion of pheochromocytoma, diagnostic work-up was ordered in this direction.

**Conclusions:** Initially in developing diabetes, the OGTT test shows a significant increase in blood glucose even with normal fasting blood glucose values, and antibody determinations for autoimmune diabetes may be negative. The differential diagnosis of palpitations should consider not only cardiac causes, but also psychiatric disorders or metabolic disorders, i.e. hypoglycemia.

**Title:** One out of the 100: Schimke immuno-osseous dysplasia as one of the rarest genetic disease with accompanied nephrotic syndrome: The Case Report

**Authors:** Kamil Sobieszek

**Tutor/s:** Maria Naruszewicz, MD

**Affiliation:** SSC at the Department of Physiology, Jagiellonian University Medical College

**Introduction:** That work is a case report about a 19-year-old boy suffering from Schimke immuno-osseous dysplasia - a very rare genetic syndrome whose pathogenesis is associated with mutations of the SMARCAL1 gene. The syndrome involves multi-organ changes, such as kidney damage, bone deformations, weakening of the immune system, hematological changes and skin manifestations (in the form of lesions resembling sun freckles that could cover the entire body). The main renal complication occurring in 97% of patients with this syndrome is nephrotic syndrome. Case reports of this syndrome are extremely valuable due to the rarity of its occurrence - currently there are only about 100 people with Schimke Syndrome in the world, and in Poland there are about 5 cases, including the one described.

**Case presentation:** Maksymilian, 19 years old, 34 kg, 116 cm, officially diagnosed with Schimke Syndrome in 2011, with previous manifestations of nephrotic syndrome (his diagnosis was made in 2007). Due to increasing kidney failure, he had a kidney transplant 10 years ago (2013), which was rejected. For this reason, the patient was admitted to the Nephrology Department of the University Hospital in Cracow. The child's initial development was typical, but disturbing symptoms related to the weakening of the immune system appeared in kindergarten, when he began to have frequent infections. Over time, skin manifestations appeared in the form of pigment, first in the groin area and then all over the body. Another manifestation were dysplastic changes in the bone marrow. The patient was the first in Poland to take Revolade (INN-eltrombopag) at the bone marrow level due to his condition. This is the tallest patient with Schimke syndrome reported in Poland.

**Conclusions:** Schimke syndrome is still a poorly understood disorder. So far, only 4 works on this topic have been written in Poland - one peer-reviewed article and 3 case reports. Therefore, it is worth spreading knowledge about this interesting issue so that specialists can have access to descriptions of the clinical images of these patients.

**Title:** Achieving Complete Molecular Remission in CML Blast Crisis without Intensive Chemotherapy: A Case Report

**Authors:** Filip Sadurski

**Tutor/s:** Prof.dr hab.med. Tomasz Sacha

**Affiliation:** UJ Student Scientific Hematology Club

**Introduction:** Chronic Myeloid Leukemia (CML) is a myeloproliferative neoplasm characterized by the BCR::ABL1 fusion gene. CML progresses through a well-defined triphasic course made up of a chronic phase (CP), accelerated phase (AP), and blast phase (BP). AP and BP are associated with a poor prognosis. Tyrosine kinase inhibitors (TKIs) targeting the BCR::ABL1 gene are the mainstay of treatment, with allogeneic stem cell transplantation (allo-HSCT) remaining a therapeutic option for advanced CML. The current goal of treatment is to achieve the deep and sustained molecular response required for treatment-free remission. Approximately 5-8% of patients develop blast crises. Until recently, despite the use of a combination of TKIs and intensive chemotherapy, the prognosis in this stage of CML was dismal, with only a 20% 2-year overall survival rate. We present a novel – less intensive approach to CML in BP that shows auspicious results.

**Case presentation:** We report the case of a 52-year-old man who presented with AP CML. He achieved a complete hematological response with hydroxyurea. Afterward, the patient was switched onto imatinib; however, due to side effects, it was discontinued and treatment with hydroxyurea resumed. Eventually treatment transitioned to dasatinib and the patient achieved a deep molecular response. Four years later, he developed a myeloid blast crisis. The patient received the third-generation TKI ponatinib and the demethylating agent azacitidine as a novel combined therapy. He achieved complete hematological remission after the first cycle, complete cytogenetic remission after two cycles, and complete molecular remission (CMR) after five cycles of chemotherapy. After achieving CMR, treatment was continued with ponatinib as a monotherapy while CMR sustained. An HLA-compatible family donor was identified, and the patient is planned to be admitted for allo-HSCT.

**Conclusions:** This case highlights the potential challenges of long-term CML management, such as treatment side effects and loss of response. It also demonstrates the effectiveness of a novel combined therapy with TKI and a hypomethylating agent. This approach avoids the need for classical, intensive chemotherapy, which is often associated with high rates of adverse events and mortality. Therapy with ponatinib and azacitidine induced CMR during a blast crisis and paved the way for allo-HSCT.

# MENTAL HEALTH ORAL SESSION

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Zofia Musiał KP
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# ORIGINAL WORK

**Title**: Predictive factors of psychoses in patients suffering from epilepsy

**Authors:** Tomasz Kałużny 1

**Tutors:** prof. Magdalena Bosak2 MD, PhD

**Affiliation:** 1 Students' Scientific Society of Neurology, Jagiellonian University Medical College, Faculty of Medicine, Krakow; 2Department of Neurology, Jagiellonian University Medical College, Faculty of Medicine, Krakow

**Introduction:** Epilepsy is one of the most common neurological disorders. Psychiatric comorbidities are often found in epilepsy patients, and reports from prior studies suggest, that occurrence of some psychiatric conditions such as depression or psychosis can vary depending on severity of the disease.

**Aim of the study:** Our aim was to find patients' characteristics that could be used as predictive factors for psychoses in course of epilepsy.

**Materials and methods:** Data from 309 patients was obtained during outpatients' visits in Epilepsy Center of Jagiellonian University Hospital in Cracow. Patients were examined by epileptologist. Their symptoms were assessed and diagnosis of definite type of epilepsy was made. Data concerning sociodemographic and medical status of patients, currently and previously taken antiseizure medication, previous or ongoing remission, previous status epilepticus, family history of epilepsy and previous psychotic episodes was recorded. Patients were assigned to two groups based on occurrence of psychotic episode in medical history. We compared these two groups using Chi2 tests or Fischer's tests for qualitative data, and Mann-Whitney U tests for quantitative data.

**Results:** Both physical (40% vs 16%, $p<0,05$) and mental disability (48% vs 13%, $p<0,05$) were more often found in patients with history of psychosis (PHP) than in control epilepsy group (EP). Focal seizures were also significantly more common in PHP group (83% vs 61%, $p<0,05$), whereas generalized seizures (5% vs 29%, $p<0,05$) and remission (19% vs 42%, $p<0,05$) were much more common in EP group. PHP group patients were on average taking more different antiepileptic drugs both at time of the study and prior to the study. Patients in EP group were significantly younger than PHP patients. There was no difference between the two groups in terms of familial history of epilepsy, sex, or age of onset of epilepsy.

**Conclusions:** Our findings suggest that we can expect patients with focal drug-resistant epilepsy to be much more prone to psychotic episodes. Difference between groups in prevalence of mental and physical disability, comorbidities, history of status epilepticus and number of antiseizure medication taken suggest that patients who experience psychosis are suffering from more severe epilepsy with many complications. These patients may require assistance from many various health care specialists and should be monitored more carefully.

**Title:** Analyzing the Impact of Early Intervention in First-Episode Psychosis in Latvia: pilot project CGI scale results

**Authors:** Jurijs Novickis, ph.D. Liene Sīle

**Tutors:** Liene Sīle PhD

**Affiliation:** Riga Psychiatry and Narcology Centre

**Introduction:** The Early Intervention Program (EIP) is vital for preventing recurrence of psychosis after the first episode. Without intervention, 80% of patients experience symptoms reappearing within a year if the medication is stopped by the patient. Interventions aim to boost engagement, acceptance, and reduce stigma, leading to a significant decrease in recurring episodes. Each relapse causes a decrease in grey matter volume, reduced effectiveness of antipsychotic medication, and worsened long-term outcomes. EIP delays the progression from the first acute episode to chronic illness.

**Aim of the study:** Assess the effectiveness of an Early Intervention Program (EIP) in preventing recurrence of psychosis and improving functional outcomes for patients experiencing their first episode of psychosis.

**Materials and methods:** During the six-month Early Intervention pilot project, 53 individuals experiencing their first episode of psychotic disorder were referred for treatment. Among them, 36 (67.9%) were male, and 17 (32.1%) were female. The average age of participating patients was 26.1 years, ranging from 18 to 44 years old. Throughout the project, there were a total of 250 psychiatrist consultations, 175 psychologist consultations, 128 psychoeducational sessions for patients and/or families, and 22 consultations with social workers. CGI-S (Clinical Global Impression - Severity) and GGI-I (Clinical Global Impression - Improvement) scales were used to assess the impact of the illness on patients.

**Results:** Based on the psychiatrist's assessment conducted throughout the program among actively engaged patients, 15 (40.5%) achieved complete remission, 10 (27.0%) achieved functional remission, and 12 (32.4%) did not achieve either. According to the GGI scale, 39 patients underwent at least one CGI-I assessment: 25 (64.1%) scored 4 or lower in all assessments, indicating improvement or no change. Five patients (12.8%) had consistent scores of 4, indicating no change. Three patients (7.7%) scored 4 or higher in all assessments, indicating deterioration or no change. Additionally, six patients (15.4%) experienced both improvement and deterioration in CGI-I scores over time.

**Conclusions:** The pilot project successfully achieved its objectives, demonstrated by notable improvements observed in GGI scale. Involving young individuals supported their reintegration into society, maintaining functionality and reducing rehospitalization rates. Extended implementation is needed for thorough program evaluation and improved service accessibility.

**Title**: Advancements in Seizure Prediction through Graph Neural Networks Modeling EEG Structures

**Authors:** Faezeh hassanikarmozdi

**Tutors:** Dr Dmytro Govseyev

**Affiliation:** Mykhailo Matiash  Doctor of Medicine, Professor, Honorary Doctor of Ukraine

**Introduction:** Introduction:  Seizure, a debilitating neurodegenerative disease affecting millions of people, is generally resistant to conventional treatment in 30% of cases. Predicting the pre-ictal state, a brief state before seizure occurrence, provides a promising intervention strategy.

**Aim of the study:** Aim: The aim of this study it to use deep learning and EEG data for seizure prediction.

**Materials and methods:** Method: Our study introduces a groundbreaking approach leveraging Graph Neural Networks (GNNs) designed to capture the complex nature of EEG data. We establish two novel EEG graph structures to encapsulate critical aspects of brain activity: the Electrode Geometry Graph and the Dynamic Brain Connectivity Graph. The Electrode Geometry Graph captures spatial relationships among EEG electrodes, encoding the physical proximity and layout of scalp electrodes. In contrast, the Dynamic Brain Connectivity Graph models the evolving functional connections between brain regions, capturing temporal dynamics in neural activity.

**Results:** Results: Implementing these graph structures significantly enhances seizure classification. Our model achieves an Area Under the Receiver Operating Characteristic Curve (AUC-ROC) of 0.875 for seizure detection and a weighted F1-score of 0.749. Crucially, it demonstrates unprecedented efficacy in accurately identifying and classifying rare seizure types, marking a substantial improvement over previous methodologies. The model's interpretability analysis precisely localizes 25.4% of focal seizures within EEG data, a critical advancement in understanding seizure onset regions.

**Conclusions:** Conclusion: Our study introduces a pioneering approach that revolutionizes EEG-based seizure prediction. By integrating EEG graph structures into deep learning frameworks, our model achieves remarkable accuracy in seizure classification, particularly in identifying rare seizure types. This breakthrough holds immense promise for clinicians, offering a deeper understanding of seizure onset regions and paving the way for more targeted and effective treatment strategies in neurology.

**Title**: Treatment Adherence and Quality of Life Among Schizophrenia Inpatients at the Riga Psychiatry and Narcology Centre

**Authors:** Alīna Bubnova

**Tutors:** Assit. prof. Ļubova Renemane MD, PhD

**Affiliation:** Riga Stradiņš University

**Introduction:** Medication adherence is crucial for managing schizophrenia, impacting treatment outcomes and well-being. However, the relationship between adherence and inpatient quality of life is underexplored despite high non-adherence rates, around 50%, urging further investigation for better care.

**Aim of the study:** This study aims to compare inpatient adherence using MARS and BARS scales and to explore their association with quality of life among schizophrenia inpatients.

**Materials and methods:** 50 schizophrenia inpatients were surveyed. Adherence was assessed using MARS (score ≥10 classified as adherent) and BARS (adherence >80% classified as adherent) scales. Quality of life was measured with WHOQOL-BREF across four domains - physical health, psychological well-being, social relationships, and environmental quality. Data were analyzed using IBM SPSS Statistics software.

**Results:** Median MARS score was 8 (Q1; Q3 5-10), with 44% adherent. Most common reason for non-adherence (44%) was forgetfulness, while 14% cited disbelief in medication efficacy. Median BARS score was 67% (Q1; Q3 33-83), with 48% adherent. 18% were unaware of prescribed medications, and 46% were unsure of dosage. 22% didn't adhere for over 20 days/month, and 16% took lower dosages.Correlation analysis found weak correlations between MARS adherence and quality of life domains (physical $r=0,272$, psychological $r=0,371$, social $r=0,375$, environmental $r=0,316$, $p < 0,005$). However, BARS adherence didn't show significant correlations with quality of life ($p > 0,005$).

**Conclusions:** The research sheds light on the intricate dynamics of medication adherence in psychiatric patients, revealing forgetfulness as the predominant factor contributing to non-adherence. While correlations between adherence and quality of life were modestly detected through the MARS scale, no significant links were found using the BARS scale. These results underscore the imperative for tailored interventions to bolster adherence rates, emphasizing the necessity for continued exploration into its nuanced nature and implications for patient well-being.

## CASE REPORT

**Title:** Autoimmune encephalitis associated with glutamic acid decarboxylase antibodies – clinical and magnetic resonance imagining characteristics in a case series.

**Authors:** Maja Mejza, Dawid Delebis

**Tutor/s:** Bartosz Bielecki MD, PhD

**Affiliation:** Department of Neurology, University Hospital No 1, Medical University of Lodz.

**Introduction:** Autoimmune encephalitis (AIE) is a group of rare conditions with psychiatric, cognitive and neurological symptoms. Many intracellular or cell surface antigens in the CNS can be a target for attack of immune system and recent years have brought a rapid increase in newly identified forms of AIE. However, data about specific antibody-associated manifestations is still limited. AIE with antibodies against glutaminic acid decarboxylase (GAD) is typically manifested by a stiff person syndrome or cerebellar ataxia, but the condition is very rare and existing knowledge relies mostly on case reports. Our work analyzes clinical and magnetic resonance imagining (MRI) features in three patients with anti-GAD AIE and review current therapeutic options for patients suffering from this condition.

**Case presentation:** Case 1:

A 59-year-old man with epileptic attacks, valproic acid-related tremor, steroid-induced psychosis and osteoporosis. On admission MRI has shown edema at the base of frontal lobes, at the poles of temporal lobes and in the left cingulate gyrus. Serological examination revealed anti-GAD antibodies. He was treated with intravenous immunoglobulin (IVIg).

Case 2:

A 23-year-old man with divergent positioning of the right eye, double, blurred vision, impaired coordination and balance. Neuropsychological examination displayed mild cognitive impairment. No pathologies were found in MRI. Serological test detected anti-GAD antibodies. Firstly, he was treated with azathioprine and then IVIg.

Case 3:

A 54-year-old man was admitted to the hospital due to left lower limb paresis and dizziness. On examination he presented with deterioration of visual acuity, double vision, increased muscle tone and abnormal gait. The MRI performed at that point showed only minor pathologies typical for his age. Upon the second hospitalization, serological examination revealed anti-GAD

antibodies. Steroid therapy was started, following immunosuppressive treatment with mofetil mycophenolate with a slow improvement of neurological symptoms.

**Conclusions:** Analysis of presented cases did not show typical MRI features associated with anti-GAD AIE. Our group did not manifest with psychotic symptoms or important cognitive deficits observed in other AIE's. Patients at least partially responded to immunotherapy and did not require aggressive treatment. To conclude, we believe our report will support establishing criteria for its diagnosis and therapy.

**Title:** Drug-Resistant Epilepsy with Focal Onset Seizures

**Authors:** Maria Goldenberg, Zofia Siwek

**Tutor/s:** prof. Monika Służewska-Niedźwiedź MD, PhD

**Affiliation:** Wroclaw Medical University

**Introduction:** Epilepsy is a chronic neurological disorder characterized by recurrent seizures. This case report presents the management of drug-resistant epilepsy of a 43-year-old man, with rare clinical features of seizures, exploring the complexities of diagnosis, treatment, and management strategies.

**Case presentation:** The patient presents with symptoms, including prodromal symptoms of "impression of weakness", numbness and pain in lower limbs, falls predominantly on the left side and headaches for several hours before the attack, with the frequency varying from several times a day to 3 attacks weekly. Diagnostic evaluations, including MRI, FDG-PET, and EEG, revealed suspected focal cortical dysplasia in the left parietal area and epileptogenic focus in the left posterior cingulate cortex. Hyperventilation-induced sporadic, single, sharp waves in the frontal-parietal-temporal leads of the left hemisphere were observed in the resting EEG. Video-EEG monitoring detected focal onset seizures very short focal seizures with motor restlessness and automatic or chorea-like movements of the left lower limb at the beginning, than tonic posturing of right limbs with with a tendency to disturb balance and fall. Patient was previously treated with many antiseizuremedication but despite that, it was ineffective. Treatment with lacosamide and levetiracetam was started, although seizure control remained inadequate. Upon inclusion of cenobamate the frequency of seizures decreased to 3 times a week, however while titrating the dose, adverse effects including fatigue, double vision, and balance issues appeared. Based on the preoperative diagnostics, the patient was qualified for resection of focal cortical dysplasia.He remains under observation in an outpatient epilepsy clinic - he has no seizures after neurosurgical intervention.

**Conclusions:** This case highlights very rare clinical features of posterior cingulate epilepsy that may be a diagnostic challenge. Comprehensive evaluation, including multimodal imaging and video-EEG monitoring, is crucial for accurate diagnosis and treatment planning in drug resistant patients. Collaboration between neurologists, neurosurgeons, neuroradiologists and neuropsychologists is essential for qualifications for surgery, that can cure the patient from seizures.Long-term follow-up is essential to optimize treatment outcomes and quality of life in patients with complex epilepsy presentations.

**Title:** Tough medical decisions: a three-card monte

**Authors:** Maria-Teodora Gruian, Alin-Ștefan Vizitiu

**Tutor/s:** Dr. Diana Olteanu MD, PhD

**Affiliation:** Universitatea de Medicină și Farmacie "Iuliu Hațieganu", Cluj-Napoca

**Introduction:** The Teratoid/Rhabdoid tumor (AT/RT) is a rare, fast-growing tumor that forms in the cerebellum or brain stem and usually occurs in children younger than 3 years old. Leptomeningeal carcinomatosis occurs when cancer cells from a primary tumor migrate to the meninges, having relatively low survival rates. It is sometimes challenging to diagnose leptomeningeal carcinomatosis, as it can mimic other pathologies in terms of clinical manifestation, radiologically, or even CSF examination.

**Case presentation:** We report the case of a 3-year-old male patient diagnosed with (AT/RT) at 1 year old (treated according to the EU- RHAB protocol). He presented to the Emergency Hospital for sudden degradation of neurological status and signs of intracranial hypertension. Cerebral CT exam indicated hydrocephalus. The patient underwent an emergency insertion of an external ventricular drainage on the left side, with CSF collection. CSF bacteriological exam indicated an infection with Streptococcus Pseudoporcinus. After antibiotic treatment, the inflammation ceases but the patient's general state is precarious. At that moment, the possible diagnosis options are AT/RT evolution, infectious meningitis, and radiotherapy secondary effects, but taking into account the nonspecific results of CSF analysis and the MRI findings, the outcome inclines towards leptomeningeal carcinomatosis.

After 2 months, a second MRI is performed, outlining a surprising decrease in the dimensions of the cerebral lesions, despite no antitumoral treatment having been administered, rather indicating it to have formed as a possible adverse reaction to radiotherapy, and the patient is administered Bevacizumab. MRI with contrast is performed to confirm the diagnosis: frontotemporal irradiation necrosis and a newly appeared tumoral lesion in the putamen.

**Conclusions:** Meningeal enhancement or contrast-enhancing brain parenchymal lesions in imaging can occur in neoplastic metastasis, infections, or radiotherapy secondary effects. It is of utmost importance to differentiate between them to be able to choose the right treatment, especially in the case of AT/RT, which is an aggressive tumor. While imaging methods and CSF cytology (the gold standard in this case) are unable to do so, it is the role of the physicians to monitor the efficacy of the therapy at short intervals when a definitive diagnosis cannot be made.

**Title:** A Case Report Of Glioblastoma Initially Diagnosed As Autoimmune Encephalitis

**Authors:** Ieva Baužaitė1, Erika Butkutė1

**Tutor/s:** Prof. Antanas Vaitkus2

**Affiliation:** [1]Faculty of Medicine, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania [2]Department of Neurology, Lithuanian University of Health Sciences, Kaunas, Lithuania

**Introduction:** Glioblastoma (GBM) stands out as the most common, aggressive form of primary malignant brain tumor. The clinical presentation of glioblastomas is varied, and definitive diagnosis requires pathologic examination and study of the tissue.

**Case presentation:** A 39-year-old patient was hospitalized in Spain after experiencing a sudden loss of consciousness. A head CT and cerebrospinal fluid analysis were performed, but no abnormalities were found. The patient's condition worsened after 24 hours - he became confused and his memory changed. He was readmitted to the hospital and a repeat examination was performed. A head MRI showed possible autoimmune encephalitis, and the patient was treated with steroids, levetiracetam, and lacosamide. The persistence of symptoms led to a repeat MRI of the head: the lesions are typical of those due to autoimmune encephalitis, but need to be differentiated with a possible lymphoproliferative process. EEG showed slow and epileptiform activity, predominant on the right, with less intense changes on the left. The dose of levetiracetam was increased. The patient was hospitalized in the Lithuanian University of Health Sciences Hospital Kaunas Clinics for further examination and decision on further treatment tactics (plasmapheresis/immunoglobulin) due to the lack of improvement in his condition. Examination results: conscious, contactable, disoriented in time and place. Pathological Babinski reflex on the left. Coordination tests are performed satisfactorily. Brain MRI: mostly evidence of lymphoproliferative or glial disease. Chest X-ray, VPAE, chest-abdomen-pelvis CT scan showed no evidence of disease spread to the examined organs. After discontinuation of glucocorticoids, a biopsy of the mass was performed. Histological and genetic examination of the sample material was performed. Results: lesions characteristic of glioblastoma. The IDG mutation has not been identified and the MGMT gene encodes O-6-methylguanine-DNA methyltransferase (MGMT), which is involved in damage repair. Tumour cells whose MGMT protein synthesis is inhibited are more sensitive to temozolomide treatment. The patient was recommended chemoradiotherapy with adjuvant treatment with temozolomide.

**Conclusions:** Despite aggressive chemoradiation with temozolomide, the median overall survival of patients still remains no longer than 15 months, due to significant tumor heterogeneity, immunosuppression induced by the tumor immune microenvironment and low mutational burden.

**Title:** Managing Insomnia and Agitation in a Patient with Phelan-McDermid Syndrome

**Authors:** 1Nika Sutara, 1Nina Špiljak – Vučinović

**Tutor/s:** 2Nataša Đuran MD, PhD

**Affiliation:** 1School of Medicine, University of Zagreb, Zagreb, Croatia, 2University Psychiatry Hospital Vrapče, Zagreb, Croatia

**Introduction:** Phelan-McDermid syndrome (PMS) is a rare, complex neurodevelopmental disorder associated with chromosomal abnormalities involving the SHANK3 gene caused by the deletion of part of the chromosome 22. PMS patients often present with global developmental delay, intellectual disability, autism spectrum disorder, and sleep disturbances which affect overall health and functioning and should therefore not be neglected. Accurate diagnosis and precise therapeutic interventions are essential for managing complex clinical profile of these patients.

**Case presentation:** A 19-year-old female is admitted at her parents' insistence to a psychiatric clinic due to sleep disturbances and significant agitation lasting for several days. The patient has a diagnosis of Phelan-McDermid syndrome and is being treated with moderate intellectual disability as the core clinical presentation. On admission, the clinical presentation was primarily characterized by intellectual impairment and restlessness. She exhibited intermittent agitation, and non-aggressive behaviour and was constantly in motion, fidgeting, jumping, and touching objects. During recent outpatient follow-ups, there had been a suspicion of extrapyramidal symptoms (EPS) due to the administration of risperidone and clozapine which could have caused her sleep disturbances and agitation, so her therapy was now adjusted. The patient was administered lorazepam (2,5 mg daily), levomepromazine (25 mg daily), sulpiride (200 mg daily), clozapine (25 mg daily), and midazolam due to insomnia. With this therapy adjustment, she became calmer, less agitated, and more cooperative within her capabilities. She showed no mood disturbances or anxiety, and her circadian rhythm was normalized. Considering her improved clinical state after the new therapy regime, she was discharged.

**Conclusions:** It is crucial to recognize sleep and agitation issues in patients with Phelan-McDermid syndrome, as they can significantly impact both the patients' and their caregivers' quality of life. Considering that these patients often receive multiple medications, it is important to acknowledge potential medication side effects. Prompt and precise adjustment of therapy may be crucial in managing symptoms and improving the clinical condition of these patients.

**Title:** Treating Bipolar Disorder masking Pituitary Nonsecretory Macroadenoma: Case Report

**Authors:** Nino Bebiashvili, Nino Dekanoidze

**Tutor/s:** Tamar Aladashvili Md, PhD

**Affiliation:** Center for Mental Health and Prevention of Addiction

**Introduction:** Pituitary adenomas, benign tumors originating from the anterior pituitary gland, are categorized into microadenomas or macroadenomas by size, and secretory or nonsecretory based on hormone secretion. Nonsecretory macroadenomas can lead to hypopituitarism by damaging surrounding pituitary tissue. Large macroadenomas may compress the optic chiasm, causing symptoms like bitemporal hemianopsia due to mass effect.

**Case presentation:** A 35-year-old male was brought to the Psychiatry Department by law enforcement authorities, presenting with marked agitation, aggression directed towards his immediate environment, pronounced irritability, elevated mood, disrobed state, and engaging in risky behaviors. Following clinical assessment, a diagnosis of Bipolar Disorder with psychosis was established, and pharmacotherapy comprising lithium, quetiapine, and valproate was initiated. Subsequently, after a two-week hospitalization period, the patient was discharged. In the ensuing months, the patient entered into marriage; however, despite concerted efforts, he and his partner encountered difficulties in conceiving, alongside complaints of decreased libido and hair loss. Attributing these symptoms to potential adverse effects of his prescribed medications, patient opted to abruptly terminate his pharmacological regimen with medical consultation. Consequently, he experienced a severe manic episode culminating in his disappearance for 72 hours, necessitating his readmission to the Center for Mental Health and Prevention of Addiction. Upon readmission, the patient reported symptoms of headache, diplopia, and bitemporal hemianopia. Neuroimaging via MRI with intravenous contrast revealed the presence of a Pituitary Nonsecretory Macroadenoma. Prompt surgical intervention was undertaken to excise the tumor, resulting in resolution of his previous complaints. Following surgical intervention, the patient resumed pharmacological management for Bipolar Disorder, achieving optimal symptom control and stabilization.

**Conclusions:** This case underscores the imperative for clinicians to maintain a vigilant approach to psychiatric patients, recognizing the potential intersection of organic etiologies and mental health conditions. It highlights the necessity of interdisciplinary collaboration and comprehensive assessment to address both psychiatric and medical comorbidities effectively. Clinicians should prioritize thorough evaluation, timely diagnosis, and holistic management, integrating pharmacotherapy, psychoeducation, and surgical intervention when necessary. This case underscores the importance of a patient-centered approach, emphasizing the need for clinicians to remain vigilant and proactive in addressing complex clinical presentations.

# NURSING & MIDWIFERY ORAL SESSION

Magdalena Humaj-Grysztar, Msc
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Aleksandra Borowiec

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# ORIGINAL WORK

**Title**: What shapes women's birth preferences?

**Authors:** Joanna Ruszała1 , Julia Wcisło1 , Julia Pałka1

**Tutors:** dr hab. Ilona Nenko2

**Affiliation**: 1 Student's Scientific Group of Midwifery Care, Institute of Nursing and Midwifery, Faculty of Health Sciences, Jagiellonian University Medical College 2 Department of Environmental Health, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College

**Introduction:** Over the years, global cesarean birth (CB) rates have witnessed a substantial increase, rising from approximately 7% in 1990 to 21% in 2018 worldwide. In Poland, 47 in 100 babies are born by CB which is among the highest rates of CB birth in OECD countries. Little is known about childbirth fear prior to pregnancy and mode of birth preferences among Polish women living in a country where childbirth is highly medicalized.

**Aim of the study:** The aim of this study is to identify factors influencing women's preferences regarding the mode of birth.

**Materials and methods:** We recruited, via online survey, 782 women aged 18 – 35 (mean 24.7, sd = 3.19) who had never been pregnant but wished to have at least one child in the future.

**Results:** 22% of surveyed women (n=173) prefer a CB in a hypothetical low-risk pregnancy. Among women preferring CB, the most commonly chosen motivations were: fear of damage to intimate areas (80.9%) and fear of pain (78.6%).

We have tested the relationship between sources of knowledge about pregnancy and childbirth and preference for mode of birth. The majority of women obtained knowledge from family members: n=570 (72.9%), followed by written media: n=427 (54.6%), friends: n=372 (47.6%), audiovisual media: n=365 (46.7%), and schools: n=246 (31.5%). Women who obtained knowledge about childbirth from audiovisual media had a lower chance of preferring natural childbirth (OR = 0.67, CI = 0.47-0.94). Women who gained knowledge from sexual/health classes at school had a higher chance of preferring natural childbirth (OR = 1.65, CI = 1.12-2.45).

**Conclusions:** The main motivation for women preferring CB is fear of complications they associate with vaginal childbirth. The sources from which women gain knowledge about childbirth can influence their preference for mode of birth. Improving the portrayal of childbirth in audiovisual media could contribute to changing preferences in favour of natural birth. There is a need for education focused on reducing women's fear of natural childbirth.

**Title**: Midwifery

**Authors:** Goda Labanauskaitė

**Tutors:** PhD candidate, MPH, lect. Alina Liepinaitiene

**Affiliation**: Kauno kolegija HEI

**Introduction:** Aromatherapy is one of the ways to help a woman not only during pregnancy, but also during labor. The term of aromatherapy only began to be used in the 20th century, even though it was discussed many years before that. Aromatic plants and their extracted essential oils have been used for millennia across diverse cultures globally, not solely for medicinal or therapeutic objectives, but also for perfumery, cosmetic, and culinary applications. Also, aromatherapy has great positive effect during pregnancy and childbirth. During pregnancy and childbirth, aromatherapy can yield substantial positive effects. This period often entails heightened stress, mood fluctuations, and hormonal variations for women. In the later stages of pregnancy, physical discomforts such as restricted mobility, respiratory challenges, and difficulties in relaxation become prominent. Incorporating essential oils during pregnancy and childbirth may significantly benefit women's well-being by mitigating pain and anxiety, inducing bodily relaxation, alleviating nausea, and enhancing sleep quality.

**Aim of the study:** To evaluate aromatherapy uses during pregnancy and labor in Lithuania.

**Materials and methods:** A study was conducted on the emotions and state of labor of women using essential oils. The study also conducted several interviews with pregnant women who used a variety of different oils to improve their well-being during pregnancy. The study encompassed a group of eight women alongside medical personnel. It was conducted over the period spanning January to March 2024. Collect data on the use of aromatherapy during pregnancy and labor, including protocols used, procedure times and feedback from participants. Content analysis was made.

**Results:** A study was analyzed and the results evaluated regarding women's experiences with the use of essential oils during childbirth. Throughout this period, aromatherapy has been recognized for its potential to alleviate the discomfort associated with contractions during labor, mitigate feelings of anxiety, and ameliorate sensations of fatigue. Women experience significant improvements in the outcomes of incorporating aromatherapy during pregnancy and childbirth. Throughout this period, aromatherapy has been recognized for its potential to alleviate the discomfort associated with contractions during labor, mitigate feelings of anxiety, and ameliorate sensations of fatigue.

**Conclusions:** Aromatherapy is a promising means of improving a woman's well-being and providing many benefits both during pregnancy and childbirth. In order to find out more accurate data about the application of aromatherapy during pregnancy and childbirth, more detailed studies should be conducted.

# CASE REPORT

**Title:** Diagnostic value of cytological and colposcopic examination in detecting pathological changes of the cervix - an individual case study.

**Authors:** Weronika Kozłowska, Katarzyna Kmieć

**Tutor:** Beata Bojarczuk, MD

**Affiliation:** Student Scientific Club of MidwiferyEnthusiasts, Department of Obstetrics and Gynecology Nursing, Chair of Obstetrics and Gynecology, Faculty of Health Sciences, Medical University of Lublin

**Introduction:** Screening for cervical dysplasia as well as cervical cancer in its the early stages of the disease should include cytology and cervical speculum. Cervical cancer is one of the most common genital cancers at the women. The main reason for its incidence is disregarding preventive examinations which are nowadays easily available and simple to perform. In Poland, cytology is still the standard, but sometimes it is not enough for a full diagnosis. Only in combination with colposcopy can we be sure that any changes will be detected early and save the life of many women.

**Case presentation:** 38-years-old female patient , first menstruation at age 13, not in labor, has struggled for many years with abnormal cytological and colposcopic findings and abnormal menstrual bleeding of unexplained etiology. The patient has been repeatedly hospitalized in the gynecology department for in-depth diagnosis. Despite pharmacological treatment, the patient continued to have abnormal cytological results in the form of abnormal ASCUS epithelial cells and low-grade intraepithelial lesions - LSIL. The patient underwent cervical canal disc specimens, which showed very focal dysplasia of low-grade squamous multilayered epithelium ( CIN I). From 2013 to 2021, the patient was under the constant care of a gynecologist and the cytology results in the following months and years were normal. In 2022, the patient again had abnormal cytology results - mild cervical dysplasia was found. In 2023, due to years of observation, diagnosis and treatment for dysplasia, the patient was referred for a LEEP/LOOP cervical conization procedure with hemostatic suture placement. The patient remains under further gynecological care.

**Conclusions:** Cytology is an equivalent diagnostic test to colposcopy for cervical changes. It allows early detection of cancers of the female genital organs. An important role in the prevention, diagnosis and treatment of cervical cancer is played by the midwife. Her tasks include, first of all, health-promoting education of women in the early detection of pathological changes in the female reproductive system. Health education and raising health awareness is a key element in providing care for a woman at any period of her life.

**Title:** Nursing care for a female patient with deep leg ulceration due to chronic venous insufficiency– case study.

**Author:** Zuzanna Mularczyk, Kinga Suchodolska, Katarzyna Sopata, Olga Skop, Diana Soboń, Małgorzata Stańko

**Tutor:** Dr n. med. Grażyna Puto

**Affiliation:** Institute of Nursing and Midwifery, Jagiellonian University Medical College, Faculty of Health Sciences

**Introduction:** Lower limb ulcers are a common health issue, particularly affecting older individuals and patients with chronic conditions (diabetes, circulatory insufficiency). Their occurrence can be attributed to various factors, including poor blood circulation. They are characterized by the formation of painful skin lesions that often heal slowly and are difficult to treat. This report presents a case of a patient struggling with painful ulcers on the lower limbs.

**Case presentation:** Report discusses a case of a 77-year-old female patient burdened with multiple comorbidities (including chronic obstructive pulmonary disease, chronic heart failure, hypertension, type 2 diabetes, abdominal obesity, chronic venous insufficiency and peripheral arterial disease). The patient was treated in the geriatric department since March 1, 2024 and was admitted for elective diagnostic purposes due to bilateral lower limb ulcers with exudate and swelling. The patient had experienced connective tissue inflammation on both lower legs in 2019. Treatment with ointments containing hydrocortisone and chloramphenicol was initiated, but her condition did not improve. In December 2023, the pain (worsening during movement) has appeared. Loss of mobility led to almost full immobilization.

According to the classification of chronic limb ischemia, patient presented with necrosis, ischemic ulcers (Fontaine stage IV) with extensive tissue damage (Rutherford scale 6). These clinical symptoms classify the patient as C6 in the CEAP scale (classification of chronic venous insufficiency).

Hospital treatment of patient's lower limb ulcers included: hydrocolloid dressings, dressings with silver-containing ointment, and dressings soaked in electrolyzed solution. During hospitalization, the patient received pain management, oxygen therapy with nasal cannulas, antibiotic therapy and low molecular weight heparin. Rehabilitation was initiated, and proper positioning of the patient's lower limbs was ensured. Significant regression of the ulcers and noticeable improvement in skin condition occurred within 13 days of treatment.

**Conclusions:** 1. The use of diverse therapeutic methods resulted as significant progress in treating ulcers of a patient, whose multiple coexisting conditions complicated the health management process.

2. Satisfactory outcomes, achieved through collaboration among multiple specialists and the use of various treatment methods in such a complex case, might be valuable guidance for medical staff dealing with patients with similar conditions.

**Title:** Midwife-centered care for a premature infant after fetoscopic treatment for fetal spina bifidia in the womb - a case study

**Authors:** Katarzyna Kmieć, Weronika Kozłowska

**Tutor:** Joanna Kopeć, MD

**Affiliation:** Student Scientific Club of Midwifery Enthusiasts, Department of Obstetrics and Gynecology Nursing, Faculty of Health Sciences, Medical University of Lublin

**Introduction:** Spina bifida is a very serious malformation that occurs in fetal life. The intensive development of medical science and advances in perinatal medicine provide the opportunity to detect it early and implement treatment as soon as possible. A minimally invasive procedure such as fetal fetoscopy gives the child a chance to be fully functional in the future and live a normal life, provided the child is properly cared for after surgery.

**Case presentation:** The aim of this study is to present the case of a premature female baby born at 29 weeks of gestation (V pregnancy, IV delivery), by caesarean section. Pregnancy history prenatally ventriculomegaly, open spina bifida from the L5-S1 level downward (myelomeningocele hernia with a developed neural plate), operated on intrauterine. After the premature baby was extracted, she required lung expansion, ventilation, then continued respiratory support in the intensive care room. From the 11th day of life, independent breathing. A large amount of amniotic fluid with hemolyzed blood was aspirated from the nasopharyngeal cavity and stomach. At birth, the baby's condition was assessed as moderately severe, Apgar score 7/8/10/10 points. Increased pain reactions were observed, with tachycardia >170 bpm. The premature infant was diagnosed with hydrocephalus, holoprosencephaly (absence of transparent septal cavity) hypoplasia of the corpus callosum, hypoplasia of the cerebellum.

**Conclusions:** Spina bifida, in the situation of most newborns, is a congenital defect that gives a good chance of normal developmental performance of the child, provided that the correct surgery is performed, and later optimal care and treatment. Spina bifida is a challenge for midwives caring for a sick child, who, with their knowledge, professional and individual approach to each young patient, know how to spot nursing problems and implement the right therapeutic and therapeutic management.

**Title:** Speech and communication disorders following an ischemic stroke of the left hemisphere of the brain – case report

**Author:** Wirginia Dąbrowska

**Tutor:** Grażyna Puto, Doctor of Medical Sciences

**Affiliation:** Afiliation: Institute of Nursing and Midwifery, Jagiellonian University Medical College, Faculty of Health Sciences

**Introduction:** Speech and communication disorders are among the most common complications of stroke. We can distinguish aphasia and dysarthria. Aphasia refers to disorders related to both oral and written communication. Individuals with this impairment experience difficulties in forming complex sentences, retrieving words, and understanding complex messages. Dysarthria, is characterized by speech abnormalities resulting from dysfunction of the articulatory apparatus. This report presents the case of a patient with speech and communication disorders resulting from a previous ischemic stroke of the left hemisphere of the brain.

**Case presentation:** This report discusses the case of a 77-year-old female patient who has been residing in a long-term care facility since 2015 with global aphasia resulting from a previous ischemic stroke. In 2013, the patient experienced a sudden stroke of the left hemisphere of the brain, resulting in paralysis of the right upper and lower limbs, as well as aphasia and central right-sided facial muscle weakness. Since then, the patient has experienced complete inhibition of speech and lack of articulatory imitation movements. Difficulties have also arisen in writing. The patient exhibits highly developed nonverbal communication through gestures, mainly using hands, and through the use of auxiliary objects.

An assessment of speech articulator function by a speech-language pathologist revealed tongue movements and attempts at tongue elevation, as well as mobility of the lips, cheeks, and jaw.

Treatment for the patient's aphasia included speech-language therapy interventions such as sensory stimulation, phonation elicitation, vowel repetition, gesture development, letter practice, and global reading exercises. Due to the lack of therapeutic effects and the patient's reluctance, a decision was made to terminate therapy. If the patient expresses a willingness to engage in therapeutic activities in the future, they will be resumed. Additionally, the patient receives psychological support due to elevated anxiety levels and a prevailing depressive mood.

**Conclusions:** 1. Therapy aims to facilitate ongoing communication. 2. Effective communication strategies with a people with speech disorders, such as active listening, using simple messages, speaking clearly and slowly, used by the entire therapeutic team, are crucial for effective rehabilitation.

# ORTHOPEDICS & PHYSIOTHERAPY ORAL SESSION

Michał Kłosiński, MD, PhD

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# ORIGINAL WORK

**Title**: Equivalence Randomized Control Trial Demonstrating Noninferiority of Copper Oxide Impregnated Dressings (COD) in Healing Diabetic Wounds as Compared to Negative Pressure Wound Treatment (NPWT)

**Authors:** Eyal A. Melamed, MD ; Jihad Dabbah, MD; Ithamar Cheyne (presenter); Michael S. Pinzur, MD ; Gadi Borkow

**Tutors:** Eyal Melamed MD

**Affiliation:** Medical University of Warsaw, Warsaw, Poland

**Introduction:** Negative Pressure Wound Therapy (NPWT) is the standard of care for treating large and deep wounds, deep cavities and enhance wound closure. Copper Oxide Dressings (COD) have been recently introduced into clinical practice due to their antimicrobial properties. Research and clinical experience showed their positive effect also in inducing wound healing, including stimulation of autolytic debridement, granulation tissue formation and epithelization.

**Aim of the study:** The aim of this RCT is to prove non-inferiority of COD in compared to the standard of care of large and deep wounds, NPWT, in the areas of wound healing, convenience, and application time.

**Materials and methods:** We initiated a randomized controlled trial with 60 diabetic patients comparing the reduction of wound size during 3 months of treatment between COD management to NPWT, by using an artificial intelligence program (Tissue Analytics, TA).

**Results:** 46 patients have finished the study, 23 patients in each arm. Average wound area was 19.9 ± 4.36 cm2 in the COD arm and 14.1 ± 2.32 cm2 in the NPWT arm (p=0.25). Reduction of wound size assessed by TA was 53.7% and 52.2% (Pooled=0.866) after 1 month, 77.7% and 72.8% (Pooled= 0.533) after 2 months, and 89.5% and 89.7% (Pooled=0.961) after 3 months, in the COD and NPWT arms, respectively.

The percentage of wounds that closed during the study were 47.83% (11/23) and 34.78% (8/23) in the COD and NPWT Arms, respectively (p=0.369). COD dressings were more convenient than the NPWT to both the patients (p<0.001) and the caregiver (p=0.0034). Applying the COD was faster than applying the NPWT (p<0.001). Cost is estimated to be ~15% in the COD Arm compared to NPWT Arm.

**Conclusions:** The results of this RCT study indicate statistically significant non-inferiority of COD therapy compared to NPWT in terms of wound healing rate and superior results in terms of convenience, and reduced application time in addition to lower cost. The findings suggest that COD may be considered as first line of treatment for wounds in diabetic patients when NPWT deemed necessary.

**Title**: Functionality perception and quality of life for patients after thumb replantation

**Authors:** Bartłomiej Wilk, Zuzanna Ząbek, Aleksandra Jasiniewska

**Tutors:** Marcin Złotorowicz MD, PhD

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**Introduction:** Thumb and its opposition enable precise grasping and manipulation of objects. Amputation of this digit can significantly impair daily activities and may lead to mental distress. Replantation allows for functionality retrieval however we cannot ignore its limitations such as long rehabilitation periods and high surgical costs. Previous studies have not extensively investigated the relation between regaining thumb function and sensitivity, and patients' self-reported quality of life after replantation.

**Aim of the study:** To assess hand functionality and ability to perform certain upper extremity activities after thumb replantation using DASH and MHQ questionnaires and overall patient's condition using SF-36 survey.

**Materials and methods:** This study included patients who underwent thumb replantation or revascularization between 2021 and 2023. A total of 18 patients (17 men, 1 woman) with an average age of 51 at the time of surgery were included. Demographic data including sex, age, height, and weight were gathered. To assess hand functionality and patients' satisfaction, three questionnaires were used. The Michigan Hand Outcomes Questionnaire (MHQ) was used to measure patients' overall hand function, daily activities, pain, work performance, aesthetics, and satisfaction with upper extremity after surgery. The Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire evaluated the ability of a patient to perform certain activities. The 36-Item Short Form Survey (SF-36) measured patients' quality of life. All scales have a score range between 0-100. Score of 100 in DASH indicates a greater level of disability, contrary to MHQ and SF-36 where score of 100 indicates better health status. Statistical analysis was performed using Spearman's correlation coefficient and the Mann-Whitney U Test.

**Results:** DASH score has a strong negative correlation with both MHQ score ($r_s$=-0.81) and SF-36 score ($r_s$=-0.59), whereas SF-36 score has a strong positive correlation with MHQ score ($r_s$=0.58). All of the data mentioned previously are statistically significant ($p<0.05$). Patient's BMI, weight, height, age, observation time and surgery type (replantation or revascularization) are not statistically significant.

**Conclusions:** A positive subjective assessment of thumb functionality depicted in MHQ and DASH scores corelates with greater self-assessed quality of life after replantation.

**Title**: Cam type femoroacetabular impingement - a cause of hip osteoarthritis and where to find it?

**Authors:** Eduards Toms Morītis

**Tutors:** Dr. Andris Džeriņš

**Affiliation:** Hospital of Traumatology and Orthopaedics, Latvia

**Introduction:** Cam-type femoroacetabular impingement (FAI) morphology of the proximal femur is an abnormal contour of the head-neck junction, and it is associated with progression of primary osteoarthritis (OA). It can be measured objectively using plain radiographs. Patients undergoing total hip arthroplasty (THA) have an increased risk of developing OA in their contralateral hip.

**Aim of the study:** To investigate the frequency of Cam type FAI associated deformities in the contralateral asymptomatic hip of patients undergoing unilateral THA for primary OA compared with a healthy population using different x-ray views.

**Materials and methods:** A total of 164 patients were included (114– OA group; 50– control group). Patients in the OA group were included before undergoing THA and the controls received their x-ray on a control visit unrelated to hip. All patients (100% in both groups) received AP view; 112 in OA group (98.2%) and 45 in control group (90%) Dunn view; 46 in OA group (40.4%) and 29 in control group (58%) a lateral (LL) view. In both groups alpha angle, HN offset ratio and pistol grip deformity were 180 analysed using mediCAD 7.0 software. Cam deformity signs were defined as alpha angle >50˚ and/or HN offset ratio <0.17 and/or a positive pistol grip deformity.

**Results:** Groups were matched by age, gender and BMI. There were significant differences for mean alpha angles between OA and control group in all three x-ray views, highest results in AP (OA 59.75±10.38; control 51.84±8.28 $p<0.001$), lowest in Dunn (OA 53.49±7.76; control 45.98±6.55 $p<0.001$). HN offset ratio was significantly lower in OA group (0.153±0.051 LL; 0.151±0.043 Dunn) than in the control group (0.183±0.047 LL; 0.185±0.036 Dunn) with $p<0.001$. Pistol grip deformity was significantly more prevalent in OA group (25.8%) vs control group (2%) with $p<0.001$. In all views, odds ratio for the OA group to have a cam deformity was significantly higher than for controls.

**Conclusions:** Higher prevelance of Cam signs in the OA group shows that this morphological abnormality plays a role in the development of primary OA. Multiple x-ray imaging techniques, especially Dunn, are necessary for accurate diagnostics.

**Title**: Modern surgical treatment methods of distal end of tibia

**Authors:** Anna Marija Petrakova, Sergejs Kižlo, Justas Sauka

**Tutors:** Ruta Jakušonoka MD

**Affiliation:** Rigas Stradins university, Latvia

**Introduction:** Distal tibia fractures are one of the most common lower extremity fractures associated with an extensive soft tissue injury, which leads to a higher risk of complications. Most fractures of the distal end of tibia, including Pilon fractures, are caused by high – energy trauma. The types of fractures depend on the injury mechanisms and severity score, which affect the choice of surgical treatment methods and the functional result. Surgical treatment for high - energy trauma usually includes two – stage treatment : external fixation, open reduction and internal fixation.

**Aim of the study:** The aim of this study was to analyse treatment methods of distal end of tibia comparing to injury mechanisms and the latest relevant surgical treatments.

**Materials and methods:** In this study used retrospective material – medical documentation analysis, where were included 30 patients, who have been surgically treated in the Hospital of Traumatology and Orthopaedics from 2019 to 2023. Treatment reason was distal tibia fracture S82.3 ( according to ICD -10). The results were evaluated by injury mechanisms, radiographs and injury AO/OTA classification. The surgical treatment outcomes were rated by using Foot and Ankle Disability Index ( FADI). Data was analysed with IBM SPSS Statistics.

**Results:** This study included 30 pacients, comprising 53.3% ( n = 16) males and 46.7% (n = 14) woman, with a mean age of 48 ± 15.1 years. The average distal tibia fracture healing time was 9 ± 3.3 weeks. Among patients, 43.3 % (n = 13) low – energy trauma and 56.7 % (n = 17) high - energy trauma. All patients were treated surgically, where 46.7% (n = 14) received internal fixation, 50% (n = 15) - osteosynthesis with intramedullary nailing, 36.7% (n = 11) - osteosynthesis with plating, 13.3 % (n = 4) - osteosynthesis with screws, 13.3 % (n = 4) - arthrotomy, 10 % (n = 3) - autobone plasty.

**Conclusions:** In most cases surgical options for fractures caused by high – energy trauma were : external fixation; osteosynthesis with intramedullary nailing; arthrotomy and autobone plasty; but for fractures caused by low - energy trauma : osteosynthesis with plating and screws.

# CASE REPORT

**Title:** Prevention of Revision Amputation Surgery with the Use of Copper Dressings - a paradigm change

**Authors:** Ithamar Cheyne, Jihad Dabbah MD, Eyal Melamed MD

**Tutor:** Eyal Melamed MD

**Affiliation:** Medical University of Warsaw

**Introduction:** Lower limb amputations carry high rates of surgical wound complications, including infection, tissue necrosis, and wound dehiscence, which often lead to repeated surgery(ies), lengthy or repeated hospitalization, and high costs to the health care system. Copper oxide dressings (COD) have broad-spectrum microbicidal effects and, in addition, induce angiogenesis, granulation tissue formation, and epithelization, as well as lysis of necrotic tissue due to their effect on metalloproteinases. We manage to take advantage of the combined effects of COD to heal amputation stump necrotic wounds of diabetic patients in an outpatient setting in cases hitherto needed surgeries. We describe the first six cases.

**Case presentation:** Six patients with wound complications after a major limb amputation (5 transtibial). Three patients were seen during hospitalization, and three in the clinic at a follow-up visit. The complication etiology was pressure necrosis, stump ischemia, tension of the sutures, and obliteration of a femoral artery bypass graft in a trans-femoral amputee. Wound measurements were done by an artificial intelligence program (Tissue Analytics). The average wound size was 19.6 cm2 (SD = 10.5cm2) Copper dressings were used through all phases of wound healing and were changed once or twice weekly in an outpatient setting. Strips of bilayer copper dressing were applied to the deep parts and tunnels in the wounds to achieve antibacterial and necrolysis effects. An adhesive copper dressing was laid on top to reduce tension and width and for convenience (allow bathing, etc.). Antibiotics were not prescribed as a rule (only one patient received oral antibiotics for two weeks). Slow-release locally applied Tobramycin beads were used occasionally. All the stump wounds healed uneventfully with an average of 84.6 days (SD = 25.4 days).

**Conclusions:** The combination of the necrolytic effect of the COD with angiogenesis, granulation tissue formation, and epithelization allows us to perform a paradigm shift towards a non-surgical treatment in many amputation stump failures. The demonstrated treatment is in line with the continuum of care concept of copper dressing through all stages of wound healing. We assess that saving to the health care system is at least 90% more than the hitherto surgical approach. The suggested low-cost treatment is convenient and safe.

**Title:** Allograft reconstruction of a chronic extensor mechanism rupture after previous total knee replacement

**Authors:** 1. Nina Špiljak-Vučinović, 2. Nika Sutara, Pia Kosanović

**Tutor:** prof. dr. sc. Mislav Jelić

**Affiliation:** Department of Orthopaedic Surgery, University Hospital Center Zagreb

**Introduction:** Extensor mechanism allograft reconstruction of the knee joint restores the knee function in chronic extensor mechanism ruptures, when the native extensor mechanism could not undergo primary repair. An extensor mechanism allograft used in this case was a fresh frozen allograft consisting of the quadriceps tendon, patella, patellar tendon, and tibial tuberosity. Dysfunction of the extensor mechanism typically presents with loss of active extension, instability, and quadriceps minus gait.

**Case presentation:** A 67-year-old patient presented to the Department of Orthopaedic Surgery, School of Medicine, University of Zagreb with complaints of right knee pain and disfunction. Upon clinical examination, the patient was unable to perform active knee extension, exhibited hypotrophy of the quadriceps musculature, and upon palpation of the joint line reported diffuse knee pain. Furthermore, the patella was proximally dislocated, palpable in the superomedial region. The patient used an orthosis and crutches for walking. Medical history revealed that the patient had already undergone several surgeries on the right knee: patellar stabilization using Campbell procedure 35 years ago, anterior cruciate ligament reconstruction 20 years ago, and total knee replacement 5 years ago. Due to the dysfunction of the extensor mechanism and dislocated patella, a transplantation of the extensor apparatus from the tissue bank was required. During surgery, the tibial tuberosity of the allograft was placed anatomically on the tibia and fixed with screws. Patella of the allograft was reduced to the cortical bone only and fixed with nonabsorbable suture to the anterior part of the native patella. The proximal part of the allograft, namely the quadriceps tendon, was proximally sutured to the native quadriceps tendon. After the surgery the patient immediately started physical therapy. Six weeks after surgery, crutches were removed and the full function of the knee was regained, and the patient was able to walk without any pain.

**Conclusions:** Allograft reconstruction of the extensor apparatus is an effective solution for restoring knee function. The successful outcome highlights the importance of this approach in addressing dysfunction of the extensor mechanism emphasizing its role in improving quality of life.

**Title:** Bimalleolar fracture complicated by secondary displacement, lateral talus subluxation and valgus deviation

**Authors:** Author: Daniel Claudiu Vișan (1)

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**Introduction:** Distal tibial physeal fractures are the third most common physeal injuries, after distal radius and phalanges fractures. They usually affect the malleoli, commonly representing Salter Harris (SH) type III or IV fractures and are associated with a risk of physeal bar formation and subsequent growth arrest. This report presents a case of bimalleolar fracture with a complication of displacement during the healing process.

**Case presentation:** A 17-year-old boy presented to the emergency department after being involved in a car accident as a passenger, complaining of acute pain in the left ankle. A radiography was performed, showing a bimalleolar fracture at the level of the ankle, including an epiphyseal detachment SH type 3 at the tibial malleolus and a suprasyndesmotic metaphyseal fracture of the left fibula. The X-ray of the ankle did not show any displacement, so the fracture was immobilized in a short leg cast for 2 months. After this period, a check-up radiography showed a secondary displacement of the fracture, accompanied by lateral subluxation of the talus, together with valgus deviation of the left leg. The patient was then admitted to our hospital, as surgical intervention was deemed necessary, involving open reduction of the tibial malleolus and left fibula fracture. Tension band osteosynthesis was performed for both fractures, as the osteoporosis induced by immobilization (which led to the lack of physical engagement of the bone) did not allow the use of other osteosynthesis methods. The radiography performed the next day after the intervention showed a correct emplacement of the distal tibia, distal fibula and talus in the articulation. Following surgery, the ankle was immobilized in a short leg cast for another 6 weeks. Postoperative recovery was favorable, with the achievement of consolidation in anatomical position of the affected structures.

**Conclusions:** Correct treatment by open reduction and internal osteosynthesis is crucial in ankle articular fractures. In order to prevent secondary displacements and malunion, the surgical intervention has to be performed per primam, as the cast immobilization without surgery has been proven insufficient.

**Title:** Traumatic Ceramic Head Fracture in Total Hip Arthroplasty with Ceramic-on-Polyethylene Articulation: A Case Report

**Author:** Aleksandra Poszytek

**Tutor:** Paweł Wojtyński MD

**Affiliation:** Medical University of Warsaw/ SKN Ortopedii Rekonstrukcyjnej i Onkologicznej

**Introduction:** Total hip arthroplasty is a frequent and relatively safe procedure in orthopedics. Wide range of materials might be used during such operation. Nowadays Ceramic-on-Polyethylene bearings are more commonly used considering the fact that it is less possible to cause osteolysis, which is a main concern after total hip arthroplasty. However, ceramic materials also have its issues, which is being more prone to breakage.

**Case presentation:** A 64-years old male of 100kg weight who underwent a total hip arthroplasty 2,5 years ago presented with strong pain of right hip joint and squeaking noise after falling on icy mountain trail. D-dimer levels were slightly increased. Radiographs showed small pieces of ceramic around the head suggesting its fracture. Revision hip arthroplasty was performed changing the Ceramic-on-Polyethylene prosthesis for Metal-on-Polyethylene. Procedure went without any complications. The patient was referred strengthening exercises and rehabilitation.

**Conclusions:** Although Ceramic-on-Polyethylene prosthesis report lower wear debris which indicate greater longevity of total hip replacements it also has its limitations. Patient's weight as well as lifestyle are important to bear in mind while choosing the adequate prosthesis. Even though Metal-on-Polyethylene shows worse articulation it might have been a more suitable choice considering active lifestyle and big weight of presented patient since it is less likely that metal head would break after the fall.

**Title:** External radiotherapy and autografting of a bone segment in a patient with bone cancer

**Author:** Gaudas Benediktas Trakymas

**Tutor:** Rimantas Zagorskis, MD

**Affiliation:** Author: Faculty of Medicine, Vilnius University, Vilnius, Lithuania. Tutor: Center for Pediatric Surgery, Orthopaedic and Traumatology, Vilnius University Hospital Santaros Klinikos, Vilnius, Lithuania

**Introduction:** Osteosarcoma is a highly aggressive bone tumor, typically affecting young individuals. Herein we detail a case of a high-grade localized osteosarcoma managed by intraoperative extracorporeal irradiation and reconstruction by reimplantation of the resected bone segment.

**Case presentation:** A 9-year-old boy presented with gradually intensifying pain and swelling of the left thigh, which had started around six months earlier. Radiography of the left thigh revealed an osteolytic diaphyseal lesion of the femoral bone, detailed by MRI. No metastases were observed in lung CT. Histological evaluation of the bone and soft tissue biopsy specimens revealed the presence of a high grade (G3) osteosarcoma in both. The patient received chemotherapy for 4 weeks, following EURAMOs-1 protocol. Two weeks later, a radical resection of the cancerous bone segment was performed, 6 cm distally and 25 cm proximally above the knee joint line. The bone segment was thoroughly scraped and rinsed with isotonic saline. Specimens from both segment ends and the scrapings were sent for histological evaluation. The resected segment was placed in a double sterile plastic bag filled with isotonic saline and transported to a radiotherapy laboratory, where it was treated with extracorporeal radiation. Meanwhile, the surgical field was thoroughly rinsed with isotonic saline and new sterile instruments and drapes were prepared. Reconstruction by reimplantation of the irradiated and thus devitalized bone autograft followed, as well as osteosynthesis with a metal plate. No lung metastases were observed upon subsequent CT.

**Conclusions:** Osteosarcoma is traditionally treated with surgery, chemotherapy and intracorporeal radiotherapy. Extracorporeal irradiation offers the possibility for a safe and effective addition to this therapeutic arsenal. Intraoperative extracorporeal irradiation and reimplantation of the resected bone segment offer a novel approach to osteosarcoma management. It has potential for fewer complications, improved biological durability, and comparable tumor recurrence rates to conventional techniques.

# PEDIATRIC ORIGINAL WORK ORAL SESSION

prof. Tomasz Tomasik, MD, PhD
prof. Walentyna Balwierz, MD, PhD
Andrzej Grudzień, MD
prof. Ewa Cichocka-Jarosz, MD, PhD

## Sessions coordinators:

Maksymilian Nowak

Wiktoria Stępień

**Title**: Immunization coverage and associated factors among toddlers at University of Kinshasa Clinics: a cross-sectional study

**Authors:** Henoch Ciswaka (presenter), Philippe Masidi, Christelle Kaja, Laeticia Mavinga

**Tutors:** Professor Dr Laeticia Mavinga, MD, PhD

**Affiliation:** Unit of Noonatology, Department of Pediatrics, University of Kinshasa Clinics, University of Kinshasa, DR Congo

**Introduction:** In terms of vaccination, the DRC is one of the countries most lagging behind in implementing health measures and achieving the WHO target with one zero-dose child (ZD) out of five.

**Aim of the study:** The aim of this study was to evaluate vaccination coverage and identify factors associated with under- or non-immunization of children at University of Kinshasa Clinics.

**Materials and methods:** An analytical cross-sectional study was performed at the Département of Pediatrics, University of Kinshasa Clinics from September 18 to October 6, 2023. According to immunization status, the children included in the study were divided into 3 groups: fully vaccinated, partially vaccinated, and ZD. Logistic regression was used to identify the determinants of sub- or non-vaccination.

**Results:** Of the 152 sick children included in the study, 80 (52.6%) were fully vaccinated, 42 (27.6%) were partially vaccinated, and 30 (19.7%) were ZD. The overall vaccine coverage was 69.2%. Depending on doses, immunization coverage decreased significantly from the 4th contact, with the lowest coverage for VAR/RR-2 (53.9%). Polygamous marriages (OR: 2.77), no formal education (OR: 2,29)and low socio-economic status of mothers/nursing mothers were determinants of under- or non-vaccination. Ignorance of the importance of vaccination completeness (36.8%) and the dangers of non-vaccination (30.9%) were the most advanced reasons.

**Conclusions:** Almost half of the study population was undervaccinated. Access to information, health education, and adequate communication are key elements to be considered in health policy on vaccination.

**Title**: Selected neuropeptides' serum concentration in differential diagnosis of headaches etiology in children

**Authors:** Michał Bochenek, Jan Tomasik

**Tutors:** prof. dr hab. Przemysław Tomasik

**Affiliation:** SSG of Clinical Biochemistry

**Introduction:** Headaches are a common problem among pediatric population, affecting over 58% of children and adolescents. Although neurological problems account for only 2% of pediatric ER visits, headaches constitute 19,7% of them. Fast differential diagnosis of headaches based on reliable measurements is still expected. The plasma concentration of certain neuropeptides like relaxines, mainly known for their role in reproduction cycle, but also involved in the vascular physiology and nesfatins that cross the brain-blood barrier and play a role in various mechanisms, mainly in the digestive system could be helpful in distinguishing the cause of headache

**Aim of the study:** Study aimed to assess NESFATIN-1, NESFATIN-2, RELAXIN-2 and RELAXIN-3 serum concentration in children who suffered from headaches of different etiology.

**Materials and methods:** We studied 56 children aged 10-18, hospitalized in Pediatric Neurology Clinic of University Children Hospital in Krakow, 24 with epilepsy with aura headache, 20 adolescents with tension headache and 12 with migraine headache. The control group consisted of 16 healthy adolescents. Fasting blood samples were collected first morning after a migraine or epilepsy attack. Subsequent samples were collected on the fourth day after the event. Neuropeptides measurements were performed using the immunoenzymatic method.

**Results:** In the control group the median concentration of NES1 was a little bit higher than in studied groups – median 36.3 ng/ml; but differences were not statistically significant. The highest concentration of NESFATIN-2 was observed in tension headache group (median 847.0 pg/ml). These values were significantly higher than those observed in migraine and control groups (641.1 and 670.3 pg/ml, respectively, $p=0.033$ and $p=0.029$). Also, relaxin-2 concentrations showed no statistically significant differences between groups. The concentrations of relaxin-3 were significantly lower in the epilepsy group (median 250.6 pg/ml) and in the tension headache group (median 159.1 pg/ml) than in the migraine group (684.1 pg/ml) $p= 0.046$ and $p=0.002$ respectively, and control group (1445 pg/ml) $p<0.001$ in both cases.

**Conclusions:** Concentration of neuropeptides, mainly NESFATIN-2 and relaxin-3 differed among studied groups. Our findings may suggest NESFATIN-2 and relaxin-3 as biomarkers for differentiating headache etiology.

**Title**: Complications following treatment with liposomal amphotericin B - analysis of complications and treatment results.

**Authors:** Kacper Żurek, Zuzanna Zakrzewska, Damian Piotrowski

**Tutors:** Prof. Szymon Skoczeń MD, PhD

**Affiliation:** Department of Pediatric Oncology and Hematology, Institute of Pediatrics, Jagiellonian University, Medical College, Kraków Students' Scientific Club of Pediatric Oncology and Hematology, Jagiellonian University Medical College Department of Infectious Diseases and Hepatology Medical University of Silesia in Katowice

**Introduction:** Introduction of liposomal amphotericin B (LAmB) in therapy of fungal infections has led to a significant reduction of complications. Nonetheless, it still carries the possibility of important complications.

**Aim of the study:** The aim of the study is to analyse the data of patients treated with LAmB in the Department of Paediatric Oncology and Haematology in the period of 2012-2022.

**Materials and methods:** We performed a retrospective analysis of 59 children (53% boys, 47% girls). Half of the patients were treated for acute leukemia (ALL-33%, AML-17%). The other half included malignant and non-malignant diseases (Burkitt's lymphoma, NHL T-cell, Ewing's sarcoma, Osteosarcoma, Sarcoma synoviale, Neuroblastoma, CNS tumors, Aplastic anemia, Thrombocytopenia HLH, SCID, Gonadoblastoma).Patients were divided into two groups based on dose of LAmB per kg of body weight: low dose - <3mg/kg bw (50 patients) and high dose - >4mg/kg bw (9 patients). Parameters analysed were as follows: immunological status, duration of therapy, duration of neutropenia, underlying disease, type and status of fungal infection, antifungal prophylaxis, doses of antineoplastic the drugs used, including the cumulative doses, response to oncologic treatment, and supported therapy used.

**Results:** The median duration of neutropenia was 21 days. Complications of LAmB were categorized into three groups: kidney dysfunction (20 cases), liver dysfunction (16 cases), and important electrolytes alteration (16 cases). Statistical analysis did not show a correlation between cumulative dose LAmB and recorded complications. Response to treatment was noted in 85% of patients. The use of a higher dose did not demonstrate better treatment efficacy (p=0.2053). Additionally there was no correlation between increased incidence of complications and higher doses of LAmB (p=0.3733).

**Conclusions:** Liposomal amphotericin B is a potent antifungal drug, dedicated to severe fungal infections. Despite numerous complications, mainly changes in laboratory results, LAmB is an effective, safe, and important antifungal drug. There was no need to discontinue LAmB therapy in any case.

**Title**: Renal manifestations of tuberous sclerosis complex in children - a single-center experience

**Authors:** Agnieszka Piróg, Wiktoria Suszek

**Tutors:** Anna Maria Wabik, MD, Piotr Skrzypczyk, MD, PhD, associate professor

**Affiliation:** Student Scientific Association at the Department of Paediatrics and Nephrology, Warsaw Medical University, Poland, Head of the Department Małgorzata Pańczyk-Tomaszewska

**Introduction:** Tuberous sclerosis complex (TSC) is a rare genetic disease characterized by benign tumors in multiple organs (e.g., brain, kidneys), caused by mutations in TSC1 and TSC2 genes. TSC patients have kidney tumors called angiomyolipomas (AML) and cysts, rarely other lesions, including renal cell carcinoma. Large AMLs increase the risk of life-threatening hemorrhages.

**Aim of the study:** Presentation of kidney manifestations in children with TSC.

**Materials and methods:** In 55 pediatric patients (28 boys, 27 girls, 8.1±4.6 years), we analyzed the presence and size of kidney lesions (ultrasonography, magnetic resonance), genetic tests, blood pressure, and biochemical parameters, including kidney function (glomerular filtration rate - GFR calculated from creatinine and cystatin C Schwartz formula).

**Results:** AMLs were found in 40/55 children, including atypical (low-fat) AMLs in 9/55 patients. The mean AML size was 13.1±15.1 mm; Larg AMLs≥30mm were present in 5/55 children. Cysts were found in 46 (83.6%) children; the mean cyst size was 10.3±12.3 mm. The largest cysts were found in 4 children with contiguous gene syndrome (deletion involving two closely located on chromosome 16 genes: TSC2 and PKD1). Seven children had arterial hypertension (AH), including 3 out of 4 children with contiguous gene syndrome. Mean GFR was 111.2±17.1 mL/min/1.73m2, and GFR<90 mL/min/1.73m2 was found in 2 (3.6%) children, 2 of them had contiguous gene syndrome. Patients with AH had significantly ($p<0.05$) higher triglycerides (111.6±61.1 vs. 77.3±32.5 mg/dL, $p=0.03$), higher kidney longitudinal dimension (114.4±21.8 vs. 92.4±15.0 mm, $p=0.001$), and larger cysts (22.6±27.1 vs. 8.0±5.3 mm), without differences in age 8.9±6.7 vs. 7.9±4.3 years, $p=0.59$) and BMI (17.8±2.6 vs. 17.8±3.2 kg/m2). AML size correlated with age ($r=0.470$, $p<0.001$) and urinary albumin-creatinine ratio ($r=0.444$, $p=0.001$).

**Conclusions:** 1. Large renal lesions are common already in children with TSC, and most severe renal manifestations are found in patients with contiguous gene syndrome.

2. The size of AML increases with age in children with TSC

3. Large AMLs are risk factors for elevated urinary albumin excretion.

4. In pediatric patients with TSC, large kidney size, large cysts, and hypertriglyceridemia are risk factors for arterial hypertension.

**Title**: Analysis of the neonatal death causes in the University Clinical Hospital in Białystok in the years 2015-2023

**Authors:** Aleksandra Kamianowska1, Cezary Kamianowski2

**Tutors:** Monika Kamianowska, Assoc Prof1

**Affiliation:** 1 Department of Neonatology and Neonatal Intensive Care, Medical University of Bialystok, Poland; 2 Department of Maxillofacial and Plastic Surgery, Medical University of Bialystok, Poland

**Introduction:** Despite constant improvement in child survival, approximately 2.5 million newborns die each year. According to World Health Organization, leading causes of neonatal deaths are: prematurity, intrapartum-related complications, sepsis and congenital anomalies. Many of these deaths are preventable. Therefore, it is necessary to know causes of neonatal deaths in a given region. The regional mortality pattern requires specific prevention methods and modifications in clinical practice aimed at preventing avoidable deaths.

**Aim of the study:** The study aimed at analyzing causes of neonatal deaths in the Department of Neonatology and Neonatal Intensive Care of the University Clinical Hospital in Białystok, Poland between 2015 and 2023.

**Materials and methods:** We analyzed Patients' Information Cards of 96 neonates (60 males, 34 females, 2 neonates of unspecified gender) who died in the Department between 2015 and 2023 paying particular attention to the causes of deaths.

**Results:** During the study period, 19,170 children were born in the Department and 0.50% of them died (N=96). The assessed group of neonates consisted of: 60 extremely immature neonates (62.50%), 18 neonates with congenital malformation/deformation (18.75%), 7 neonates with chromosomal abnormalities (7.29%), 6 immature neonates aged ≥28 weeks of gestation, not burdened with genetic disorders (9.38%) and 5 term neonates not burdened with genetic disorders (5.21%). Most neonates died on the 1st day of life (N=42, 43,75%). Median gestational age of the deceased neonates was 26 weeks. The highest percentage of deaths occurred among neonates aged 22 0/7-27 6/7 weeks of gestation – 35.71% (N=60). Median body weight of the deceased neonates was 780.00 g. The highest percentage of deceased children occurred among extremely low birth weight children – 23.31% (N=55). The underlying causes of deaths were certain conditions originating in the perinatal period (76.04% (N=73) and congenital malformations, deformations and chromosomal abnormalities (23.96% (N=23)). The most common underlying cause of death was extreme immaturity of newborn (N=59, 61.46%).

**Conclusions:** The underlying causes of assessed neonatal deaths corresponded to the worldwide and nationwide data. The results of the analysis show that special attention should be paid to the problem of prematurity and congenital diseases as the cause of neonatal deaths.

**Title**: Analysis of the orofacial clefts in neonates from the University Clinical Hospital in Białystok in the years 2016-2023

**Authors:** Cezary Kamianowski1, Aleksandra Kamianowska2, Krzysztof Kindeusz1

**Tutors:** Monika Kamianowska, Assoc Prof1

**Affiliation:** 1 Department of Maxillofacial and Plastic Surgery, Medical University of Bialystok, Poland; 2 Department of Neonatology and Neonatal Intensive Care, Medical University of Bialystok, Poland

**Introduction:** Orofacial clefts, occurring in approximately 10 per 10,000 live births, are among the most common birth defects. In many cases orofacial clefts coexist with other congenital defects. However both their global and regional prevalence needs to be more comprehensively analyzed, as they are an important health and social burden.

**Aim of the study:** The study aimed at analyzing the occurrence of orofacial clefts in the Department of Neonatology and Neonatal Intensive Care of the University Clinical Hospital in Białystok, Poland in the years 2016-2023.

**Materials and methods:** Patients' Information Cards of all neonates with orofacial clefts born in the Department between 2016 and 2023 were analyzed in terms of the occurrence of cleft lip, cleft palate and cleft lip with cleft palate.

**Results:** During the study period 17,349 neonates were born in the Department and 0.25% of them had an orofacial cleft (N=43). The incidence was 25 per 10,000 live births. Median gestational age of the assessed neonates was 39 weeks, 90.70% of the children were term neonates. The median body weight was 3120 g. 32.56% of the orofacial clefts were recognized prenatally (N=14). Other congenital defects occurred in 41.86% of the cases (N=18). In the assessed group there were: 14 cases of cleft hard and soft palate (32.56%), 7 cases of unilateral cleft lip (16.25%), 6 cases of cleft soft palate (13.95%), 4 cases of cleft hard and soft palate with unilateral cleft lip (9.30%), 4 cases of cleft hard and soft palate with bilateral cleft lip (9.30%), 3 cases of cleft hard palate with unilateral cleft lip (6.98%), 3 cases of cleft hard palate with bilateral cleft lip (6.98%), 1 case of cleft hard palate (2.33%), 1 case od cleft soft palate with unilateral cleft lip (2.33%).

**Conclusions:** Orofacial clefts are fairly common congenital defects. Higher incidence of orofacial clefts in our Department is probably due to its characteristic as a tertiary care center. Particular attention should be paid to prenatal diagnosis of the orofacial clefts. Early awareness of the defect may enable better parental adaptation and treatment planning, which may reduce its impact on health and quality of life.

**Title**: Assessment of pediatric patients with arthrogryposis using the Pediatric Outcome Data Collection Instrument scale.

**Authors:** Gabriela Kwoka, Barbara Kowalska, Justyna Wawrzeczko

**Tutors:** dr Alicja Fąfara

**Affiliation:** Jagiellonian University Medical College, Faculty of Health Sciences

**Introduction:** Arthrogryposis Multiplex Congenita (AMC) is a rare congenital disorder, with its full clinical picture evident immediately after birth. Symptoms of arthrogryposis are apparent even in fetal life (fetal akinesia is visible), while after birth, the child exhibits, among other things, symmetric muscle contractures, joint stiffness, and bone-joint deformities.

**Aim of the study:** The aim of the study was to perform a functional assessment of pediatric patients with arthrogryposis using the Polish-validated Pediatric Outcome Data Collection Instrument (PODCI), completed by parents. The use of this tool allowed for describing patients in terms of gross motor function, fine motor function, self-care, and quality of life.

**Materials and methods: T**he study included 52 pediatric patients treated for arthrogryposis at the Arthrogryposis Treatment Center at the University Children's Hospital in Krakow. A standardized and Polish-validated version of the Pediatric Outcome Data Collection Instrument was used for functional assessment and quality of life evaluation, intended to be completed by parents. Depending on the child's age, a scale designed for the age range of 2-10 years old or 11-18 years old was utilized.

**Results:** Fifty two children with arthrogryposis aged 3 to 18 years old were examined. The average score for Upper Extremity function domain was 61, while for Transfer function domain it was 60. A significantly low average score was observed in the Sport and Activity domain, which was 41. In the domain describing pain complaints, most caregivers did not report significant pain-related problems - the average score in this segment was 73. However, importantly, the older the child with arthrogryposis, the more frequently pain complaints were reported. The average score in the Happiness domain was 66. Based on the collected data, the averaged Global Functioning score according to the PODCI scale for a child with arthrogryposis was 59 points.

**Conclusions:** In children with arthrogryposis, there is observed a limitation in independent functioning and self-care compared to the population of healthy children. However, despite significant difficulties associated with movement limitations, individual compensatory mechanisms allow for the performance of basic activities in the environment.

**Title**: The prevalence of eating disorders and their association with depression and anxiety symptoms in Latvian school students

**Authors:** Mihails Zuravlovs

**Tutors:** Laura Kevere MD

**Affiliation:** University of Latvia, Riga, Latvia;

**Introduction:** Individuals who are affected by depression and anxiety are known to be more vulnerable to developing eating disorders. There is a bidirectional correlation between mood disorders and eating disorders (ED).

**Aim of the study:** The study aimed to obtain information on the prevalence of the risk of eating disorders as well as their association with depression and anxiety symptoms among school students in Latvia.

**Materials and methods:** A longitudinal questionnaire-based descriptive study. The sample consisted of Latvian school students from 14 to 19 years. An anonymous survey consisted of depression (PHQ-9) and anxiety (GADF-7) screening tools, as well as SCOFF screening for eating disorders. SPSS v.27 was used for statistical analysis.

**Results:** 633 respondents completed the survey: 81.7% were females (N=517) and 18.3% were males (N=116). The average age of students was 16 years. Of all the females who completed the survey, 69.6% (N=360) had a serious risk of eating disorders, while in boys this risk was in 29.3% of cases (N=34). In adolescents without or with mild anxiety, ED risk was found in 46.1% of cases, and for those with moderate - 69.7%. In contrast, in adolescents with severe generalized anxiety, ED risk was found in 84.8% of cases. In adolescents with no or mild depression, ED risk was found in 22.7% of cases, in those with moderate depression – in 54.5% of cases, while in students with severe depression, ED risk was found in 81.3% of cases. Females were more than twice as likely to have the risk of an eating disorder (p=0,001). As students' depression levels rise to moderate, they are 75% more likely to have a risk of ED. Compared to adolescents with no/mild anxiety, students with moderate are 50% more likely to have a risk of ED, while those with severe anxiety - 84% more likely (p=0,001). Compared to participants with no/mild depression, students with moderate are 2,5 times more likely to have a risk of ED, while those with severe anxiety – 3,5 times more likely (p=0,001).

**Conclusions:** In general, 49% of students had a risk of ED. The more severe depression and anxiety symptoms, the greater the risk of an eating disorder.

**Title**: Critical Insights Into Paediatric Healthcare: Usage Habits, Accessibility And Parental Valuation In Latvia

**Authors:** Klavs Putenis, Alise Antuanete Snikere

**Tutors:** Sigita Snikere, Marcis Trapencieris

**Affiliation:** RSU

**Introduction:** This study assesses parental evaluation of paediatric healthcare services in Latvia, examining accessibility to different specialists and their competence as seen by parents. demographic data. It explores the impact of financial sources of specialists' services and respondents' demographic data.

**Aim of the study:** Aim of the study is to explore satisfaction and experience of the latvian population with the quality and availability of health care services to their children

**Materials and methods:** The study was part of the Latvian healthcare monitoring survey 2023 which assesses healthcare quality and accessibility of various healthcare services in different age groups and regions in Latvia. Part of the questionnaire included questions about paediatric healthcare services. A total of 2856 people aged 18-94 years old were interviewed by using face-to-face computerised data collection tool.

**Results:** 25.8% (n= 737) of all respondents had at least one minor (<18 years-old) in their household, and of those 88.5% (n=652) responded to questions on paediatric healthcare services.

631 respondents children have visited a state-funded family doctor (FD) at least once in the last year, and of those 90.0% (n=568) evaluate the accessibility of FD as very good/good ($\chi 2=16.3$; $p=0.001$), and 91.9% (n=580) see the competence of their FD as very good/good ($\chi 2=28.9$; $p<0.001$).

330 respondents children have visited a state-funded doctor-specialist at least once in the last year. 88 have used privately-funded specialist services, and of those 85.2% (n=75) indicate that the privately-funded services were used because the same state-funded service was not available soon enough or at all. A significant correlation emerged comparing differences in availability of state-funded paediatric specialists across different regions.

As for accessibility for acute paediatric dental care, 79.7% (n=384) rate it as poor/very poor, with the worst being in Vidzeme - 89.1% ($\chi 2=11.7$; $p=0.020$). Elective dental care accessibility was evaluated as poor/very poor by 66.4% (n=374).

**Conclusions:** This study highlights critical aspects of paediatric healthcare accessibility in Latvia, revealing differences of parental judgement and challenges in specialist availability. Targeted interventions are needed to enhance overall satisfaction, and ongoing monitoring for uniform access across regions and specialists is very important.

**Title**: Evaluation of the severity of the course of the disease in the case of hemocolitis caused by Shiga-toxin producing E.coli and associated HUS in patients before and after the development of the unified action algorithm at the Children's Clinical University Hospital of Riga.

**Authors:** Natalja Malisa

**Tutors:** MD Mareks Marcuks

**Affiliation:** Children's Clinical University Hospital of Riga

**Introduction:** Hemocolitis caused by Shiga-toxin producing E.coli (STEC) can progress in 5-15% of cases to the development of hemolytic uremic syndrome (HUS), a rare but severe complication. Accurate assessment of the risk of STEC infection, quick identification of the causative agent and timely initiation of correct therapy allow minimizing the severity of the disease.

**Aim of the study:** To investigate the effectiveness of the unified action algorithm developed by the Children's Clinical University Hospital of Riga in the course of the disease severity in relation to the STEC-HUS.

**Materials and methods:** This retrospective analysis includes analysis of data from the Children's Clinical University Hospital of Riga for a group of patients with laboratory-proven STEC infection in the period from January 2017 to December 2023. Two groups are compared - before and after the implementation of the algorithm. The severity of the disease is assessed by the duration of hospitalization and renal replacement therapy (RRT), need for transfusion of blood components, enteral feeding through tube, need for artificial ventilation. The obtained data were analyzed in the SPSS program.

**Results:** The course of STEC infectious disease in 40 children was analyzed - 14 children before the of the algorithm and 26 after. HUS was diagnosed in 78.6% of patients before and 80.8% after the algorithm. The obtained results show that the total number of days spent in the hospital was less after the implementation of the guidelines (before M = 20.9, SD 13.8; after M = 14.7, SD 9.4), the duration of RRT also decreased (before M = 10.8, SD 12.5; after M = 4.7, SD 8.6), but the obtained data were not statistically significant. Erythrocyte mass transfusion and artificial ventilation were more often required after the implementation of the algorithm, while the need for platelet mass transfusion and enteral feeding was less, but the difference was not confirmed as statistically significant.

**Conclusions:** No statistically significant difference was observed in the course of the patients' disease. The analysis of other parameters (such as the dynamics of blood tests) and evaluation of the speed of diagnosis would allow more accurate judgments about the efficiency of the algorithm.

# PEDIATRIC CASE REPORT ORAL SESSION

prof. Ewa Cichocka-Jarosz, MD, PhD
lek. Marek Rączka
lek. Gabriela Mielecka-Jarmocik
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## Sessions coordinators:

Julia Köhnlein

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**Title:** Intraoral Atypical Spitzoid Tumor associated with Peutz-Jeghers Syndrome: A Case Report

**Authors:** Adrianna Jażdżewska

**Tutor/s:** Karolina Śledzińska MD, PhD

**Affiliation:** Student Scientific Circle of Rare Diseases at Department of Pediatrics, Hematology and Oncology at University Clinical Centre, Gdansk, Poland

**Introduction:** Peutz-Jeghers Syndrome (PJS) is a hereditary cancer syndrome caused by an autosomal dominant inheritance pattern from mutations in the STK11 gene. It is characterized by the presence of melanocytic lesions (mouth, fingers) and hamartomatous polyps of gastrointestinal tract.

**Case presentation:** We present a family (father and 3 children), with PJS features: 43-year-old father, with a history of small bowel tumour, gastrointestinal tract hamartomatous polyps, mucocutaneous lesions, the 17-year-old daughter with similar symptoms, 9-year-old son with mucocutaneus lesions and the 3-year old son with two atypical spitzoid tumors.

STK11 gene analysis for each of the family members revealed the variant c.920+7G>C;(p.?), re-classified with time from VUS to benign. Subsequent diagnostics of SMAD4, BMPR1, PTEN genes and aCGH didn't reveal any abnormalities. Re-analysis of STK11 gene reported heterozygous, likely pathogenic variant c.451_452del,p.(Cys151Profs*11) in the father, that finally confirmed PJS. In the remaining members of the family the result of the analysis is pending.

In 2022, the youngest boy was examined for a pink-red intraoral lesion on the left cheek's mucosa. Histological analysis showed markers ALK-BOND(+/-), BAP-1(+), BRAFV600E(-), cyclinD1(+), p16(+/-), CKPAN(-), melanA(+/-), HMB-45(+/-), and a Ki67 positivity rate of around 18%; diagnosed as Atypical Spitz Tumors (ALK-positive), showcasing a distinct histopathological profile of melanocytic intradermal neoplasm. Subsequently, a similar lesion emerged on the right cheek, which was excised along with an extension of the margins from the initial tumor.

**Conclusions:** PJS increases the risk of various cancers, although the incidence of tumors in individuals under 20 remains very low (2%). This case represents the first documented instance of an intraoral Atypical Spitz Tumor possibly associated with PJS, that might be showing the potential link between these two conditions, contributing to the expanding spectrum of clinical manifestations associated with this genetic disorder.

**Title:** Single-stage bilateral derotational osteotomy for congenital radio-ulnar synostosis: Case report

**Authors:** Tomasz Kucharski, Michalina Prowotorow

**Tutor/s:** J.Michał Deszczyński MD, PhD

**Affiliation:** Students' Scientific Association at Paley European Institute

**Introduction:** Congenital Radio-Ulnar Synostosis (CRUS) is a rare upper-extremity deformity which results in decreased supination-pronation range of motion (ROM). Many different surgical approaches have been described in the literature. The point of this case report is to present surgical technique of bilateral single-stage proximal derotational osteotomy through the synostosis of both forearm bones and its functional outcome.

**Case presentation:** 4 y/o female diagnosed with radio-ulnar synostosis, type 2 due to Cleary and Omer classification based on X-ray and MRI. Additionally lack of elbow extension was noted due to 20 degrees of ulna bowing. Dorsal approach was performed followed by anterior and posterior fasciotomy. Closing-wedge osteotomy was completed at synostosis level. Special attention was paid to dissect radial nerve and protect it. Patient functional outcomes were evaluated before and 2 months after the surgery. The Shriners Hospital Upper Extremity Evaluation (SHUEE) and the Pediatric Outcomes Data Collection Instrument (PODCI) forms were used to assess patient's quality of life. After 6 weeks of immobilization ROM was assessed as follows: 10 degrees left and 20 degrees right forearm supination and 90 degrees of pronation bilaterally. Improvement of elbow extension was also noted: - 5 degrees of extension on the right and -10 degrees of extension on the left. SHUEE score in Dynamic Positional Analysis of forearm segment was 12/12 compared with 7/12 preoperatively. PODCI assessed the patient postoperatively for 92 out of 100 (Standardized Mean) in Upper Extremity Scale (92/100 preoperatively) and 96/100 (Mean of Standardized Means) in Global Functioning Scale (94/100 preoperatively).

**Conclusions:** Bilateral single-stage proximal derotational osteotomy followed by physiotherapy gave satisfying results for the patient. Further research should be done in other to evaluate predictability of this procedure.

**Title:** A case report of Haddad Syndrome in a male newborn

**Authors:** Justyna Osińska, Wojciech Bubczyk

**Tutor/s:** Karol Taradaj MD, PhD

**Affiliation:** Student Scientific Association ProNeo at the Department of Neonatology and Rare Diseases, Medical University of Warsaw, Poland Head of Department: prof. Bożena Kociszewska-Najman MD, PhD

**Introduction:** Congenital central hypoventilation syndrome (CCHS), also known as Ondine curse, is a rare genetic disease which leads to the respiratory failure. It is caused by a severely impaired central autonomic control of breathing resulting in a dysfunction of ventilation. Hirschprung's Disease (HD) is a relatively common cause of congenital intestinal obstruction due to the agenesis of ganglion cells in the intestinal walls. They are both probably caused by a neurocristopathy. The occurrence of those diseases simultaneously is defined as Haddad Syndrome (HS).

**Case presentation:** A male patient was born in the 37th week of gestation by C-section in a serious general condition (APGAR 6/7/9/8). He had difficulty breathing and needed increased oxygen supply. The intubation and mechanical ventilation were necessary in the following days due to ineffective breathing, episodes of apnea during sleep and cumulation of CO2. Pathologies of the respiratory system were ruled out. Genetic testing confirmed a mutation in PHOX2B gene, which validated the suspicion of CCHS.
The patient had flatulence, didn't pass the stool in the first days after birth and didn't tolerate enteral feeding. This led to suspicion of HD, which was confirmed after a biopsy of the rectum. The patient was 5-weeks old when the surgery to create a stoma was performed and since then he's been fed only enterally.
Coexisting of CCHS and HD led to the diagnosis of Haddad Syndrome.
In neurological examination the patient was inactive, hypotonic, had his eyes closed with no eye guidance or fixation. MRI revealed features of demyelination and excluded neuroblastoma.

**Conclusions:** Haddad Syndrome is a very rare disease, which makes it quite difficult to diagnose, and the treatment requires cooperation of many specialists.
There is a big risk of mortal complications and no accurate treatment therefore more research is needed to create effective therapeutic methods.

**Title:** A case of focal cortical dysplasia type IIIb associated with dysembryoplastic neuroepithelial tumor

**Authors (including the presenter):** Mateusz Zajączkowski, Aleksandra Midro

**Tutor/s:** Olga Milczarek, MD, PhD

**Affiliation:** Department of Pediatric Neurosurgery, Faculty of Medicine, Jagiellonian University Medical College, Kraków, Poland

**Introduction:** Dysembryoplastic neuroepithelial tumor (DNET) is a distinct type of low-grade glioneuronal tumor (WHO grade I) with low malignancy potential, developed predominantly in the pediatric population. DNETs are highly associated with chronic drug-resistant epilepsy. They are accompanied by a surrounding rim of the dysplastic cortex, in which the presence of the focal cortical dysplasia (FCD) can be found. In most cases, they are situated in the temporal lobe. The coexistence of FCD and DNET corresponds to increased resistance to current pharmacological therapies. The concomitance of FCD and DNET is classified by the International League Against Epilepsy as "FCD Type IIIb". There are only several reports of FCD Type IIIb available, especially with tumor mass located in the frontal lobe. Achieving seizure termination without neurological deficits is the goal of the FCD and DNET treatment.

**Case presentation:** We present the case of a 3-year-old patient diagnosed with FCD Type IIIb-associated dysembryoplastic neuroepithelial tumor. The patient showed a history of high-frequency, repeated absence-like seizures with an impaired conscious level and uncoordinated movements. Prior to the initial episode, the patient exhibited excessive psychomotor excitability and febrile-triggered seizures. During the physical examination at the admission, the patient was in a good general condition, except for being constantly distracted and having difficulties maintaining eye contact. In the neurological examination, neither generalized central nervous system damage nor psychomotor development abnormalities were found. Antiepileptic treatment was initiated. Imaging revealed a hypodense lesion in the left frontal lobe. The patient underwent a left-sided frontal craniotomy with a lesionectomy. Intraoperative electroencephalography was applied during the surgery. A neuropathological analysis revealed G1 DNET with FCD type IIIb. There were no significant surgical complications, the patient was discharged and reported no complaints.

**Conclusions:** The coexistence of focal cortical dysplasia and DNET poses challenges in treatment due to increased resistance to pharmacological therapies. Using a tumoral as well as an epilepsy surgery-oriented strategy usually benefits excellent seizure control following appropriate surgical resection. The use of intraoperative electrocorticography recordings results in better postoperative outcomes. Due to the rarity of the disease, the precise treatment guidelines and its pathogenesis is still unclear.

**Title:** Tuberous sclerosis complex - a multisystem disease: Case Report

**Authors:** Wiktoria Suszek

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**Introduction:** Tuberous sclerosis complex (TSC) is a rare autosomal genetic condition. Its manifestation includes seizures, delayed mental development, and tumors of the brain, heart, kidneys, retina, skin, and lungs. Despite being usually benign, tumors may cause potentially severe dysfunction in the affected organ. Monitoring for potential complications and treatment with mTOR inhibitors can minimize their severity.

**Case presentation:** A 14-year-old boy with TSC was admitted due to control follow-up. The diagnosis of TSC was based on the multiple cardiac rhabdomyomas during prenatal ultrasonography at the 21st week of gestation. During his first year of life, the cardiac ablation was done due to Wolff-Parkinson-White syndrome.
On admission, he was in good general condition with blood pressure 97/57mmHg, heart rate 85/min, BMI 14 kg/m2 (height 160cm, weight 36.2kg). Physical examination revealed the following TSC-specific skin lesions: numerous facial angiofibromas, multiple hypomelanotic macules, fibromas of the neck and left arm and shagreen patch. His neurological manifestations are lateral ventricle tumors, cortical and subcortical tubers in both hemispheres, narrow optic nerves, decreased anteroposterior dimension of the eyeballs, severe mental retardation, drug-resistant epilepsy treated with a vagus nerve stimulator, vigabatrin, valproate, brivaracetam, and lacosamide. The echocardiography showed a rhabdomyoma in the left ventricle with a preserved ejection fraction. Magnetic resonance revealed multiple cysts and three atypical angiomyolipomas (AMLs) in the kidneys. The size of the right kidney AML was 17x19x23mm (previous control examination 18x20x23mm). The sizes of left kidney AMLs were 17x22x24mm and 13x16x16mm (previously 18x24x26mm and 14x17x17mm). In addition, the patient has a focal change in the liver (49x40x36mm), most likely focal nodular hyperplasia, optic nerve atrophy, nosebleeds, and petechiae due to IX and XII coagulation factors deficiency. Due to large renal AMLs (>30mm), the patient has been treated with mTOR inhibitors (initially sirolimus for 3.5 years followed by everolimus for 2.0 years), which results in the reduction of AML size.

**Conclusions:** 1. Patients with TSC require multidisciplinary care.
2. Diagnosing TSC as early as possible is crucial to control changes in different organs and prevent severe complications.
3. Treatment with mTOR inhibitors positively impacts many TSC symptoms, including brain and kidney tumors.

**Title:** Many Complications with Pediatric Acute Mastoiditis: A Case Report

**Authors:** Claudia Sieńko (the presenter), Aleksandra Osińska

**Tutor/s:** dr. hab. n. med. Magdalena Woźniak

**Affiliation:** Student Scientific Association at the Department of Pediatric Radiology of the Medical University of Lublin, for tutor: Department of Pediatric Radiology, University Children's Hospital Lublin

**Introduction:** Acute mastoiditis is the most common complication of acute otitis media. Antibiotic therapy, paracentesis, and/or antromastoidectomy with abscess drainage are the primary therapeutic methods, although their application may vary depending on institutional protocols and the severity of the disease. At each stage of the development of acute mastoiditis, further complications such as an epidural abscess may arise. With the formation of an epidural abscess, the risk of thrombosis increases due to venous compression or local inflammatory processes. Issues that may arise in untreated or improperly treated otitis media require a multidisciplinary approach from specialists of medicine.

**Case presentation:** Our case report describes a 2-year-old girl who was admitted to the Emergency Department with a cough, runny nose, ear pain and fever up to 40°C. The patient showed signs of sepsis, such as apathy and pinpoint petechiae on the skin under the left armpit and on the back. Laboratory tests revealed very high inflammatory parameters CRP = 15.79 (normal range 0.00-0.50) PCT = 9.32, as well as prolonged coagulation times and elevated D-Dimers. After an otolaryngological consultation, the patient was diagnosed with acute otitis media. Bilateral paracentesis was performed. Due to the patient's persistent drowsiness and vomiting, CT, MRI and lumbar puncture were ordered. CT imaging revealed a fluid collection near the mastoid pyramid of the left temporal bone, which may suggest an inflammatory lesion or an epidural abscess. The next day, MRI revealed thrombosis of the left transverse and sigmoid sinuses. The patient's treatment began with a left-sided antromastoidectomy. Previously initiated antibiotic therapy was also continued and anticoagulant treatment was introduced. Due to emerging communication problems with the girl, neurological diagnostics were started. Blood was also drawn for molecular testing for thrombophilia.

**Conclusions:** In pediatric patients with acute mastoiditis, it is essential to remain vigilant for complications such as epidural abscess and venous sinus thrombosis. In pediatric patients presenting with fever and symptoms such as neck stiffness, confusion, or seizures, CT and MRI scan should be considered. Early recognition and prompt intervention are crucial in preventing neurological deficits.

**Title:** 11 Recurrent Lower Respiratory Tract Infections In Vacter Association Patient- Underlying Cause And Diagnosis Process

**Authors:** Jagoda Pastucha

**Tutor/s:** dr Izabela Szymońska MD, PhD

**Affiliation:** SKN przy Klinice Chorób Dzieci, UJ CM

**Introduction:** VACTER association is a rare group of birth defects including vertebral anomalies, anal atresia, cardiac defects, tracheo-esophageal fistula, esophageal atresia and renal anomalies. It is reported that as much as 70% of children from this group have tracheal and esophageal defects. Due to congenital anatomical abnormalities and multiple conducted surgeries, the function and the structure of the respiratory tract can be deranged. It leads to recurrent respiratory tract infections- the diagnostic process in groups such as children with tracheo-esophageal defects is complex and multi-stage.

**Case presentation:** A 5.5-year-old boy was admitted to the hospital with signs of pneumonia: cough, dyspnea, rhinorrhea, fever up to 38.3 degrees Celsius, oxygen saturation level at 87%. During auscultation wheezes and crackles were heard. In the USG there were visible inflammatory consolidations in both lungs. One crucial fact is that the patient was born with anal atresia, cardiac defects, tracheo-esophageal fistula and esophageal atresia, classified as VACTER association and treated accordingly. The mother of the patient stated that it was his 11th lower respiratory tract infection in the period of just a few months. Besides correct diagnosis, finding the underlying cause of the infections was needed. A full set of tests was conducted- immunology consultation, bronchoscopy, chest x-ray, esophagography, CT scan, blood tests along with complex medical interview. The tests showed the narrowing of the trachea and tracheomalacia caused by postsurgical changes connected to the tracheo-esophageal fistula and a surgical clip near the aortic arch. It was impairing the effective elimination of the mucus from the respiratory tract which created a perfect environment for the growth of bacteria, leading to infections. The treatment of pneumonia consisted of antibiotics and bronchodilators, the patient left the hospital in good condition with the plan for further consultations.

**Conclusions:** The differential diagnosis process of the cause of recurrent respiratory tract infections is challenging, especially in patients with history of tracheo-esophageal defects. The possibility of the recanalization of the fistula, aspiratory pneumonia, tracheomalacia and narrowing of the trachea must be considered. The chosen case presents perfectly the full standard procedure needed for such differential diagnosis, including imaging tests, medical interview and specialistic consultations.

**Title:** Neurofibromatosis type-1 Familial Case Report: Importance of Genetic Counselling

**Authors:** Fer Florina Iulia, Petchesi Codruta Diana

**Tutor/s:** prof. Codruta Diana Petchesi MD, PhD

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**Introduction:** Neurofibromatosis type 1 (NF-1, MIM #162200), or von Recklinghausen disease, is an autosomal dominant disorder that appears with an incidence of 1:3000 live births. The disease exhibits complete penetrance and variable expressivity. The major clinical features include café-au-lait spots, axillary and inguinal freckling, Lisch nodules, and peripheral neurofibromas.

**Case presentation:** A 9-year-old girl presents to the Department of Genetics for clinical evaluation. Following the medical history, a familial aggregation of NF-1 is discovered (paternal great-grandfather, maternal grandmother, mother and two younger twin sisters).
The clinical examination indicates: multiple café-au-lait spots, the largest having a diameter >10 cm, a chin neurofibroma measuring 0,5/0,5 cm, macrocephaly with a head circumference of 56.5 cm (>95th percentile).
Over time, she develops multiple axillary freckles and subcutaneous neurofibromas. The positive diagnosis is established using clinical criteria. Metaphasic Fluorescence In Situ Hybridization (FISH) was performed using Cytocel probes to detect the deletion of the NF-1 gene (chromosome 17). 15 mitoses were analyzed, all showing two bright signals corresponding to the NF-1 gene. Result: NF-1 clinical criteria met. Analysis using the SALSA MLPA (Multiplex Ligation-dependent Probe Amplification) P082 kit revealed a reduced signal in the chromosomal region 17q11.2 involving the NF-1 gene, exon 19. To confirm the patient's mutation, a molecular test has been recommended, which is currently in progress.
Despite the disease being transmitted through four generations, she is the first to benefit from genetic counselling.

**Conclusions:** In NF-1, clinical manifestations may vary from patient to patient, both inter- and intrafamilial, as well as the disease progression. This index case ,of the 9-year-old girl, experienced a more aggressive progression of the diseases. Genetic counselling is important for providing clarifications regarding the diseases onset, natural evolution of the disease and the recurrence risk for other member of the family.

**Title:** 2 sisters with sex developement disorder (DSD) - sex reversal disorder type 3

**Authors:** Dominik Skoczylas

**Tutor/s:** lek. Ewelina Preizner-Rzucidło, MD

**Affiliation:** 1. University Children's Hospital of Cracow, Poland 2. Student Scientific Group of Medical Genetics, Jagiellonian Medical College, Cracow, Poland

**Introduction:** Often it is hard to indicate the cause of sex reversal due to complex molecular process that may interfere with sex differentiation. NR5A1 pathogenic variants have been associated with a wide range of phenotypes including isolated 46,XY partial and complete gonadal dysgenesis, 46,XY undervirilization, vanishing testes, and male infertility. 46,XX individuals can have premature ovarian insufficiency, and some have been reported to have testicular or ovotesticular DSD. Adrenal insufficiency is a rare finding.

**Case presentation:** Sister 1: Ambiguous genitalia were noted at birth, and throughout initial examination dysgenetic gonads, residual uterus and 46,XY karyotype were found with female phenotype in favour. SRY gene deletion, 9p24 monosomy, Xp21.2-p22.2 duplication, SOX9 gene mutation and AR gene mutation resposible for PAIS/CAIS were excluded. At the age of 4, AMH and inhibin B levels were subnormal – all together corresponded with partial gonadal dysgenesis.

Sister 2: Sister 2 is an older sister who at the age of 15 was admitted to the clinic due to primary amenorrhea. The levels of AMH and inhibin B were subnormal and an irregular mass 24 mmx13 mm within right gonad area – potential atrophic testicle was found in USG and had been confirmed in MRI. Hormonal analysis indicates gonadal dysgenesis (hypergonadotropic hypogonadism and low AMH and inhibin B levels). After the results of genetic tests, the patient was referred for urgent gonadectomy

Within 2 months gap, WES test results for both sisters were completed and showed mutations in NR5A1 gene, which correlates with sex reversal typ 3 and 4. Moreover, sister 1 has been confirmed with single CYP21A2 gene mutation which indicates autosomal recessive CAH (congenital adrenal hyperplasia). Sister 2 has also been confirmed with aforementioned mutations (NR5A1, CYP21A2) and additionally BRCA2 pathogenic mutation was found in sister 2.

**Conclusions:** In the mentioned case, we can see how long the diagnostic path was for the first sister. The use of high-throughput diagnostic methods allows more effective diagnosis and implementation of fast casual treatment. Moreover, the use of techniques based on the analysis of all genes allows for incidental findings that can drastically change the patient's prognosis.

**Title:** Rare coincidence, HLHS accompanied by teratoma

**Authors:** Anna Róg, Milena Wątek

**Tutor/s:** PhD Magda Rybak Krzyszkowska

**Affiliation:** Student Scientific Group of Neonatal Pathology

**Introduction:** Hypoplastic left heart syndrome is a rare but classified as a critical congenital heart defect. Birth prevalence of HLHS is 25 in 100 000 births. Congenital teratomas are rare neoplasms originating from three germ layers occurring in 1 in 40.000 births with girls to boys ratio of 4:1.

**Case presentation:** A 2540 g, male was born a G5P5 neonate, at 37 weeks of gestation via Cesarean section. The Apgar scores were 8 at 1., 3., 5. and 10. minute. During pregnancy mother suffered from hypothyroidism. The prenatal ultrasound of the first trimester had initially indicated a suspicion of hypoplastic left heart syndrome which was confirmed by echocardiography in the second trimester. During screening ultrasound of the second trimester hypoechoic spaces in the pelvic region were noted. The follow-up confirmed the diagnosis of teratoma at 28 weeks' gestation. The baby was admitted to the Intensive Care and Neonatal Pathology Unit after delivery. Features of facial dysmorphia, absence of the right auricle, the presence of a tumor modeling both buttocks and anus were noted. In the abdominal cavity, in the pelvic region, ultrasound examination showed a tumor of about 10 cm modeling the large intestine, urinary bladder, protruding into the spinal canal at the height of S2. The child could not be fed therefore decompressive intestinal probe was applied as the features of transient intestinal obstruction and a trace of interloop fluid was noticed. Alprostadil was included in the treatment. Due to apnea, the dose of alprostadil was reduced and caffeine citrate was administered. Because of dysmorphia the karyotype and microarrays were performed and they revealed no abnormalities. On day 11, a protocol to reduce futile therapy was implemented. Due to the coexistence of 2 major organ defects, with no improvement in the prognosis for distant survival, a team of specialists disqualified the patient from surgical treatment. The same day the patient was pronounced dead.

**Conclusions:** Prenatal screening is paramount in identifying coexistence of rare diseases. Early detection allows for timely planned medical interventions, which can significantly improve the well-being of the newborn and the mother even in such a severe condition.

**Title:** Caecal Duplication As A Rare Cause Of Acute Abdomen: Case Report

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**Tutor/s:** Dr. Anete Rozentālberga

**Affiliation:** 1 Rīga Stradiņš University, Riga Latvia // 2 Children's Clinical University Hospital, Riga, Latvia

**Introduction:** Gastrointestinal duplications are rare congenital malformations with reported incidence of 1:4500 births, and caecum is one of the most infrequent localisation of this anomaly, occurring in only 3% of gastrointestinal duplications in children (Stringer, M.D., et al., 1995). As the clinical presentation and medical imaging is non-specific, often delaying the diagnosis, we present a rare case of caecal duplication to raise awareness on this topic.

**Case presentation:** Seven months old male presented with episodic abdominal pain, frequent vomiting after feeding, feeding failure and constipation for three days. Motor and cognitive development was adequate but the patient was lethargic. No remarkable changes in laboratory testing were found. Similar symptoms were reported at four months of age but as there were no indications for acute surgical pathology from abdominal x-ray imaging, the symptoms were relieved by an enema and the patient was discharged.
This time the abdominal ultrasonography suspected an intussusception combined with volvulus and a cystic mass of uncertain aetiology in the left hypogastric region. The same day, on laparotomy, an ileocaecal intussusception, 7 to 8 cm long, was found and resolved. Consequently, a palpable mass, approximately 3 cm x 2.5 cm, in caecum was detected and an ileocaecal resection with end-to-end anastomosis was performed. Histologically an enterogenic, caecal duplication cyst was confirmed. Post-operative course was uneventful, feeding per os was gradually resumed on the 2nd postoperative day and on the 8th postoperative day the patient was discharged.

**Conclusions:** The presented case highlights the diagnostic challenges of caecal duplication anomaly requiring multiple visits at the emergency department. Despite having a non-specific presentation, a high suspicion of congenital malformations is recommended in young children with recurrent gastrointestinal symptoms and otherwise unaltered laboratory testing. Early recognition and intervention can significantly impact patient outcomes.

**Title:** Difficulties in using therapeutic hypothermia in newborns with congenital anaemia due to fetomaternal haemorrhage - case series

**Authors:** Julia Seidel

**Tutor/s:** Joanna Puskarz-Gąsowska MD, PhD

**Affiliation:** Department of Neonatology and Neonatal Intensive Care, Medical University of Warsaw, 00-315 Warsaw, Poland

**Introduction:** Fetomaternal haemorrhage (FMH) refers to entry of foetal blood into maternal circulation before or during delivery. Massive FMH can cause severe congenital anaemia and may result into hypoxic ischaemic encephalopathy. This may lead to profound neurologic sequalae. The recommended treatment, reducing neurological complications, is the therapeutic hypothermia.

**Case presentation:** The aim of the study is to compare outcomes and difficulties in qualification to therapeutic hypothermia in newborns with FMH and severe congenital anaemia.

Our study group consisted of two female and one male infants. All newborns were delivered via caesarean section due to abnormalities visible in KTG and decreased foetal movements. Directly after delivery they required sustainable inflation and breathing support, presented with paleness, metabolic acidosis, and severe anaemia with HgB < 3g/dL. FMH was confirmed in all infants and estimated as higher than 200 ml.

Blood transfusion was necessary in all cases, which delayed possibility of therapeutic hypothermia (possible to 6th hour of life).

1st newborn, presenting neurological abnormalities, was qualified to therapeutic hypothermia - was treated for 72 hours (recommended time) without any complications. She was discharged from hospital with no significant brain damage visible in diagnostic imaging.

2nd newborn presented with dysmorphic features, transitional hypotension, oliguria and features of pulmonary hypertension. Despite serious condition he was qualified to therapeutic hypothermia. Brain US and EEG remains abnormal. Hypothermia had to be stopped due to his worsening state. Newborn's parameters were deteriorating in the next days and did not respond to treatment. Death occurred on the 4th day of life.

3rd newborn presented with circulatory centralisation, pulmonary hypertension, oliguria, increasing oedemas and features of hypovolemic shock. Due to unstable state of infant and prematurity she was disqualified from therapeutic hypothermia. The infant presented seizures visible in EEG, features of brain atrophy and periventricular malacia lesions in brain US. In the

control MRI (2nd month of life) she presented subarachnoid and brain tissue bleeding, extensive ischaemic and post-hypoxic changes in whole brain.

**Conclusions:** Usage of therapeutic hypothermia can prevent serious neurological complications, but procedures required in treatment of congenital anaemia and severe state of infants may prevent it from being carried out.

**Title:** Dysmorphic patient with CHD1 gene variant - case report

**Authors:** Zofia Golińska 1, Justyna Chomej 1

**Tutor/s:** Ewelina Preizner-Rzucidło MD 2

**Affiliation:** 1 Students' Scientific Group of Clinical Genetics, Jagiellonian University Medical College in Cracow 2 University Children Hospital in Cracow

**Introduction:** Mutations in chromodomain helicase DNA binding protein 1 (CHD-1) gene are associated with Pilarowski-Bjornsson syndrome (PBS). It is a rare autosomal dominant disorder characterized by intellectual disability, growth retardation, developmental delay and craniofacial dysmorphism.

**Case presentation:** An infant from pregnancy I, delivery I, complicated by hypothyroidism, was born by caesarean section in the 38 Hbd. Patient's APGAR score was 9/10, birth weight and measurements were within the normal range. Prior to birth, at 17 weeks of gestation amniocentesis was performed, after 1st trimester prenatal ultrasound revealed fetal hydrops and thickened nuchal translucency. Amniocentesis revealed normal male karyotype of 46, XY. The newborn presented with hydrops, left-sided cryptorchidism and signs of hypertrophic cardiomyopathy. DNA screening analysis for selected microdeletions (MLPA) showed no abnormalities.
Due to a history of fetal hydrops, growth restriction, heart defect and particular dysmorphia, all characteristic for Noonan syndrome, Sanger sequencing was performed, revealing no mutations in exons of PTPN11 gene.
Microarray test revealed duplication of 6q16.3 region, which has maternal origin and is unlikely to influence patient's phenotype.
At the age of 10, patient presented with growth disturbance and dysmorphia similar to Noonan syndrome. His intellect and social skills were not impaired.
Diagnostic panel NGS (Next Generation Sequencing) concentrated on RASopathies was performed due to Noonan-like symptoms and showed no point mutations.
Then Whole Exome Sequencing test showed no pathogenic or potentially pathogenic variant, but among variants of unknown significance one likely benign intronic variant of CDH1 gene, not yet reported in databases, caught attention due to overlapping patient's phenotype.
Patient shows external features of PBS such as growth retardation, depressed midface, downslanting palpebral fissures and flared eyebrows, but his development and intellect remain unaffected. Mutation has not been detected in neither of patient's parents, confirming its „de novo" character.

**Conclusions:** So far, less than 10 cases of PBS have been described, as the final diagnosis takes years to develop and rarely completely explains patients' phenotypes, which variability can be associated with reduced gene penetration. Phenotype of presented patient is not consistent with reported PBS manifestation and its link with the newly discovered CHD1 mutation remains unclear.

**Title:** Down Syndrome, Leukemia, and Facial Nerve Paralysis - Clinical, Diagnostic, and Therapeutic Analysis of a case of a 3-year-old girl with an exceptional triad of symptoms

**Authors:** Natalia Zamorska (presenter), lek. Gabriela Mielecka-Jarmocik

**Tutor/s:** Małgorzata Czogała, PhD, MD

**Affiliation:** SSG of Pediatric Oncology & Hematology in JU CM

**Introduction:** Acute leukaemias are among the most common childhood cancers. Down syndrome is a significant risk factor for developing acute leukemia, notably increasing the likelihood of both ALL and AML. Facial nerve paralysis is an atypical manifestation of childhood leukemia. This neurological symptom (in the paediatric population predominantly idiopathic) may accompany viral infections, head trauma, or has a congenital nature. It may also coexist with tumors (and even be one of the first manifestations of the proliferative process). In this case study, we explore the complex interplay between these conditions in a 3-year-old girl who presented to the Emergency Department with facial asymmetry, heralding a cascade of diagnostic and therapeutic interventions.

**Case presentation:** A 3-year-old patient with phenotypic features of Down syndrome was brought to the Emergency Department due to facial asymmetry that appeared on admission in the morning and worsened in the subsequent hours. Due to the drooping of the right corner of the mouth and the inability to close the right eye, suspicion of peripheral facial nerve paralysis was raised. Additionally noted in the physical examination were bruises on the thighs and shins, small individual petechiae on the face, eyelid swelling, enlarged lymph nodes, and hepatomegaly. Diagnostic workup began with neurological consultation and imaging studies. CT imaging revealed inflammatory changes in the maxillary sinuses, mastoid processes, and tympanic cavities, with no significant pathologies described. Basic laboratory tests in the ED showed high leukocytosis, thrombocytopenia, and slightly elevated CRP. Further diagnostic procedures (bone marrow aspirate showing 89.7% blasts, cytogenetic, immunophenotypic, and molecular studies) led to the diagnosis of acute lymphoblastic leukemia (ALL) pB "common" with partial CD33 co-expression. Due to facial nerve paralysis, involvement of the central nervous system by the proliferative process was confirmed (CNS status 3c). Treatment was initiated and continued based on the AIEOP-BFM ALL 2017 Protocol. Thanks to steroid therapy (as part of the induction treatment), the symptoms of facial nerve paralysis quickly resolved.

**Conclusions:** The convergence of Down syndrome, leukemia, and facial nerve paralysis presents a unique and challenging clinical scenario. Therefore, it is crucial for doctors to be aware of the neurological symptoms of leukemia and consider such a diagnosis in the differential diagnosis of facial nerve paralysis. Diagnostic vigilance can prevent patients from suffering the consequences of delayed diagnosis.

**Title:** Association between maternal SARS-CoV-2 infection and fetal Juvenile Xantogranuloma : Case Report

**Authors:** Oriana Dziechciarz, Oliwia Kałwak, Martyna Berej

**Tutor/s:** PhD Beata Borek-Dzięcioł

**Affiliation:** Student Scientific Association ProNeo at the Department of Neonatology and Rare Diseases, Medical University of Warsaw, Poland Head of Department: prof. dr hab. n.med. Bożena Kociszewska-Najman

**Introduction:** Juvenile Xanthogranuloma (JXG) is a rare, benign condition originating from a group of histiocytosis from cells other than Langerhans. The pathogenesis of JXG has not been definitively explained.. There is a suspected association between JXG and viral infection. It most commonly presents as yellow-brown nodules or papules, mainly occurring on the face, neck, and trunk. Involvement of other systems is rare and most commonly includes the viscera, eyes, lungs, and central nervous system. Cutaneous lesions usually do not require treatment and resolve spontaneously. Systemic JXG is associated with numerous complications and requires intensive therapy.

**Case presentation:** The authors present a case of a male infant delivered at 36 weeks of gestation via caesarean section due to intrauterine foetal asphyxia. During pregnancy, the mother contracted COVID-19, after which foetal oedema appeared. The previous course of pregnancy was uneventful. Following birth, a physical examination revealed a significantly enlarged abdominal circumference, testicular hydroceles and respiratory distress. Abdominal ultrasonography revealed a large volume of fluid in the peritoneal cavity, an abnormal mass in the pancreatic tail, and numerous nodules in the retroperitoneal space. Histopathological examination of the lesions confirmed infiltration of histiocytic cells with a phenotype similar to Juvenile Xanthogranuloma. The infant was referred to a reference centre where he underwent 2 cycles of chemotherapy. A recent PET scan at the age of 2 years did not detect any lesions.

**Conclusions:** The impact of SARS-CoV-2 infection in pregnant women on foetal development remains unclear. The presented case confirms the possibility of a correlation between SARS-CoV-2 infection and Juvenile Xanthogranuloma. Further analysis of case reports of newborns exposed to this infection during foetal life is necessary.

**Title:** Was it only an unfortunate accident?- CASE REPORT

**Authors:** Marcelina Kurek, Aleksandra Ziółkiewicz

**Tutor/s:** dr hab. n. med. Magdalena Chrościńska-Krawczyk, lek. Klaudia Szukała

**Affiliation:** Studenckie koło Naukowe przy Katedrze i Klinice Neurologii Dziecięcej Uniwersytetu Medycznego w Lublinie

**Introduction:** Polyneuropathy is a disease resulting from damage to multiple peripheral nerves. We can divide it into congenital polyneuropathy, which is the main type of polyneuropathy occurring in children, and acquired polyneuropathy, resulting from chronic, emergency conditions. Congenital polyneuropathy can present as a single disease, but can also be part of a complex syndrome of clinical manifestations. Risk factors for development include: toxins, infections, autoimmune reactions and chronic use of medications.

**Case presentation:** A 7-year-old boy was admitted to the Department of Paediatric Neurology after a head injury. He fell while riding his bicycle and complained only about a headache. The boy was transported to hospital, where vomiting and loss of consciousness occurred. In the ED the patient got 6 on GCS. A performed CT scan showed a supratentorial haematoma. After surgery the patient was left in a pharmacological coma. A follow-up CT scan showed a new focus of fresh intracerebral haemorrhage. After four days of hospitalisation, the patient had no abnormalities on neurological examination. 10 days after the operation beginning atrophy of the straight muscles. The boy was not walking, only sitting with assistance. An MRI of the lumbar spine was ordered - it showed no abnormalities. Due to ongoing rehabilitation, the boy was able to improve muscle strength. The patient was able to walk several metres with assistance. While on the ward, a nerve conduction study was also performed, which showed axonal-demyelinating damage to sensory and motor fibres, generalised loss of active sensory fibres and asymmetrical damage to the peripheral motor neuron.

Initial post-accident symptoms did not indicate that the boy might develop motor disorders. A seemingly harmless accident revealed features of sensory-motor polyneuropathy of the demyelinating-axonal type in the patient. This condition is an indication for a WES examination to further the genetic diagnosis to find a possible cause.

**Conclusions:** Post-accident symptoms may obscure the main problem the patient is experiencing. In addition to treating the patient, an overall assessment of the patient's condition is important. It is worth looking at what underlies the disorders at the time of assessment.

# PHARMACY & MOLECULAR BIOLOGY ORAL SESSION

prof. Rafał Olszanecki, MD, PhD
Małgorzata Lasota, MD
prof. Grażyna Chłoń-Rzepa
prof. Aleksander Mendyk, PhD
Leszek Drabik, MD

## Sessions coordinators:

Agnieszka Czapska

Jan Jamroś

# ORIGINAL WORK

**Title**: Developing a new classification model for efficient compound selection with 5-HT2A antagonistic activity.

**Authors:** Aleksandra Rezka

**Tutors:** Jakub Jończyk, PhD; Agnieszka Zagórska, PhD

**Affiliation:** Jagiellonian University Medical College, Faculty of Pharmacy, Chair of Medicinal Chemistry, 9 Medyczna Street, 30-688 Kraków, Poland

**Introduction:** The 5-HT2A receptor is an essential biological target for drugs and drug candidates in treating central nervous system diseases. Antagonism to this receptor is one of the mechanisms of action of atypical antipsychotics, among others, in the treatment of schizophrenia, manic episodes, or bipolar disorder. Using computational methods to find patterns indicating ligands with antagonist activity can effectively accelerate future research in the search for drug candidates and multifunctional ligands.

**Aim of the study:** The study aimed to develop a model to identify and classify potential active 5-HT2A receptor antagonists with diverse chemical structures.

**Materials and methods:** A group of 3931 ligands derived from the ChEMBL database was used to build the model, and the activity of 5-HT2A inhibition was experimentally determined. The group was divided into active (IC50 < 1000nM) and inactive compounds. Compounds were described using descriptors from RDKit, CDK,and Mordred tools. An additional pool of features was obtained after docking the compounds to the active site of the 5-HT2A receptor from the 6A93 complex, using the Glide program (Maestro - Schrödinger). The SMOTE algorithm was used to balance the classes. Four different classification models were trained: linear regression model, decision tree model, random forest, and gradient-boosted trees. In the 5-fold cross-validation process, each model's accuracy, recall, and precision were assessed. Additionally, the ability to distinguish between active and inactive antagonists of the 5-HT2A receptor was assessed on an additional set of 200 ligands structurally different from the training set (Tanimoto similarity > 0.5).

**Results:** The gradient-boosted trees model was the most accurate of the models evaluated. It achieved an accuracy of 0.94 and an AUROC of 0.987 during 5-fold cross-validation. When evaluated using an external dataset, the model demonstrated a consistent accuracy of 0.815.

**Conclusions:** Gradient-boosted trees prove to be highly effective in differentiating between active and inactive 5-HT2A receptor antagonists. The model's robust accuracy across datasets highlights its value in predictive modeling of bioactive compounds.

**Title**: Integration of molecular modeling and machine learning techniques for precise identification of PDE10A inhibitors

**Authors:** Daria Kluzik

**Tutors:** Jakub Jończyk, PhD; Agnieszka Zagórska, PhD

**Affiliation:** Jagiellonian University Medical College, Faculty of Pharmacy, Chair of Medicinal Chemistry, 9 Medyczna Street, 30-688 Kraków, Poland

**Introduction:** Schizophrenia, Huntington's, and Parkinson's pose a long-standing treatment challenge despite research and new antipsychotic medications. Recent studies link higher PDE10A activity to psychiatric disorders, indicating PDE10A inhibitors as promising antipsychotic options. Machine learning boosts the search for bioactive compounds, but creating practical predictive models faces challenges, including the lack of balanced datasets for training on publicly available biological data.

**Aim of the study:** The study focused on developing machine learning models that could precisely detect potential PDE10A inhibitors and analyze the effect of different data sampling approaches on model efficacy.

**Materials and methods:** The training set (4999 ligands) and test set (520) were obtained from the CHEMBL and PubChem databases. The compounds were considered active if their IC50 value was lower than 1000 nM. The compounds were described by molecular descriptors calculated using the RDKit, CDK, and Mordred, as well as descriptors obtained in the docking process (Glide-Schrödinger). The datasets undergo Z-score normalization. The data's disproportionate distribution of active and inactive cases, with a ratio of 10:1, was equalized using one of three approaches: SMOTE, Bootstraping, and Undersampling. For each balancing approach, 4 classifiers were trained: linear regression, decision tree, random forest, and gradient-boosted trees. Genetic Algorithm was applied for feature selection, and hyperparameters were optimized with Bayesian optimisation (TPE). In the process of 10-fold cross-validation, the accuracy and AUROC of the models were assessed.

**Results:** Of all the obtained models, the best one was the Gradient-boosted trees model trained using data undersampling methods. During the 10-fold cross-validation of the training set, accuracy reached 0.79 with an AUROC of 0.87. Predictions for the external test set achieved an accuracy of 0.74 and an AUROC of 0.81. Comparison of data sampling methods showed the advantage of the SMOTE technique when using linear regression models and decision trees. However, random forest and Gradient boosting trees models showed the opposite trend and a significant advantage of the undersampling method.

**Conclusions:** The model we have developed is a useful tool that can enhance the efficiency, accuracy, and cost-effectiveness of identifying new therapeutic agents, ultimately accelerating the development of treatments for diseases influenced by PDE10A activity.

**Title**: Evaluation of Progression-Free Survival in Patients with Metastatic Bowel Cancer After First-Line Systemic Therapy at Pauls Stradiņš Clinical University Hospital from 2018 to 2023

**Authors:** Dina Zaiceva1

**Tutors:** Sigita Hasnere, Dr, 1,2

**Affiliation:** 1 University of Latvia Faculty of Medicine; 2 Pauls Stradiņš Clinical University Hospital

**Introduction:** Colorectal cancer is the third most prevalent cancer type worldwide and the second most common cause of cancer death. Unfortunately, the screening program in Latvia covers only a small part of the target population, resulting in a high primary missed cases (stage III-IV), which significantly complicates and limits treatment. Standard regimens used to treat patients with metastatic colorectal cancer are FOLFOX, FOLFIRI and 5Fu/LV, which probably affects progression-free survival.

**Aim of the study:** The aim of this study was to identify the progression-free survival in patients with metastatic bowel cancer after first-line systemic therapy.

**Materials and methods:** A retrospective study of patients who underwent first-line chemotherapy. Patient data was collected for a period of 5 years.

**Results:** A total of 160 cases were collected – 63% men and 38% women. The mean age of patients was 65.13, SD = 10.122 for men, and 67.42, SD = 11.985 for women. Colorectal cancer incidence varied depending on the primary tumor location: rectum (35%), colon sigmoideum (21%), rectosigmoid region (15%), caecum (8%), colon descendens (7%), colon transversum (6%) and colons ascendens (6%). Additionally 65% presented with liver metastasis, 18% with lung, 10% with peritoneum and 8% with other localization. The results show that there is a statistically significant negative correlation between progression-free survival and systemic therapy ($r_s = -0.287$, $p=0.001$). The most frequently used systemic therapy was a combination of FOLFOX6 and Bevacizumab (30%), with a progression-free survival of 14.2 months. Furthermore there was a weak negative correlation between progression-free survival and grade ($r_s =-0.115$; $p =0.15$). There also is a statistically significant negative correlation between progression-free survival and ECOG ($r_s=-0.172$,$p=0.03$), survival decreases with increasing ECOG.

**Conclusions:** Colorectal cancer demonstrates a higher incidence among men. Systemic therapy choice is influenced by primary tumor localization, grade, and ECOG performance status. These findings underscore the importance of personalized treatment approaches in managing metastatic colorectal cancer.

**Title**: a 3D printed wound dressing with antibacterial effects

**Authors:** Azin Abedi, Jaleh Varshosaz, Faramarz Dobakhti

**Tutors:** Prof.Jaleh Varshosaz

**Affiliation:** Zanjan University of Medical Sciences

**Introduction:** Effective wound dressing not only promotes healing but also prevents infection, reduces pain, and accelerates recovery.

**Aim of the study:** The aim of this study was fabricating a wound dressing via 3D-printing by a bioink composed of alginate , Tragacanth , and the antibacterial agent of zinc oxide nanoparticles .

**Materials and methods:** The dressing was fabricated via 3D printing technique by incorporation of ZnO NPs in a solution of Alg and TG by a 3D extrusion bioprinter using CAD design. The printed scaffolds were then cross-linked by a 2% CaCl2. Surface of the Alg, Alg-TG and Alg-TG-ZnO 3D-printed scaffolds was observed via SEM and EDX mapping. FTIR, swelling ratio, degradation rate, tensile profile and water vapor permeability were studied. The release rate of zinc ion from the scaffold was determined by Inductively Coupled Plasma Spectroscopy (ICP) method. Disc diffusion method assessed antibacterial effects of the scaffolds on E. coli and S. aureus by agar plate method.

**Results:** The results showed all 3D printed scaffolds had a smooth surface, and addition of TG decreased the thickness slightly while size of macro pores increased. Alg, Alg-TG, and Alg-TG-ZnO scaffolds all had swelling ratios more than ~175% and increasing degradability over 7 days. The water vapor permeability was about 3×10-6 g.h-1.cm-3.mmHg-1 and not significantly different in scaffolds. The release of zinc from Alg-TG-ZnO was measured to be 23.8±2.7 ppm after 7 days. Alg-TG-ZnO had a tensile strength and Youngs' modulus of 0.25±0.05 and 1.16±0.21 MPa, respectively, which were significantly ($p<0.05$) more than Alg scaffold. Printed Alg scaffold had not any antibacterial activity, after addition of TG the antibacterial activity impressively increased against both E. coli and S. aureus. Addition of ZnO further improved the antibacterial activity, which was impressively ($p\leq0.0001$) higher than Alg-TG.

**Conclusions:** Alg-TG showed to be a suitable bioink for 3D printing. ZnO NPs were useful as antibacterial agent since they are highly biocompatibile with human cells. TG is also reported as a biodegradable, non-allergenic, non-toxic, and non-carcinogenic material with excellent antibacterial activity.

**Title**: Synthesis of NLX-219 analogs containing new structural bicyclic motif.

**Authors:** Olga Ostrowska

**Tutors:** Beata Gryzło PhD, prof. Marcin Kołaczkowski PhD

**Affiliation:** Jagiellonian University Medical College, Faculty of Pharmacy, Chair of Medicinal Chemistry, 9 Medyczna Street, 30-688 Kraków, Poland

**Introduction:** 5-HT1A receptors have a significant impact on CNS functions, such as mood or pain perception. However, among the currently approved therapeutics acting on this target, there are none that are fully selective and therefore entirely free from side effects arising from off-targets. Moreover, none of them are functionally selective, which limits their efficacy. A notable exception here are the derivatives of benzoilpiperidinemethanamine, such as NLX-101, NLX-204 or NLX-219. These investigational drugs are highly selective biased agonists of the 5-HT1A receptor, showing a marked preference for ERK1/2 phosphorylation versus other signaling pathways. Functionally selective stimulation of the 5-HT1A receptor can bring many benefits in conditions such as depression, anxiety, schizophrenia, or Parkinson's disease. Therefore, we have decided to focus on the synthesis of novel derivatives of one of the highly selective biased agonists, NLX-219.

**Aim of the study:** The aim of the presented work was to synthesize a small series of NLX-219 analogs, based on the spirobicyclic central scaffold, replacing the methylpiperidine core. The new compounds will be commissioned to physicochemical and pharmacological studies, to assess the effect of the bioisosteric replacement on their drug-likeness, affinity, target selectivity, and functional selectivity.

**Materials and methods:** The desired compounds have been synthesized via a three-step reaction pathway. The first step involved the alkylation of a commercially available N-Boc-protected spirocyclic derivative, using three different benzoyl derivatives. Subsequently, the amino group was deprotected, followed by alkylation of each derivative with either previously synthesized 2-bromoethoxybenzene or 1-(2-bromoethoxy)-2-methoxybenzene. The final step underwent preliminary optimization, with microwave heating applied under solvent-free conditions and with DMSO as a solvent.

**Results:** We obtained five spirocyclic derivatives and optimized the reaction conditions for alkylation to minimize competitive reactions such as bisalkylation and decomposition of the desired compound.

**Conclusions:** The proposed approach provides a reliable method for obtaining new NLX-219 analogues, from commercially available N-Boc-protected spirocyclic amine, with high yields.

**Title**: Synthesis of chiral 2-(iodomethyl)- and 2-(aminomethyl)- benzodioxane, a crucial building block for derivatives possessing high and selective affinities for D2-like and 5-HT1A receptors.

**Authors:** Jakub Sroka, Karolina Pazdan, Dr Beata Gryzło, Dr Anna Czopek

**Tutors:** Dr hab. Agnieszka Zagórska, Prof. dr hab. Marcin Kołaczkowski

**Affiliation:** Jagiellonian University Medical College, Faculty of Pharmacy, Chair of Medicinal Chemistry, 9 Medyczna Street, 30-688 Kraków, Poland

**Introduction:** For years, research has been conducted on molecules interacting with dopamine D2 and serotonin 5-HT receptors. Despite many of them being used today in the therapy of CNS diseases, such as psychosis, mania and bipolar affective disorder, they are still burdened with numerous adverse effects. Therefore, it is crucial to seek new structures exhibiting high selectivity, including functional selectivity, towards these receptors. One of such ligands is SSR181507, which possesses high and selective affinities for both D2-like and 5-HT1A receptors. It was proposed as a drug for schizophrenia with additional anxiolytic properties. SSR181507 contains a 1,4-benzodioxane moiety, which has become a widely used motif in active derivatives. The 1,4-benzodioxane moiety also occurs, among others, in JNJ-26489112, an anticonvulsant compound with additional carbonic anhydrase II inhibitory activity, and in compound WB4101, the first selective antagonist developed for the α1B-adrenergic receptor.

**Aim of the study:** The aim of the study was to synthesize the chiral 2-(iodomethyl)- and 2-(aminomethyl)- benzodioxane, a building block for further synthesis of derivatives with potential biological activity, primarily towards the central nervous system.

**Materials and methods**: 1,4-Benzodioxane derivatives have been obtained in a four-step synthesis. First, 5-chlorosalicylaldehyde has been alkylated with (R)-oxiran-2-ylmethyl-4-methylbenzenesulfonate. Then, by the Baeyer-Villiger reaction, the oxygen atom was inserted. The resulting ester was cyclized to (S)-(2,3-dihydro-1,4-benzodioxin-2-yl)methanol, following the Mitsunobu reaction, leading to the desired 2-aminomethyl derivative. Lastly, as a result of activation of the (S)-(2,3-dihydro-1,4-benzodioxin-2-yl)methanol derivative and subsequent substitution, 2-iodomethyl derivatives were obtained.

**Results:** Chiral iodo and amine derivatives of 1,4-benzodioxane were successfully obtained and can be used as nucleophiles and electrophiles in the further synthesis of compounds with potential activity in the CNS.

**Conclusions:** We have established that the four-step synthesis presented herein can be used as scalable method for obtaining the chiral benzodioxane-based building blocks, which are widely used in the synthesis of pharmacologically active compounds.

**Title**: Evaluating the antiamnestic potential of the novel 2-methoxyphenylpiperazine derivative, HBK-14, against scopolamine- and MK-801-induced memory deficits in mice

**Authors:** Filip Kosior1, Henryk Marona2, Anna Janus1

**Tutors:** Klaudia Lustyk1 PhD, Karolina Pytka1 prof., post. doc., PhD

**Affiliation:** 1Department of Pharmacodynamics, Faculty of Pharmacy, Jagiellonian University Medical College, Cracow, Poland 2Department of Bioorganic Chemistry, Chair of Organic Chemistry, Faculty of Pharmacy, Jagiellonian University Medical College, Cracow, Poland

**Introduction:** Deficits in cognitive functions, such as attention, memory, and executive functioning, worsen symptoms of depression impairing coping mechanisms, problem-solving abilities, and adaptive behaviors. Additionally, they can persist even after depressive symptoms improve with treatment. This negatively affects patients' recovery and reduces the effectiveness of antidepressant therapies. In our previous study, HBK-14, which acts as a dual antagonist of 5-HT1A and 5-HT7 receptors, has demonstrated promising antidepressant-like and anxiolytic-like properties in mice.

**Aim of the study:** Building upon these findings, we aim to investigate its antiamnesic potential using the object recognition test and inducing memory impairments through two different mechanisms.

**Materials and methods:** Male CD-1 mice were subjected to the object recognition test. Twenty-four hours after the familiarization phase, we measured the time mice spent exploring the novel object. To induce cognitive deficits similar to those observed in neuropsychiatric disorders, we used a muscarinic receptor antagonist- scopolamine, and an NMDA receptor antagonist- MK-801. HBK-14's was administered at doses 0.625, 1.25, and 2.5 mg/kg, and its ability to reverse cognitive deficits was evaluated. Additionally, we used rivastigmine as a reference compound.

**Results:** Our results indicated that scopolamine and MK-801 effectively induced long-term recognition memory impairments in mice. Although HBK-14, at the dose of 2.5 mg/kg for scopolamine-induced memory impairments and 1.25 mg/kg for MK-801-induced cognitive deficits, showed a tendency to mitigate recognition memory impairments, the effects did not reach statistical significance.

**Conclusions:** These findings underscore the need for further investigation into the pharmacological activity of HBK-14. Its dual-action profile holds promising prospects for advancing therapeutic strategies in the treatment of neuropsychiatric disorders accompanied by cognitive deficits.

**Title**: Pharmaceutical gummies as an extemporaneous platform for the administration of modified release pellets to pediatric patients.

**Authors:** Magdalena Piergies, Kinga Krupa, Gabriela Florek, Martyna Ihas, Dziyana Hliabovich, Kamila Odbierzychleb

**Tutors:** Witold Brniak PhD, Jagiellonian University, Department of Pharmaceutical Technology and Biopharmaceutics

**Affiliation:** SSG of Pharmaceutical Technology

**Introduction:** With the growing challenges in administering medications to pediatric populations, the development of suitable dosage forms becomes imperative. Omeprazole, a proton pump inhibitor, is available only in form of capsules with delayed-release pellets, making its administration to pediatric patients very challenging, because it requires modification of the dosage form. Therefore, the development of more palatable and easy to swallow formulations suitable for children is necessary.

**Aim of the study:** The aim of this study is to evaluate the possibility of incorporation of delayed release omeprazole pellets into pharmaceutical gummies.

**Materials and methods:** Omeprazole-loaded pellets extracted from commercial capsules were used for the formulation of gelatin-based gummies. Gelatin mass with maltitol, sucrose, glycerol and lemon flavor was prepared as a carrier for pellets. After pouring 2,5 mL of this mass into cylindrical forms, pellets with 5 mg of omeprazole were suspended in each unit. The mass was cooled to solidification and then withdrawn from the form and dried for 1 h in a laboratory dryer to form gummies. Dissolution tests for the prepared gummies and reference capsules were carried out with an apparatus type II in 0,1 mol / L of HCl and in phosphate buffer pH = 7,2.

**Results:** The average omeprazole content in one gummy was 5,37 mg. The amount of released omeprazole in the acid stage from capsules was less than 1%, while it increased significantly after the incorporation of pellets into the gummies. The value was 12,21%, which still did not exceed the USP limit. The dissolution of omeprazol in the buffer stage in both forms was completed in about 30 minutes. Analysis of the effect of chewing on omeprazole release showed an increase of approximately 20% in the first stage of dissolution, but after 1 h it was invisible.

**Conclusions:** The results of the study proved that pharmaceutical gummies are convenient platform for the extemporaneous preparation of the dosage form with omeprazole, which may be convenient for the pediatric patients.

**Title**: Brain-Derived Neurotrophic Factor in Multiple Sclerosis Disability: A Prospective Study

**Authors:** Gheorghe-Eduard Marin, Cristina Nistor, Olga Maria Iova, Stefan Cristian Vesa, Silvia Ilut, Dorian Traian Nistor

**Tutors:** Prof. Fior-Dafin Muresanu MD, PhD, MBA. Lecturer Vacaras Vitalie MD, PHD.

**Affiliation:** Neurology Department, Cluj Emergency County Hospital, 400012 Cluj-Napoca, Romania. Department of Neurosciences, Faculty of Medicine, Iuliu Haţieganu University of Medicine and Pharmacy, 400012 Cluj-Napoca, Romania

**Introduction:** Multiple sclerosis (MS) is an autoimmune demyelinating disease of the central nervous system, and it represents the most common non-traumatic disease that causes neurological disability in young people.
Brain-derived neurotrophic factor (BDNF) is a common neurotrophic component of the CNS, with important roles in the development of the nervous system, as well as in supporting neuron survival, neurogenesis, neuroplasticity.

**Aim of the study:** The aim of the study was to asses the viability of BDNF as an easy to use biomarker for assessing the clinical and/or paraclinical severity of MS. Additionally, we wanted to see if BDNF could be used as a biomarker for disease remission/activity.

**Materials and methods:** The study was designed as a case-controlled, longitudinal, prospective study. 63 recently diagnosed MS patients, as well as 16 healthy controls were enrolled. Baseline BDNF values were measured for all participants, with clinical and paraclinical disease severity assessed for all MS patients. At a follow-up 12 months later, everything was reassessed, and BDNF remeasured.

**Results:** Baseline BDNF did not significantly differ between MS patients and healthy controls at baseline. However, after a year, BDNF of values of healthy controls were significantly lower than those of MS patients ($p=0.03$).
Clinical and paraclinical disease severity did not seem to be correlated with BDNF values.
Treatment did reduce BDNF values after a year ($p=0.001$), however treatment type (Teriflunomide vs interferon) did not influence the reduction ($p=0.45$).

**Conclusions:** BDNF as a diagnostic marker remains controversial, due to inconsistent results in the literature. Considering that our study found no significant link between BDNF and the severity of the disease, and the fact that BDNF values can be influenced by other factors, such as intense physical activity or the season, its value as a diagnostic marker is questionable.
However, it could still serve a role as a monitoring marker in order to assess the effectiveness of treatment and induction of remission. This use needs to be validated in future studies.

**Title**: Research on the effectiveness of ceftazidime-avibactam in combination with aztreonam for treatment of infections caused by carbapenemase-producing Klebsiella pneumoniae.

**Authors:** Oliwia Cepok, Tomasz Kliś, Agnieszka Kozioł

**Tutors:** Aldona Olechowska-Jarząb PhD, Iwona Skiba-Kurek PhD

**Affiliation:** Students' Scientific Society of Pharmaceutical Microbiology, Department of Pharmaceutical Microbiology, Jagiellonian University Medical College

**Introduction:** Growing drug resistance of microorganisms is one of the most significant problems. An increasing number of bacterial strains produce carbapenemases, which break down carbapenems. Infections caused by carbapenemase-producing Klebsiella pneumoniae contribute to prolonged hospitalization, increased mortality and the quantity of antibiotics taken. Therefore, new therapeutic methods are being sought to treat these infections effectively.

**Aim of the study:** The aim of the study was to compare three methods for detecting synergy between ceftazidime-avibactam and aztreonam using various screening assays to identify rapid and easily performable screening tests applicable in hospital laboratories. The goal is to enable more effective therapy for infections caused by carbapenemase-producing Klebsiella pneumoniae.

**Materials and methods:** The strains Klebsiella pneumoniae NDM-positive or NDM/OXA-48-positive were isolated from clinical samples. Suspended strains with a density of 0.5 McFarland were cultivated and tested for the synergistic effect of ceftazidime-avibactam and aztreonam using methods:
Method 1: A strip containing ceftazidime-avibactam was applied to MHA, and a disk soaked in aztreonam was placed 1.5 cm away.
Method 2: A strip containing aztreonam was applied to MHA, incubated for 10 minutes at room temperature, then the strip was removed, and a strip of ceftazidime-avibactam was placed in its position. The Fractional Inhibitory Concentration index was calculated.
Method 3: Two antibiotic gradient strips were applied to the MHA, placed at a 90 degree angle to intersect within the MIC values predetermined for each antibiotic individually. The fractional inhibition concentration index was calculated.

**Results:** All the methods used were comparable. Synergism based on the determined FIC was confirmed in all strains tested (12/14 strains tested) that were individually resistant to aztreonam and ceftazidime/avibactam. In two cases there was no synergistic effect with the described methods, but this was not confirmed by the microdilution method. Our results for 12 of the 14 isolates tested were in agreement with the reference microdilution method.

**Conclusions:** It is important to implement targeted therapy that effectively treats strains with specific antibiotic resistance profiles. This study outlines simple, cost-effective, and reliable methods that have the potential to improve the quality of treatment. The methods used may provide an alternative to the evaluation of the synergistic effects of antibiotics, which can be used on a routine diagnostic.

# CASE REPORT

**Title:** The role of cytogenetic aberrations in acute myeloid leukemia – a patient with FLT3 tandem duplication and a pathogenic variant of the DXX41 gene

**Authors:** Weronika Ploch1

**Tutor:** Marcin Jasiński MD2

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**Introduction:** Cytogenetic aberrations play an essential role in the pathogenesis of many malignancies including acute myeloid leukemia (AML), originating from hematopoietic stem cells (HSC). As the availability of Next-Generation Sequencing (NGS) is rising, it should be used for risk classification based on 2022 European LeukemiaNet guidelines.

**Case presentation:** A 47-year-old woman had been suffering from recurrent respiratory infections for 2 months. Blood count revealed pancytopenia and she was admitted to the Department of Hematology, Transplantation, and Internal Medicine with the suspicion of leukemia.
There were 6% blasts in her peripheral blood suggesting the diagnosis of AML. It was confirmed by a bone marrow biopsy with 48,3% blasts. RT-PCR showed a tandem duplication of the FLT3 gene and the NGS revealed a pathogenic variant of the DXX41 gene. It is usually a germline mutation, but in this case the variant allele frequency was only 18% and testing other tissues was not available, so it was more likely a somatic mutation.
The patient was classified as intermediate-risk and qualified for induction chemotherapy with DA60 protocol (daunorubicin on days 1–3, cytarabine on days 1–7) with midostaurin. After 31 days bone marrow biopsy results indicated, she did not go into remission and the second-line treatment was initiated. She achieved complete remission after the FLAG-IDA (fludarabine, cytarabine, idarubicin, and granulocyte colony-stimulating factor) protocol and was prepared for HSC transplantation. Her brother was verified as a HLA match for her. Before the procedure, his DXX41 gene needed to be tested, as it was not confirmed whether her mutation was somatic or germline. Moreover, her father died of lymphoma, suggesting an inherited predisposition. After 2 months her bone marrow consisted of 100% donor cells and she started consolidation therapy with azacytidine. Unfortunately, her residual disease assessment revealed 6% marrow involvement, therefore she needs further treatment with sorafenib.

**Conclusions:** Patients with AML with FLT3 tandem duplication have a higher risk of a relapse and sorafenib might be a remedy for them. If there is a chance the patient has a germline mutation, a related donor must undergo genetic testing before the transplantation procedure.

**Title: A Clinical Case on Toxic Epidermal Necrolysis Triggered by Lamotrigine**

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**Introduction:** Toxic epidermal necrolysis (TEN) represents a rare but severe cutaneous adverse reaction characterized by widespread epidermal detachment, with mortality rates ranging from 14.8% to 48% [Wasuwanich P, 2023]. It is predominantly associated with medications and presents a significant clinical challenge due to its rapid onset and potential life-threatening complications. Lamotrigine is an antiepileptic and mood-stabilizing agent commonly prescribed for epilepsy and bipolar disorder (BPD). The administration of it‘s initial doses or rapid escalation of dosage is linked to TEN, which commonly occurs within 8 weeks of treatment [Frey N, 2017]. We present a clinical case of patient with multidrug regimen for BPD treatment and lamortrigine recognized as trigger of TEN.

**Case presentation:** A 24-year-old female patient referred to the clinic due to a four-day fever up to 38.5$^0$C, sore throat, and a widespread maculopapular rash with detached skin, erosions, and crusts on the oral mucosa, also genitals (85% body surface area involved), Nikolsky sign positive. TEN-specific severity of illness score (SCORTEN) was 1. Culture revealed Candida albicans in oral mucosa, Staphylococcus aureus on the eyelids, and Pseudomonas aeruginosa from buttock erosions. Histology confirmed the signs of TEN: widespread keratinocytes necrosis, separation of epidermis, mixed inflammatory infiltrate. The patient had a history of BPD, managed with sertraline and alprazolam. Eighteen days prior to presentation, lamotrigine was added at a dosage of 200 mg/day. The latter was identified as the causative agent for TEN and was promptly discontinued. The patient improved after three days of pulse therapy with 500 mg/day of methylprednisolone, followed by two weeks of supportive care. This included antibiotics (vancomycin, ceftazidime, ciprofloxacin), intravenous fluids and electrolytes, nutritional support, prophylactic anticoagulation, opioids for pain management, local skin care with paraffin-based dressings and antiseptics.

**Conclusions:** The patient's TEN acute phase didn’t lead to severe complications due to timely identification of the causative agent, a low SCORTEN, the patient's young age, and absence of comorbidities. A multidisciplinary approach is essential in prescribing tailored supportive TEN’s care, also in reconciliation BPD management. Supervised by a clinical pharmacologist, psychiatrist, and dermatovenerologist, the patient was advised to continue lithium for BPD control.

**Title:** Transplant-Associated Thrombotic Microangiopathy as a Consequence of Graft-versus-Host Disease and Cyclosporine Administration after Hematopoietic Stem Cell Transplantation

**Authors:** 1Nika Sutara, 1Nina Špiljak – Vučinović

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**Introduction:** Transplant-associated thrombotic microangiopathy (TA-TMA) is a serious complication that can occur after hematopoietic stem cell transplantation (HSCT). It is characterized by microangiopathic haemolytic anaemia and thrombocytopenia, resulting from endothelial dysfunction and complement activation, leading to formation of microthrombi. Among the numerous predisposing factors for TA-TMA, graft-versus-host disease (GVHD) and the use of immunosuppressive medications have emerged as significant risk factors.

**Case presentation:** A 29-year-old male was admitted to the haematology department on suspicion of acute leukaemia and after diagnostic work-up T-cell acute lymphoblastic leukaemia was confirmed. Following diagnosis, the patient underwent induction and consolidation therapy which were well-tolerated. The patient proceeded to receive conditioning regimen containing total body irradiation followed by allogeneic hematopoietic stem cell transplantation from a haploidentical male donor. The transplant procedure was uneventful, but post-transplant complications included post-radiation parotitis, sepsis, and acute GVHD affecting the skin and intestines which responded to first line treatment with cyclosporine. Two months post-transplant patient presented with hypertension (163/116 mmHg), proteinuria, thrombocytopenia (<5 x 109/L), anaemia (Hb 96 g/L), elevated LDH levels (758 U/L), and high urea (13,3 mmol/L) and creatinine (125 mol/L) levels so TA-TMA was suspected. Patient tested negative for CMV, EBV and HHV-6 infections, direct and indirect Coombs test were negative and ADAMS13 activity was slightly reduced, so other aetiologies were ruled out and TA-TMA was confirmed. The patient's complement profile analysis revealed normal complement parameters, rendering him unsuitable for potential targeted eculizumab therapy. Therefore, supportive measures were provided as main treatment, including red blood cell and platelet transfusions, granulocyte colony-stimulating factor (GCSF) administration, and regular fresh frozen plasma infusions. The cyclosporine therapy was discontinued, and ruxolitinib was administered instead. With multidisciplinary management renal function normalized, blood count improved, and the patient's overall condition stabilized.

**Conclusions:** Distinguishing TA-TMA from other conditions with similar clinical features poses a diagnostic challenge as its clinical presentation is highly variable. Recognizing this pathology in patients who presented with GVHD and those on cyclosporine therapy, particularly those with elevated blood pressure and proteinuria, is essential. While therapy primarily remains supportive, early suspicion and interventions are vital to prevent negative outcomes, as TA-TMA can impede recovery and raise mortality rates.

**Title:** Off-label drug use series: A rare case of a malignant benignancy

**Authors:** Hugo Gea Campillo, Andrea Toth, Mate Adam Balazs

**Tutor:** Prof. Dr. Magdolna Dank M.D., Ph.D

**Affiliation:** Semmelweis University, Faculty of Medicine, Department of Internal Medicine, Oncology Unit, Pharmacovigilance and Patient Safety Research Group

**Introduction:** Hemangioblastoma is a rare, highly vascularised, benign neoplasm. This type of tumours mostly develop in the central nervous system (CNS) and can be associated with Von-Hippel Lindau Syndrome. Cerebellum is the most common location in CNS. Although hemangioblastomas are typically asymptomatic lesions, their location; particularly in the central nervous system can lead to complications due to mass effect.

**Case presentation:** We present the case of a 69-year-old male patient diagnosed with a pontocerebellar hemangioblastoma in 2003. The patient received stereotaxic irradiation therapy in 2003; however, after several years of stable disease a control magnetic resonance imaging (MRI) examination in 2011 showed moderate progression of the tumour so another stereotaxic irradiation was performed. In 2014 further progression was revealed and neurosurgery intervention was indicated. Subtotal tumour removal verified the histopathological diagnosis of hemangioblastoma. Between 2014-2017 due to progression of the residual mass, two re-irradiations and one neurosurgery were performed with partial success, as the patient had significant radio-morphological progression in the ponto-cerebellar region and a new lesion in the pons with the potential of brain stem compression in 2020. Patient had the complaint of difficulty swallowing and hoarseness. After several attempts to eliminate the residual tumour mass with surgical interventions and radiotherapy, pharmacotherapy was considered to inhibit the growth of the lesions. Bevacizumab with off-label indication was requested within an individual reimbursement scheme from the National Health Insurance Fund of Hungary. In June 2020 bi-weekly 10 mg/kg bevacizumab with dose escalation was started intravenously with a follow-up brain MRI every 3 months. The treatment was well tolerated and without serious adverse events.

**Conclusions:** 41 months of progression free survival was achieved with off-label drug use of bevacizumab until October 2023. Drug use with off-label indication is frequent in oncology, as it could provide ultimate choice for specific cases without further available therapeutic options. Bevacizumab, a humanized anti-VEGF (vascular endothelial growth factor) monoclonal antibody was chosen with the permission of Hungarian Health Authority based on experimental clinical data and case reports as a therapeutic option of a rare case of complicated hemangioblastoma with unexpected therapeutic success.

**Title:** Off-label drug use series: A rare case of an early onset hepatocellular carcinoma

**Authors:** Julia Rocha Cavalheiro de Almeida, Gyongyver Szentmartoni, Mate Adam Balazs

**Tutor:** Prof. Dr. Magdolna Dank M.D., Ph.D.

**Affiliation:** Semmelweis University, Faculty of Medicine, Department of Internal Medicine, Oncology Unit, Pharmacovigilance and Patient Safety Research Group

**Introduction:** Hepatocellular carcinoma (HCC) is the most prevalent form of primary liver cancer with aetiology of environmental, genetic, and behavioural risk factors. It primarily affects the elderly patient population. Individuals with alcohol disorder, non-alcoholic fatty liver disease and chronic hepatitis B or C infection with subsequent cirrhosis are at an increased risk of developing this malignancy. While the incidence of HCC in young adults is comparatively lower than in older patients, it still occurs, particularly among those with genetic susceptibility or having history of genotoxic exposure. In spite of the increasing number of therapeutic interventions and therapeutic options available, the five-year survival prognosis of HCC remains poor.

**Case presentation:** We present the case of a young female patient who presented with pain in the right hypochondrium in June 2019. The patient has no history of genotoxic exposure or history of hepatitis B or C infection. The patient has a history of oral contraception administration for 2 years. First computed tomography (CT) imaging described a lesion in the S6 of the liver with a diameter of 8,5 cm as a benign focal nodular hyperplasia. Surgical removal was planned but considering the size and perioperative risk, trans-arterial embolization (TAE) was indicated to reduce the size of the lesion. After two TAE treatments the patient experienced progression and biopsy of liver confirmed HCC. Thus, the patient received 22 cycles of atezolizumab and bevacizumab treatment. In February 2022 the CT scan showed progression. According to molecular pathology and genetic testing, olaparib treatment with off-label indication was started within an individual reimbursement scheme from the National Health Insurance Fund of Hungary in August 2022. Olaparib treatment was continued until August 2023.

**Conclusions:** 12 months of progression free survival was achieved with off-label drug use of olaparib. In our case series it was demonstrated that drug use with off-label indications is common in oncology, as it could provide ultimate choice for such cases without further available therapeutic options. Olaparib was chosen based on genetic testing, experimental clinical and ongoing clinical trial data as a therapeutic option of a rare early onset case of hepatocellular carcinoma.

**Title:** Complete response after treatment in a patient with BRAFV600E mutated, microsatellite-instable colon cancer: a medical paradox?

**Author:** Natalia Ostruszka [1]

**Tutor:** Paweł Potocki MD, PhD [1, 2]

**Affiliation:** [1] Jagiellonian University Collegium Medicum [2] Oncology Department at the Jagiellonian University Hospital

**Introduction:** Colorectal cancer (CRC) with indolent clinical course may present with oligometastatic spread, which can be surgically treated yielding results superior to systemic therapy alone. BRAF V600E mutation occurs in 6 - 12% of CRCs and is linked with aggressive clinical course and inferior treatment results. Mismatch repair deficiency (dMMR) commonly coexists with BRAF V600E mutation and is a negative prognostic itself. Optimal management of oligometastatic CRC with aforementioned adverse molecular features is a subject of debate.

**Case presentation:** In 2013 a 66 years old female, with history of smoking and coronary artery disease, underwent diagnostics for malaise, anemia and hematochezia. A colonoscopy revealed a tumor in the sigmoid colon, later verified as adenocarcinoma. As no metastases were apparent, the patient underwent resection of the tumor.

Five months after the procedure her carcinoembryonic antigen level rose. Positron emission tomography with fluorodeoxyglucose revealed a mass in the pelvis connected to the colon with increased radiotracer uptake.
In 2014 she underwent a rectal resection with hysterectomy and bilateral salpingo-oophprectomy. Postoperative histopathology confirmed adenocarcinomal metastasis in the right ovary and adenoma in rectum. Following the surgery the patient received 12 cycles of FOLFIRI regimen. As no residual lesions were found on follow up imaging the patient entered an active follow up. The subsequent imaging showed no signs of cancer recurrence.
As molecular testing became available the archival samples from ovarian metastases were retrospectively assessed. The tests revealed an activating mutation in V600E codon of BRAF gene and loss of MLH1, PMS2 genes resulting in deficient mismatch repair. The patient is still cancer-free 10 years into follow-up.

**Conclusions:** BRAF V600E mutation is associated with poor outcomes. More recently studies demonstrated a paradoxically favourable outcomes in cancers with BRAF V600E mutation and MSI coexistence, although the molecular underpinning is not yet fully understood. Several case series reported diminished yet still meaningful outcomes of surgical oligometastatic disease management in patients with dMMR or BRAF mutations. It is therefore a valuable option in this subgroup of CRCs.

# PUBLIC HEALTH ORAL SESSION

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**Title**: Medicine

**Authors:** Linda Līva Geldnere

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**Introduction:** In the world and in Latvia, there is an increasing interest in the evaluation of patient experiences in health care institutions and the connection of these experiences with patient comfort and changes in health status.

**Aim of the study:** The aim of the work is to assess the patients' experience and satisfaction with the received outpatient care services, to determine the relationship between outpatient patient satisfaction indicators and socio-demographic data.

**Materials and methods:** From 2.05.2023 until 3.08.2023 a quantitative cross-sectional study was conducted. The CPOSS survey was translated in Latvian and Russian languages. Patient surveys were carried out in paper format at the RPNC outpatient centers; surveys were conducted in electronic format - in form of SMS (hyperlink). In total, 338 surveys were analysed in the study - response rate of 67.1% for paper-filled surveys, 13.7% for electronically filled surveys.

**Results:** Average characteristics of respondent: female (71.5%), 31-40 years old (28.6%), married (37.7%), with higher education (58.1%), working (68.6%), has mental illness (68.2%). Patient satisfaction and comparing the obtained results between age groups - patients who are older rated that the assistance provided by the receptionist ($r(167)=0.193$, $p=0.012$), the availability of information ($r(168)=0.155$, $p=0.044$), the waiting time until receiving the service ($r(168)=0.151$, $p=0.049$), the appearance of waiting rooms higher than younger patients ($r(168)=0.213$, $p=0.005$). Comparing the results of gender, the patient's education level, the marital status relations and CPOSS ratings, no statistically significant difference is found.

**Conclusions:** Patient satisfaction with outpatient care is not related to the socio-demographic status - the obtained results demonstrate a weak or very weak correlation, or no statistically significant difference between the obtained results can be observed. Patients are not more critical in the electronically filled surveys compared to the paper filled surveys. The CPOSS survey is suitable for ascertaining the satisfaction of outpatients in psychiatric clinics.

**Title**: What Do Medical Students Think Of Own Participation As Subjects In Clinical Trials?

**Authors:** Aleksandar Sič, Tatjana Gazibara

**Tutors:** Prof dr Tatjana Gazibara

**Affiliation:** Institute of Epidemiology, School of Medicine, University of Belgrade

**Introduction:** Testing of new drugs by means of clinical trials is essential in efforts to increase generalizable knowledge. Little is known about the medical students' perception of own participation as research subjects in clinical trials. The aim of this study was to examine willingness and attitudes of medical students toward own participation as volunteer subjects in clinical trials.

**Aim of the study:** The aim of this study was to examine willingness and attitudes of medical students toward own participation as volunteer subjects in clinical trials.

**Materials and methods:** A cross-sectional study was conducted among 297 medical students in years 4, 5 and 6 at the University of Belgrade, from October to December 2023. Participants completed a pen-and-paper questionnaire including demographic characteristics, opinions on own participation in clinical trials, and attitudes toward clinical trials in general. Validity of the attitude scale was verified.

**Results:** One in five medical students expressed a positive opinion about own participation in clinical trials, with the majority (about one-half) remaining undecided. General attitudes of students about research and own participation were positive. Students with prior blood donation experience were more willing to participate. Lower socio-economic status and volunteering experience were also associated with more positive attitudes toward clinical trials in general.

**Conclusions:** Most students were undecided about own participation, but their attitudes toward clinical trials in general were positive. Positive general attitudes towards clinical trials did not uniformly translate to willingness for personal participation. Promotion of blood donation and volunteering at universities could be beneficial in providing students with hands-on experience with sharing of personal material and non-material properties for the purpose of common good.

**Title:** The self-assessed perception of food advertisements impact on purchasing decisions and the consumption of unhealthy food.

**Authors:** Julia Jędrasik; Justyna Wcisło; Gabriela Hendzel

**Tutors:** Paulina Smoła, MPH; Mariusz Duplaga, MD, PhD

**Affiliation:** Students' Scientific Circle of Health Promotion, Department of Health Promotion and e-Health, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College, Cracow, Poland

**Introduction:** The choices individuals make regarding their food consumption are influenced by many factors. Advertising messages play a significant role, particularly in modern society, where marketing pressures abound.

**Aim of the study:** This study's main aim was to assess the association between individuals' self-perceived importance of advertisements in their purchasing decisions for food products and their consumption of unhealthy food, as measured by the Index of Unhealthy Food Consumption (IUFC).

**Materials and methods:** The analysis was performed on data from a computer-assisted web-based interviewing (CAWI) survey in a representative sample of 774 Polish Internet users aged 18-35. IUFC was calculated based on the responses to twelve items asking about the frequency of the consumption of selected types of food. Data was analyzed using: the Whitney U-Mann test, the Kruskal-Wallis test, the Spearman correlation coefficient, and the multiple linear regression (MLR) model for IUFC as the dependent variable.

**Results:** Females comprised 53.5% (n=414), and respondents with university education comprised 32.4% (n=251) of the study sample. Higher food literacy (SFLQ) was significantly associated with lower IUFC (B coefficient (B), confidence interval 95%CI: -0.17, -0.26- -0.08). Males were likelier to consume unhealthy food than females (B, 95%CI: 4.07, 2.92-5.22). Persons with a master's degree (B, 95%CI: -2.52, -4.51 - -0.54) had lower IUFC compared to people with lower than secondary education. Respondents who declared that they made decisions about food purchasing based on adverts showed higher IUFC (B, 95%CI: 4.05, 2.29 – 5.79) compared to people who were rarely influenced by adverts. Internet use of more than 5 hours per day also resulted in a higher IUFC (B, 95%CI: 3.20, 0.55 – 5.85).

**Conclusions:** Higher self-assessed perception of the importance of food advertising on purchasing decisions is significantly associated with unhealthy nutritional patterns. The consumption of unhealthy food is negatively associated with female gender and higher education levels, and it is positively associated with the male gender and frequency of Internet use.

**Title**: Organizational error in a medical entity

**Authors:** Jakub Dulniak, Paweł Lipowski PhD

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**Affiliation:** Student Scientific Club Law in Health, Institute of Public Health, Faculty of Health Sciences, Jagiellonian University Medical College

**Introduction:** Practical observations of the functioning of the health care sector indicate that managers of medical entities, struggling with many management problems, increasingly often have to deal with patients' claims regarding the provision of health services. The health care system conditions influence the work of medical teams and thus the development of the so-called organizational errors, which pose a significant threat primarily to patient safety and affect the quality of services provided.

**Aim of the study:** The aim of the following work is to present the conceptual scope of organizational error and to present examples of these errors observed in medical entities, which, illustrating the scope of the problem, will refer to patient safety and the quality of medical care.

**Materials and methods:** Review and analysis of the literature on medical law and Polish law provisions through legal information systems, as well as review and analysis of studies by the Patient Ombudsman and the Center for Monitoring Quality in Health Care and the results of available empirical research, using Internet sources.

**Results:** Both a review of the subject literature and research results indicate that decisions made by management staff regarding the work of medical entities (including those relating to the number of staff, their time and work organization) primarily affect the work of medical staff and, consequently, lead to to organizational errors (such as: mixing up the medicine, falling, infection, leaving a foreign body).

**Conclusions:** Raising awareness of the causes of organizational errors occurring as adverse events may improve the quality of services provided and patient safety. In addition, factors such as medical staff fatigue and burnout also contribute to errors in the treatment process patients. The development of systems for identifying and reporting organizational errors may allow for faster diagnosis and appropriate response by the management staff of medical entities.

**Title**: Stress As An Occupational Risk Factor In Medical Profesionals

**Authors:** Vilius Sivickis

**Tutors:** Jelena Stanislavovienė, assist., Dr.

**Affiliation:** Faculty of Medicine, Vilnius University

**Introduction:** Dedicated to the admirable goal of healing, medical practitioners frequently battle a silent enemy at work - stress. Comprehending the subtleties of this work-related risk opens the door to efficient measures and safety nets that can protect medical professionals' health.

**Aim of the study:** To analyze the prevalence of stress as a work-related risk factor and stress management among Lithuanian doctors.

**Materials and methods:** Convenience sampling was used to gather data for the research. An online survey was conducted in November 2023, targeting 188 doctors from various Lithuanian hospitals and clinics. Most of the respondents (98%) were under the age of 50. The questionnaire related to age, sex, workload, work experience, medical specialty group, stress levels and management served as the data collection instrument. Chi square method was used to obtain relationship between stress, sociodemographic characteristics, and stress coping strategies.

**Results:** Only 3% of the doctors claim not experiencing stress at work at all. 28% of respondents experience high stress levels at work, 46% - moderate, 23% - mild. The most frequent factors causing stress at work are too fast-paced work (71%), lack of job evaluation (55%), disrespectful as well as inadequate behavior of patients (56%), lack of competence (43%), and mobbing at work (25%). More than a quarter (28%) of doctors admitted being unable to manage stress effectively. This study showed, that 72% of respondents claim using healthy stress management tools, e.g., meditation or physical activity, and tiny subset of this group, precisely 16%, manage their stress by visiting a psychologist/psychotherapist. Nevertheless, no relationship was found between the experienced stress and gender, age, workload, work experience, nature of work or usage of stress coping strategies. Possible, to obtain such a relationship, bigger simple size and more specific sampling procedure is required.

**Conclusions:** This study reveals a concerning prevalence of stress among Lithuanian doctors, with 28% experiencing high stress levels at work. The most frequent factors causing stress at workplace: too fast-paced work, lack of job evaluation and disrespectful as well as inadequate behavior of patients. 72% of respondents use healthy stress management tools.

**Title**: Ergonomic analysis of novel gaming keypad in comparison with standard keyboard

**Authors:** Ksenija Starovoitova, Viktorija Loginova, Anna Petrova, Linda Jakuboviča, Nadīna Rīmere

**Tutors:** MD, PhD Jeļena Reste

**Affiliation:** Rīga Stradiņš University, Faculty of Medicine

**Introduction:** Repeated and monotonous movements made while working with a computer keyboard can lead to an overload of hand muscles and joints. Consequently, the development and implementation of ergonomic computer aids in the work environment and for cybersports is becoming increasingly relevant. Although many such devices are available today, there is limited evidence regarding their effectiveness and safety.

**Aim of the study:** The study aimed to evaluate the ergonomics of the novel gaming keypad Azeron in comparison with a standard keyboard in terms of the range of motion in fingers' joints.

**Materials and methods:** The descriptive study involved one healthy volunteer who used an individually adjusted Azeron keypad and standard keyboard in multiple scenarios. The range of motion of five fingers of the left hand was measured by 5DT Data Glove palm motion tracker with a specialized computer program provided by the manufacturer. The 20-second-long recordings of palm movements were captured while pressing buttons on Azeron keypad and most common gaming combinations of buttons on keyboard and compared to angles of fingers joints placed in the most ergonomic neutral position without any device.

**Results:** The Azeron keypad has been identified as closely aligning with the physiological neutral position of the palm. For Azeron, the similarity of angles in finger joints to the neutral position was between 95% and 110%, which was found across multiple fingers and buttons (for seven Azeron buttons showing complete (100%) resemblance), while on the conventional keyboard, the same results were achieved in one case only (for Space tab and thumb). Several buttons in the Azeron keypad deviated from the neutral position slightly more, so frequently used functions should not be set to these buttons.

**Conclusions:** A standard keyboard puts more stress on fingers by placing them more far away from neutral position compared to the Azeron keypad, which generally aligns with neutral finger positions across its primary button layout. Individual adjustments and thorough programming of button layout can allow reaching optimal ergonomics. Our measurements suggest that the Azeron device could serve as an ergonomic alternative to traditional keyboards for gaming and specific tasks.

**Title**: Epidemiology and Management of Viral Conjunctivitis in Tanzania (cultural context and conspiracy beliefs surrounding outbreak) A Mixed-Methods Study

**Authors:** Andrew E Tendeka, Elizabeth Yohanes Mbilinyi, Angela Kaiza, Najma Khalid Abdulrazak, Bisma Mehmood.

**Tutors:** Dr.Honni Samkha- Kateryna ,MD, PHD, General Surgeon and Dr. Jesus Ochoa ,MD, Doctor of Internal Medicine.

**Affiliation:** Kyiv Medical University, Hitech Sai Hospital.

**Introduction:** Conjunctivitis, Inflammation of the eye membrane, can stem from allergies,bacteria, or viruses like adenovirus. In January 2024, Tanzania faced an epidemic, affecting 869 individuals compared to 17 previously. Adenovirus accounts for 65,000 to 90,000 cases per 100,000 of acute conjunctivitis in the country

**Aim of the study:** Assessing the different treatment tactics used in the management and treatment of viral conjunctivitis in Tanzania.

**Materials and methods:** The review employed a mixed-method approach, utilizing a web-based survey with a randomized age group. Results were compared with government statistics and raw data from patients, citizens, and caregivers in Tanzania. It adhered to PRISMA guidelines, screening various databases like Cochrane Library, PubMed, Google Scholar, and SpringerLink for systematic integration.

**Results:** The results were collected from two sets of data. Set 1 was a web based survey which consisted of 68 people and set 2 was government statistics. Both set of data demonstrated the region Dar-es-salaam with the highest cases of viral conjunctivitis, 35 from set A and 641 from set B. Furthermore through set A it was shown that highest place of contact for the virus was within workplace setting. There was an increase in number of cases in december and january by 60% compared to november which was followed up by a decrease in february. Overall females were more likely to suffer from conjunctivitis in comparison to males. 33 people from set A used alternative remedies. 27 people used salt water compared
to 5 who used breast milk. There were also an individual case of urine being used. The remaining 35 from set A used ointment along with visiting hospital and acquiring medical attention.

**Conclusions:** In conclusion from the sample used conjunctivitis cases were slightly higher in women compared to men. The survey results demonstrated that people used a combination of alternative remedies and not just seeking hospital guidance. Salt water and breast milk were some of the most common alternative remedies used in management of conjunctivitis. It is yet to see if alternative remedies do play a role in successfully treating and managing viral conjunctivitis.

**Title**: The determinants of the perception of the Big Food industry's impact on society's health

**Authors:** Gabriela Krężel

**Tutors:** Paulina Smoła, MPH; Mariusz Duplaga, MD, PhD

**Affiliation:** Students' Scientific Circle of Health Promotion, Faculty of Health Sciences, Jagiellonian University Medical College, Krakow, Poland

**Introduction:** Large corporations offering processed food products with high content of sugar, saturated fats, salt, and other unhealthy ingredients generate profits at the expense of society's health.

**Aim of the study:** The main aim of the study was to assess the determinants of the perception of the health effects of the Big Food Industry (PERBF).

**Materials and methods:** The analysis was performed on the data originating from the computer-assisted web-based interviewing (CAWI) survey in the sample of 2008 Internet users aged 18-75. The survey was carried out in May 2022. The associations of PERBF with health literacy (HL), e-health literacy (eHL), Index of Unhealthy Food Consumption (IUFC), food literacy (SFL), selected socioeconomic variables, and self-assessed health status were analyzed. In the first stage, test allowing for two-dimensional analysis were performed, then multivariable logistic regression (MLR) model was developed for PERBF as a dependent variable.

**Results:** The mean (standard deviation, SD) age in the study group was 40.00 (12.80), the mean SFL was 31.40 (6.64), the mean eHL was 29.42 (5.06), and the mean IUFC was 42.40 (8.39). Two-dimensional analysis showed that the PERBF depended on age, eHL, SFL and IUFC. MLR model revealed that respondents with higher eHL (odds ratio (OR), 95% confidence interval (95%CI): 1.05, 1.03-1.07) and SFL (OR, 95%CI: 1.04, 1.02-1.06), as well as respondents with chronic disease (OR, 95%Cl: 1.30, 1.05-1.61) were more likely to see harmful effects of Big Food Industry. Persons with problematic (OR, 95%Cl: 0.57, 0.35-0.92) and sufficient HL (OR, 95%Cl: 0.69, 0.48-0.99) less than those with undetermined HL were inclined to confirm the negative impact on the health of the Big Food industry. A similar effect was observed among respondents with higher IUFC (OR, 95%CI: 0.97, 0.95-0,98). The PERBF was not significantly associated with gender, income, and self-assessed health status.

**Conclusions:** The presence of chronic disease, higher eHL, and SFL is associated with an increased perception of the Big Food industry's harmful effects on society's health. Unhealthy nutritional patterns, as well as problematic and sufficient HL, are linked to lower awareness of such effects.

**Title**: Early Investigation into Comparative Techniques for Forearm Muscle Assessment

**Authors:** Sigita Skrastina, Madara Kivleniece, Patricija Stapulone

**Tutors:** Assoc prof. Dr. med. Jelena Reste, Dr. Marija Burcena

**Affiliation:** Riga Stradins University, Institute of Occupational Safety and Environmental Health, Latvia

**Introduction:** Hand muscle disorders pose a current challenge in occupational medicine, often eluding early diagnosis. This study delves into the complexities of forearm muscle assessment, recognising the limitations of clinical examination.

**Aim of the study:** This pilot study investigates the efficacy and precision of various arm muscle examination methods, with a particular focus on the forearm.

**Materials and methods:** 17 healthy volunteers participated in the study (52.94% women, 47.06% men, average age 24.2 ± 4.254 years, 94.12% right-handed). Our examination focused on six pairs of arm muscles (m.deltoideus, m.biceps brachii, m. brachioradialis, m.triceps brachii, wrist flexors and extensors), utilizing the Medical Research Council Manual Muscle Testing scale for clinical examination, dynamometry for muscle strength measurement, and surface electromyography (sEMG) for assessing electrical activity. Data analysis was performed through IBM SPSS 27.

**Results:** Our findings reveal a disparity between clinical examination outcomes and electromyography spectrum means, particularly underlining the right wrist extensors as a point of interest. Clinically, the right wrist extensors emerged as the weakest muscle group among participants, with 35.29% displaying a muscle strength of 4 (on a scale of 5). Dynamometry corroborated these results, indicating the right wrist extensors as the weakest, with an average strength of 84.29 N (SD 24.10). sEMG presented the right wrist extensors with the highest spectrum mean (157.03 Hz, SD 21.35), suggesting a lack of correlation between muscle strength and electrical activity ($p > 0.05$). Our study also observed significant correlations between BMI and dynamometry outcomes across various muscle groups ($p < 0.05$), except for the right wrist extensors. Gender significantly influenced dynamometry results ($p < 0.05$), excluding the wrist extensors, while showing no correlation with electrical activity. Age demonstrated a significant relationship with the spectrum mean in right wrist extensors.

**Conclusions:** Our findings challenge the conventional reliance on clinical examinations for muscle strength assessment, especially for the wrist extensors, and highlight the importance of integrating multiple evaluation methods for a comprehensive understanding of muscle function.

# SURGERY ORAL SESSION

prof. Mateusz Rubinkiewicz, MD, PhD
lek. Magdalena Mizera
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## Sessions coordinators:

Michał Jurczak

Kinga Glądys

**Title**: Influence of the Ventricular Catheter Placement on Ventriculoperitoneal Shunt Malfunction

**Authors:** Karolina Markusiewicz, Agata Marszałek, Bartłomiej Wiśniewski

**Tutors:** Emilia Sołtan MD PhD

**Affiliation:** Medical University of Warsaw

**Introduction:** Ventriculoperitoneal shunt (VP) insertion stands as the gold standard procedure for managing hydrocephalus (HCP), facilitating the drainage of excess cerebrospinal fluid (CSF) from the ventricular system into the peritoneal cavity. Among VP malfunctions, ventricular catheter blockage emerges as the most prevalent issue. Access through either the anterior horn of the lateral ventricle via Kocher's point or the trigone through the parieto-occipital approach (Keen's point) are the most common techniques of VP shunt placement.

**Aim of the study:** This study aimed to evaluate the safety and efficacy of VP placement while determining the risk of shunt malfunction based on the site of ventricular catheter insertion.

**Materials and methods:** A retrospective analysis encompassed data from 176 patients under 10 months old (39% female, 61% male) over six years (2017-2022). Among these, 145 patients (n=145) who underwent VP placement via frontal ($n1$ = 91) or parieto-occipital ($n2$ = 54) approaches were included. Notably, 24.2% of patients from the frontal horn group required catheter replacement, compared to 40.7% from the parieto-occipital group.

**Results:** A null hypothesis ($H : p - p = 0$) implying no difference in outcomes between the groups was tested against the alternative ($H : p - p \neq 0$) using a Z-test. The calculated Z-test value of -2.0975 yielded a p-value of 0.03572, leading to the rejection of the null hypothesis at a significance level of 0.05, indicating a statistically significant difference in outcomes.

**Conclusions:** Patients undergoing ventriculoperitoneal shunt placement via the parieto-occipital approach exhibited a higher likelihood of requiring catheter replacement due to ventricular catheter blockage. Thus, based on these findings, preference should be given to the frontal approach whenever feasible.

**Title**: Prediction of small cerebral aneurysms rupture - do we have sufficient tools?

**Authors:** Jakub Nowicki, Wojciech Siłka

**Tutors:** Maciej J. Frączek MD; Roger Krzyżewski MD, PHD

**Affiliation:** Students' Scientific Group of Neurosurgery and Neurotraumatology Clinical Department Jagiellonian University Medical College

**Introduction:** Intracranial aneurysms that may cause devastating subarachnoid haemorrhage (SAH) are subject to reparative treatment. Small (≤7mm) intracranial aneurysms (SIAs), in contrast to larger ones, are difficult to weight treatment risk against rupture risk.

**Aim of the study:** Our study aim was to compare results of different scoring systems and SIA features between ruptured and unruptured SIAs.

**Materials and methods:** We have investigated all patients with ruptured and unruptured SIAs admitted to Department of Neurosurgery in 2021 and 2022. In case of SAH patients with only ones with ruptured SIA were qualified for the study. Patient data, radiological data and operative notes were studied. SIAs were diagnosed and described based on computed tomography/magnetic resonance angiography or digital subtraction angiography. SIAs rupture risk was estimated by 4 different scoring systems: PHASES, Small intracranial aneurysms of the anterior circulation (SIAAC), Unruptured Cerebral Aneurysm Study (UCAS) and simplified version of Unruptured Intracranial Aneurysm Treatment Score (UIATS) by Juvela.

**Results:** Study group included 170 patients, including 111 females (64,7%) 74 patients (43.5%) were admitted with SAH. All analyzed scoring systems results were significantly higher in SAH group. The one with over 2-fold greater scores for ruptured SIA was simplified UIATS by Juvela. Patients with SAH were younger and had larger SIA domes, but size difference was relatively small (0,46mm; p=0,059). Strikingly, male patients were admitted with SAH more often than female patients (64,4% vs 32,4%; p<0,001). Internal carotid artery and anterior communicating artery SIAs were ruptured in 25.9% and 74.5% respectively.

**Conclusions:** SIAs are a complex field that differs from larger aneurysms. Male dominance, lack of size difference between ruptured and unruptured SIA, suggests the necessity to evaluate precisely other rupture influencing factors with the use of modern scoring systems with simplified UIATS giving the biggest difference.

**Title**: Application of the Facial Injury Severity Scale as a Standardising Tool for Facial Trauma Patients: A Retrospective Clinical Study

**Authors:** Adam Łuksza2, Weronika Michalik2, Julia Toppich2

**Tutors:** Michał Gontarz1 DDS, Jakub Bargiel1 DDS, Krzysztof Śliwiński1 DDS

**Affiliation:** 1. Department of Cranio-maxillofacial Surgery, University Hospital in Cracow, Poland 2. Cranio-maxillofacial Surgery Students' Scientific Group, Jagiellonian University Medical College, Cracow, Poland

**Introduction:** The Facial Injury Severity Scale (FISS) is the scoring system that provides a numerical value based on individual facial fractures. It is considered an accurate communication tool for interdisciplinary trauma management teams.

**Aim of the study:** The study aimed to evaluate the epidemiological factors and their correlation with FISS in classifying and standardising facial injuries.

**Materials and methods:** A retrospective analysis was conducted on 728 patient records from the University Hospital in Cracow, covering facial fractures treated between 2020 and 2023. The data included age, sex, mechanism of facial trauma, medical diagnosis, length of hospitalisation and surgery time. FISS values were calculated in all cases. In the male-dominated study group, 549 patients underwent surgery and 179 obtained conservative management. Statistical analysis was limited only to surgical cases. A significance level of 0.05 was used for statistical analysis($\alpha = 0.05$) in. R-Studio 9.3 Build 191.259.

**Results:** Once we distinguished 3 facial subunits [lower face(L), midface(M), upper face(U)], we analysed single-unit and complex fractures (in UM, ML, UL and UML patterns) separately. The zygomaticomaxillary complex was the most common fracture site, accounting for 59% of cases and presenting the highest heterogeneity. The highest mean FISS value for single-unit fracture concerned the upper face (6±2.66). A statistically significant association was found between the FISS score and the hospitalisation length ($p<0.000$) or length of surgery ($p<0.000$) for all single-unit fractures and ML configuration ($p<0.050$). No correlation was found for other types of panfacial fractures. FISS values were significantly correlated with male gender and the presence of other concomitant injuries. However, no correlation was found regarding the patient's age or postoperative complications.

**Conclusions:** An individual approach is required in many complex cases of facial trauma. Unfortunately, the classification does not consider all types of fractures (including blow-out orbital or isolated zygomatic arch fractures). Some fractures, such as mandibular condylar fractures, have low scores, but the treatment time and difficulty are much greater than the osteosynthesis within the mandibular body. Nonetheless, classifying the patients should facilitate comprehensive treatment planning and multidisciplinary cooperation through a deeper understanding of reciprocal influences in complex injuries.

**Title**: Hearing evaluation in patients with otosclerosis after stapedoplasty

**Authors:** Karīna Elza Stiģe

**Tutors:** Dr. Svetlana Koņuhova

**Affiliation:** Student

**Introduction:** Otosclerosis is a common cause of conductive hearing loss, most frequently seen between the third to fifth decade affecting women 2 times more often. The disease is characterized by abnormal bone remodulation of otic capsule, causing stapes fixation. Stapedoplasty is the preferred treatment option, during which fixated stapes is replaced by synthetic prothesis

**Aim of the study:** The aim of this study was to assess hearing improvement after stapedoplasty in patients with otosclerosis.

**Materials and methods:** This retrospective study was conducted at Private clinic of Otorhinolaryngology HEADLINE and Pauls Stradiņš Clinical University Hospital from January 1st, 2015, to December 31st, 2023. We reviewed all audiograms before and after surgery, evaluating air and bone conduction in 500Hz, 1000Hz, 2000Hz and 3000Hz frequencies, and air-bone gap. Data was processed using IBM SPSS Statistics 22.

**Results:** The study included 154 patients; 46 (29,9%) were males and 108 (70,1%) were females. Their ages were between 13 years to 75 years; the mean age was 46,35 years (SD=10,982), male:female ratio 1:2,3. Related-Samples Sign's test was used to assess the differences between air and bone conduction, and air-bone gap before and after stapedoplasty. There were positive changes in all tested frequencies (500Hz, 1000Hz, 2000Hz, 3000Hz) between air and bone conduction after surgery. This difference was found statistically significant (p=<0,001). The median of air-bone gap before surgery was 25,53dB (SD=9,715), and after surgery 14,49dB (SD=10,864), demonstrating positive difference after stapedoplasty with statistically significant value (p=<0,001).

**Conclusions:** Otosclerosis is two times more common in females and most typically affecting adults between the third to fifth decade. Primary stapedoplasty indicates a high success rate and was efficient in improving hearing outcomes in adults with otosclerosis.

**Title**: Predictors of bleeding from brain arteriovenous malformations

**Authors:** Gabriela Brożek

**Tutors:** Roger Krzyżewski MD, PhD

**Affiliation:** Students' Scientific Group at Department of Neurosurgery and Neurotraumatology, Jagiellonian University Medical College, Cracow, Poland

**Introduction:** Bleeding from brain arteriovenous malformation (bAVM) is a leading cause of a non-traumatic subarachnoid haemorrhage in young patients. It is still not well known which bAVMs are at the highest risk of bleeding and need to be treated more urgently.

**Aim of the study:** The aim of our study was to determine the anatomical factors associated with the risk of bleeding from bAVMs.

**Materials and methods:** We retrospectively analysed all patients with bAVM admitted to the Department of Neurosurgery and Neurotraumatology of Jagiellonian University Hospital in Cracow between 2007-2023. The study group consisted of 127 patients at the age of 18-75. Based on operative reports, patient histories, detailed anatomical location, feeding arteries and coexisting aneurysms were examined.

**Results:** Subarachnoid haemorrhage from bAVM was not associated with the history of bleeding (12.90% vs. 13.54%; p=0.93). Patients with bleeding significantly less often had feeding vessels from middle cerebral artery (44.00% vs. 68.92%; p=0.025) but more often from frontopolar artery (16.00% vs 1.38%; p<0.001) and cerebellar arteries (28.00% vs. 10.81%; p=0.03). Smaller bAVMs (<3 cm) bled more frequently (70.00% vs. 40.00%; p=0.005). After adjustment for possible cofounders, feeding arteries from frontopolar artery (OR: 18.43; CI95%: 1.77-101.57;p=0/013) and cerebellar arteries (OR: 4.54, CI95%L 1.28-15.54; p=0.018) remained independently associated with bleeding from AVM.

**Conclusions:** Feeding arteries from cerebellar arteries and frontopolar arteries are independently associated with the risk of bAVM bleeding. AVMs that are fed by arteries from middle cerebral artery are less likely to bleed.

**Title**: Morphometric Analysis of the “Omega” and “Epsilon” Radiologic Signs in Patients with Intrinsic Brain Tumours

**Authors:** Natalia Rogowicz Garay, Gabriela Kasza

**Tutors:** Roger Krzyżewski MD, PhD

**Affiliation:** SSG at the Department of Neurosurgery and Neurotraumatology Jagiellonian University Medical College

**Introduction:** The “omega sign” and “epsilon sign” are landmarks that aid identification of the hand motor cortex (HMC) in axial-plane MR and CT images. The conservation of this area is of upmost importance during neurosurgical procedures, as it influences the post-op manual dexterity of the patients. Although some preliminary morphological analyses of the HMC have been carried out, so far there has not been a comprehensive paper on the topic.

**Aim of the study:** To analyse the morphological features of the ”omega/epsilon sign” and to corelate them with the patient’s sex and hemisphere side.

**Materials and methods:** Structural MR images of 124 patients admitted to a Department of Neurosurgery with intrinsic brain tumour diagnoses were analysed. Of those, 57 were men and 67 were women. All hemispheres were assessed for the presence of the “omega/epsilon sign”. Measurements of the omega’s/epsilon’s height, width, neck width, gyrus thickness and distance from the midline were taken using the measuring tool in IMPAX.

**Results:** The “omega sign” was identified in 101 hemispheres. The difference in mean omega neck width between men and women was statistically significant (11.98mm ± 2.89mm and 10.92mm ± 2.14mm; $p=0.039$), as was the internal gyrus thickness (10.45mm ± 1.94mm and 9.75mm ± 1.85mm; $p<0.001$). The “epsilon sign” variant was identified in 41 hemispheres. It was three times more frequent in men than in women (14.22% and 4.59%; $p<0.001$). The Medially Asymmetric Epsilon variant was present in 4.84% hemispheres, whereas Laterally Asymmetric Epsilon’s frequency was 1.21%. No significant corelation was found between hemisphere side and HMC morphology.

**Conclusions:** The morphometry of the “omega/epsilon sign” is influenced by the sex of the patient. We suggest that to identify MAE/LAE variants the difference between the external and internal knob’s width should be $\Delta>4$mm. The morphological analysis of the “omega/epsilon signs” could prove useful in planning of surgeries of intrinsic brain tumors located in the HMC area.

**Title**: Correlation between the post-esophagectomy anastomotic leaks and future esophageal strictures in patients with esophageal cancer.

**Authors:** Sofiia Popovchenko, Jarosław Kużdżał

**Tutors:** Prof. Jarosław Kużdżał M.D. Ph.D.

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**Introduction:** Subtotal esophagectomy is recommended as a first choice for the treatment of esophageal cancer. Anastomotic stricture may lead to further hospitalizations and surgeries, as well as significantly impair long-term quality of life. Anastomotic leaks are one of the most significant complications after esophagectomy. Anastomotic leaks can be treated with several techniques including Endo-VAC system, T-tube drainage, endoscopic stenting, operative drainage, and others. Surgery technique and type of anastomosis may be the main factors that impact future complications of anastomosis.

**Aim of the study:** The aim of the study was to assess if there is a correlation between post-esophagectomy anastomotic leaks and future esophageal strictures in patients with esophageal cancer.

**Materials and methods:** 635 patients, hospitalized in the years 2010-2021 at the Department of Thoracic Surgery, John Paul ll Hospital in Cracow due to esophageal cancer, were analyzed. All patients have undergone esophageal resection. 531 patients (83,8%) underwent Ivor Lewis esophagectomy, 53 patients (8,2%) underwent esophagectomy with Roux-en-Y anastomosis and 51 patients (8%) underwent McKeown operation. The patients were grouped into 2 groups according to the presentation of anastomotic leaks, 1 group- patients with anastomotic leaks and 2 group- patient without anastomotic leaks. The primary outcome measure was the relation between the post-esophagectomy anastomotic leaks and future esophageal strictures. 76 patients (12%) had post-operative anastomotic leaks. 23 patients from were excluded the first group due to performing cervical esophagostomy. Statistical analysis using Chi2 test and Pearson correlation coefficient was performed.

**Results:** In the first group there were 53 patients and 13 of them (24%) had esophageal strictures after the operation. In the second group the number of patients was 582 and 68 of them (11,7%) had postoperative esophageal strictures. Pearson correlation coefficient was 0,84.

**Conclusions:** Our study suggests that there is a correlation between post-esophagectomy anastomotic leaks and future esophageal strictures in patients with esophageal cancer. Therefore, patients who underwent anastomotic leak need to come for check-ups more often and it seems better to warn them about the higher risks of esophageal stricture and their behavior in the event of symptoms of esophageal obstruction.

**Title**: Intraoperative ultrasound impact on oncological radicality of laparoscopic liver resection

**Authors:** Anna Dąbrowska

**Tutors:** Wojciech Serednicki, MD

**Affiliation:** SSG of 2nd Department of General Surgery, Jagiellonian University Medical College

**Introduction:** Laparoscopic liver resection (LLR) has proven its utility and several advantages over open liver surgery and is increasing in popularity in recent years. However, due to its complexity it is still a demanding procedure that require precise diagnostic imaging.

**Aim of the study:** The aim of the study was to analyze the impact of intraoperative ultrasound used in LLR on oncological radicality.

**Materials and methods:** A total number of 114 adult patients who underwent elective laparoscopic liver surgery due to oncological indications at the II Department of General Surgery of the University Hospital in Krakow in the years 2014-2023 were analyzed. Patients were divided into 2 groups: a control group of 56 patients without any type of intraoperative radiological imaging and a research group of 58 patients, in which intraoperative laparoscopic ultrasound was performed. Demographic, perioperative and histological data were collected retrospectively and compared between groups with SPSS statistics.

**Results:** The study revealed that intraoperative ultrasound in LLR considerably increases achieving R0 resection margin ($p = 0,031$). It was also observed that with intraoperative ultrasound less healthy parenchyma was cutted out ($p = 0,037$; minimal margin IQR 5 mm vs 12 mm). Moreover, blood loss during the LLR with intraoperative ultrasound was lower ($p = 0,008$; IQR 300 vs 750 ml) with no statistically significant differences ($p > 0,05$) in operation time, hospital stay, postoperative complications, conversion rate.

**Conclusions:** Intraoperative ultrasound in LLR increases oncological radicality and helps achieving R0 resection margin with no differences in operation time, hospital stay, postoperative complications and conversion rate. Nevertheless, due to the study limitations, further researches are needed.

**Title**: The impact of the lumbar and cervical discectomy on quality of the sleep.

**Authors:** Edyta Dyngosz, Wojciech Bednarz, Oliwia Madej

**Tutors:** Roger Krzyżewski MD, PhD

**Affiliation:** Students' Scientific Group of Neurosurgery and Neurotraumatology, Jagiellonian University Medical College

**Introduction:** Sleep quality is essential for general well-being and health. Since more than half of the society suffers from degenerative spine diseases, our rational was to explore the influence of lumbar and cervical disc herniation on quality of the sleep. Our investigation was focused on patients undergoing lumbar or cervical discectomy and its impact on quality of the sleep after surgery.

**Aim of the study:** The aim of our study was to assess prevalence of sleep disturbances among patients with lumbar or cervical disk herniation qualified to surgical treatment, before and 3 weeks after microdiscectomy.

**Materials and methods:** We assessed 34 patients undergoing lumbar or cervical discectomy. Quality of the sleep was assessed using Epworth Sleepiness Scale, Pittsburgh Sleep Quality Index, Revised Oswestry Low Back Pain Disability Scale and STarT Back Tool prior to the surgery and 3 weeks after surgery. We used Chi2 test to compare proportions and t-test to compare continuous variables.

**Results:** Discectomy decreased the amount of times that patients could not fall asleep within 30 minutes (1.18±1.16 vs 1.17±1.19; $p=0.02$), decreased the amount of times patients had bad sleep during week (2.50±0.82 vs 1.47±1.26; $p<0.01$), decreased the amount of times that patients deemed their sleep as bad within 4 weeks (1.47±0.79 vs 0.94±0.77; $p<0.01$) and decreased their night-time leg cramps (1.00±1.19 vs. 0.20±0.59; $p<0.01$). According to Epworth scale discectomy decreased sleepiness and drowsiness in public places (0.44±0.78 vs. 0.088±0.37; $p=0.02$). Overall time of sleep was not affected by discectomy (6.63±1.64 vs. 6.80±1.58; $p=0.68$) as well as general Epworth score (6.65±4.91 vs. 5.23±3.85; $p=0.20$) and general Pittsburgh score (6.63±1.64 vs. 6.80±.58; $p=0.91$)

**Conclusions:** Sleep may by significantly improved in patients with lumbar or cervical discopathy. Sleep factors most significantly impacted by discectomy are: ability to fall asleep within 30 minutes, night time leg cramps and overall subjective quality of sleep assessed by patients.

**Title**: Association of parameters of the draining veins with epilepsy in brain arteriovenous malformations

**Authors:** Gabriela Brożek

**Tutors:** Kornelia Kliś MD, PhD, Roger Krzyżewski MD, PhD

**Affiliation:** Students' Scientific Group at Department of Neurosurgery and Neurotraumatology, Jagiellonian University Medical College, Cracow, Poland

**Introduction:** After hemorrhage, epilepsy is the second most common symptom of brain arteriovenous malformation (bAVM). However, despite similar physiology, only a quarter of patients with bAVMs present with epilepsy.

**Aim of the study:** The aim of our study was to establish the association between epilepsy and radiomics features, as well as hemodynamic parameters of the draining veins in bAVMs.

**Materials and methods:** We conducted a retrospective study involving a group of 41 patients admitted to the Department of Neurosurgery and Neurotraumatology of Jagiellonian University Hospital in Cracow, who underwent endovascular embolization of a brain arteriovenous malformation. Hemodynamic parameters and radiomics features of bAVM draining veins were analysed.

**Results:** Seven out of 41 patients included into the study presented with epilepsy. These patients had higher stasis index (1.317 vs 0.529; p=0.014), along with higher inflow index (11.734 vs 4.494; p=0.017) and lower energy (5.919 vs 8.602; p=0.019) in the draining vein, in comparison to patients with no epilepsy. We also observed that patients with epilepsy significantly more often had deep venous drainage (71.43% vs 26.47%; p=0.02).

**Conclusions:** Epilepsy in bAVM patients is associated with presence of deep venous drainage, higher stasis index and higher inflow index, as well as lower energy in the draining vein.

# SYSTEMATIC REVIEW ORAL SESSION

Konrad Stępień, MD
lek. Dawid Storman

## Sessions coordinators:

Patrycja Kurczyna

Olga Wilk

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**Title**: The importance of the immune system in the development and progression of schizophrenia

**Authors:** Aleksandra Kozińska

**Tutors:** prof. Sebastian Mertowski PhD

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**Background:** Schizophrenia is a chronic mental illness that, according to statistics, affects approximately 24 million people around the world. Despite medical progress, the cause of schizophrenia remains unknown. The disease diagnosis is based on a medical interview, physical examination, and laboratory tests. It is made after excluding other possible diseases, such as mood disorders or substance abuse. An increasing body of literature underscores the hypothesis that concurrent dysregulation of the immune system and neuroinflammatory mechanisms within the central nervous system (CNS) may play a role in both the onset and advancement of schizophrenia. This study aims to systematically review and synthesize existing literature on the contribution of immune system aberrations to the etiology and progression of schizophrenia.

**Methodology:** A systematic review of the literature in English was performed using the PubMed, Scopus, and Web of Science databases, using the keywords: schizophrenia, immunopathogenesis, lymphocytes, microglia, cytokines. The time range of the searched articles was set to 2019-2024, using filters related to the type of articles (clinical trials, review, systematic review, case report, and meta-analysis).

**Main results:** In individuals diagnosed with schizophrenia, alterations have been observed in cytokine profiles within the CNS, alongside the activation of macrophages and microglial cells, and shifts in T lymphocyte subpopulations, leading to an imbalance in the CNS's immune regulation. Additionally, the theory of autoimmunity and the activation of the maternal immune system during gestation are considered significant. Conjectures are suggesting that the Epstein-Barr Virus (EBV) might initiate an atypical immune response in the host, contributing to the pathogenesis of schizophrenia. Investigations have also identified modifications in the composition of the gut microbiome, which induces subclinical inflammation, potentially implicated in the onset of schizophrenia.

**Conclusions:** Dysregulation of immune homeostasis within the CNS results in neuronal apoptosis, neuroinflammation, and CNS dysfunction, manifesting by psychopathological changes typical of schizophrenia. Further research on the interactions between the immune system and the nervous system in the context of schizophrenia is necessary, because, despite many hypotheses, the exact mechanisms underlying the immunopathogenesis of this disease are not fully understood.

**Title**: Galectin-3: Heart Failure Biomarker in Pediatric Heart Defects

**Authors:** Daniel Gondko, Patrycja Dębiec, Jakub Roman, Nikodem Pietrzak

**Tutors:** PhD Krzysztof Kocot

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**Background:** The prevalence and complexity of congenital heart defects in pediatric patients necessitate ongoing research into effective diagnostic and prognostic biomarkers. Galectin-3 has emerged as a promising biomarker due to its role in pathological processes, including myocardial remodeling, inflammation, and fibrosis, which are pivotal in the progression of heart failure.
This review aims to consolidate current knowledge regarding the utility of Galectin-3 as a biomarker for predicting heart failure in pediatric patients with congenital heart defects.

**Methodology:** A comprehensive literature review was conducted, focusing on studies that have explored the relationship between Galectin-3 levels and heart failure in pediatric patients with CHD. The review analyzed the methodologies, patient populations, and measurement techniques employed in these studies.

**Main results:** The review identified a consistent correlation between elevated levels of Galectin-3 and the onset and progression of heart failure in pediatric CHD patients. It highlights Galectin-3's potential in not only predicting heart failure but also in providing insights into the severity and prognosis of the disease.

**Conclusions:** Galectin-3 is a potent biomarker for the early detection and management of heart failure in pediatric patients with congenital heart defects. Its role in myocardial remodeling and the inflammatory response makes it a valuable tool in predicting the disease course and tailoring patient-specific management strategies. Future research should focus on establishing standardized protocols for Galectin-3 measurement and integrating its use into clinical practice for early intervention and improved patient outcomes.

**Title**: Sleep quality in multiple sclerosis: a systematic review and meta-analysis

**Authors:** Afshin Moradi(presenter), Asal Ebrahimian, Saeed Sadigh-Eteghad, Mahnaz Talebi, Amirreza Naseri

**Tutors:** prof. Mahnaz Talebi, prof. Saeed Sadigh-Eteghad

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**Background:** Sleep quality is individual satisfaction with the sleep experience, which is likened to patients' quality of life. This study aims to investigate the sleep quality in multiple sclerosis (MS) patients in comparison to healthy controls (HCs).

**Methodology:** Following the PRISMA statement, a systematic search was conducted through PubMed (MEDLINE), Web of Science, Scopus, and Embase online databases and studies which assessed the sleep quality based on the Pittsburgh Sleep Quality Index (PSQI), in MS patients and HCs were included. The risk of bias in the included studies is assessed using the Joanna Briggs Institute (JBI) critical appraisal tools and meta-analysis was conducted using the random effect model by the third version of Comprehensive Meta-Analysis (CMA3).

**Main results:** Out of 1574 identified records, 13 studies were included. Regarding the PSQI scores, this difference was statistically significant (10 studies; I2:94.61%; Standard difference in means: 1.065 (95%CI: 0.758-1.372; p-value<0.001). MS patients were found to have more prevalence of poor sleep quality (PSQI>5); however, the difference is not statistically significant (4 studies; I2: 87.08%; odds ratio: 2.31 [95% CIs: 0.82-6.35]; p-value: 0.113).

**Conclusions:** The limited available evidence suggested that sleep quality is affected by MS and it should be considered by the clinicians for prevention of sleep-related symptoms. Future well-designed studies are needed to reach a comprehensive conclusion on this topic.

**Title**: Is negative pressure wound therapy superior to conventional therapy on split-thickness skin grafts? A systematic review and meta-analysis

**Authors:** Kacper Stolarz1, Piotr Panek1, Daniel J Rams1

**Tutors:** Tomasz Stefura MD, PhD2, Prof. Anna Chrapusta MD, PhD2

**Affiliation:** 1. Faculty of Medicine, Jagiellonian University Medical College, Kraków, Poland 2. Małopolska Burn and Plastic Surgery Center, Ludwik Rydygier Memorial Hospital, Kraków, Poland

**Background:** Split-thickness skin grafts (STSG) are commonly employed for repairing significant skin defects. Traditional aftercare typically involves applying a protective layer of petroleum and cotton gauze, secured with a tie-over dressing. Nonetheless, this conventional approach to securing and protecting the skin graft is frequently cumbersome and not very effective. Negative-pressure wound therapy (NPWT) has emerged as a promising alternative method for dressing split-thickness grafts, offering a more efficient solution.

**Methodology:** A review of studies comparing STSG dressing methods was performed. The Medline/Pubmed, Embase, Scopus, Cochrane Library, and Web of Science databases were thoroughly searched. The data concerning graft take percentage, reoperation rate, and complication (infection, seroma, hematoma) rates were extracted. The Cochrane risk-of-bias tool was used for randomized studies, while Newcastle-Ottawa Quality Assessment for Cohort Studies was used for other types of research. Statistical analysis was conducted with PS IMAGE PRO 9.0 (IBM SPSS Statistics 29.0) software.

**Main results:** Our meta-analysis included 30 studies (14 randomized and 16 non-randomized), comprising a total of 2,025 patients. No study was excluded because of its poor quality. We observed a significantly higher percentage of graft take in the group of patients treated with NPWT when compared to those treated with conventional therapy (standarized mean difference (SMD) = 1,34% (95% CI: 0,62-2,07%; p<0,01)). NPWT was associated with a reduction in reoperation rate (OR = 0,29 (95% CI: 0,17-0,50; p<0,01)), a reduction in graft infection rate (OR = 0,37 (95% CI: 0,24-0,58; p<0,01)), and a reduction in seroma formation rate (OR = 0,38 (95% CI: 0,15-0,93; p = 0,03)). The reduction in hematoma formation rate was not statistically significant (OR = 0,64 (95% CI: 0,33-1,22; p = 0,17)).

**Conclusions:** When contrasted with traditional treatment methods, negative-pressure wound therapy (NPWT) notably enhances the success rate of grafting and lowers the need for additional surgeries when utilized for split-thickness skin grafting. Additionally, NPWT decreases the risk of wound infection and seroma formation under the graft, which improves the healing process of the graft's recipient site.

**Title**: Therapeutic strategies in the management of Metabolic-Associated Fatty Liver Disease VS Non-alcoholic Fatty Liver Disease

**Authors:** Cristina Trocin

**Tutors:** Ina Pogonea, PhD

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**Background:** The mutual relationship between non-alcoholic fatty liver disease (NAFLD) and metabolic disorders, both from an epidemiological and pathophysiological perspective, requires a revision of the nomenclature and diagnostic criteria. As a solution, the term Metabolic-Associated Fatty Liver Disease (MAFLD) has been introduced as a more appropriate designation. The diagnosis of MAFLD has shifted to a more clinically relevant approach, requiring hepatic steatosis in conjuction with one of three indicators: overweight/obesity, type 2 diabetes, and signs of metabolic dysfunction. Notably, MAFLD is independent of alcohol consumption and other co-existing liver conditions. The terminological transition suggests distinct advantages and the possibility of adjustments in pharmacological therapeutic strategies.

**Methodology:** A comprehensive search was conducted in English across major scientific databases such as: PubMed, Cochrane, Scopus and HINARI. Of the 72 results, published from 2019 until 2024, only those which specifically identified therapeutic strategies for NAFLD and MAFLD and linked to the keywords: ”MAFLD”, ”NAFLD”, ”pharmacology”, and ”treatment”, were included for analysis.

**Main results:** The pharmacological strategy for both NAFLD and MAFLD involves a conceptual framework that centers on the causative factors responsible for sustaining the state of hepatic steatosis and the consequent progression toward fibrosis and cirrhosis. The primary obstacle in the advancement of pharmacological therapies for NAFLD has stemmed from the heterogeneous nature of the population captured by the diagnostic criteria, which includes hepatic steatosis and three exclusion criteria: absence of excessive alcohol intake, absence of viral infection, and absence of autoimmune or hepatic disorders. By contrast, therapeutic strategies for MAFLD exhibit greater potential due to more stringent clinical criteria, incorporating antidiabetic, antioxidant and hypolipidemic agents, alongside the early management of frequently observed complications such as cardiovascular events and chronic kidney disease.

**Conclusions:** The pharmacological scenario between MAFLD and NAFLD is promising. The introduction of the novel acronym provides a groundwork for subsequent research, given its sharper focus on the dysmetabolic etiology and the early intervention that mitigates the successive stages of hepatic cirrhosis. Nevertheless, both conditions need further investigation to formulate a comprehensive treatment plan.

**Title**: The Power of GPR18: How RvD2 and Other Small Molecule Ligands Could Modulate and Resolve Inflammation

**Authors:** Grzegorz Baran

**Tutors:** Ewelina Honkisz-Orzechowska PhD and prof. Katarzyna Kieć-Kononowicz PhD

**Affiliation:** Department of Technology and Biotechnology of Drugs, Faculty of Pharmacy, Jagiellonian University Medical College Acknowledgement: The research was funded by the National Science Centre (Poland) Grant No. UMO-2021/43/D/NZ3/01440 and No. DEC-2021/43/B/NZ7/01938

**Background:** The resolution of inflammation is the primary domain of specialized pro-resolving mediators (SPMs). The role of these SPMs has been discussed by many authors in the literature, with particular reference to neuroinflammation and significant neurological disorders. We decided to discuss the role of SPM-resolvin D2 (RvD2) and its G protein-coupled receptor 18 (GPR18), as well as the role of small molecule ligands of GPR18 in inflammation in various health disorders because of its great therapeutic potential. With this contribution we aimed to present a comprehensive review of the most recent literature, perform a constructive view of data, and point out research gaps.

**Methodology:** The following literature databases were searched up to 15 January 2024: PubMed, Scopus, and Web of Science (entry words: “GPR18”, “inflammation”, “resolution”, and “resolvin D2”). We considered only no more than 5-year-old sources relevant for citing.

**Main results:** The effect of GPR18 activation in the resolution of inflammation is omnidirectional. The action of RvD2 has positive effects on brain damage, cardiometabolic diseases, neuropathic pain, mild cognitive decline and mood disorders, pulmonary diseases, arthritis, and wound healing. Non-SPM modulators also confirmed the anti-inflammatory role of the GPR18 in vitro and in vivo.

**Conclusions:** These findings point to the great therapeutic potential of GPR18 modulation. However, there are many challenges associated with this type of therapeutic intervention. The binding pattern to GPR18 is complex, and whether this positive effect on inflammation is only due to the GPR18-RvD2 signalling axis is unclear. Another issue is that the results obtained by different research groups are now inconsistent and sometimes controversial, possibly due to the lack of selective pharmacological tools, as GPR18 is an orphan receptor. Finally, it is necessary to check whether more stable small molecule modulators can replace the activity of RvD2.

**Title**: The Complete Anatomy of the Medial Patellofemoral Ligament: A Meta Analysis with Clinical Implications for Repair Surgery in Recurrent Lateral Patellar Dislocation

**Authors:** Maria Klimeczek-Chrapusta, Kacper Stolarz, Jan Damian, Filip Prochaska

**Tutors:** Jarosław Śmieszek

**Affiliation:** SSG of Pediatric Surgery, Jagiellonian University Medical College, Faculty of Medicine

**Background:** The medial patellofemoral ligament (MPFL) is the primary soft tissue stabilizer of the patellofemoral joint, providing restraint against lateral translation of the patella. Rupture of the MPFL, typically at the femoral origin, is an essential cause of a primary or a recurrent lateral dislocation of the patella, which often has to be surgically managed. Reconstruction techniques such as gracilis and semitendinosus tendon grafting use anatomical MPFL insertion. Nonphysiologically attached or tightened reconstructed MPFL can result in loss of knee flexion, increased patellofemoral joint pressure and risk of chondral damage.

**Methodology:** Major online databases were searched to gather relevant studies regarding the MPFL anatomy. Data concerning sample size, its characteristics, distances to surroundings (AT, MFE, gastrocnemius tubercle (GT)), length at a different degrees of flexion, width at patellar, femoral insertion, and thickness were collected. Researchers used the Anatomical Quality Assessment (AQUA) tool to evaluate the quality of the studies. Statystical analysis was conducted with Comprehensive Meta-Analysis software using a random-effects model.

**Main results:** We included 62 articles that met inclusion criteria, comprising total of 2483 knees. The lenght of MPFL in 0° degree knee flexion was 63.55 mm (95% CI: 57.19–69.92 mm) at the inferior margin and 66.11(95% CI: 61.67–70.55 mm) at the superior margin. MPFL was widest at its patellar insertion (23.17 mm; 95% CI: 20.99–25.35 mm) and narrowest at its femoral insertion (11.96 mm; 95% CI: 10.63–13.29 mm). The area of MPFL's patellar insertion averaged 53.02 mm2 (95% CI: 40.93–65.12 mm2). Femoral insertion of MPFL encompassed 36.60 mm2 (95% CI: 26.67–46.54 mm2). The center of MPFL's femoral insertion was located on average 6.21 mm (95% CI: 4.18–8.23 mm) posteriorly, 9.03 mm (95% CI: 6.79–11.27 mm) proximally, or 4.77 mm (95% CI: -0.30–9.84 mm) anteriorly in relation to MFE. The middle of MPFL's femoral insertion was located on average 9.17 mm (95% CI: 7.38–10.97 mm) distally, 10.81 mm (95% CI: 8.54–13.08 mm) proximally, 6.82 mm (95% CI: 0.94–12.07 mm) posteriorly, or 2.22 mm (95% CI: 1.45-2.99 mm) anteriorly in relation to ATT.

**Conclusions:** These results provide the anatomic foundation needed for an anatomic-based placement of femoral tunnel and reconstruction of MPFL in recurrent lateral dislocation.

**Title**: The prevalence of ANCA-associated vasculitis following COVID-19 vaccination - the 45 patients systematic review.

**Authors:** Agata Walulik (1), Kinga Łysak (2), Michał Błaszkiewicz (1)

**Tutors:** Krzysztof Gomułka, MD, PhD (3)

**Affiliation:** 1) Student Scientific Group of Adult Allergology and Internal Medicine, Wroclaw Medical University, 50-369 Wrocław, Poland. 2) Faculty of Medicine, Medical University of Gdansk, 80-210 Gdańsk, Poland. 3) Department of Internal Medicine, Pneumology and Allergology, Wroclaw Medical University, 50-369 Wrocław, Poland.

**Background:** As vaccinations against the SARS-CoV-2 virus have become a crucial tool in controlling the spread of the disease, reports of rare health complications have emerged, including new-onset antineutrophil cytoplasmic autoantibodies (ANCA)-associated vasculitis (AAV). It raised a concern about possible causal relationships or coincidences.

**Methodology:** We systematically reviewed new-onset AAV following COVID-19 vaccination case reports and case series published in PubMed, Embase and Scopus databases before January 2024 following PRISMA guidelines. After database search and duplicate rejection, 404 articles were screened respectively by title, abstracts and full-texts. 35 papers fulfilled the inclusion criteria and have been analysed.

**Main results:** The detailed analysis covered 45 patients with new-onset AAV after COVID-19 vaccination with no prior history of COVID-19 infection, with a mean age of 56 (SD=14.83). The cohort predominantly were females (n=28; 62%). Comorbidities were present in 24 (53.3%) patients. Anti-MPO was positive in 26 (59.1%) patients, anti-PR3 in 19 (43.2%), both in 3 (6.8%). AAV diagnosis was confirmed via biopsy in 39 (86.7%) cases with renal dysfunction as a prevailing manifestation, observed in 33 cases (73.3%). 25 (55.6%) patients received Pfizer-BioNTech, 10 (22.2%) Moderna, 5 (11.1%) Oxford AstraZeneca, and 5 (11.1%) another vaccine. Initial symptoms occurred after the first dose in 18 (40.0%) cases, second in 20 (44.4%), and third in 7 (15.6%) with weakness (n=27; 60%), fever (n=19; 42.2%), and dyspnea (n=12; 26.7%) mainly. Primary treatment involved steroid therapy, with favourable response in 35 (77.8%) patients, with 2 (4.4%) fatalities despite treatment.

**Conclusions:** This systematic review provides the most recent summary of new-onset AAV cases after COVID-19 vaccination. Hypothetically the immune response triggered by vaccination may induce the production of MPO- and PR3-ANCA autoantibodies, which in the face of widespread vaccination against SARS-CoV-2, results in a notable subset of cases of AAV with potentially serious complications. Our report aims to raise awareness among clinicians in the field regarding this rare but possible complication, to promote the prompt recognition and diagnosis of de novo AAV in timely association with SARS-CoV-2 vaccination.

**Title**: Geographic and imaging prevalence of Os Trigonum: a meta-analysis

**Authors:** Maciej Preinl, Aleksander Osiowski, Maksymilian Osiowski, Kacper Stolarz

**Tutors:** Dominik Taterra MD

**Affiliation:** Orthopedic and rehabilitation University hospital of Zakopane

**Background:** There have been over 40 descriptions of the common developmental variants of the accessory ossicles of the feet. Although they are frequently linked to painful conditions, they may also remain asymptomatic and could be incidental findings during imaging studies. One of the most common accessory ossicles in foot is Os Trigonum (OT), located posterior to the talus. Our research provides a meta-analysis that establishes its frequency by contrasting 40 studies from across the globe. To our knowledge it is the first meta analysis concerning the issue of accessory foot ossciles.

**Methodology:** Up to November 2023, PubMed and Embase were thoroughly searched for research on the Os trigonum using the following terms: ”os trigonum," "ossa trigona," "trigonal process” "stieda process," and "posterior ankle impingement." Language and publication date were not the exclusion criteria. Case reports, case series, reviews, or articles lacking the full-text were not included in our meta-analysis. This study followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) standards closely.

**Main results:** Total of 40 studies and 31 332 feet were analyzed in our study. The pooled prevalence estimate (PPE) of os trigonum was found to be 9.0% (95% CI: 7.1-11.2)($p<0,001$). The most common test used by the authors was X-ray used in 32 out of 40 studies. in this group the prevalence of OT was 7% (95% CI: 5.7-8.6). CT studies showed the presence of the OT in 24.95% (95% CI: 21.3-28.8) and MRI studies revealed the presence of the OT in 21.2%(95% CI: 9.7-40.4). The geographical distribution of the OT was as follows: Australia (17,7%, 95% CI: 10.1-29.3), East Asia (10.3%, 95% CI: 6.8-15.4), Asia (9.6% 95% CI: 7.1-12.8),
Middle East (8.9% 95% CI: 5.5-14.2), North America (7.7% 95% CI: 2.7–19.9). Lowest prevelance was noted in European population (6.9%, 95% CI: 4.9-9.7).

**Conclusions:** Os Trigonum is a common finding in imaging studies. Due to the much higher resolution of tests as CT or MRI, its prevalence 4is higher than when using X-ray. Its prevalence also depends on the population covered by the study and varies depending on the latitude in the global distribution.

# TECHNOLOGIES IN MEDICINE ORAL SESSION

prof. Grzegorz Tatoń, MD, PhD
Tomasz Rok, MD, PhD
dr Piotr Walecki
dr Justyna Hajto-Bryk

## Sessions coordinators:

Jagoda Sarad

Grzegorz Fibiger

**Title**: Correlation of artificial intelligence percentage probability of malignancy and tumour size in mammography examination

**Authors:** Anna Mutjanko, Milana M.Toločkina, Anete Zgirska, Kārlis Ozoliņš

**Tutors:** Ilze Eņģele MD

**Affiliation:** Student

**Introduction:** Artificial intelligence (AI) is increasingly used in medicine especially in mammography screening. As breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death in females worldwide, screening plays a critical role in the effective management of breast cancer and mammography is used as the primary method for breast cancer screening and diagnosis. LUNIT is an AI program that analyses mammography images by calculating the probability of malignancy as a percentage.

**Aim of the study:** The aim of the current study was to analyse whether tumour size correlates with AI percentage probability of malignancy.

**Materials and methods:** This retrospective study was conducted at the Oncology Centre of Riga East University Hospital. From January 1st, 2023, to October 31st, 2023. Were reviewed all breast ultrasonography descriptions in AIRIS (radiology information system) of which were selected those patients who had mammography examination performed using the artificial intelligence function (LUNIT). Were collected data on tumour size and AI percentage probability of malignancy. Data was processed using IBM SPSS Statistics.

**Results:** Study included 160 patients. 100 (62,5%) patients were of screening age (50-68 years). The median age was 62 years. From all the patients 62 (39%) didn't have a tumour and 98 (61%) had a tumour on mammography examination.
In the group of patients who did not have a tumour in mammography 56 (90%) of patients AI showed the possibility of malignancy.
Spearman's rank correlation was computed to assess the relationship between AI percentage probability and tumour size. There was a positive correlation between the two variables (rs= .558; p=<0,001).

**Conclusions:** As the size of the tumour increases, the AI percentage probability of malignancy also increases, however, there are many false positive cases when the tumour does not appear in the mammography examination, but the percentage probability of AI is positive.

**Title**: The influence of individualized Three-Dimensional Holographic Models on Patient's Knowledge qualified for Intervention in the treatment of Peripheral Arterial Disease

**Authors:** Patryk Skórka, Michał Kargul

**Tutors:** Paweł Rynio MD,PhD

**Affiliation:** Klinika Chirurgii naczyniowej, Ogólnej i Angiologii w Szczecinie

**Introduction:** We sought to determine the role of the patient-specific, three-dimensional (3D) holographic model on patient knowledge and influence on obtaining a more conscious informed consent process for percutaneous balloon angioplasty (PTA).

**Aim of the study:** The impact of holograms on the patient's awareness.

**Materials and methods:** Patients with peripheral arterial disease who had been scheduled for PTA were enrolled in the study. Information regarding the primary disease, planned procedure, and informed consent was recorded in typical fashion. Subsequently, the disease and procedure details were presented to the patient, showing the patients their individual model. A patient and student with HoloLens2 could both simultaneously manipulate the hologram using gestures. The holographic 3D model had been created on a scale of 1:1 based on the computed tomography scans. The patient's knowledge was tested by completion of a questionnaire before and after using HoloLens2.

**Results:** Seventy-nine patients manipulated arterial holograms in mixed reality head-mounted devices. Before the 3D holographic artery model interaction, the mean ± standard deviation score of the knowledge test was 2.95 ± 1.21 points. After the presentation, the score had increased to 4.39 ± 0.82, with a statistically significant difference ($p = 0.0000$) between the two scores. Using a Likert scale from 1 to 5, the patients had scored the use of the 3D holographic model at 3.90 points regarding its usefulness in comprehending their medical condition; at 4.04 points regarding the evaluation of the holograms as helpful in understanding the course of surgery; and rated the model at 1.99 points in reducing procedure-related stress. Using a nominal scale (know or don't know), the patients had self-assessed their knowledge of the procedure before and after the 3D model presentation, with a score of 6.29 ± 2.01 and 8.39 ± 1.54, respectively. The study group tolerated the use of head-mounted devices. Only one patient had nausea and dizziness, while four patients experienced transient eye pain.

**Conclusions:** The 3D holographic arterial model aided in the understanding of patients' knowledge regarding the disease and procedure, making the informed consent process more conscious. The holograms improve the patient's self-consciousness.The mixed-reality headset related complications are rare and within acceptable rate.

**Title**: Beyond Diameter: Enhancing Abdominal Aortic Aneurysm Surveillance with Volumetric Assessments after Endovascular Aneurysm Repair (EVAR)

**Authors:** Patryk Skórka, Michał Kargul, Jakub Brelik

**Tutors:** Paweł Rynio MD, PhD

**Affiliation:** Department of Vascular Surgery Pomeranian Medical University in Szczecin

**Introduction:** An abdominal aortic aneurysm (AAA) is a life-threatening dilatation of the aorta in the abdomen that can be repaired with either an open surgical repair (OSR) or an endovascular repair (EVAR). As of right now, intervention thresholds are based on maximum transverse diameters (MTD), where surgical treatment should be considered if the MTD reaches 5.5 cm for males, and 5.0 cm for females. EVAR is a leading treatment method in patients with diagnosed AAA.

**Aim of the study:** This study aimed to investigate the relationship between maximum transverse diameter (MTD) and volume measurements in patients who underwent reoperations after endovascular aneurysm repair (EVAR), and their association with the occurrence of endoleaks

**Materials and methods:** The study included 51 patients who underwent EVAR and subsequent re-operations caused by endoleaks type I–III. In some number of events, multiple re-operations were needed. MTD was measured using the Horos software, and segmentations of the AAA were performed using 3D Slicer. This study first evaluated post-operative computed tomography angiography (CTA) to measure MTD and volume. Then, similar measurements were made in the control scan for re-operation qualification. Negative remodeling (increase in MTD and/or volume) was observed in 40 cases using MTD, and 48 cases using volume measurements.

**Results:** The volume measurement showed lower missed negatives than MTD, indicating its effectiveness in screening for negative remodeling ($p < 0.001$). Combining both methods identified 51 negative remodeling cases and 8 positive changes, with a higher sensitivity compared to MTD alone. The volume of the sac did not predict specific endoleak types.

**Conclusions:** Volume measurement is a valuable screening tool, and combining MTD and volume enhances sensitivity. However, sac volume does not predict endoleak type.

**Title**: Machine learning in search of new PARP1 inhibitors

**Authors:** Radosław Kunicki

**Tutors:** dr. Jakub Jończyk , dr. hab. Agnieszka Zagórska, dr. Anna Czopek

**Affiliation:** Jagiellonian University Medical College, Faculty of Pharmacy, Chair of Medicinal Chemistry, 9 Medyczna Street, 30-688 Kraków, Poland

**Introduction:** Breast cancer stands as the primary malignant tumor affecting women, with ovarian cancer displaying elevated mortality rates despite its lower incidence. In instances where BRCA1 and BRCA2 gene mutations are present, PARP1 inhibitors stand out among the few effective treatments. Discovering new drugs that target this protein may contribute to the increased effectiveness of therapy. By integrating knowledge of known inhibitors, machine learning constructs predictive models that enable the efficient exploration of chemical databases to identify compounds with anticipated activity.

**Aim of the study:** The study aimed to develop a novel and versatile predictive model capable of identifying potential PARP1 inhibitors.

**Materials and methods:** The training dataset consisted of 2593 ligands from the ChEMBL database, all possessing known activity against PARP1 expressed as IC50. The compounds were categorized into active (IC50 < 1000nM) and inactive groups, and the relevant descriptors were calculated using RDkit and Mordred tools. Next, we use Glide (Maestro-Schrodinger) for molecular docking to obtain additional descriptors that reveal compound interaction with PARP1. Using the Knime program, we trained four distinct predictors - logistic regression, decision tree, random forest, and gradient-boosted trees. Accuracy, recall, precision, and AUROC were assessed through a fivefold cross-validation of these predictors. We incorporated an additional set of 62 ligands that exhibit low similarity to the structures in the training set (Tanimoto score < 0.5) to evaluate the range model usability further.

**Results:** During validation, all models showed high accuracy between 0.846 and 0.920 and AUROC from 0.866 to 0.975. Recognizing that our model is designed to evaluate a variety of compounds that might not closely resemble the ones in our training set, we undertook an assessment focused on compounds with low similarity. During this evaluation, the Random Forest algorithm was the most accurate predictor (0.613).

**Conclusions:** Our model is an innovative tool for virtual screening, identifying new PARP1 inhibitors with remarkable efficiency. Its proven capability in cross-validation and assessing structurally diverse ligands underscores its value.

**Title**: Preliminary Study Of The Brain Mr-Volumetric Signs In Selected Neurodegenerative Disorders

**Authors:** Katharina Maria Šebáková

**Tutors:** Ing. Petra Hnilicová, PhD.

**Affiliation:** Biomedical Centre Martin, Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava, Malá Hora 4D, 036 01 Martin, Slovakia

**Introduction:** Neurodegenerative disorders (NDDs) are CNS diseases with diffuse progressive neurodegeneration causing morphological and volumetric brain changes. The volumetric alternations can be noninvasively assessed using magnetic resonance (MR)-volumetry. MR-volumetry is still being explored as a primary neurological tool for monitoring atrophic processes and clinical deterioration in NDDs patients.

**Aim of the study:** In this preliminary study, we started to create a local institutional MR brains volumetric database of NDDs patients and appropriate controls to clarify the clinical usefulness of MR-volumetry.

**Materials and methods:** Recruited were 24 patients diagnosed with Amyotrophic Lateral Sclerosis (ALS; 6 patients aged 51 ± 7 years), Sclerosis Multiplex (SM; 6 patients: 46 ± 6 years), Alzheimer's disease (AD; 6 patients: 65 ± 3 years), and Parkinson's disease (PD; 6 patients: 58 ± 6 years), and 14 healthy controls aged correspondingly to patient groups (CON; aged 57 ± 6 years). The gender distribution was equal in each study group. MR-volumetry was performed at 3 Tesla MR-scanner acquiring sagittal T1-weighted MR-scans (time to repeat/echo = 2400/2.24 ms, field of view = 256x240 mm2, 208 slices per slab with 0.8 mm thickness). The MR-volumetry of 63 brain regions was evaluated using FreeSurfer. Statistical differences in MR-volumes between NDDs and CON and between NDDs' subgroups were analyzed using ANOVA in Jamovi of the R-Core Team.

**Results:** Our results showed MR-volumetric signs of AD (enlarged lateral ventricles and choroid plexus, atrophied cerebellum), PD (enlarged putamen and nucleus accumbens), SM (atrophied mid/posterior corpus callosum), and ALS (enlarged 4th ventricle), that can distinguish these NDDs from CON; but to a considerable extent also from others NDDs.

**Conclusions:** Despite the small sample size in this preliminary study, our results suggest the non-negligible benefits of MR-volumetry as a supportive clinical tool in NDDs distinguishing and characterization. The utility of establishing (not only) an institutional MR brain volumes database was so declared.
This study was supported by VEGA 1/0092/22 and JFMED CU.

**Title**: The effect of repeated administration of vortioxetine on female mice behaviour in the unpredictable chronic mild stress model .

**Authors:** Aniqa Saiyara1, Aleksandra Koszałka1, Kinga Sałaciak1, Karolina Pytka1

**Tutors:** Prof. dr. Karolina Pytka,PhD

**Affiliation:** 1.Department of Pharmacodynamics, Faculty of Pharmacy, Jagiellonian University Medical College, Medyczna 9, 30-688 Krakow, Poland

**Introduction:** Depression, a highly prevalent mental health condition, presents a significant challenge to healthcare, especially for women, who experience twice the prevalence compared to men. However, despite the availability of various treatment options, there are notable variations in treatment responses.

**Aim of the study:** In this study, using the unpredictable chronic mild stress (UCMS) model, we aimed to assess the efficacy of vortioxetine in female mice, focusing on its effects on recognition memory and anhedonic behavior.

**Materials and methods:** Female C57BL/6 mice underwent 6 weeks of UCMS, while a control group remained unstressed. Daily administration of vortioxetine at a dosage of 5 mg/kg began during the final 14 days of the study. Depressive-like behavior was assessed using the sucrose preference test, while cognition was evaluated using the novel object recognition test.

**Results:** We observed the successful induction of anhedonia after the third week of UCMS, with a more pronounced effect evident by the fourth week. Furthermore, repeated administration of vortioxetine effectively reversed anhedonia in female mice. However, an antidepressant did not attenuate recognition memory deficits.

**Conclusions:** while our findings suggests that vortioxetine has the ability to reverse anhedonia in female mice. However, we did not see any effect on memory, indicating that the treatment response may vary depending on the sex.

**Title**: Breast density effect on diagnostic accuracy of artificial intelligence in mammography examination

**Authors:** Anna Mutjanko, Milana Marija Toločkina, Anete Zgirska, Karīna Elza Stiģe

**Tutors:** Ilze Eņģele MD

**Affiliation:** Student

**Introduction:** Artificial intelligence (AI) is increasingly used in medicine especially in mammography screening. As breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death in females worldwide, screening plays a critical role in the effective management of breast cancer and mammography is used as the primary method for breast cancer screening and diagnosis. ''Lunit'' is an artificial intelligence (AI) program that analyzes mammography images to calculate the percentage probability of malignancy.

**Aim of the study:** As it is known that dense breasts can make a mammogram more difficult to interpret, the aim of the current study was to analyze whether breast density affects the diagnostic accuracy of AI in mammography examination.

**Materials and methods:** The retrospective study was conducted at the Oncology Centre of Riga East University Hospital. From January 1st, 2023, to October 31st, 2023. Were reviewed 11 000 breast ultrasonography description in AIRIS (radiology information system) of which were selected those patients who had mammography examination performed by using the AI function (Lunit). Data on breast density and percentage probability of AI malignancy were collected. Statistical analysis was processed by using IBM SPSS Statistics 22.

**Results:** Study includes 160 females. Their ages were between 25 years to 91 years; the mean age was 62 years (SD=12,273). Of all females 31 (19,3%) had A (almost entirely fatty) category breast density, 66 (41,2%) had B (scattered areas of fibroglandular density) category breast density, 54 (33,7%) had C (heterogeneously dense) category breast density and 9 (5,6%) had D (extremely dense) category breast density. Pearson Chi-Square test was used to compare breast density and AI percentage probability of malignancy. The relation between these variables was not statistically significant ($p>0,05$).

**Conclusions:** Breast density more likely does not affect the diagnostic accuracy of AI. However, for more accurate result would require a larger number of patient population.

**Title**: Casticin – a new perspective for supporting chemotherapy of non-small cell lung cancer

**Authors:** Aleksandra Łapa, Michał Pyszka, Barbara Dąbrówka, Natalia Kocot, Karolina Słoczyńska, Katarzyna Wójcik-Pszczoła

**Tutors:** dr hab. Paulina Koczurkiewicz-Adamczyk Head of department: prof. dr hab. Elżbieta Pękala

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**Introduction:** According to GLOBOCAN, lung cancer is one of the most frequently diagnosed in the world. 5-year survival rate is less than 14% which means that lung cancer, along with pancreatic, liver and brain cancer is the fourth most deadly. At the early stage of the disease, lobectomy-excision of lung is used. Subsequently, the therapy includes chemotherapy, kinase inhibitors, and immunotherapy.[1] Despite significant progress in lung cancer therapies, patient mortality is still high what determinates needed to search for new therapeutic solutions, especially targeted cancer migration and prevented systemic metastasis.
Casticin (CST) is a natural compound found in the fruits of Vitex sp. Currently, is used to relieve symptoms of menopause, migraine prevention and reducing rheumatic pain. In recent years, anticancer properties of casticin have been evaluated using both in vitro and in vivo models. Studies indicated that casticin inhibited tumor growth and cancer cell migration by regulation of PI3K/Akt, nuclear factor kappa-B (NF-κB), STAT3 and c-Met signaling pathways.[2] [3]

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[2] Duma N, Santana-Davila R, Molina JR. Non-Small Cell Lung Cancer: Epidemiology, Screening, Diagnosis, and Treatment. Mayo Clin Proc. 2019 Aug;94(8):1623-1640. doi: 10.1016/j.mayocp.2019.01.013. PMID: 31378236
[3] Ramchandani S, Naz I, Lee JH, Khan MR, Ahn KS. An Overview of the Potential Antineoplastic Effects of Casticin. Molecules. 2020 Mar 12;25(6):1287. doi: 10.3390/molecules25061287. PMID: 32178324; PMCID: PMC7144019.

**Aim of the study:** The purpose of this project was to investigation of chemosensitizing properties of casticin in non small cell lung cancer (A549) cellular model treated with cisplatin (CISPL), 5-fluorouracil (5-FLU), daunorubicin (DNR) and mitoxantrone (MTX).

**Materials and methods:** Non small cell lung cancer (A549) model was used in the study. Cells were incubated alone with DNR, MTX, CISPL, 5-FLU, CST and in co-treatment with CST+ DNR/MTX/CISPL/5-FLU for 24 hours and 48 hours. Chemotherapeutic properties of compounds was investigated using viability and proliferation assay. Ability of migration of A549 was measured by Transwell model system and wound healing assay.

**Results:** Our results demonstrated that CST chemosensitized A549 cells to DNR and MTX but not to CISPL and 5-FLU. Co-treatment with CST+DNR/MTX significantly decreased the viability and proliferation of A549 cells in time and dose dependent manner. Furthermore, CST+DNR/MTX inhibited the migration of cancer cells in Transwell model system and wound healing assay.

**Conclusions:** CST is promising candidate for DNR or MTX adjuvant therapy however, further studies are necessary to establish the exact molecular mechanism of casticin chemosensitizing properties toward A549 cells treated with DNR or MTX.

**Title**: Development of Targeted Nanoliposomes Conjugated to A Cell-Penetrating Peptide for Delivery of Mitomycin C in Breast Cancer Cells

**Authors:** Mehrnaz Salahi1, Jaleh Varshosaz1, Ali Jahanian Najafabadi2 , Mahbubeh Rostami3

**Tutors:** Prof.Jaleh Varshosaz PHD

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**Introduction:** Cancer remains a pressing challenge in healthcare, exacerbated by cellular resistance to drugs. Poly-L-arginine stands out as a widely-used cell-penetrating peptide, facilitating drug penetration through endocytosis and direct penetration mechanisms. Additionally, chondroitin sulfate serves as a targeting agent, which binds to CD44 receptors of 4T1 breast cancer cells.

**Aim of the study:** The aim of the present work was enhancing the cell penetration of mitomycin C by poly-L-arginine conjugated nanoliposomes targeted with chondroitin sulfate in treatment of triple-negative breast cancer.

**Materials and methods:** Poly-L-arginine was synthesized by heating arginine in an aqueous solution of NaOH at 220°C and subsequently conjugated with chondroitin sulfate and dodecyl amine. The confirmation of the synthesized products was carried out using FTIR and H-NMR. The synthesized targeting moiety was then used in preparation of nanoliposomes composed of lecithin and cholesterol. Mitomycin C was loaded into nanoliposomes and characterized for their particle size, zeta potential, drug loading percentage and release profiles. Cell viability and cellular uptake were assessed using the MTT assay and flow cytometry on 4T1 cells.

**Results:** The study identified the optimal formulation for nanoliposomes, comprising 67.5% lecithin and 33.5% cholesterol, resulting in an average particle size of 294 nm and a polydispersity index (PDI) of 0.032. The zeta potential was -36.96 mV and drug encapsulation efficiency was 73%, with controlled release kinetics over 18 hours. FTIR and H-NMR spectra confirmed successful synthesis of poly-L-arginine alone and in combination with chondroitin sulfate. Incorporation of the conjugated moiety into the structure of nanoliposomes notably changed their physical specifications with a significant acceleration in the release of mitomycin C. MTT assay and cellular uptake demonstrated a notable decrease in cell viability by targeted-poly-L-arginine conjugated nanoliposomes compared to non-targeted ones and free drug.

**Conclusions:** Our results suggest that incorporation of the CD44 targeting agent conjugated to a cell-penetrating peptide can facilitate cell penetration of nanoliposomes to cancer cells, while minimizing off-target effects. In conclusion, all of the results proved that poly-L-arginine conjugated chondroitin sulfate nanoliposomes were an efficient drug delivery system for enhancement of cellular uptake of mitomycin C in 4T1 breast cancer cells.

**Title**: The in vitro evaluation of permeability of new potent triazine – derived serotonin 5-HT6 receptor ligands

**Authors:** Malika Shibasaki

**Tutors:** Dr hab., prof. Gniewomir Latacz

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**Introduction:** Serotonin receptors 5-HT6 (5-HT6R), one of the G protein-coupled receptors (GPCR) family, were shown in the brain areas responsible for mnemonic and cognitive processes, i.e., the dorsal hippocampus, the striatum and the prefrontal cortex (PFC). Recently, 5-HT6R become the targets of new promising and innovative therapies. For instance, the ligands of 5-HT6R seem to be pivotal for the successful treatment of several cognitive impairments, including Alzheimer's disease (AD) and an age-related decline in cognitive abilities.

**Aim of the study:** Since 5-HT6R receptors are mainly located in the brain, it is inevitable to determine the permeability of the newly developed triazine – derived ligands through biological membranes in order to determine the effectivity and efficacy of the obtained series.

**Materials and methods:** Parallel artificial membrane permeability assay (GentestTM) was used to determine the permeability of 10 different compounds – 9 selected triazine derivatives being a potent 5-HT6R ligands and caffeine as a control compound due to its excellent permeability through the biological membranes. For analysis purpose, each compound was labelled from compound 1 to 10 where compound 1 indicates caffeine. The results were then quantified by liquid chromatography mass spectrometry (LC/MS) and the permeability coefficients (Pe) were calculated according to manufacturer's protocol.

**Results:** Pe values of the tested compound ranged from 0 to 0.022 mm/s, where compound 4 with the highest permeability while compounds 6 and 10 were completely impermeable. The results were compare to the Pe value of the well permeable reference caffeine (0.006 mm/s).

**Conclusions:** Overall, the newly developed serotonin receptor inhibitor compounds had a good permeability but compounds 5, 6 and 10 are exceptions since it has a permeability of 0.0008 mm/s or below.

**Title**: Using CACTUS, a classification AI, to predict survival outcomes in a gastric cancer cohort

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**Introduction:** Gastric cancer (GC) is a malignancy with sexually dimorphic behaviour, that benefits from neoadjuvant chemotherapy (NeoChT), though prognostic prediction tools are lacking. The machine learning tool CACTUS – Comprehensive Abstraction and Classification Tool for Uncovering Structures - was developed according to the principles of explainable artificial intelligence specifically for the small and incomplete datasets in health sciences.

**Aim of the study:** In this study we use CACTUS to develop a model for prediction of survival outcomes of gastric cancer patients.

**Materials and methods:** We studied 137 cases of operated GC, 51 of which were submitted to NeoChT. Collected data included demographics, histopathological, molecular, clinical and staging information. CACTUS was used to analyze the data and classify the patients according to their survival status. Two experiments were done with CACTUS, the first included staging information, whereas in the second did not include disease staging. Each experiment was performed using the whole dataset, data stratified by sex and data stratified by NeoChT status. CACTUS classification was characterized using accuracy, balanced accuracy (BA), sensitivity, specificity, positive predictive value and negative predictive value. Furthermore, knowledge graphs were created to evidence feature aggregation and individual features were evaluated to determine their influence on the classification. Classical statistical analysis was performed to compare with the results of CACTUS.

**Results:** The first experiment yielded a high quality classification (BA=75.9%), with the most relevant features for classification being lymph node metastasis, perineural invasion and pathologic M stage. For the second experiment, the quality of the classification was lower (BA=66.4%), with the most relevant features being perineural invasion, lymphovascular invasion and lymphoid stroma presence. CACTUS classification using stratified data yielded better results, with the exception of women in the second experiment (BA=65.8%). For women, the most relevant

feature for classification was the microsatellite status, with classical statistical analysis indicating a statistically significant difference between survivors and non-survivors (p=0.034), whereas for men age was the most important feature, which also had statistically significant differences (p=0.014).

**Conclusions:** CACTUS has a high performance in classifying GC patients according to their survival status. This tool might have a role in clinical pratice to help predict the outcome of GC patients.

**Title**: Enhancing Anatomy Learning with the HoloAnatomy Software Suite: A Mixed Reality 3D Anatomical Atlas

**Authors:** (1)Julianna Dąbrowa, (1,2)Klaudia Proniewska, (1)Krzysztof Piotr Malinowski, (2)Piotr Walecki

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**Introduction:** In response to increasing demands in medical education, virtual anatomy atlases (e.g. Complete Anatomy) offer valuable support alongside traditional university courses. Despite existing 3D visualization capabilities of anatomical structures, these atlases are typically limited to 2D screens. Mixed Reality technology, exemplified by the HoloAnatomy Software Suite, addresses this limitation by seamlessly integrating 3D holograms with the real world, facilitating interactive exploration and manipulation of anatomical structures from various perspectives.

**Aim of the study:** The objective of the investigation was to assess users' proficiency in adapting to the learning process within the Mixed Reality environment employing the HoloAnatomy Software Suite, along with identifying the factors impacting this learning process and delineating the utility of various functions therein.

**Materials and methods:** Multiple thematic presentations were developed in alignment with the current anatomy curriculum at Jagiellonian University Collegium Medicum. These presentations were conducted in the Mixed Reality Laboratory of UJCM, specifically designed for such purposes, mirroring topics covered in the dissection room. Each session, led by anatomy instructors proficient in equipment operation, accommodated groups ranging from 1 to 10 individuals. After each session, surveys were administered, gathering feedback from 85 participants regarding their experience with HoloAnatomy.

**Results:** Out of 85 respondents, the majority reported positive experiences with HoloAnatomy. Among them, 55 (65%) had prior anatomy learning experiences, and 58 (68%) regularly used 3D visualization software alongside traditional study materials. Notably, prior anatomy experience did not influence users' perceptions of device comfort, usability, and functionality. However, respondents with prior exposure to 3D visualization software were more adept at identifying structures (81% vs. 95%, p=0.03), found the side-by-side model display (93% vs. 100%, p=0.09) and toggle function (70% vs. 88%, p=0.048) more useful, and were better able to recognize relationships between anatomical components (81% vs. 97%, p=0.03).

**Conclusions:** Widely accessible virtual anatomical atlases play a pivotal role in facilitating 3D reality teaching modalities, including Mixed Reality. The study presented herein underscores the efficacy of Mixed Reality technology in anatomy education. However, despite promising results, this technology necessitates further validation, necessitating meticulous course preparation, and the development of materials compatible with widely accessible virtual anatomical atlases.

**Title**: The influence of non-ionizing electromagnetic fields on health - perspective of Polish university students

**Authors:** Patryk Bałut, Kamila Undas, Norbert Kapczyński

**Tutors:** prof. Grzegorz Tatoń MD, PhD

**Affiliation:** Students' Scientific Group of Medical Biophysics, Jagiellonian University Medical College, Department of Physiology, Chair of Biophysics

**Introduction:** The ubiquity of electronic devices in modern society has led to the emergence of various misconceptions about their potential health impact, particularly regarding the effects of non-ionizing electromagnetic fields (EF). Such beliefs have caused concerns among the general population and require further research in order to accordingly address this phenomenon.

**Aim of the study:** To assess the knowledge and opinions of Polish university students regarding the influence of electromagnetic fields on health and well-being.

**Materials and methods:** An online questionnaire was distributed among Polish university students using Google Forms. The survey consisted of 23 questions about demographic data, knowledge and opinions regarding the influence of EF on health, as well as habits pertaining to the usage of devices that generate EF.

**Results:** We managed to acquire 42 responses from university students from 11 universities, aged 22±0.8 years old (range 21–24). 71.4% were female. 64.3% (27) of respondents believed that electronic devices negatively affect health. 47.6% (20) of respondents believed that carrying mobile phones in pockets can cause infertility; however, only 16.7% (7) respondents stated they refrain from doing so. 69.0% (29) of respondents believed that sleeping with mobile phones near the head can cause sleep disturbance or diminished well-being the next day, and 47.6% (20) responded that they avoid having their mobile phone under their pillow or near their head while they sleep. 16.7% (7) of respondents believed that consuming 3 or more meals heated in a microwave oven daily could increase the risk of developing cancer. 26.2% (11) avoid using the microwave oven. The most commonly reported side effects of electronic device usage were fatigue and drowsiness - 40.5% (17), headache - 38.1% (16) and eye pain or otalgia - 35.7% (15). Interestingly, 45.2% (19) respondents declared the close neighbourhood of high voltage lines would not influence their choice of house location.

**Conclusions:** The influence of electromagnetic fields is a concern among a significant portion of the Polish university student population, which suggests a potential need for further efforts in the implementation of a better education system regarding the influence of electronic devices on health.

# POSTER SESSIONS

# BASIC SCIENCES & PHARMACY POSTER SESSION

prof. Piotr Laidler, MD, PhD
Katarzyna Nazimek, MD, PhD
Ewa Jasek- Gajda MD, PhD
Beata Giżycka-Bujak, MD

## Sessions coordinators:

Olga Wilk

Magdalena Cieślik

**Title**: Biotransformation of propranolol and metoprolol by Cunninghamella species and Aspergillus niger

**Authors:** Barbara Dąbrówka, Aleksandra Łapa, Adrianna Bargieł, Aleksandra Guzda

**Tutors:** Paulina Koczurkiewicz-Adamczyk, Asst. Prof. and Karolina Słoczyńska, Asst. Prof.

**Affiliation:** Department of Pharmaceutical Biochemistry, Faculty of Pharmacy, Jagiellonian University Medical College, Krakowana

**Introduction:** Cardiovascular diseases (CVDs) are the leading cause of death globally. The escalating sales and consumption of beta-blockers such as propranolol and metoprolol have resulted in the pollution of the aquatic environment. As a result, there is an increasing need to explore new bioremediation approaches. Fungi such as Cunninghamella and Aspergillus have been extensively studied for their capacity to biotransform a wide range of xenobiotic compounds.

**Aim of the study:** The purpose of this study was to evaluate the biodegradation efficiency of propranolol and metoprolol by Cunninghamella and Aspergillus species. Moreover, in silico tools were used to predict the toxicity of fungal transformation products.

**Materials and methods:** Three strains of Cunninghamella (C. echinulata, C. blakesleeana and C. elegans) and Aspergillus niger were used to biotransform propranolol and metoprolol. The progress of 7 days biotransformation was monitored by liquid chromatography coupled with tandem mass spectrometry (LC-MS/MS). The in silico toxicity of fungal transformation products was assessed using the Derek Nexus system.

**Results:** Different outcomes were noted in the degradation of propranolol and metoprolol following a 7-day incubation period with Cunninghamella and Aspergillus strains. Propranolol demonstrated a more efficient biotransformation compared to metoprolol. The primary metabolite, hydroxypropranolol, was observed in 79% for C. blakesleeana, 24% for C. echinulata, and 3% for C. elegans post-biotransformation. Metoprolol's major metabolite, O-desmethylmetoprolol, was detected in 11% for C. echinulata and 5% for C. blakesleeana. Biotransformation of metoprolol did not occur in C. elegans. Similarly, A. niger did not biodegrade any of the drugs. The in silico toxicity tool indicated plausible carcinogenicity and hERG channel inhibition in vitro in mammals for the aromatic hydroxylation products of propranolol.

**Conclusions:** To sum up, the study indicates that Cunninghamella strains possess better biotransformation abilities than Aspergillus niger. Furthermore, the degree of biotransformation is probably impacted by the compound's chemical structure.
The project was supported by the National Science Center Grant No 2020/37/B/NZ7/02546.

**Title**: Cheminformatics approach to the search for novel GPCR ligands

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**Introduction:** Initial stages of drug developement are dominated by computational approach. By calculating putative ligand affinity to its target and simulating possible interactions, we can accelerate search of novel molecules, while simultaniously lowering the cost and labour, when compared to conventional high-throughput screening. G-protein coupled receptor's (GPCR) family consists of vast landscape of receptors, many of which being molecular targets for currently utilized drugs.

**Aim of the study:** The aim of the study was to search for possible biological targets, for novel ligands library, among GPCR family members. The library was designed and synthethised by Prof. Dr Vitalii Palchykov. Selected hits are to be submitted for in vitro binding assays towards particular targets.

**Materials and methods:** Ligand-based search by online service SwissTargetPrediction was used to find possible biological targets. Structures sourced from PDB (Protein Data Bank) were prepared using Maestro Schrödinger Suite, then molecular docking was carried out using ligand library. Seleted complexes were further analysed using molecular dynamics simulations.

**Results:** Ligands: PA1455, PA1161, PA1452 expressed good binding interactions and were stable in binding pockets of adenosine A1, serotonin 5-HT2C and 5-HT6 receptors respectively.

**Conclusions:** Selected ligands constitute putative, potential hits for adenosine A1, serotonin 5-HT2C and 5-HT6 receptors. Further in vitro assays are needed to validate the findings.

**Title**: The role of exosomes and miR150 in cell response-induced collagen-specific arthritis

**Authors:** Kacper Klasa - presenter, Izabela Krzemień, Hubert Stankowicz

**Tutors:** Krzysztof Bryniarski PhD

**Affiliation:** SSG of the Department of Immunology for Students of the Faculty of Pharmacy with the Division of Medical Analytics

**Introduction:** Rheumatoid arthritis is a major health concern, inspiring extensive research, particularly using animal models like collagen-induced arthritis. Finding new treatment methods is crucial in the area of immunomodulatory molecular therapy research

**Aim of the study:** The aim is to study the effect of exosomes (microvesicles containing natural miR-150) and use synthetic miR150 to achieve inhibition of the inflammatory cellular response in collagen-specific arthritis in male DBA-1 mice.

**Materials and methods:** Mice were injected intravenously with solution of syngeneic erythrocytes and then immunized with intradermal administration of collagen solution. Lymph nodes and spleens was isolated from immunized animals, 48h cell cultures of suppressive lymphocytes were established in Mishell-Dutton medium and then the resulting filtrate was centrifuged and filtered to isolate suppressive exosomes (microvesicles containing collagen-specific factor coll-TsF).
Arthritis was induced by immunization by the subcutaneous route into the caudal epiphysis using an emulsion of acidic collagen solution (coll) in saline with incomplete Freund's adjuvant. After 8 days, coll was additionally administered intradermally. After day 21, the severity of inflammation was assessed daily in SCORE scale.
Half of the positive group was administered exosomes intraperitoneally, and a statistically significant difference was observed in the reduction of inflammatory symptoms compared mice not treated with coll-TsF. In order to identify the factor responsible for the reduction of arthritis, another experiment was performed, involving transfer of inflammatory cells to previously untreated recipients and transfer of inflammatory cells using coll-TsF exosomes or anti-miR150 antagomir, respectively blocking the action of natural coll-TsF. Synthetic miR-150 was administered to transfer of inflammatory cells to assess its effect on inflammatory symptoms in the another study group.

**Results:** The results group showed that the group receiving pure miR-150 expressed a similar level of symptom inhibition as the group receiving coll-TsF alone. However, the group receiving coll-TsF with anti-miR150 antagomir showed a similar result to the positive control group that developed arthritis, suggesting that anti-miR150 antagomir abolishes the inhibitory effect of the coll-TsF.

**Conclusions:** The results indicate the possible use of miR-150 in inhibiting the cellular component in arthritis. The degree of symptom reduction is statistically significant but, due to the small study group, the results should be considered pilot and research in this direction is needed.

**Title**: Phytochemical analysis and anti-tyrosinase activity of extracts from Ardisia crenata Sims

**Authors:** Gabriela Florek, Oliwia Dulewska, Kacper Stępak, Angelika Ściupider

**Tutors:** Dagmara Wróbel Biedrawa, PhD

**Affiliation:** SSG of Pharmacognosy

**Introduction:** Ardisia crenata Sims is a plant belonging to the primrose family (Primulaceae), which naturally occurs in swampy areas and wet forests across Asia. Its root is used in Traditional Chinese Medicine in the treatment of respiratory-tract infections, infertilty, menstrual cycle disorders. A number of studies have been conducted to assess the presence and activity of chemical compounds in the plant. Among others benzoquinones and saponins were found. In the current study we decided to check anti-tyrosinase effect of extracts from A. crenata. Substances with such an activity could be potentially used as skin whitening or anti-browning agent.

**Aim of the study:** An assessment of phytochemical composition and anti-tyrosinase effect in vitro of extracts obtained from leaves of white variety of Ardisia crenata Sims.

**Materials and methods:** Methanolic and chloroform extracts from leaves of Ardisa crenata were obtained using the classical extraction (heat-reflux solvent extraction) and ultrasound-assisted extraction. The preliminary phytochemical analysis was performed using thin-layer chromatography (TLC) and high-performance liquid chromatography (HPLC). The biological activity was checked using an in vitro assay with L-DOPA and L-tyrosine as the substrates for tyrosinase.

**Results:** TLC showed the content of polyphenols, benzoquinones and saponins in Ardisia crenata leaf extracts. HPLC analysis confirmed the presence of rapanone and polyphenols. Methanol extracts from Ardisia crenata showed tyrosinase-inhibiting effect, with IC50 =0.202 mg/mL (with L-DOPA as a substrate), which was only a few times higher than a standard substance, kojic acid.

**Conclusions:** The obtained Ardisia crenata leaf extracts presented in vitro tyrosinase inhibiting activity which provides grounds for further research confirming this effect.

**Title**: The impact of CBD on protein lipid transporters of fatty acids transporters in subcutaneous and visceral adipose tissue in HFD-induced obese rats

**Authors:** Lara Swierkot (1), Patryk Chabowski (1)

**Tutors:** Karolina Konstantynowicz-Nowicka, PhD (2)

**Affiliation:** (1) Student Science Club "Creative Physiologist", Department of Physiology, Medical University of Bialystok. (2) Department of Physiology, Medical University of Bialystok

**Introduction:** In the present era, obesity emerges as a foremost and substantial healthcare issue on a global scale. Two key factors contributing to the current state are sedentary lifestyle and increased accessibility of highly processed food, rich in saturated fats. The dietary pattern designated as High Fat Diet, is a key factor contributing to accumulation of the lipids in the cells, which in turn may impair their proper functioning. The degree of excessive aggregation is dependent on the intracellular transport level, which is coordinated by protein fatty acids transporters. A substance capable of regulating the excess of transport, seems to be cannabidiol (CBD).

**Aim of the study:** The aim of the study was to investigate the potential beneficial impact of CBD on lipid metabolism by changing the expression of fatty acids transporters, which could thwart obesity and other conditions associated with it such as type 2 diabetes.

**Materials and methods:** Male Wistar rats were divided into four experimental groups. Rats in the Control and CBD groups were given a standard rodent diet, while those in the HFD and HFD+CBD groups received a high-fat diet. The study lasted for seven weeks. During the last two weeks of the experiment, the CBD and HFD+CBD groups received a daily intraperitoneal injection of cannabidiol at a dosage of 10 mg/kg of body weight, administered consistently at the same time each day. Gas-liquid chromatography (GLC) was performed to analyze total n-3 and n-6 in TAG, DAG, FFA and PH. Moreover, the expression of FAT/CD36, FABPpm, FATP1 and FATP4 were assessed by Western Blot.

**Results:** In our study we observed a substantial decrease in the content of total n-3 and n-6 in lipid fractions in VAT and SAT in the HFD+CBD group compared with the corresponding HFD group. Furthermore, in the HFD+CBD group clearly diminished expression of FAT/CD36, FABPpm, FATP1 and FATP4 was determined.

**Conclusions:** The results indicate that CBD may hold promise as a therapeutic agent for addressing a prominent healthcare issue - obesity. Furthermore, cannabidiol could be regarded as a remedy for metabolic disorders associated with or triggered by excess body fat, such as insulin resistance.

**Title**: Inhibitory properties of mare milk oligosaccharides in Cutibacterium acnes cultures

**Authors:** Kacper Pająk 1, Sylwia Jarzynka 2, Wiktoria Stańska 1 , Olga Witkowska-Piłaszewicz 3, Bartosz Pawliński 3, Dominika Domańska 3, Gabriela Olędzka 2

**Tutors:** Sylwia Jarzynka, PhD

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**Introduction:** Acne vulgaris is a common skin disease affecting approximately 9.4% of the world's population, with the highest prevalence among adolescents. Many pharmaceutical substances are applied in day-to-day clinical practice, but demand for new therapy options is constant.

**Aim of the study:** Our study aims to evaluate whether Animal Milk Oligosaccharides (AMOs) present in mare milk may inhibit the growth of planktonic and biofilm-living Cutibacterium acnes.

**Materials and methods:** We used Cutibacterium acnes ATCC 11827 from the American Type Culture Collection and AMO probes from our laboratory collection. The C. acnes isolates from a 3-day BHI (Brain Heart Infusion) cultures were transferred to the 96-well plates to acquire final concentrations of AMO's ranging from 50 to 0,1529 mg/mL in each well. Lactose and pure BHI were used as control solutions. The cultures were grown under anaerobic conditions at the temperature of 37 °C. The ability of AMOs and lactose to inhibit the growth of C. acnes strain was evaluated quantitatively by droplet serial dilution. We serially diluted the contents of each well and set new cultures. The number of formed colonies was counted.

**Results:** In this preliminary study, the mare's milk oligosaccharides showed good potential for antimicrobial activity on C. acnes. The AMO's solution inhibited the growth of planktonic bacteria of C. acnes (concentration 6.25 – 0,15 mg/mL) with a decrease of even 2-3 Log for 3.12 mg/mL and 6.26 mg/mL, respectively. The inhibition of the biofilm formation was at the highest level (4 Log) for 6.25 mg/ml of AMOs concentration. The AMO's effect on biofilm living bacteria was poor, and the preliminary minimum biofilm inhibitory concentration (MBIC 50 mg/mL) was unsatisfactory. The lactose didn't present the AMO's activity either on planktonic or biofilm-living bacteria.

**Conclusions:** Our primary study first demonstrated that mare's milk oligosaccharides might be effective against Cutibacterium acnes. The bacteriostatic and bactericidal effects of AMOs are promising. The poor performance of AMOs against biofilm-forming bacteria needs to be evaluated more carefully. AMOs in the mare milk might be a natural, cost-effective anti-acne therapy option that limits antibiotics use.x

**Title**: Effect of Low-, Moderate-, and High-Intensity Exercise on ANP and SERCA2a Gene Expression in Rat Cardiac Muscle

**Authors:** Averina Octaxena Aslani

**Tutors:** Hanna Goenawan, MD, M.Kes., PhD and Nova Sylviana, MD, MKes.

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**Introduction:** While exercising, the heart maintains optimal function by producing certain substances known as cardiac biomarkers, including ANP (Atrial Natriuretic Peptide) and SERCA2a (Sarcoplasmic/Endoplasmic Reticulum Calcium-ATPase 2a). Thus far, it is recommended to exercise with moderate intensity. However, this recommendation has not had adequate bio-molecular basis.

**Aim of the study:** This study is aimed to analyse the effect of low-, moderate-, and high-intensity treadmill exercise on ANP and SERCA2a gene expression in rat cardiac muscle.

**Materials and methods:** This study was conducted using semi-quantitative analytic method and experimental study design. Total of 24 male Wistar rats were divided randomly into 4 groups: 1 control group (0m/min) and 3 exercise groups (low-: 10m/min, moderate-: 20m/min, high-intensity exercise: 30m/min). All groups received 30 min/day running, 5x/week for 12 weeks. The rats were terminated under anaesthesia, cardiac muscle extraction was done from left ventricle, and gene expression of ANP and SERCA2a was studied. Statistical analysis was done using SPSS software with one-way ANOVA followed by post hoc comparisons if the p-values <0.05.

**Results:** The expression of ANP increased but insignificant in low-, moderate-, and high-intensity exercise group of rat (0.872±0.034 vs 0.901±0.018 vs 0.916±0.015 vs 0.938±0.025; p=0.304). The expression of SERCA2a also increased insignificantly in low-, moderate-, and high-intensity exercise group of rat (1.044±0.019 vs 1.051±0.015 vs 1.063±0.011 vs 1.082±0.027; p=0.493).

**Conclusions:** Different exercise intensity did not have significant effect on ANP and SERCA2a expression in rat cardiac muscle. Further studies are required to analyze the effect of different exercise intensity on histopathology changes in rat cardiac muscle.

**Title**: Topography and anatomical variabilities of the right ventricle apical region and right ventricular surface of interventricular septum- could they be a problem during electrocardiological procedures?

**Authors:** Karolina Gutkowska [1], Maria Kurek [1],Jakub Batko [1], Marcin Jakiel [2],

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**Introduction:** The right ventricle (RV) apical region and the interventricular septum (IVS) are electrode implantation sites. An effective attainment of this region, bypassing the numerous structures in the RV, i.e. anterior and posterior papillary muscles (APM, PPM), moderator band (MB) is one of therapeutic success criteria, thus a detailed knowledge of the anatomy of this area is necessary.

**Aim of the study:** The aim of study was a detailed assessment of the morphology of the RV apical region and the right ventricular surface of IVS, including a definition of anatomical variabilities in this region.

**Materials and methods:** We analysed 81 hearts obtained during forensic medical autopsies from adult donors without structural heart disease. The RV was opened by dissecting the muscle along its right periphery. Researchers assessed the presence and structure of APM, PPM and SB. MB, its departure level from the SB, dimensions and position in relation to APM were assessed. Linear dimensions were recorded using a precise electronic caliper by 2 different investigators. Statistical analyses were performed using STATISTICA 13.1.

**Results:** In all hearts both APM and PPM were described, with dimensions of 7.52x16.95x15.37mm for APM (mean), and 4.97x2.75x11.14mm for PPM (median) (width, thickness and length respectively). A single-belly APM was present in 83.1% hearts. The stabilization of APM was mostly linked to connections with the anterior wall or MB (62% and 29.6% of cases respectively). A single-belly PPM was found in 88.9% cases. The distance between papillary muscles was 13.54mm (mean). The width of the SB in initial and final sections was 16.78mm and 10.42mm (mean) respectively, wherein in 47.9% of cases it divided distally to 2 branches. 1-3 myocardial bridges, departing from the SB and terminating at the RV anterior wall, was found in 72.3% of cases. A single MB was present in 89.8%. The MB length from the departure to APM was 14.04mm (mean). In 28.3%

cases MB extended right from APM, in this group length was 25.65mm (median). In 78.6% of cases a trabeculation grid was found in the structure of the RV apical region.

**Conclusions:** Morphology of the RV apical region and IVS right ventricular surface presents a high variability in each analysed aspect. Anatomical variabilities of the aforementioned structures may create difficulties to achieve the goal of a procedure, and simultaneously may promote complications.

**Title**: Can β-carotene inhibit the progression of prostate cancer?

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**Introduction:** Prostate cancer (PC) is the second most common malignancy in men worldwide. PC tissue is regulated by androgens, which are engaged in regulating cell proliferation by androgen receptors (AR) and the next progresses to the metastatic, androgen-independent stage for which there is currently no satisfactory treatment. Epidemiology data suggests the possibility of a nutritional approach for disease prevention and treatment with carotenoids as one of the considered classes of nutrients. The effects of carotenoid intake depend on many factors, such as used concentration and type of carotenoid. Studies have proposed that β-carotene (BC) affects PC cells by altering intercellular signaling and influencing epithelial to mesenchymal transition (EMT), though the detailed molecular mechanism of this phenomenon remains unclear.

**Aim of the study:** To determine the impact of BC and its liposomal form on steroid metabolism in PC cells in the different stages of cancer.

**Materials and methods:** The study was conducted on PC cell lines PC-3, LNCaP, Du145, and healthy prostate cells. Cells were cultured according to protocol and treated with 3 μM BC, liposomes, and liposomes containing 3 μM BC. After 24h and 48h, the cells were lysed and used for the analysis by QR-PCR and Western Blot techniques. Scratch assays were performed to determine cell migration.

**Results:** The results of expression analyses depended on the cell line specifications. In androgen-independent PC-3 and Du145, BC elevated levels of SREBP or LDL-R and decreased them in LNCaP. BC affected EMT markers by increasing epithelial markers, although mesenchymal marker results differed in the 24h and 48h samples. In scratch assays, BC reduced cell migration.

**Conclusions:** The results of the study indicate that BC can either limit or promote steroid accumulation in PC cells, depending on AR presence. In the context of EMT, BC seems to both inhibit and promote the process. The ambiguity of results shows the complexity of carotenoid-dependent cellular response. Nevertheless, carotenoids seem promising in prostate cancer prevention and therapy but require further research.

# CARDIOVASCULAR CASE REPORT POSTER SESSION

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**Title:** Consternation during cardiac examination - incidental diagnosis of a rare anomaly in two adult patients

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**Introduction:** Cor triatriatum sinister (CTS) is an extremely rare congenital heart defect that accounts for about 0.1% of all congenital heart anomaly cases. It is defined as the presence of a pathological septum within the left atrium. The severity of symptoms correlates with the number and size of septal perforations. Clinical manifestations might range from severe circulatory failure to an asymptomatic course. Even though the condition has a number of known complications, some cases may be discovered incidentally and have no bearing on treatment. This case report covers two adult patients who received a diagnosis of CTS.

**Case presentation:** The first patient, a 63-year-old male, has been admitted to the hospital for oncological treatment and has been consulted by a cardiologist before planned surgery. During the cardiological examination, echocardiography was performed, which revealed an intraatrial membrane separating the pulmonary vein insertion from the remaining left atrial body, indicating CTS. Computed tomography has been performed, and an intraatrial membrane was reported. The diagnosis of the congenital heart defect did not result in a modification of the treatment, as it was classified as an incidental, asymptomatic finding. The second patient, a 75-year-old female, was referred for a cardiology assessment after her pulmonologist suspected angina. Coronary ischaemia has been excluded after non-invasive cardiac tests. However, CTS has been diagnosed with echocardiography. An intraatrial membrane was found on a prior CT scan of the patient's chest, which supported the diagnosis. In this instance, the patient's symptoms were not considered to be caused by the presence of an intraatrial septum.

**Conclusions:** While congenital heart defects are usually detected among pediatric patients, some of them may remain silent for years. CTS is an extremely rare anomaly in which symptomatic cases are usually diagnosed during infancy. Among patients with no specific symptoms, CTS may be an incidental finding that has no significant effect on the cardiovascular system. In such patients, no therapy modifications are required, and surgical intervention is not advised. Classifying a patient into this group is possible after excluding the influence of the defect on the patient's symptoms, which is not always evident.

**Title:** As big as it gets? Sinus of Valsalva Aneurysm case study.

**Authors:** Grzegorz Horosin, Alicia del Carmen Yika, Karolina Gutkowska

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**Introduction:** Sinus of Valsalva aneurysm (SVA) is a dilation of the aortic root segment between the aortic valve annulus and the sinotubular junction. It is a rare cardiac defect with an estimated rate of 0.09% in the general population and associated with congenital or acquired conditions promoting connective tissue weakness. The following case presents tremendous example of this pathology and highlights the details of diagnostic and therapeutic procedures.

**Case presentation:** A 77-year-old obese man, with hypertension, dyslipidemia, ventricular arrhythmias, coronary artery disease, and history of two myocardial infarctions, was hospitalized for further cardiological diagnostics. Echocardiography revealed an asymmetrical isolated dilatation of the aortic root with preserved normal aortic valve function and the findings related to patient's comorbidities. The diagnosis was confirmed by computed tomography angiography, which demonstrated atherosclerotic changes in the elongated and dilated thoracic aorta as well as an aneurysm of the right sinus of Valsalva with the aortic root measurements; 4.1 × 3.7 × 5.7 cm, sinotubular junction; 3.2 cm and ascending aorta; 3.5 cm. Furthermore, a coronarography was performed, which visualized diffused coronary artery stenosis with up to 50% occlusion in LAD, a maximum of 90% stenosis in the diagonal arteries and aneurysmal dilatation of the right coronary artery in the third segment. Finally, the patient was qualified by Heart Team for the conservative treatment of coronary artery disease and close observation of the aortic root with the recommendation of an angioplasty procedure, in case of enlargement of the sinus of Valsalva aneurysm.

**Conclusions:** One of the most severe SVA complications remains its rupture. In patients with unruptured SVA other complications and coexisting factors should be assessed before the invasive treatment. According to the 2022 AHA guidelines maximum diameter of the aortic root greater than 5,5 cm is an individual class 1 indication for surgery treatment. The discussed patient had an asymptomatic, unruptured aneurysm limited to the right Valsalva sinus with a maximum diameter of 5.7 cm, presumably as a consequence of atherosclerosis. Considering patient's age, preserved aortic valve function, and a lack of associated symptoms, close observation of the aneurysm was recommended.

**Title:** Large coronary artery fistulas – an unexpected finding during diagnosis of coronary artery disease

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**Introduction:** Coronary artery fistula (CAF) is an abnormality in which a coronary vessel is connected to the cardiac chamber or another large vessel. A substantial majority of CAFs are congenital defects, however sometimes they occur as a result of trauma or surgery procedure. Most fistulae are asymptomatic and are discovered during imaging studies. The disorder may remain undiagnosed for years, which can cause various complications, such as thrombus formation, arrhythmias and myocardial ischemia. We present the case of a patient with intercurrent cardiovascular diseases who was diagnosed with numerous pathological fistulas at an advanced age.

**Case presentation:** A 73-year-old patient was admitted to University Hospital in Krakow (Poland) to determine the cause of the reported angina pectoris and abnormal results of an exercise test. Coronary angiography was performed; in addition to critical narrowing of two coronary arteries, numerous anastomoses with the pulmonary trunk and aorta were discovered. The patient underwent a successful percutaneous coronary angioplasty of the left anterior descending artery and was discharged from hospital with recommendations. Computed tomography angiography (CTA) performed a few months later confirmed the good effects of the operation and provided more detailed information about a very rich and tortuous course of the anastomoses.

**Conclusions:** CAFs may cause a number of potentially life-threatening complications for patients. Currently, CTA with 3D reconstruction is the recommended imaging modality to study the anatomy of CAFs. In some cases, surgical closure of fistulas may be considered. However, the patient's general health state and the risk of postoperative complications should be taken into consideration. In this case, conservative treatment was chosen due to the patient's advanced age and the complete resolution of his angina symptoms after procedure.

**Title:** Cor triatriatum dexter

**Authors:** Gwan Yong Lim

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**Affiliation:** Student Scientific Club, Cardiothoracic and Transplantology Department, Medical University of Warsaw, Warsaw, Poland

**Introduction:** Cor triatriatum dexter (CTD) is a rare congenital heart anomaly, first described in 1868. The prevalence of CTD is approximately 0.1% of all congenital cardiac abnormalities. It is a right atrium abnormality due to the persistence of the right sinus venosus valve. The majority of cases are discovered as incidental findings. Transthoracic echocardiography (TTE) remains the gold standard of diagnosis, however, primary diagnosis can be done by magnetic resonance imaging (MRI) and computed tomography (CT). Asymptomatic patients are generally under observation. In cases of tricuspid valve obstruction, surgical resection of the prominent Eustachian valve is the conventional treatment.

**Case presentation:** A 4-week-old male infant was referred for cardiac evaluation and surgical treatment of a hyperplastic eustachian valve (EV) causing symptoms of tricuspid stenosis. The child was delivered on term with a birth weight of 3520 g. The Apgar score at birth was 10 points. The initial pulse oximetry test revealed low SaO2 (88–92%) and TTE shows a prominent eustachian valve (EV) with stenosis of TV and a right-to-left shunt throught the foramen ovale. On the electrocardiogram (ECG) and Holter-ECG, premature atrial contractions were noticed. On admission, the patient was in general good condition. Physical examination revealed a mild central cyanosis on the mucous membrane while crying, otherwise, it was unremarkable. TTE confirmed the initial diagnosis of CTD. The fibromuscular membrane caused TV obstruction during diastole, resulting in a right-to-left shunt via FO. The surgery with Eustachian valve resection was performed relieving the symptoms. In 6 month follow-up, the patient was in good condition and did not require any pharmacological treatment.

**Conclusions:** CTD has a wide spectrum of clinical manifestations. Thus, early diagnosis plays a significant role in the prognosis. For most asymptomatic patients, surgical treatment is not necessary and regular medical check-ups are usually sufficient. However, patients with symptoms of tricuspid valve obstruction (central cyanosis, right ventricle failure) should be offered early surgical intervention to prevent further complications. In neonates with desaturation and distress, an echocardiogram should be conducted to rule out CTD.

**Title**: Emergency treatment of cardiogenic shock in the course of aortic valve stenosis

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**Introduction:** Aortic valve stenosis is progressive and irreversible acquired heart disease that can lead to cardiogenic shock. Standard treatment of this disease is cardiac surgery; however transcatheter aortic valve implantation (TAVI) is increasingly being used in patients with increased perioperative risk. Patients with progressive cardiogenic shock require the use of left ventricular assist devices.

**Case presentation:** 63-year-old man, a smoker with a history of stroke (2 years prior) was transferred to our facility from another hospital due to cardiogenic shock in the course of severe aortic valve stenosis despite the use of conventional treatment. After admission he was consulted by The Shock Team and qualified for urgent balloon valvuloplasty and left ventricular assist device (LVAD) support. Patient was immediately transferred to the Hemodynamics Laboratory, intubated and placed on mechanical ventilation. Critical stenosis of biscupid aortic valve with a planimetric area of opening (AVA) of 0.5-0.6 cm2 and decreased ejection fraction was confirmed with transesophageal echocardiogram. Valvuloplasty was performed, using access through the right femoral artery, which resulted in an increase in the valve's surface area. Due to persistent features of cardiogenic shock, the left ventricular assist device (Impella CP) was implanted. As a result of successful treatment, over the following days, stabilization of the patient's clinical condition was achieved. After the consultation by The Heart Team, the patient was qualified for Transcatheter Aortic Valve Implantation (TAVI). Valve Sapien 26 mm was implanted with simultaneous removal of the Impella pump. Patient's condition improved and after two days he was extubated. In the follow-up echocardiography, an increase in the left ventricular ejection fraction to 52% was observed. Patient was discharged home in good condition after 36 days from admission.

**Conclusions:** Treatment of cardiogenic shock in severe aortic valve stenosis using balloon valvuloplasty, left ventricular assist device support and subsequent transcatheter aortic valve implantation is highly effective.

**Title:** Pulmonary embolism - a rare complication of May-Thurner syndrome

**Authors:** Agnieszka Mariowska

**Tutor/s:** MD Aneta Klotzka

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**Introduction:** May-Thurner syndrome (MTS) is mainly due to compression of the left common iliac vein between the right common iliac artery and the fifth lumbar vertebra. It most commonly affects women in the third to fifth decades of life, and the first symptoms may appear during pregnancy. Patients may report sudden heaviness and swelling of the left lower limb associated with physical activity. A multidetector CT scan or MRI is performed as the study of choice.

**Case presentation:** A 21-year-old female patient was admitted to the hospital for severe abdominal pain occurring for a week. To date, she has not been chronically ill. She has been using oral hormonal contraception for the past 6 months. Although no abdominal abnormalities were noted on physical examination, the patient had reticular cyanosis of the left thigh and elevated D-dimer values (9000 IU, N<500) on laboratory tests. Doppler ultrasound of the lower extremities was performed, which did not find features of thrombosis. Angio-CT of the pulmonary arteries was ordered, which confirmed pulmonary embolism. Due to the presence of abdominal pain, a multidetector CT scan of the pelvis was performed. The final diagnosis was May-Thurner syndrome (MTS) with thrombosis in the left common iliac vein (LCIV). The patient had a mechanical thrombectomy and a stent was implanted into the left common iliac vein. She also received Apixaban.

**Conclusions:** The incidence of May-Thurner Syndrome is considered underestimated, and is rarely included in the differential diagnosis, while embolism is a rare complication of the disease. The long-term anticoagulant treatment used, although necessary, is not sufficient, so invasive therapeutic techniques are indicated to prevent distant sequelae. In addition, MTS patients suffering from chronic venous insufficiency (recurrent edema, skin lesions and superficial venous reflux) will also benefit from angioplasty and stenting.

**Title**: Young patient with hypertrophic cardiomyopathy and a heart murmur

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**Introduction:** Hypertrophic cardiomyopathy (HCM) is a heart muscle disease most often genetically determined. Its characteristic feature is an increased thickness of the left ventricular wall that cannot be explained solely by its abnormal load. Cardiovascular examination is often unremarkable, but characteristic symptoms may be observed in patients with left ventricular outflow tract obstruction (LVOTO), including systolic ejection murmur along the left sternal border.

**Case presentation:** A 35-year-old woman with HCM (mutation of MYH 7 gene), diagnosed at 17 y.o. was admitted to the cardiology department for diagnostic evaluation due to complaints of dyspnea - New York Heart Association (NYHA) functional class II, palpitations, and non-sustained ventricular tachycardia (NSVT) observed on Holter monitoring. Physical examination revealed systolic heart murmur 5/6 at Erb's point. ECG showed LBBB and hypertrophy features in both ventricles. NT-proBNP level was elevated. MRI scan showed intramuscular late gadolinium enhancement (LGE) areas, mainly in the interventricular septum. In the echocardiography examination, asymmetric left and right ventricular hypertrophy were found with a resting pressure gradient in LVOT - 15 mmHg, after the Valsalva maneuver - 20 mmHg, in an upright position – 24 mmHg, while the pressure gradient inside the right ventricle was 60 mmHg. The result in the HCM sudden cardiac death calculator was 6.02%, and as a result, the patient was qualified for implantation of a subcutaneous implantable cardioverter-defibrillator (s-ICD).

**Conclusions:** The patient was qualified for an ICD, which is supposed to protect her from sudden cardiac death. Many patients with HCM experience none or very few symptoms; in such cases, the diagnosis may be accidental or the result of screening tests. An intriguing aspect of the patient was the loud systolic heart murmur, which loudness did not correspond to the gradient measured in the left ventricle (where it occurs most often). Further examinations showed that the gradient occurred in the right ventricle, a rare phenomenon described in isolated cases. The presence of this loud murmur prompted the search for a gradient outside the standard location. Despite the use of modern diagnostic techniques (MRI, genetic tests), the physical examination was crucial in this case.

**Title:** Atypical presentation of myocarditis as Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA) in a 39-year-old patient

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**Introduction:** Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA) is a unique clinical entity that demonstrates acute myocardial infarction clinically without overt coronary artery obstruction on angiography. As researchers are still developing the definition, MINOCA is often used as a working hypothesis for yet-to-be-found other clinical states. The prevalence varies widely across studies (from 1% to 14% of patients with acute coronary syndrome undergoing angiography).

**Case presentation:** A 39-year-old man with a history of hypertension was admitted to the hospital with suspected myocardial infarction with ST segment elevation in the lateral wall. In review stinging, spilled and severe pain in the chest. The pain had started the night before with sudden onset and graduate intensification. It could not have been alleviated by medication. The patient had suffered from upper respiratory tract infection a week before admission.
Laboratory and imaging tests were performed. ECG showed ST elevation in lead I, aVL and V4-V6. The patient was scheduled for urgent coronary angiography, which did not reveal any abnormalities in the arteries, as confirmed by intravascular imaging with IVUS (Intravascular Ultrasound). The patient had elevated myocardial infarction markers – CK, CK-MB, high sensitivity troponin T (typical evolution) and pro-BNP, as well as inflammation markers and white blood cell count. The patient was diagnosed with MINOCA (Myocardial Infarction with Non-Obstructive Coronary Arteries). In the next step, MRI showed damage to the myocardium of non-ischemic ethology and edema in this location as the first step of the active inflammation process.
The diagnosis of myocarditis was drawn. Antihypertensive treatment was implemented.

**Conclusions:** Myocarditis is a serious and undiagnosed disease of myocardium which can be manifested as MINOCA. It usually occurs after viral infection of upper respiratory tract. Treatment is usually supportive and focuses on the management of potentially associated complications such as heart failure and arrhythmias. Prognosis is overall good, but ignored myocarditis can lead to severe consequences such as dilated cardiomyopathy. It is crucial to investigate the cause of a heart attack when no coronary artery obstructions are found, in order to provide appropriate treatment for patients and improve prognosis in these individuals.

**Title:** The misleading concomitance of aortic stenosis and cardiac amyloidosis – why we should always look further.

**Authors:** Katarzyna Deleska, Wiktoria Ziółek

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**Introduction:** Transthyretin amyloidosis (ATTR) is a rare condition characterized by misfolding of the transthyretin protein, leading to its deposition in various organs such as the heart, liver, and neurons. Cardiological manifestations of ATTR cardiomyopathy include left ventricular hypertrophy (LVH) with a restrictive profile, heart failure with preserved (HFpEF) or reduced ejection fraction, and abnormal intracardiac conduction. A novel diagnostic pathway, with 99m-technetium scintigraphy (99mTc-SPECT), allows physicians to identify ATTR in a safer manner.

**Case presentation:** Case presentation
A 83-year old male with severe aortic stenosis (AS), HFpEF (with prior cardiac decompensation) paroxysmal atrial flutter, diabetes mellitus, and a history of two carpal tunnel surgeries was admitted to the hospital for the evaluation for surgical valve replacement. Upon admission, he presented with dyspnea (NYHA class II) and typical exertion angina (CCS class II). Laboratory tests showed elevated cardiac markers (NT-proBNP 3419pg/ml, high sensitive T 0.026ng/ml). Echocardiogram confirmed severe AS with aortic valve area of 0.49 cm2 (gradient 93/53 mmHg, AVAI 0,24 cm2/m2) and showed concentric symmetrical LVH (LV mass 119mg/m2) with normal systolic (LV ejection fraction 59%) and abnormal diastolic function (E/e' 16, TRV 3,1 m/s). Coronary angiogram ruled out significant coronary artery disease. Due to LVH with concomitant "red flags" (carpal tunnel syndrome, AS) patient underwent 99mTc-SPECT imaging. With high accumulation of the marker in the heart (Perrugini = 3), and after serum and urine protein immunofixation negative, the patient was diagnosed with ATTR and initiated on tafamidis therapy. He was evaluated by the Heart Team and deemed eligible for urgent transcatheter aortic valve implantation. The procedure was performed without complication, and the patient was discharged home.

**Conclusions:** ATTR is a condition that is often overlooked and can be challenging to diagnose, particularly in patients with concomitant AS. This condition primarily affects the elderly population and is frequently associated with heart failure and musculoskeletal disorders. It is essential to include ATTR in the differential diagnosis to ensure appropriate management, including the consideration of tafamidis treatment.

**Title:** Complicated case of the patient with morbid obesity and other comorbidities, requiring Percutaneus Coronary Intervention (PCI) after Non-ST-Elevation Myocardial Infarction (NSTEMI).

**Authors:** Michalina Jelonek

**Tutor/s:** prof UJ Paweł Kleczyński MD PhD

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**Introduction:** Nowadays most patients have at least a few comorbidities, which can exclude from the surgical intervention. Then although coronary artery bypass grafting (CABG) is the treatment of choice for patients with the left main coronary artery (LMCA) critical stenosis, according to the European Society of Cardiology (2018), sometimes because of the contraindications, we have to choose a different treatment, for example, complicated PCI assisted with a left ventricular assistance device (LVAD).

**Case presentation:** A 70-year-old male with chronic heart failure has been admitted to the hospital, with NSTEMI. Comorbidities included hypertension, hypercholesterolemia, diabetes mellitus 2, and morbid obesity (BMI 45).

Echocardiography revealed a lowered left ventricle ejection fraction (55%), and hypokinesis of the inferior wall. In coronary angiography, we could see clinically relevant LMCA obstruction, as well as a chronically closed right coronary artery.

Because of his obesity, patient was excluded from the CABG surgery, and sent to the interventional cardiology ward for the PCI of the LMCA with the help of the LVAD device.

Before the procedure, Angio-Computed Tomography was performed, it showed narrowing of all femoral and common iliac arteries, transporting the lvad device this way was impossible, the left axillary artery has been chosen instead.

During the PCI, the catheter was inserted through the left radial artery, first, the stenosis was predilated with the use of the balloon, then the stent was put in the LMCA, stent placement, and possible residual stenosis was checked with intravenous ultrasonography (IVUS), the result has been optimal.

The patient was then discharged from the hospital and advised to come back for the checkup.

**Conclusions:** Obesity as well as cardiovascular diseases are becoming an overwhelming occurrence, and a lot of guidelines need to be updated with the data considering this group of patients and possible different approaches.

As we know many of them require PCI or CABG treatment, often the procedure is possible thanks to the left or right ventricular assistance device, we need to acknowledge, that the usual access points for larger delivery systems, the femoral artery, might be often unusable, and then we have to look for the alternative insertion places.

**Title:** An Influenza-related fulminant myocarditis complicated by cardiogenic shock and treated with venoarterial Extra Corporeal Membrane Oxygenation and Impella CP: a case report.

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**Tutor/s:** Dr hab. Konstanty-Kalandyk Janusz [1], [2]

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**Introduction:** Fulminant myocarditis (FM) is a rare complication that occurs up to 11% of influenza infections that leads to heart failure and cardiogenic shock (CS). Influenza A is linked with the highest cardiovascular mortality among other viral types. It is associated with acute clinical course and early recognition and treatment are critical for improving the prognosis.

**Case presentation:** A 35-year-old female patient was admitted to Intense Care Unit with FM and CS. An Influenza type A H1N1 infection was confirmed with a Polymerase Chain Reaction test.

The patient required inotropes and Impella CP. Echocardiography revealed a decreased left ventricle ejection fraction (LVEF) of 15% and pericardial tamponade. Due to the deteriorating condition of the patient, a decision was made to proceed with surgical treatment. Pericardiocentesis was performed using mini substernal access with drainage of the pericardial sac. Venoarterial extracorporeal membrane oxygenation (va-ECMO) was implanted via femoral artery.

The woman was administered intravenous infusion of human immunoglobulins as a part of anti-inflammatory treatment in addition to antibiotic therapy with ceftriaxone.

Repeatedly performed echocardiography have shown gradual improvement of LVEF reaching 55% and decreased myocardial oedema under continuous circulatory support. After 7 days both Impella CP and va-ECMO were removed.

After 25 days of hospitalization control echocardiography showed only a minimal layer of fluid with fibrin behind the side wall of the left ventricle. The woman was conscious, breathing on her own, hemodynamically stable with symmetrical vesicular sounds and no residual pathological symptoms.

**Conclusions:** FM followed by CS is associated with moderate mortality and can develop in any case of influenza. Early implantation of Impella CP is indicated in CS and can highly improve the patient state. The utility of the device appears in unloading left ventricle and maintaining a systemic circulation and consequently providing hemodynamic stabilization. The result is rapid and increases overall systemic cardiac output. In some cases, the use of Impella CP alone is

insufficient to ensure proper hemodynamic stability and at the same time adequate peripheral perfusion. In these cases it seems necessary to add an additional circulatory support system - va-ECMO - a valuable treatment option for this group of patients.

**Title:** Hiding in plain sight – Purulent Mediastinitis caused by Coxiella burnetii

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**Introduction:** Coxiella burnetii, the infectious agent of Q fever, is an obligate intracellular bacterium with one of the highest infectivity rates. It is responsible for a significant number of endocarditis-like afflictions in cardiac patients, and can be deadly if left untreated.

**Case presentation:** We present the case of a 44-year-old man who developed purulent mediastinits after an aortic dissection reconstruction surgery. He was previously known with multiple endocarditis episodes that resulted in an aortic valve replacement, as well as with IgG4 related disease, with large vessels involvement.

On clinical examination, the patient was responsive and afebrile, in stark contrast to the pus evacuating through a suprasternal fistula. Purpura on his legs was observed. Lab works revealed unreacted inflammatory markers, positive p&c-ANCA antibodies, and negative hemocultures. Surprisingly, bacterial cultures from the evacuated pus returned negative on multiple investigations.

Following the positive ANCA antibodies, skin biopsies were performed, which confirmed the vasculitis diagnosis, seemingly unrelated to the mediastinitis.

Given the situation, atypical bacteria were suspected, and serological tests returned positive for Coxiella burnetii (highly elevated phase 1 & 2 IgG and IgM antibodies).

Specific antibiotic therapy with doxycycline combined with Plaquenil was initiated, under which the patient's condition improved significantly.

**Conclusions:** Coxiella, due to its intracellular infectivity, is known to impact multiple cellular pathways, including some involved in immune responses. Therefore, it can sometimes manifest without any inflammatory response. Additionally, standard bacterial cultures and hemocultures will return negative because Coxiella cannot grow in those conditions.

It has been noted in literature that Coxiella infections can create cross-reactive antibodies that mimic ANCA antibodies, and as such can cause vasculitis. Our patient's seemingly unrelated vasculitis remitted after the treatment. However, we cannot be sure if that is due to treating the infection, or as a result of Plaquenil treatment.

In patients with endocarditis of unknown causes, or purulent infections that have negative cultures, that have associated vasculitis, Coxiella infection should always be suspected and evaluated using serological tests.

**Title:** Excimer laser treatment for the recurrent treatment of in-sent restenosis complicated with no-reflow

**Authors:** Wojciech Jakubowski

**Tutor/s:** prof. Paweł Kleczyński MD, PhD

**Affiliation:** SSG Modern Cardiac Therapy at Department of Interventional Cardiology, Jagiellonian University Medical College

**Introduction:** In-stent restenosis (ISR) has become more widespread with the exponential growth in stent implantation due to an aging population and a higher life expectancy, in addition to the high rates of obesity and diabetes. Even though brachytherapy became frequently used technique for treating ISR, removing the tissue is still under evaluation. Excimer laser coronary atherectomy (ELCA) is considered to be advantageous for ISR treatment by debulking and softening of the neointima, allowing to treat lesions that are uncrossable or undilatable. Excimer laser debulks and modifies the tissue with its photochemical, photothermal, and photokinetic properties without causing significant injury.

**Case presentation:** 66-years-old female with history of myocardial infarction, multiple PCI procedures, brachytherapy due to ISR, strokes and atherosclerosis risk factors (BMI=35, hypertension, dyslipidaemia) was admitted to undergo invasive coronary diagnostics, due to CCS III and NYHA II symptoms. Performed coronarography revealed diffuse ISR in left main (LM) and left anterior descending artery (LAD). Echocardiography showed hypokinesis of the lateral wall, and anterior wall of the apical and middle segments. The patient was qualified by Heart Team for percutaneous coronary intervention (PCI). Revascularization was performed under intravascular ultrasnogoraphy (IVUS) guidance showing diffusely narrowed and calcified neoatherosclerosis within previously implanted stents in LAD with mild underexpansion. High risk PCI was involved with the use of 1.7 mm catherer. Several passages were performed with hyped fluence and frequency up to maximal values. Finally, the catheter was able to cross the lesion causing however a no-reflow in LAD resulting in cardiac arrest - pulseless electrical activity (PEA). The patient was immediately resuscitated, infusion pressors were required together with intracoronary adenosine administration. After restoring blood flow and achieving stable hemodynamic status of the patient, ballon angioplasty with non-compliant and cutting balloons with subsequent drug eluting stent implantation was performed. Finally, the patient was discharged home with good left ventricle function.

**Conclusions:** Excimer laser is a useful tool for the treatment of calcified ISR, however, serious complications like no-reflow need to be taken into account.

**Title:** Pseudoaneurysm of the left ventricle (LV) in a male with sarcoidosis and diabetes after experiencing a silent myocardial infarction (MI).

**Authors:** Ewa Kwiatkowska, Szymon Król

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**Introduction:** Pseudoneurysms of the heart most commonly occur as a result of MI or vascular interventions. While true aneurysms usually involve the anterior wall, false aneurysms are commonly located on the posterior wall of the LV. They represent only 2% of postinfarction aneurysms.

**Case presentation:** A 65-year-old asymptomatic male with sarcoidosis and type 2 diabetes on insulin therapy was admitted to the hospital due to a suspicion of a lung tumour. Control chest X-ray exposed a round shadow 7 x 6 cm in size in the lower field of the right lung, partially obscured by the silhouette of the heart.

Computed tomography revealed a massive false aneurysm of the posterior wall of the LV measuring 74x48x73mm, numerous nodular changes with accompanying fibrosis, and enlarged surrounding lymph nodes.
Echocardiography showed hypokinesia of the basal segment of the posterior wall of the LV, an akinetic middle segment with scar tissue, and a massive pseudoaneurysm with thrombus (2x2 cm) and visible flow into the LV cavity.
Coronarography indicated a significantly narrowed right coronary artery (RCA) by about 70%.
The patient was qualified for intraventricular LV reconstruction using a round patch (Dor procedure) with coronary artery bypass grafting (CABG) to the posterior descending artery (PDA). The pseudoaneurysm was excised, and LV was repaired.
The postoperative course and wound healing were uneventful. The patient was discharged in good general condition.

**Conclusions:** Silent heart attacks (especially among patients with diabetes) are not uncommon occurrences. According to some reports, they account for up to 45% of all heart attacks. Lack of treatment and complications increase the mortality rate of patients. In the case of untreated false aneurysms, the 5-year survival rate is less than 50%. Therefore, regular follow-up examinations of patients at risk are essential, as they can lead to the earlier detection of complications, as was the case here.

# INTERNAL MEDICINE
# CORIGINAL WORK
# POSTER SESSION

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**Title**: Composite cytochrome C-montmorillonite nanoparticles: a novel approach to cancer therapy

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**Tutors:** Chief Assis. Svetlana H. Hristova, PhD 2, Prof. Alexandar M. Zhivkov, PhD3

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**Introduction:** The programmed cell death (apoptosis) is hindered in cancer cells due to the inability of their mitochondria to release cytochrome C (cytC). As a result, inducing apoptosis can be achieved by introducing external cytC into the cells, exploiting the tumor cells' ability to engulf submicron-sized colloid particles carrying pre-adsorbed cytC. Therefore, we use the mineral montmorillonite (MM), which is approved for application in human medicine, because of its high adsorption capacity, attributed to its remarkable size/thickness ratio. Normal cells, with the exception of neutrophils and macrophages, do not possess the capability to phagocytize colloid particles, providing them with a safeguard against this cytotoxic mechanism. This selectivity forms the basis for the composite cytC-MM's specificity.

**Aim of the study:** The objective of our study was to investigate the characteristics of cytC-MM nanoparticles in relation to varying cytC concentrations in the suspension and their cytotoxicity.

**Materials and methods:** We employed physicochemical techniques such as static and dynamic light scattering, along with microelectrophoresis, to determine electrophoretic mobility, the number of cytC globules adsorbed on a single MM monoplate, the mass increment of MM nanoplates upon cytC adsorption, the ratio of adsorbed to free cytC, and the concentration of cytC-MM composite particles. Additionally, we assessed the cytotoxic effects of cytC-MM on a colon cancer cell culture.

**Results:** Notably, neither the cytC solution nor the MM suspension exhibited any discernible impact on the cancer cells. In stark contrast, the composite cytC-MM nanoparticles proved highly effective, causing a remarkable 97% cell death after a 96-hour period. Intriguingly, the degree of cytotoxicity exhibited a logarithmic correlation with the concentration of cytC in the cytC-MM suspension.

**Conclusions:** Our in vitro experiments highlight the potential of cytC-MM composite nanoparticles as a promising approach for the treatment of superficial neoplasms (mouth cavity, esophagus, stomach and colon).
The study was supported by the National Research Fund (Contract КП-06-Н69/4).

**Title**: Influence of body mass on adverse events in patients after acute myocardial infarction

**Authors:** Lucija Šapro (author and presenter), Maša Babin-Lacić (coauthor), Milica Klindo (coauthor), Nemanja Stanković Stevanović (coauthor)

**Tutors:** Assist. Prof. dr. Aleksandra Ilić

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**Introduction:** Obesity is one of the risk factors for the development of cardiovascular diseases. However, despite the known harmful effects of obesity on the cardiovascular system, the impact of obesity on survival has been debated in the literature for the last two decades. In several studies that included a large number of patients, it was shown that normally-nourished and malnourished patients compared to pre-obese and obese patients have worse prognoses (increased risk of in-hospital complications, death and one-year mortality) in patients with coronary artery disease, and the concept of "obesity paradox" was proposed.

**Aim of the study:** The aim of our research was to examine the influence of body mass index (BMI) on the survival of patients after acute myocardial infarction (AMI) of the population of Vojvodina.

**Materials and methods:** The retrospective one-year cohort study included all patients who were hospitalized at the Institute for Cardiovascular Diseases of Vojvodina (ICVDV) with a diagnosis of AMI. Data were collected from the electronic database - hospital information system (BIS) ICVDV regarding the patient's risk factors, comorbidities, clinical findings at admission, length of hospitalization, echocardiographic findings and in-hospital mortality. According to BMI, patients were divided into 5 groups: low body mass (BMI), normal BMI, overweight, obese and pathologically obese.

**Results:** 1678 patients with AMI, average age of 63.49 years, participated in the study. Arterial hypertension, hyperlipidemia and diabetes mellitus were most prevalent in the obese and pathologically obese group (<0.01). Although Cox regression showed that with an increase in BMI of 1 kg/m2 there is a 5% lower risk for in-hospital mortality, the association of BMI with in-hospital mortality was not statistically significant.

**Conclusions:** Overweight or obesity does not have a protective effect on in-hospital mortality after AMI, i.e. the statistical significance of BMI as a predictor of in-hospital mortality has not been proven.

**Title**: The impact of antihypertesnives on the secretory activity of two macrophage cell lines.

**Authors:** Wiktoria Sobocińska, Julia Czaja, Amanda Zyzdorf , Mateusz Jarczyński, Katarzyna Zięba,Konrad Kaleta, Dominik Felkle,

**Tutors:** Dr hab. Katarzyna Nazimek (MD)

**Affiliation:** Students' Scientific Group at the Department of Immunology, Jagiellonian University Medical College,

**Introduction:** According to data from the National Health Fund, in Poland in 2018, as many as 9.9 million people suffered from hypertension, and in the same year, 55 million prescriptions were filled for 127.9 million packages of antihypertensive drugs. Due to the widespread use of these drugs among patients, we decided to investigate their reported immune system modulating properties. Macrophages play a key role in the immune response and their function can be influenced by many drugs. Our current research investigated the influence of selected hypotensive drugs on the response of two mouse macrophage cell lines against Staphylococcus aureus (Sa).

**Aim of the study:** Assessment of the effect of selected antihypertensive drugs (from the group of angiotensin-converting enzyme inhibitors, beta-blockers and calcium channel blockers) on the secretory activity of RAW264.7 and J774A.1 macrophage cell lines cultured in the presence of Staphylococcus aureus or without.

**Materials and methods:** RAW264.7 and J774A.1 cells were standardly cultured (1×106/well) with the addition of either captopril, propranolol (40μg/106 cells); carvedilol, verapamil (20μg/106 cells); amlodipine (12μg/106 cells) or olmesartan (4μg/106 cells) for 24 hours and then Sa at MOI=10 was added to selected wells for the next 24 hours. Yielded culture supernatants were tested for nitric oxide and cytokine concentrations, while cell lysates were subjected to Western blot analysis. Results were analyzed with three-way ANOVA.

**Results:** Olmesartan increased nitric oxide production by both cell lines, especially after Sa stimulation, and this positively correlated with iNOS expression.
Conversely, TNFα and IL-6 production together with cyclooxygenase-2 expression were decreased under the influence of propranolol and verapamil, and the latter drug blocked the Sa-induced cytokine boost. In most cases, the response of J774A.1 cells was weaker than that of RAW264.7 macrophages.

**Conclusions:** Antihypertensives differently modulate macrophage reactivity and response against Gram-positive bacteria in vitro, which strongly suggests their significant impact on anti-microbial immunity.

**Title**: How young people perceive ageing?

**Authors:** Aleksandra Kilka, Michalina Mejbaum, Karolina Gutkowska

**Tutors:** dr hab. Karolina Piotrowicz, mg. Anna Rudzińska, dr. Grażyna Puto

**Affiliation:** SKN Geriatrii, Katedra Chorób Wewnętrznych i Gerontologii UJCM

**Introduction:** The increasing average age of the population poses new challenges to the health care system. In order to adapt services to the individual needs of older people, we should better understand the needs and limitations of geriatric patients.

**Aim of the study:** The aim of this study was to understand how nursing students who experienced the GERT age simulation suit perceive the process of ageing and its difficulties.

**Materials and methods:** This qualitative study involved six second-year nursing students (5 female) who had no previous experience with the gerontologic simulator. The first step was to simulate the hospital admission of a geriatric patient in groups of four, playing the roles of doctor, nurse, family member and patient. The person playing the patient wore the gerontologic simulator. In the second stage, in-depth interviews were conducted with the study participants, followed by transcription of the dialogue and analysis of the results using the deductive method.

**Results:** Participants in the study described that, prior to participating in the old age simulator activity, their overall perception of old age was negative. Remarkably, it was despite the fact that this life period in their families was described as a positive phase of life. All respondents said that their compassion for the older generation increased following their experience with GERT simulator, while their anxiety about this stage of life worsened. The students interviewed stated that they would not be able to carry out their daily tasks in the ageing simulator. Social care workers were identified by the respondents as a professional group that should experience the simulator in order to raise awareness of the difficulties faced by the older adults.

**Conclusions:** The use of the old age simulator in the teaching course changed the respondents' view of old age. The exercise has the potential to improve students' understanding of the limitations associated with old age and to increase compassion towards geriatric patients. It seems that strengthening such attitudes may have a positive impact on the quality of care provided to the older adults.

**Title**: Adherence to medical advice among patients with pulmonary hypertension.

**Authors:** Emilia Lis, Klaudia Zaczyńska

**Tutors:** Marcin Waligóra MD, PhD, Prof. Grzegorz Kopeć MD, PhD

**Affiliation:** Pulmonary Circulation Center, Jagiellonian University Medical College, Cracow, Poland

**Introduction:** Pulmonary hypertension (PH) is a progressive disease that leads to right ventricular failure and poor survival if left untreated. Besides invasive procedures, pharmacotherapy forms the cornerstone of treatment and involves specific groups of drugs that act directly on the pulmonary vessels. However, these medications exhibit numerous adverse effects and are often administered several times daily, potentially hindering patients' daily functioning. Therefore, managing PH is complex and requires a comprehensive approach, with active patient involvement and adherence to achieve treatment targets.

**Aim of the study:** In the study, we aimed to investigate the adherence of patients with pulmonary hypertension to oral pharmacotherapy.

**Materials and methods:** The study included 80 patients with PH who were asked to fill out the Adherence to Refills and Medications Scale questionnaire.

**Results:** Among the participants, there were 55 (68.75%) women, 62 (77.5%) patients with pulmonary arterial hypertension, and 18 (22.5%) with chronic thromboembolic pulmonary hypertension, with an average age of 60 ±15.82 years. Lack of adherence was confirmed in 49 (61.25%) patients, and these patients were more frequently female (77.6% vs 54.8%, p=0.03), had a higher mean pulmonary arterial pressure (40 ±13.3 vs 33.50 ±9.48 mmHg, p=0.049), and reported drug side effects more frequently (44.9% vs 22.6%, p=0.04). However, they did not differ in terms of age, WHO functional class, NT-proBNP, six-minute walk test distance, and the number of orally administered medications. The most commonly reported drug associated with side effects was epoprostenol (n=14, 17.50%), followed by sildenafil (n=10, 12.5%), and bosentan (n=5, 6.25%). Among the most frequently mentioned adverse effects, patients listed gastrointestinal disturbances, headaches, skin flushing, skin rashes, as well as jaw and lower limb pain.

**Conclusions:** The study revealed that females and patients experiencing adverse effects from their medications demonstrated worse adherence. Moreover, these patients had higher mean pulmonary arterial pressure than those in the adherent group, possibly as a result of irregular drug intake and less effective treatment outcomes.

**Title**: The Blood Transfusion Laboratory - Interview series

**Authors:** Kiran Uppal, Ro Francis

**Tutors:** Dr Preeya Ummur MBChB

**Affiliation:** University of Leicester, University Hospitals of Leicester NHS Trust

**Introduction:** With an increased number of places at medical schools across the UK, there has been a corresponding increase in competition for in-hospital learning experiences without an increase in the hospital's capacity for training students.

**Aim of the study:** To create a video interview and demonstration of the workings of a blood transfusion laboratory in the UK, which is accessible to students of any healthcare discipline and members of the public, to reduce the demand on in-hospital training.

**Materials and methods:** Learning needs of current medical students were identified in relation to haematology teaching when on hospital placements. Interview questions for blood transfusion practitioners and biomedical scientists were formulated. Appropriate professionals were recruited, interviewed, and recorded. A controlled ABO mismatch was demonstrated by a biomedical scientist and recorded.

**Results:** The interviews were successfully recorded in the haematology laboratory at Leicester Royal Infirmary within a day. Emphasis was placed on the risks of blood transfusions, the role of the multidisciplinary team in processing blood transfusions and their response to blood transfusion reactions, as well as the organisation of blood laboratories in the NHS.

**Conclusions:** Three educational videos focused on blood transfusions in the laboratory were created, having gained a total of over 600 views on a public platform. The videos are relevant for the training of students in all healthcare professions, providing insight into the roles of the multidisciplinary team in the blood transfusion pathway. They also highlighted the seriousness of ABO mismatch reactions, providing a visual representation of what occurs in this reaction, and why healthcare professionals must be vigilant in identifying and treating it immediately. The videos have provided an opportunity for many students to learn about the blood transfusion pathway without adding strain to the hospital's capacity for providing learning opportunities in the laboratory.

**Title**: Normotensive shock and how to detect it among patients with intermediate-high risk pulmonary embolism.

**Authors:** Weronika Chaba, Michał Karnaś, Patrycja Kurczyna

**Tutors:** Jakub Stępniewski MD, PhD

**Affiliation:** Students' Scientific Group of Pulmonary Circulation and Thromboembolic Diseases

**Introduction:** Normotensive shock (NS) is described in the literature as a decreased cardiac index (CI) ≤2.2 L/min/m2 without hypotension (BP>90 mmHg) and is gaining relevance in determining the risk of deterioration among patients with acute pulmonary embolism (PE). However, identifying patients with NS without invasive hemodynamic methods is tough, thus there is a need to create clinical tools, which would help physicians select those patients.

**Aim of the study:** Our study aimed to develop a clinical parameter scale for detecting NS in patients with intermediate-high risk pulmonary embolism (IHR-PE) and to assess the effectiveness of the treatment administered to these patients.

**Materials and methods:** We retrospectively reviewed medical records of consecutive patients who underwent a transcatheter intervention due to PE in the Pulmonary Circulation Centre of Saint John Paul II Hospital in Cracow. Normotensive patients were included in the analysis and assigned into two groups, based on their CI. We evaluated laboratory and imaging parameters that could predict the occurrence of NS. For statistical purposes, receiver-operating characteristics (ROC) curves were drawn. The cut-off values were determined using the Youden index.

**Results:** Between January-2018 and March-2024, there were 94 patients with acute PE who underwent transcatheter procedures and 74 (78.7%) of them met the inclusion criteria and had complete hemodynamic evaluation (median age 65 IQR[50-74], 51.4% women). NS was identified in 47 (63.5%) individuals. A scale containing lactate, NT-proBNP, creatinine concentration, pulse pressure and TAPSE (tricuspid annular plane systolic excursion) was created with cut-off values: >1.8 mmol/l, >2800 pg/ml, >100 µmol/l, <40 mmHg and <16 mm, respectively. One point was assigned for each parameter that went beyond the established range. ROC analysis of that scale revealed a threshold of 2 points out of 5 (AUC 0.789, sensitivity 89.4%, specificity 51.9%, p<0.001) for the detection of NS. Moreover, implementation of transcatheter interventions contributed to a significant increase in CI (p<0.001).

**Conclusions:** A scale combining laboratory, vital and imaging parameters can be used as a screening tool among IHR-PE patients with NS. Transcatheter interventions may offer an effective treatment approach for managing those patients.

**Title**: Infectious Exacerbation of Psoriasis- Retrospective Analysis among Patients with Psoriasis and Pharyngitis

**Authors:** Paulina Dobecka, Karolina Jamrozik

**Tutors:** Dr Joanna Czerwińska

**Affiliation:** Koło Naukowe Dermatologiczno-Wenerologiczne Uniwersytetu Warmińsko-Mazurskiego w Olsztynie

**Introduction:** Psoriasis is a multifactorial disease caused by a combination of genetic predisposition and the influence of environmental factors, which include, among others, infections caused by microorganisms. Microorganisms such as bacteria (Staphylococcus aureus, Porphyromonas gingivalis), fungi (Candida albicans) and viruses (HIV, HPV5, retroviruses) are important factors triggering or the onset or exacerbation of psoriasis.

**Aim of the study:** The study aims to assess the exacerbation of psoriasis manifestations during infections and compares severity of symptoms depending on the causative microorganism.

**Materials and methods:** The presented retrospective study included the analysis of oral swabs from patients (n=468) of the Dermatology, Sexually Transmitted Diseases and Clinical Immunology Clinic of the Municipal Polyclinical Hospital In Olsztyn, diagnosed with psoriasis and psoriatic arthritis (PsA) as well as assessment of PASI (psoriasis area and severity index) of patients.

**Results:** The pharyngitis symptoms were observed in 42% of patients (n= 198): 72 women (37%), 126 men (63%). The symptoms were present in 125 patients (63%) with PASI>10, in 40 (20%) with PASI<10 and in PsA - 33 (17%). Among the cultivated bacteria, the most common species is Streptococcus viridans, the presence of which correlated with the severity of symptoms.

**Conclusions:** The presented analysis indicates the need to perform oral swabs in order to eliminate factors causing exacerbation of symptoms.

**Title**: The influence of COVID-19 on the quality of life of the patients treated in the hematology outpatient clinic

**Authors:** Patrycja Lebowa

**Tutors:** Professor Tomasz Sacha MD, PhD

**Affiliation:** Students Scientific Group at the Department and Clinic of Hematology, Jagiellonian University Medical College, Krakow, Poland

**Introduction:** The COVID-19pandemic has significantly impacted all dimensions of human functioning, including health status. In hospitals, procedures and patient care temporarily changed. Hematological patients were a group especially vulnerable due to underlying malignancy, immunosuppression, therapy and comorbidities.

**Aim of the study:** To investigate the relationship between the quality of life (QoL) of hematological patients and COVID-19 pandemics.

**Materials and methods:** Patients treated in the outpatient hematology clinic completed a questionnaire about their functioning during the COVID-19 pandemic (199 patients) and the EORTC QLQ-C30 (118 patients). Both questionnaires were distributed to the patients during their routine medical visits between May 2022 and October 2023. The median age was 61 years. 47,2% of the patients were women. Statistical analysis was performed using IBM SPSS Statistics version29.0.0.0 software.

**Results:** The QoL in the study group was 58.3 (Q1 50.0; Q3 75.0). 41% of the patients had a COVID-19 infection confirmed by PCR test. 20% of them were hospitalized, 16% of whom required oxygen therapy. Hospitalization and oxygen therapy were associated with worse physical functioning ($p=0.043$, $p=0.01$, respectively). 24.7% of the patients had complications after COVID-19 infection. The prolonged duration of the complications was associated with a greater severity of loss of appetite ($p=0.05$) and diarrhea ($p=0.021$). Patients who lived with someone during the COVID-19 pandemic had better cognitive functioning than those who lived alone ($p=0.033$). 82.5% of the patients were vaccinated, 66% recommended vaccination to other people, and 79% admitted that the obligation to wear a mask in public places was rational. 20% of the respondents claimed that treatment for their hematologic disease was delayed during the COVID-19 pandemic. Those who considered the impact of COVID-19 on their functioning negative compared to neutral had worse physical ($p=0.021$), emotional ($p=0.038$), role ($p=0.002$), and social functioning ($p<0.001$).

**Conclusions:** Our findings support the hypothesis that hematologic patients were negatively affected by COVID-19 pandemics due to the direct influence of infection and limited access to healthcare. Most of the patients were vaccinated against COVID-19 and agreed with pandemic restrictions. Living with a companion was a factor that improved QoL. The results of EORT QLQ-C30 were correlated with subjective patients' feelings about their functioning.

**Title**: To create an online educational resource featuring patient experiences, regarding all aspects of their care and treatment, to promote holistic and empathetic transfusion medicine

**Authors:** Roisin Francis, Kiran Uppal

**Tutors:** Dr Preeya Ummur

**Affiliation:** University of Leicester

**Introduction:** Person centred care is the "focus on the needs of the individual" and core to the care provided within all healthcare specialties. This approach to care has been shown to improve healthcare outcomes. Transfusion of blood products is a common treatment procedure, with sickle cell patients alone receiving 10,000 units of blood per month in the UK, so both patient and healthcare education is invaluable.

**Aim of the study:** To create an online educational resource featuring patient experiences, regarding all aspects of their care and treatment, to promote holistic and empathetic transfusion medicine.

**Materials and methods:** Recruitment of an actor to play the role of a simulated patient to portray the questions and concerns that a patient may have throughout their transfusion journey, and a patient who has undergone transfusions to share their story. Creation of a script for pre-transfusion counselling, discussion of alternatives and transfusion-related circulatory overload management. Writing questions for the patient regarding their transfusions and care that they received, with an emphasis on how their treatment previously and currently affects their life.

**Results:** Successful production of a scripted educational series of videos regarding the transfusion process, and video interview with a patient exploring their perspectives on the management of their care. The scripted portion is undergoing the final stages of editing.

**Conclusions:** The interview with our patient has been uploaded onto a public platform, making it accessible to the public and healthcare professionals involved in transfusion medicine, providing insight into the views and concerns of transfusion recipients. An extension of this project would be to recruit other demographics of patients, such as those receiving platelet units or from different socio-economic backgrounds to highlight a wider range of patient attitudes and opinions.

# INTERNAL MEDICINE CASE REPORT POSTER SESSION

prof. Andrzej Surdacki, MD, PhD
Przemysław Miarka, MD
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## Sessions coordinators:

Viktoriia Zolotykh

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**Title:** From adrenal insufficiency to their increased activity

**Author:** Paweł Szajewski

**Tutor:** Agnieszka Żyłka MD, PhD

**Affiliation:** Student's Scientific Society "ThyroIdea" of Department of Oncological Endocrinology and Nuclear Medicine, Maria Sklodowska-Curie National Research Institute of Oncology

**Introduction:** Increasingly widespread use of imaging studies and biochemical tests is leading to the diagnosis of adrenal lesions at an early stage. Such lesions include rare neuroendocrine tumors called pheochromocytomas. Many of them are clinically silent. However, even asymptomatic tumors require an adrenalectomy since they can become clinically apparent and lead to a hypertension crisis if they are provoked to secrete catecholamines.

**Case presentation:** The case presents a 68-year-old patient with multiple health conditions who underwent subcutaneous mastectomy due to right breast cancer. In 2011, the patient developed septic shock, transient acute adrenal insufficiency, and imaging tests revealed a haemorrhage into a focal lesion located in the right adrenal gland. The tumor has been regularly monitored using ultrasound examination (US). Over time, a gradual, slow growth of the lesion was observed. Due to a significant oncological background, a magnetic resonance imaging (MRI) was performed, which showed the phenotype of either a pheochromocytoma or an atypical adrenal adenoma. Hormone studies were then performed. There were elevated metanephrine and chromogranin A concentrations in plasma, which prompted a pheochromocytoma. Right-sided adrenalectomy was carried out, and histopathological examination verified that the lesion was, in fact, a pheochromocytoma. Due to a high Pheochromocytoma of Adrenal Gland Scaled Score, the patient was qualified for functional imaging tests to assess presence of distant metastases. (131)I-meta-iodobenzylguanidine scintigraphy and (68)Ga-DOTATATE positron emission tomography-computed tomography were carried out. No metastases were found in both studies. Hormonal tests performed after the adrenalectomy showed a significant decrease in metanephrine concentration and normal chromogranin A level.

**Conclusions:** Every focal lesion in adrenals found in US requires confirmation by a computed tomography or MRI to differentiate between adenomas and "non-adenomas". Secondly, hormonal tests are crucial because sometimes imaging studies may give ambiguous results. It is also important to remember that in all adrenal tumors, regardless of the clinical picture and other conditions, evaluation for a pheochromocytoma and hypercortisolemia is recommended. This case shows that pheochromocytomas are known for their insidious, very slow growth. They can be asymptomatic despite catecholamine excess. Moreover, a haemorrhage could've masked the tumor's phenotype and its hormonal activity.

**Title:** Atypical patient with kidney disease

**Authors:** Piotr Głowacki

**Tutor:** lek. Zuzanna Jakubowska PhD

**Affiliation:** Student scientific association at the department of nephrology, dialysis and internal diseases, Medical University of Warsaw

**Introduction:** Atypical hemolytic uremic syndrome is a thrombotic microangiopathy with symptoms of thrombocytopenia and hemolytic anemia caused by uncontrolled activation of the complement system. The dominant symptom is impaired kidney function. The disease should be differentiated from haemolytic uremic syndrome and thrombotic thrombocytopenic purpura. Patients are treated with eculizumab or plasmapheresis. The diagnostic process is often ambiguous and complicated

**Case presentation:** The case concerns a 24-year-old patient with end-stage renal failure treated with peritoneal dialysis. In the past, the patient has undergone numerous hospitalizations due to dialysate leakage, 2 transplants or sepsis. She reported in the interview that she has suffered from hypertension since childhood and denies dysuric symptoms. The description refers to hospitalization in the autumn of 2018 after treatment with eculizumab. At that time, the patient was characterized by mild acidosis, normocytic anaemia and intermittent thrombocytopenia. Other studies show increases in D-dimer, ferritin, fibrinogen, LDH and RDW. Previous studies have shown high ADAMTS13 activity, negative STEC, which may suggest aHUS. Genetic results clearly did not confirm a clinical diagnosis. The patient has been receiving 5 doses of eculizumab since March 2018. 3 boluses of GKS were administered and 6 plasmapheresis procedures were performed due to deterioration of transplanted kidney function. The patient received tacrolimus, vitamin D and appropriate antibiotic therapy. Finally, the patient continues to be treated with Automatic Peritoneal Dialysis and enoxaparin.

**Conclusions:** We can conclude that the patient has been suffering from aHUS since childhood. Despite treatment with eculizumab, satisfactory results have not been achieved and dialysis remains. Genetic testing has not unequivocally confirmed aHUS diagnosis. The Eculizumab prevents vascular endothelial damage and platelet aggregation. Therapy allows only some patients to improve renal and hematological function. Sudden relapse can occur after transplantation and this process may be facilitated by drugs or viral infections.

**Title:** Unconventional diagnosis of multiple myeloma: a case report

**Authors:** stu. Ioana Vasile, stu. Iasmina-Florina Veres

**Tutor:** Vlad Andrei Ichim MD, PhD

**Affiliation:** "Iuliu Haţieganu" University of Medicine and Pharmacy, Cluj Napoca Romania

**Introduction:** Multiple myeloma is a hematological malignancy that involves plasma cell proliferation in the bone marrow. It is usually diagnosed using bone marrow examinations and laboratory tests conducted by hematologists. However, atypical clinical presentations or extramedullary involvement can complicate the diagnosis. Our case report explores these complexities, discussing clinical signs and diagnostic methods beyond the conventional hematological practice.

**Case presentation:** A 66-year-old woman presented with significant asthenia, fatigue, balance disturbances, and recent weight loss. Her medical history included cholecystectomy and pharmacologically controlled second-grade hypertension. Laboratory tests revealed moderate macrocytic anemia (hemoglobin: 9.2 g/dl) and hyperproteinemia, given by the elevation of the gamma fraction. Ultrasound detected two hypoechoic liver lesions, hepatosplenomegaly and multiple splenic micronodules. Upper gastro-intestinal (GI) endoscopy revealed erythematous pangastritis and a partially healed prepyloric ulcer and consequently, biopsies were procured. Lower GI endoscopy showed uncomplicated sigmoid diverticulosis and hemorrhoidal disease without evidence of recent bleeding. A thoracic-abdominal-pelvic CT scan with contrast showed the lesion in the second liver segment, exhibiting arterial hyperenhancement and venous wash-out, indicative of malignancy. Multiple osteolytic lesions were observed at the level of several vertebral bodies, the left humeral head, the sacrum and the coxal bone, suggestive of a myeloproliferative disorder. Native brain scan did not reveal nervous system involvement. The patient's anemia worsened over her two weeks of hospitalization, leading to pancytopenia and hypocalcemia. Hematological consultation prompted a medulogram confirming the diagnosis of multiple myeloma. Liver biopsies, obtained via performing endoscopic ultrasound-guided fine-needle aspiration (EUS-FNA), and gastric biopsies showed plasmacytoma features such as clusters of atypical plasmacytoid cells positive for CD138 immunomarking. The patient's final diagnosis was that of multiple myeloma with extramedullary hepatic, gastric, and likely splenic involvement.

**Conclusions:** Though multiple myeloma primarily manifests as a blood disorder and is commonly diagnosed via bone marrow aspirate, suspicions of plasmacytomas in the gastrointestinal tract or other abdominal organs may necessitate further exploration. Utilizing methods like upper and lower gastrointestinal endoscopy or EUS-FNA can prove beneficial in accurately diagnosing patients with the aggressive form of the disease, thereby guiding treatment decisions.

**Title:** Nonsteroidal Anti-Inflammatory Drug-Induced Enteropathy: A Case Report

**Authors:** Erika Butkutė, Ieva Baužaitė

**Tutor:** Prof. Laimas Jonaitis

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**Introduction:** Nonsteroidal anti-inflammatory drugs (NSAIDs) are very frequent cause of upper gastrointestinal tract damage. NSAIDs may also damage the lower intestinal tract, causing intestinal ulcerations, strictures, perforations. This case report represents the NSAID-induced protein-losing enteropathy with severe intestinal damage.

**Case presentation:** 46-year-old female was hospitalized in a regional hospital with severe diarrhoea, leg swelling, chronic leg ulcers, and general weakness. Laboratory tests showed anaemia (Hb 90 g/L), elevated CRP and hypalbuminaemia (17 g/L). Esophagogastroduodenoscopy (EGDS) revealed erosive gastropathy. Upper abdominal ultrasound showed dilated small intestines with pendulum movements. In a CT scan of the abdomen and pelvis - image of terminal ileitis, signs of small bowel obstruction. Crohn's disease was suspected, and glucocorticoids (GCs), mesalazine (5-ASA) were prescribed. After one month the patient was readmitted with a recurrence of abdominal pain and increased diarrhoea. Patient had anaemia, elevated CRP, albumin concentration - 10g/L. Sigmoidoscopy revealed ulcerative lesions in the distal part of the colon. The patient was transferred to the Hospital of Lithuanian University of Health Sciences. Total protein was 31 g/L, albumin – 12 g/L. Sigmoidoscopy findings were suggestive of Crohn's disease. In a CT scan - view of terminal ileitis. Histology revealed lesions compatible with a diagnosis of Crohn's disease. The patient was started on methylprednisolone 60 mg I/V. Later, a full colonoscopy was performed, and the endoscopic picture was not typical of Crohn's disease, which led to a detailed medical history. It has been clarified that the patient took high doses of diclofenac, up to 10 tablets daily (1000-1500 mg) for about 10 years. Mesalazine and NSAIDs were stopped. Inflammatory changes improved, but an intestinal obstruction became apparent. The patient underwent a right ileo-hemicolectomy, a segment of the small intestine and an appendix was removed. The patient was discharged with improved protein levels (albumin 20.8 g/L, total protein 42.9 g/L). Dietary management and topical leg ulcer care initiated. Paracetamol and tramadol prescribed for pain.

**Conclusions:** NSAIDs may cause severe ulcerative damage to small intestine and promote the protein-losing enteropathy.

**Title:** Thrombotic thrombocytopenic purpura - a disease still rarely diagnosed

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**Introduction:** Thrombotic microangiopathy(TMA) is a rare group of diseases defined as a multisystem condition in which the walls of capillaries and arterioles are damaged, leading to platelet(PLT) activation and occlusion of these vessels. Thrombotic thrombocytopenic purpura(TTP) is one of the original TMAs, characterised by ADAMTS-13 deficiency, with signs and symptoms overlapping with other microangiopathies and ischaemic conditions. Despite its rarity(3 per million a year), it requires particularly rapid diagnosis and appropriate treatment.

**Case presentation:** A 66-year-old woman with a history of hypertension and hyperthyroidism was admitted to the regional hospital with neurological symptoms suggestive of stroke. Despite the absence of abnormalities on computed tomography(CT) of the head and angioCT, the patient had the criteria for thrombolytic treatment and Actylise was administered. Treatment was stopped when a laboratory test revealed a platelet count(PLT) 25000/uL. Two platelet concentrates(PC) were urgently transfused due to a control blood count of PLT 13000/uL. Magnetic resonance imaging(MRI) showed an ischaemic area in the left hemisphere of the cerebellum. Red cell concentrate(RCC) was transfused due to severe anaemia. After haematological consultation, steroids and low-molecular-weight heparin(LMWH) were started empirically, but after epileptic seizure and no bleeding on control CT, the LMWH was replaced with fondaparinux.
With suspected TTP(elevated LDH and bilirubin, decreased haptoglobin, negative direct Coombs test, normal renal parameters and schistocytes in blood sample with significant reticulocytosis), the patient was admitted to the University Hospital in Krakow in serious condition with PLT 6000/uL, severe haemolytic anaemia and jaundice (Glasgow score-3 points). Significantly reduced ADAMTS-13 activity(undetectable) and the presence of ADAMTS-13 inhibitor(>15IU/ml) confirmed TTP. Treatment with pulses of methylprednisolone, rituximab(4x500mg) and 15 plasmapheresis were initiated. The patient required 7 RBC transfusions and 4 PC. During hospitalisation, ECG showed atrial flutter, probably related to plasmapheresis (successfully treated with amiodarone). The patient regained consciousness on the 4th day of therapy and was discharged in optimal neurological state with only mild memory impairment.

**Conclusions:** This case illustrates the spectacular improvement in the patient's condition due to immunosuppressive treatment and plasmapheresis. It also highlights the frequent involvement of

the central nervous system and the significant difference in the medical approach compared with the stroke patient.
**Title:** Crossed cerebellar diaschisis due to drug - resistant epilepsy.

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**Introduction:** Crossed cerebellar diaschisis (CCP) is a metabolic abnormality of a supratentorial lesion in the cerebral cortex mirrored in the contralateral cerebellar hemisphere. CCP is suspected to be caused by a functional disconnection of the cerebropontine-cerebellar pathway leading to remote transneuronal metabolic depression. No treatment is currently known, the main goal is prevention of further progression.

**Case presentation:** We present a 21-year old woman with drug-resistant epilepsy and crossed cerebellar diaschisis. The patient was first diagnosed with epilepsy at 11 after focal seizures with impaired awareness and secondary generalization. Semilogy of focal seizures pointed to epileptogenic focus in the right temporal lobe. Auras with fear, dizziness and consciousness disturbance, were followed by left mouth twitching, turning the head to the left, excessive salivation, tonic posturing of left hand, progressing to cluster seizures daily and evolving to bilateral tonic-clonic seizure. Drug-resistant epilepsy was diagnosed after unsuccessful cessation of seizures with carbamazepine, valproic acid, oxcarbazepine, lamotrigine, clobazam, levetiracetam, and topiramate. During physical examination the patient was in good contact, but exhibited: hyposensitivity of left lower cheek and lower limb, slight paresis of left upper limb, and hypodisdiadochokinesis on the left. MRI images of the head showed hyperintensity of the subcortical white matter in the anterior pole of the temporal lobe consistent with cortical dysplasia. In addition, a band-like zone of gliosis was found in the posterior part of the right insula and outer capsule possibly as a result of epileptic discharge. Significant atrophy of the left cerebellar hemisphere with similar broad zones of gliosis lead to the diagnosis of crossed cerebellar diaschisis secondary to chronic epilepsy. The patient underwent video monitoring and invasive stereo-EEG for presurgical evaluation. Currently, the patient is after partial right temporal lobectomy, still receives levetiracetam, lacosamide and lamotrigine, no seizures were observed during one year follow-up.

**Conclusions:** Based on the radiological images and absence of other potential causes, the mirrored infratentorial lesion is most likely to be associated with crossed cerebellar diaschisis. The possible cause of CCP in our case are frequent focal seizures arising from the right temporal pole. Reduction of seizures after surgical treatment may prevent further cerebellar atrophy.

**Title: Complex diagnostic approach of a patient with multiple tumors**

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**Introduction:** Synchronous tumors refer to the uncommon occurrence of multiple primary tumors, diagnosed within 6 months. The most prevalent subtype of Renal Cell Carcinoma is Clear Cell Renal Cell Carcinoma (CCRCC). The association of hepatocellular carcinoma (HCC) and CCRCC is rare and insufficiently documented.

**Case presentation:** A 65-year-old male patient with a history of alcoholism and smoking presented with moderate pain in the right lumbar region and involuntary weight loss. The patient was not known to have associated pathology.
The clinical exam revealed an altered general state that was influenced by the abdominal pain syndrome and altered nutrition state (BMI=19 kg/m2). Deep palpation of the right lumbar region shows discomfort and pain and a palpable liver 5 cm under the costal rim.
The blood tests resulted in mild, normochrome, normocytic anemia, elevated G-GT (243U/L N.V. 30U/L), Alpha-fetoprotein (4921ng/ml N.V.<7.0 ng/mL), CA-19-9 (57,4U/ml N.V.<37U/ml) and positive HCV antibodies.
A CT scan revealed multiple tumors: mediastinal, hepatic, abdominal and renal. However, the precise location of the primary tumor could not be determined.
Considering the result of the imaging examination, linear endoscopic ultrasound with fine needle aspiration was performed. Biopsy samples were taken from the pancreatic/peripancreatic tumor formation, a hepatic lesion and the mediastinal lymph node block. Ultrasound-guided percutaneous biopsy was performed for the renal tumor. The final diagnosis was: Synchronous tumors - HCC (BCLC D) and left CCRCC cT1bNxMx.
An oncological commission decided to start the patient on sorafenibum. Sorafenibum, a medication that inhibits tumor cell proliferation and angiogenesis, has been considered the standard of care for patients with advanced unresectable HCC. It is also used as a second-line therapy, especially in patients with CCRCC initially treated with cytokine therapy.
Approximately 3.7% of CCRCCs present synchronous primary tumors. The association between HCC and other synchronous primary tumors was reported to be about 4.89% in North American patients with HCC.

**Conclusions:** The diagnostic process for synchronous tumors is complex and requires multiple biopsies from all metastasis sites. Unfortunately, this intricate diagnostic approach may impact the effectiveness of oncological treatment.

**Title:** Pseudo-thrombotic microangiopathy – A rare complication of vitamin B12 deficiency post-total gastrectomy

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**Introduction:** The deficiency of gastric intrinsic factor, along with the altered post-gastrectomy anatomy, increases the potential for severe vitamin B12 deficiency among individuals. Pseudo-thrombotic microangiopathy arising from insufficient vitamin B12 levels presents as an uncommon hematological complication.

**Case presentation:** An 81-year-old female patient presented to our Internal Medicine Department complaining of fatigue and loss of appetite for approximately 6 months. The patient's history revealed gastric low-differentiated adenocarcinoma (G3), for which she received chemotherapy and was operated by performing a total gastrectomy with eso-jejunal Roux-en-Y anastomosis 6 years earlier. Jaundice was observed on physical examination. Laboratory tests indicated increased liver enzymes, hyperbilirubinemia primarily due to elevated indirect bilirubin levels, hypoproteinemia, and pancytopenia with severe macrocytic anemia. Abdominal ultrasound revealed biliary sludge, moderate bilateral pleural effusion and mild ascites. Iron, ferritin, folic acid, LDH, and reticulocytes levels were above the normal range and vitamin B12 levels were severely reduced. Schistocytes and hypersegmented neutrophils were observed on peripheral blood smear. Anti-parietal cell antibodies, as well as both direct and indirect Coombs tests were negative, ruling out pernicious and hemolytic anemia. These investigations led to the diagnosis of pseudo-thrombotic microangiopathy due to vitamin B12 deficiency. The hematological complication was successfully treated with intramuscular vitamin B12.

**Conclusions:** This case is unique as severe anemia occurred six years post-gastric cancer surgery due to vitamin B12 deficiency, leading to pseudo-thrombotic microangiopathy. It highlights the need for thorough assessment in post-gastrectomy patients to detect rare nutritional deficiency-related hematological complications early for successful management.

**Title:** What does a macrophage storm hide? A Hodgkin lymphoma story

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**Introduction:** A 48-year-old male patient presents in the emergency room with fever and altered general condition. Physical examination gives out hepatosplenomegaly and an inguinal lymphadenopathy of 2x3cm mobile, solid, and painful.

**Case presentation:** Biologically, are notable elevated C-reactive protein (CRP=206.02mg/l), extremely high levels of Ferritin (42 581 ng/ml), elevated aspartate aminotransferase (AST=202U/l) and hypertriglyceridemia (TGL=322mg/dl). Haematological tests show anemia, thrombocytopenia, and leukopenia with lymphopenia. Infection markers are negative for viral infections. Bone marrow biopsy shows images of hemophagocytosis. A CT scan reveals multiple adenopathy lesions present in the abdomen and thorax. At ultrasound the inguinal lymphadenopathy is suggestive of malignancy, probably haematologic. In this case, a biopsy is recommended for histologic examination. The results come out with a diagnosis of classic Hodgkin lymphoma (HL).
The clinical presentation associated with inflammatory syndrome, extreme hyperferritinemia, thrombocytopenia, and hemophagocytosis on bone marrow biopsy are suggestive for Macrophage activation syndrome (MAS). While inguinal lesion biopsy reveals a histologic structure fitting for HL. Based on the multiple lymphadenopathies present on both sides of the diaphragm, stage III lymphocyte depletion HL is retained. Due to the advanced state, the patient was in at the time of admission and the reserved prognosis, the patient declined chemotherapy treatment.

**Conclusions:** MAS is a rare immunologic syndrome described by an exaggerated immune response. At the center of this is a cytokine storm leading to excessive activation and expansion of T lymphocytes and macrophages that exhibit hemophagocytic activity. This is clinically expressed by cytopenia, liver dysfunction, coagulopathy resembling disseminated intravascular coagulation, and hyperferritinemia. MAS is mostly associated with rheumatic or autoimmune disorders. On the other hand, HL is a malignant disease derived from B cells. Therefore, it is exceptional to see HL revealed by MAS. This association is rare enough to be observed in only a few cases and it appears to be a particular entity.

**Title:** Thiazide-associated hyponatremia (TAH): a typical picture of SIADH

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**Introduction:** Hyponatremia, a life threatening condition, is a side effect of thiazide use in a minority of susceptible patients. Frequently, it occurs soon after the onset of the treatment, although there are cases when hyponatremia develops months or even years later. The clinical and biochemical profile of patients with thiazide-associated hyponatremia may be that of extracellular volume depletion and in a variety of cases, it may mimic a syndrome of inappropriate antidiuretic hormone secretion (SIADH).

**Case presentation:** Woman, 67 years old, with a history of cardiovascular diseases, is admitted to the nephrology department complaining of severe nausea, dizziness, lack of appetite and weight loss. She has been undergoing treatment with perindopril-indapamide (10mg/2.5 mg) for 8 months to manage the heart failure. Laboratory tests show low serum sodium (Na=107 mmol/L), hypokalemia (3,29 mmol/L), low uric acid levels (<1,5 mg/dL), low plasma osmolality (237 mOsm/kg) and increased urinary sodium (168 mmol/L). Total serum proteins, glucose and lipids levels, cortisol and TSH are within normal limits. On examination, she appears to be clinically euvolemic. Focusing on euvolemic hyponatremia and it's causes - adrenal insufficiency, hypothyroidism, diuretic-induced hyponatremia, SIADH and psychogenic polydipsia were the differential diagnosis. Considering the laboratory investigations are highly suggestive for a SIADH and the patient meets the essential criterias of this syndrome, a CT scan of the head and chest was performed, but no abnormalities were found. The perindopril-indapamide treatment was withheld and the patient was started on hypertonic saline infusion, oral fluid restriction and increased sodium intake. During follow up, her sodium levels along with the rest of the electrolytes have normalised and her quality life and cognitive status were significantly improved. Based on her medical history, clinical and laboratory findings and the major amelioration after thiazide cessation, the most likely diagnosis was TAH (SIADH-like).

**Conclusions:** Our case confirms that thiazides can induce hyponatremia and the clinical and biochemical profile may consist with a SIADH. Physicians must be aware of the thiazide diuretics potential to cause hyponatremia and that it can be very similar to SIADH, which can create diagnostic difficulties.

**Title:** Posterior Polymorphous Corneal Dystrophy: A Case Report Of A Very Rare Disease

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**Introduction:** Posterior polymorphous corneal dystrophy is a very rare disorder that is genetically inherited as autosomal dominant. Structures affected in this disease are Descemet‘s membrane and corneal endothelium.

**Case presentation:** A 34 year-old female patient was referred for an ophthalmologist‘s consultation because of the decreased visual acuity and changes in the cornea of the right eye. A complex ophthalmic examination was performed. The best corrected visual acuity in the right eye was 0,5 and in the left eye 1,0. Intraocular pressure – normal range. A Slit lamp examination showed thickening of Descemet‘s membrane in the right eye. Central corneal thickness was decreased in both eyes. The endothelial cell count was significantly decreased in the right eye and normal in the left eye. Confocal microscopy showed endothelial cell polymegathism, along with variable-sized vesicles among endothelial cells. After performing anterior segment optical coherence tomography, a localized irregular, thickened hyperreflective posterior surface of the endothelium was observed. Screening for secondary eye diseases (glaucoma, retinal pathologies and corneal ectasia) was conducted. Because none of these pathologies were diagnosed, the follow-up was recommended.

**Conclusions:** During posterior polymorphous corneal dystrophy, the endothelial cells lose their properties due to a genetic mutation and endothelial epithelialization occurs. Descemet's membrane irregularly thickens, and a pathological posterior collagenous layer accumulates on it. Posterior polymorphous corneal dystrophy can lead to increased intraocular pressure, keratoconus, corneal edema, decreased visual acuity. It is important to diagnose and actively monitor this condition. The treatment plan is based on the stage of the disease. We report a case of decreased visual acuity because of a congenital corneal dystrophy.

**Title:** Back to the past - cerebral form of HIV

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**Introduction:** According to data from the National Institute of Public Health, 2,384 new HIV infections were detected in Poland in 2022, and from January to mid-November 2023, the number surged to 2,590, marking a record high in the history of recorded positive cases. At the beginning of 2024, approximately 19,496 patients were receiving anti-retroviral treatment. The cerebral form of HIV can manifest in various ways, posing numerous diagnostic challenges. Cognitive, behavioral, and motor abnormalities are typically present in 25-70% of cases. White matter changes in the course of HIV vary in etiology and can be divided into primary effects of HIV, opportunistic infection, neoplasms and others. Magnetic resonance imaging can be a helpful tool in identifying HIV-induced pathologies.

**Case presentation:** A 41-year-old patient had been experiencing gradually increasing weakness of the left upper limb muscle strength and speech disturbances for the past 3 months. The patient was referred to the neurological department.
On non-contrast CT there was a suspicion of a neoplastic lesion in the right frontal lobe.
MRI of the head in both cerebral hemispheres and cerebellum showed scattered abnormal areas with irregular outlines; hyperintense on T2-weighted images and FLAIR sequence, and without diffusion restriction features. The largest of the described lesions was visible in the right frontal lobe extending to the genu of the corpus callosum and measuring 5.0 cm in the long axis. Apart from that, the visualized brain structures showed no abnormalities. Post-administration of paramagnetic contrast agent, no signs of pathological contrast enhancement were observed.
Based on the clinical picture and MRI results, the patient underwent a panel of laboratory tests, including an HIV antibody test, which was positive. This allowed for the diagnosis of inflammatory brain changes of HIV etiology.

**Conclusions:** MRI examination allows for the detection of inflammatory changes in the brain in the course of HIV. Familiarity with the typical imaging findings in HIV infection facilitates the early identification of patients presenting with non-characteristic neurological symptoms, which allows for prompt initiation of the treatment process.

**Title:** Low-grade B-cell non-Hodgkin's lymphoma in 65 years old male with splenic marginal zone lymphoma

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**Introduction:** Splenic marginal zone lymphoma (SMZL) is a type of slow-growing non-Hodgkin lymphoma (NHL) that develop from B cells. SMZL is the second most common subtype of marginal zone lymphoma, comprising about 20% of the cases. It represents about 0.9% of all NHL and was considered a specific pathological entity only in 1991. About 25% of the patients are asymptomatic, with a median survival of 8-10 years. Patients usually present massive splenomegaly and bone marrow involvement with minimal or absent lymphadenopathy except for the spleen hilum.

**Case presentation:** A 65-year-old patient experienced a sudden onset of nausea and repeated vomiting in 2020. The patient underwent an ultrasound examination, revealing splenomegaly. Blood analysis further indicated leukopenia, mildly elevated C-reactive protein, and hypoalbuminemia in the free fraction. Additionally, a contrast-enhanced CT scan of the abdominal cavity was performed, confirming splenomegaly measuring 16 cm. The patient received no therapy and was placed under observation. From 2021 to 2022, the spleen increased in size from 16 cm to 25 cm. On 23.01.2024, the patient's spleen continued to enlarge, causing discomfort, the decision was to perform splenectomy. Histopathological examination revealed infiltration of immature CD20++ B-lymphocytes due to white pulp hyperplasia. Phenotypically, the cells were CD5-, CD23-, bc16-, CD10-, with CD138+ cells accounting for less than 10%, predominantly located in the periphery of nodules, showing polyclonal kappa/lambda. Proliferation, as indicated by Ki67, was low (<5%). On 26.02.2024, the patient underwent PET/CT imaging. At least 4 additional parts of spleen were visible on the left side of the sagittal projection. One larger exhibited moderate hypermetabolism, corresponding to Deauville level 3 in absolute terms.

**Conclusions:** This case report holds significance as splenic marginal zone lymphoma is a rare condition when it affects isolated spleen and is associated with various general symptoms and complications. It is important to understand this disease, its causes, diagnosis, and treatment to ensure better patient care and education. Additionally, discussing this disease can help increase public awareness of lymphomas and promote patient support and awareness.

**Title:** Rare case of cholestasis caused by external compression of a metastatic lymph node: a case report

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**Introduction:** Cholestasis due to lymphatic metastases is considered rare, despite colorectal cancer, one of its causes, being the third most common type of cancer. Additionally, the primary causes of cholestasis are calculi, cholangiocarcinoma and pancreatic head cancer, with lymphadenopathies often being overlooked, especially those due to metastases. The aim of this case report is to document a case of cholestasis caused by external compression of a metastatic lymph node secondary to rectosigmoid cancer.

**Case presentation:** A 69-year-old patient presented to the hospital with abdominal pain, acholic stools, and dark urine. Ultrasound revealed dilation of the intrahepatic bile ducts and the main bile duct, but no visible stones. Blood tests revealed a cholestatic syndrome, slightly elevated total bilirubin, inflammatory syndrome and anemia. Therefore, a MRCP was performed, where only a calculus was suspected. A CT scan also showed findings consistent with the ultrasound, along with the sigmoid colon exhibiting a 15 cm wall over a 7 cm distance and multiple adenopathies. Additionally, CEA and CA19-9 levels were positive.
The patient was then transferred to the gastroenterology institute where multiple retroperitoneal and peri-biliary main duct adenopathies, up to 30 mm in diameter, were detecting during EUS causing compression of the main bile duct to 11 mm. The adenopathies also exhibited a rapid washout of contrast substance. Initially, lymphoma was suspected, but the biopsy was inconclusive. Subsequently, a colonoscopy with biopsy revealed a circumferential infiltrative tumor formation with ulcerated stenosis and microscopic features of moderately differentiated adenocarcinoma. Therefore, the final diagnosis was rectosigmoid adenocarcinoma with peritumoral and peri-biliary main duct lymph nodes metastases, the latter responsible for the patient's signs of cholestasis.
Surgical treatment, including laparoscopic rectosigmoid resection, L-L colo-colic anastomosis and protective ileostomy, was performed, with further scheduling for an oncology consultation.

**Conclusions:** In conclusion, even diseases as extensively researched and common as rectosigmoid cancer can present diagnostic challenges when they manifest atypically, as seen in this case where the initial symptoms of discolored stools and colored urine indicated a very advanced stage of the disease. Therefore, it is crucial for clinicians to consider the presence of any primary cancer with secondary determinations in the lymph nodes around the main bile duct after excluding the primary biliary-hepatic-pancreatic causes of cholestatic syndrome.

**Title:** Neuroendocrine Tumor Unknown Origin Manifested With Metastatic Liver Lesions - A Case Report

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**Introduction:** Neuroendocrine tumors (NETs) are rare neoplasms that develop from cells of the endocrine and nervous systems. Their slow progression often leads to diagnosis at metastatic stages, primarily due to the presence of secondary lesions. Diagnosis of NETs can be challenging due to nonspecific symptoms and slow development. Globally, NETs have a prevalence of approximately 35 cases per 100,000 people, with about 10% originating from an unknown primary source. Managing NETs is complex and prognosis can be unpredictable. This case report delves into a rare instance of NET with unknown origin, focusing on symptoms, treatment and the patient's overall progress.

**Case presentation:** We present a case of a 58-year-old male who underwent routine ultrasound examination that revealed small nodular lesions in the liver, despite the absence of accompanying symptoms. Subsequent toracic and abdomen CT scan imaging identified numerous liver lesions with character of metastases, lobular bronchovascular pulmonar malformation on the left side, apico-medial cyst on the right, which didn't exhibit malignant characteristics. SPECT imaging and hepatic biopsy confirmed secondary NET Grade 2, with KI67 5%. Blood tests indicated elevated levels of Chromogranin A (810) and NSE (neuron-specific enolase) (21.6), supporting the diagnosis. Initially, the patient underwent oncologic treatment for a year before switching to alternative therapy. After a year, Lanreotide treatment commenced. Despite no changes observed in lesion appearance on subsequent CT scans, Chromogranin A levels surged to 24160. Following two years of treatment, CT scan revealed hepatic lesion multiplication and the emergence of pancreatic and adrenal nodules, prompting Everolimus therapy. Subsequently, the patient presented with altered general condition, subicteric sclerae, ascites and hepatosplenomegaly. Paracentesis ruled out peritoneal carcinomatosis, while lab results suggested cholestatic syndrome, hepatocellular syndrome, renal failure and hypoalbuminemia. Abdominal ultrasound showed heterogeneous liver with multiple nodular lesions, pancreatic calcifications and portal vein abnormalities indicative of thrombosis, explaining the appearance of ascites. The final diagnosis was NET of unknown primary origin with secondary hepatic involvement, portal vein thrombosis , accompanied by hypoalbuminemia and ascites.

**Conclusions:** This case highlights diagnostic and treatment challenges posed by NETs with unknown origins. It underscores the importance of frequent examinations and treatment compliance in managing such cases.

**Title:** Skin lesions – mechanical damage or autoimmune disease?

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**Introduction:** Dermatomyositis is a progressive proximal muscle weakness with a distinctive heliotrope rash. It is often associated with many systemic manifestations, including cardiac involvement. Herein, we present a case of a 56-year-old patient with dermatomyositis associated with myocardial involvement detailing the clinical presentation, diagnostic challenges, and treatment strategy.

**Case presentation:** 56-year-old patient presented in March 2023 with erythematous-papular lesions of the scalp, the dorsal surface of the hands, the extensor surface of the elbows, and erythema on the face to the rheumatology department. Initially, the patient associated the skin lesions with his job (windows installations). In April 2023, symptoms progressed to muscle weakness, joint pain and exercise intolerance. Biochemical tests showed increased inflammatory parameters and creatine kinase, and the immunological profiles proved positive ANA in the titer of 1:160 with a fine-grained cytoplasm pattern with midbody; in myositis profile, positive MDA5 (+++) and Ro52 (++) antibodies were detected. Cardiac echocardiography showed LVEF of 50% with diastolic dysfunction. In 2023, polymyositis was diagnosed, and cyclophosphamide pulses with methylprednisolone were administered, achieving clinical improvement and reduction of inflammatory parameters. Physical examination revealed erythema of face skin, neck, and upper chest, scarf's sign, Gottron's sign, Gottron's nodules on the extensor surface of the interphalangeal joints, and muscle limbs weakness (4/5 point in the Lovett scale). The patient was discharged on mycophenolate mofetil and reduced glucocorticosteroids, with plans for re-evaluation.

**Conclusions:** The case highlights the difficulty of dermatomyositis with myocardial involvement and skin lesions may suggest work-related mechanical damage requiring a multidisciplinary approach for its diagnosis and management which posed as a challenge. Treatment with immunosuppressive agents and glucocorticoids shows promising results, which indicates the need for a long-term follow-up and monitoring to prevent chronic complications.

**Title:** Whitmore's Disease – A Maestro Masquerader.

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**Introduction:** Melioidosis, caused by Burkholderia pseudomallei, is an endemic infection in Southeast Asia and northern Australia. Presentations vary from acute septicaemia to chronic localized infection but suppurative lymphadenitis caused by melioidosis is a rare encounter. Mandatory suspicion of the disease is required in immunocompromised patients. Microbiological diagnosis of the organism is considered the gold standard method. Here we have a patient with Melioidosis masquerading as Tuberculosis (TB).

**Case presentation:** HISTORY
42-year-old patient with known co-morbidities - Type 2 DM, HTN, dyslipidaemia for 9 years presented with complaints of swelling over the right upper side of the neck for 3 weeks. The swelling was acute in onset and associated with pain on touch. He also had productive cough for 3 weeks and single episode of blood-stained sputum.
H/O recurrent episodes of tonsillitis for the past 1 year.
No relevant Family/Personal History.

CLINICAL EXAMINATION Vitals stable.
On local examination,
A 3x2 cm sized round firm and tender swelling was found on the right upper side of the neck. The skin over the swelling appears normal. No pressure symptoms. Not fixed to surrounding structures.
On examination of oropharynx, bilaterally enlarged tonsils [grade II] and flushing of anterior pillars seen.
Systemic examinations normal.

INVESTIGATIONS
Hb: 12.9gm%
TC: 9940/cu mm of blood; Neutrophils: 65%; Lymphocytes: 25%
RBS: 446mg%
CXR: Normal
USG Neck: Hypoechoic round lymph node of approx. 4x3 cm noted posterolateral to right upper sternocleidomastoid muscle.
FNAC: Right Upper Cervical lymph node- necrotizing granulomatous lymphadenitis

PROVISIONAL DIAGNOSIS
Tuberculous Lymphadenitis

MANAGEMENT & INTERVENTIONS
Antibiotics were prescribed and later Incision & Drainage of the right cervical abscess with biopsy under GA was done.
The aspirated pus was sent to microbiology for further tests.
FINDINGS
1. Culture grew non lactose fermenting dry wrinkled colonies with a metallic sheen on MacConkey Agar which was identified by VITEK 2 automated system as Burkholderia pseudomallei sensitive to Ceftazidime, ciprofloxacin, cotrimoxazole, meropenem and levofloxacin.
2. HPE- Necrotising granulomatous lesion
3. AFB – negative, CBNAAT- not detected, blood culture- sterile

FINAL DIAGNOSIS
MELIOIDOSIS with Right Cervical Lymphadenopathy/Type 2 DM/ Hypertension.

**Conclusions:** Melioidosis/Whitmore Disease is a great mimicker of other diseases like malignancy, TB etc and often goes misdiagnosed. Symptoms may range from mild fever and skin changes to severe with pneumonia, abscesses, septic shock which could lead to death. Hence, there is an increasing need to create awareness among the doctors in the endemic areas to consider Melioidosis as a D/D for all immunocompromised patients so as to prevent morbidity and mortality.

**Title: Swift Progression of Advanced Colorectal Cancer**

**Authors:** Maya Stefania Borlan, Constantin Simiras, MD

**Tutor:** Abdulrahman Ismaiel, MD, PhD

**Affiliation:** 2nd Department of Internal Medicine, "Iuliu Hatieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania

**Introduction:** Several decades ago, colorectal cancer was infrequently diagnosed. Nowadays, it is the world's fourth most deadly cancer with almost 900,000 deaths annually. As the disease only becomes symptomatic at an advanced stage, worldwide organized screening programs are being implemented, which aim to increase early detection and reduce morbidity and mortality of colorectal cancer.

**Case presentation:** A 69-year-old female was admitted to the Emergency Clinical County Hospital of Cluj-Napoca due to exertional dyspnea and fatigue. The patient was known to have type 2 diabetes mellitus, hypertension, dyslipidemia, and obesity grade 1. Despite the lack of specific symptoms and no distinct physical examination, laboratory tests showed abnormal liver function tests with hypertransaminasemia, elevated levels of bilirubin, gamma-glutamyl transferase, alkaline phosphatase, and inflammatory markers. Abdominal ultrasound identified several hepatic lesions suggestive of metastasis. A later performed colonoscopy identified a circumferential and stenotic tumor in the transverse colon. The biopsy results confirmed a poorly differentiated colon adenocarcinoma (G3). Subsequently, the patient decided to leave the hospital against medical advice. In no more than a week, the patient suffered a cardiac arrest. Unfortunately, the resuscitative efforts couldn’t save her, and the autopsy report showed a pulmonary embolism as the cause of death, an ileo-cecal tumor, as well as several liver and pulmonary metastases.

**Conclusions:** Taking into consideration the patient’s advanced colon cancer stage with liver and pulmonary metastases and the lack of specific symptoms, this case gives physicians a great perspective regarding the importance of colonoscopy screening programs, urgency of early detection and intervention to prevent further complications and fatal outcomes.

**Title:** Atypical 3q26-Rearranged Acute Myeloid Leukemia With Myelomonocytic Differentiation: A Case Report

**Authors:** Lilija Bancevič̆a

**Tutor/s:** Prof. Sandra Lejniece; MD Arturs Uzars

**Affiliation:** Rīga Stradiņš University, Latvia; Department of Hematology, Latvian Oncology Centre, Riga, Latvia

**Introduction:** Acute myelomonocytic leukemia (AMML) is a rare subtype of acute myeloid leukemia (AML), with estimated prevalence of 1-9/1000000. Morphological evaluation plays crucial role in diagnostics where >20% of myeloblasts, blast equivalents are necessary to establish the diagnosis. Both cytogenetical, molecular testing are needed for risk stratification, planning of treatment. The report describes a rare case of acute myelomonocytic leukemia with atypical MECOM gene rearrangement.

**Case presentation:** A 58-year-old male patient was transferred to the hematology department at Latvian Oncology Centre from regional hospital due to suspected acute leukemia. Patient complained of tooth pain, fever, night sweats, persistent cough, fatigue. CBC results showed leukocytosis (78^103), prominent monocytosis (48^103), anemia, thrombocytopenia. On peripheral blood (PB) smear 63% of blast equivalents were observed (myeloblasts 6%, monoblasts 17%, promonocytes 40%) which was consistent with PB flow cytometry, showing 65% of monocytes of which half were harboring immature immunophenotype (strong CD14, CD11b, CD33, dim CD16, HLA-DR positivity). PB FISH revealed t(3;7)(q.26.2;p22) which confirmed diagnosis and is scarce type of MECOM rearrangement, associated with poor prognosis. Patient was initiated on standard 3+7 (Idarubicin+AraC) chemotherapy, during post-chemotherapy period no neutropenia was observed. On day 25 post-chemotherapy bone marrow evaluation showed 9% of malignant cells, no remission was achieved, salvage chemotherapy was planned, however, patient developed multiresistant Pseudomonas aeruginosa sepsis and expired due to multi-organ dysfunction syndrome.

**Conclusions:** We describe a rare case of AML with t(3;7)(q26.2;p22), myelomonocytic differentiation. It is important to note that integrative incorporation of morphological, immunophenotypical, genetic testing is needed for diagnostics, prognostics, treatment of acute leukemias. Despite recent advances in understanding the biology of the disease, novel treatment options, AML still is associated with high mortality rates. The study demonstrates the case of acute myeloid leukemia with myelomonocytic differentiation and rare MECOM gene rearrangement.

**Title:** Retrobulbar and paranasal diffuse large B-cell lymphoma treatment outcome: case report

**Authors:** Daria Medvedeva

**Tutor/s:** Sigita Hasnere MD

**Affiliation:** Faculty of Medicine, University of Latvia

**Introduction:** Diffuse large B-cell lymphoma (DLBCL), the prevailing form of lymphoma comprising approximately 25% - 30% of non-Hodgkin lymphomas (NHL). It is the most common subtype of lymphoma involving the orbits and sinonasal tract. Despite its aggressive nature, DLBCL exhibits a favorable response to six cycles of rituximab in conjunction with cyclophosphamide, doxorubicin, vincristine, and prednisone (R-CHOP) treatment.

**Case presentation:** A 51-year-old female was hospitalized at Pauls Stradiņš Clinical University Hospital in September 2023. In spring 2023, the patient presented with right eye tearing, weight loss (12 kg over 3 months), night sweats, and fatigue. During hospitalization, a computed tomography (CT) scan of the head revealed an extensive right retrobulbar and paranasal tumor process with possible intracranial extension into the pituitary fossa, as well as metastases in the right preauricular lymph nodes. Destructive changes were observed in the nasal sinuses and orbital bony wall. Abdominal CT revealed splenomegaly (13.7 cm) with no other pathological changes noted. Immunohistochemical stains showed that the lymphoid cells were positive for CD20. Ki-67 demonstrated proliferative activity in greater than 70% of tumor cells. Morphological and immunohistochemical findings are consistent with high malignancy grade large B-cell lymphoma with tissue-specific damage.

**Conclusions:** The patient received six cycles of R-CHOP therapy along with six cycles of intrathecal methotrexate for CNS prophylaxis. After four months of chemotherapy, disease advancement significantly decreased, indicating positive response to treatment. The diagnosis of DLBCL was based on patient's medical history, physical examination, laboratory tests, histology, and immunohistochemistry results. The patient's treatment plan included chemotherapy following the established protocol for malignant NHL. Following four months of chemotherapy, there was a notable reduction in disease progression, indicating a highly favorable response to the administered chemotherapy regimen.

# PUBLIC HEALTH POSTER SESSION

Magdalena Klimek, PhD
Marcin Grysztar, MSc
Magdalena Sikora, PhD

## Sessions coordinators:

Joanna Jonkisz

Izabela Płonka

**Title:** A crisis on top of crisis

**Authors:** Raghav Gupta, Dana Swaidan, Ali Hok, Cyrielle Saba and Lina Ahmed

**Tutor:** Shahryar Rana MD

**Affiliation:** Yale School of Medicine

**Introduction:** In recent years, Lebanon has been grappling with significant economic and political challenges, which have profoundly affected its infrastructure and public health systems. One of the most pressing public health concerns in Lebanon, among others, is the outbreak of hepatitis A, a disease closely linked to poor sanitation and inadequate access to clean water. Compounding these issues is the influx of refugees from neighboring countries, further straining Lebanon's already fragile resources and infrastructure. These conditions create an ideal environment for the spread of infectious diseases, exacerbating an already dire situation.

Climate change adds another layer of complexity to the situation. Long-term shifts in temperatures and weather patterns have been altering the transmission dynamics of food and water-borne diseases worldwide. Increased precipitation, for example, has led to a rise in outbreaks of diseases like cholera, primarily due to factors such as contamination of water sources and displacement of populations into overcrowded shelters, limiting access to clean water and proper hygiene practices.

**Case presentation:** On a Friday evening, Sara, a 45-year-old single mother of two, presented at the emergency department, visibly exhausted and overwhelmed, begging for help. Upon admission, her liver function tests revealed significantly elevated levels, confirming a diagnosis of acute hepatitis A infection. Sara's case underscores the human toll of the hepatitis A outbreak in Lebanon, where poor sanitation and limited access to clean water have created a fertile ground for the spread of infectious diseases.

Lebanon's struggle with hepatitis A is not an isolated incident but reflects a larger global trend exacerbated by climate change. Instances of cholera, for instance, are resurging in countries that were once considered cholera-free, with a 25% increase in outbreaks reported from 2021 to 2022 alone. The link between climate change, limited access to clean water, and the spread of water-borne diseases is evident, posing significant challenges to public health systems worldwide.

**Conclusions:** In conclusion, the convergence of economic challenges, political instability, and climate change has created a perfect storm for the spread of infectious diseases like hepatitis A and cholera in Lebanon and beyond. The urgency of the situation necessitates comprehensive strategies involving governments, international NGOs, and individuals to address the root causes of these outbreaks. While the costs of implementing eco-friendly resources and proper waste disposal methods may seem prohibitive, the cost of inaction far outweighs the initial investments

required. Real-world examples from various countries demonstrate the effectiveness of collaborative efforts in combating waterborne diseases amidst changing climate patterns.

Immediate action is imperative to mitigate the impact of diseases like hepatitis A and cholera, and key stakeholders must come together to promote a healthier and safer world for all. By prioritizing climate resilience and public health infrastructure, we can work towards building a more sustainable future for generations to come.

**Title:** The socioeconomic effects of overgeneral recall bias in Bipolar I Disorder: A Case Report

**Author:** Roisin Francis 4th Year Medical Student

**Tutor:** Dr Preeya Ummur MBChB

**Affiliation:** University of Leicester

**Introduction:** Overgeneral recall bias refers to a dysfunction in memory formation causing one to recall specifically detailed autobiographical memories as more general ones. Emotional valence of autobiographical memory influences our behaviour and social interactions, and overgeneralisation can occur to both positive and negative memories. Overgeneral recall bias is a well-documented cognitive finding and prognostic factor in patients with anxiety and affect disorders.

**Case presentation:** The patient self-presented to ED with relatives who thought he may have had a seizure, but irritability, labile mood and agitation prompted a mental health review. He reports that at the time of admission his appetite, concentration and mood were normal, libido and sleep had decreased but his energy levels were unaffected. He has a 36-year history of affect dysregulation with previous episodes of psychosis, depression, and mania. Records state that he became non-compliant with his anti-psychotics 3 months prior to this admission. Medical management for his psychiatric condition is currently IM Paliperidone 100mg extended release and 50mg Sertraline OD. On examination he was orientated and displayed normal attention level and span. He has one episode of memory loss in relation to the current admission. He has impaired judgement and no insight into his condition, denying current or previous mania yet acknowledging his Bipolar I Disorder diagnosis. The patient's recollection of their forensic and family history contradicts the records and collateral reports, with inaccuracies regarding memories that are negative in nature. During this admission, an absconsion from the ward involving violence towards his wife resulted in a restraining order placed by her. He recalls no violence and believes the police were unjustly called. He also makes regular bomb threats in response to his perceived previous mistreatment by the police and has a separate upcoming court case in which he believes to be the victim.

**Conclusions:** This case highlights the financial burdens on the public sector and significant social impacts that autobiographical memory biases can contribute to. Further research is required to determine the cause for this cognitive abnormality in Bipolar I, to guide the development of appropriate talking therapies and management options.

**Title:** Vertical yoga using the anti-gravity “Sping” belt as an example of promising autotherapy for lumbar spine pain in patients leading a sedentary lifestyle

**Authors:** Zofia Majcherczyk, Filip Adamczewski

**Tutor:** Dr Ewa Klocek

**Affiliation:** Cracow School of Health Promotion, University School of Physical Education in Cracow

**Introduction:** The idea of anti-gravity exercises is based on reducing the effect of gravity on the human body, which allows the person to perform various theraputic exercises (such as vertical yoga practice) with less strain on the body. The "Sping" device is an innovative belt for anti-gravity exercises, which can be mounted on a standard door at home. The device can be used in physiotherapy to reduce the risk of injury, increase the range of motion and eliminate pain in an easilly accesible environment, which makes it an extremely universal autotherapeutic medium.

**Case presentation:** The patient presents as a 21-year-old woman, a student, who leads a sedentary lifestyle and does not engage in physical activity. The patient has been complaining about persistent pain in the lumbar spine for over a year. The pain worsens during long periods of inactivity. There are no comorbidities present. Before starting the treatement period, physiotherapy diagnostic tests were performed (VAS pain scale, selected functional tests, muscle strength exam according to Lovett scale, muscle length test for the quadratus lumborum muscle, hypermobility provocation tests). The BMI index was calculated. Test results before treatment excluded sciatica, bone problems, and excessive joint mobility. Physiotherapeutic tests confirmed the muscular origin of the pain.

For a period of 2 months, twice a week, exercises lasting 40-60 minutes were performed using the device. The patient did not perform any additional exercises during treatment and did not change her lifestyle. The BMI index has not changed. After 8 weeks of regular exercise - all diagnostic tests were performed again. A significant improvement in the patient's range of motion was observed, as well as a correction of her posture, and the pain subsided.

**Conclusions:** Performing traditional yoga positions, while not experiencing the normally present full gravity power on joints, was benefitial for the patient. The force of gravity was reduced and the body was experiencing less strain, which ensured better stretching of the muscles and relief of the joints. The device is a promising form of auto-therapy, easily accessible to patients, which is considered a valid trait in this form of independent rehabilitation.

# SURGICAL CASE REPORT POSTER SESSION

prof. Piotr Chłosta, MD, PhD
Tomasz Kruszyna, MD
lek. Magdalena Stachura

## Sessions coordinators:

Dominika Kowaluk

Hanna Tymchenko

**Title:** A young patient facing diagnostic complexities: secondary malignancy during remission of a hematological cancer.

**Authors:** Patryk Obajtek, Sylwia Sanakiewicz

**Tutors:** Anna Taczanowska-Niemczuk MD, PhD

**Affiliation:** SSG of Pediatric Surgery, Pediatric Surgery Clinic, Institute of Pediatrics, Faculty of Medicine, Jagiellonian University Collegium Medicum

**Introduction:** Morbidity of cancer in childhood is low.The risk of developing cancer in the population of children aged 1-15 is 0.16%. The most common cancer in children is acute lymphoblastic leukemia (ALL).Encountering both leukemia and thyroid cancer within the same patient poses a rare and intricate diagnostic dilemma.We present the case of a young patient initially hospitalized with ALL, who subsequently, upon attaining remission, developed papillary thyroid cancer.

**Case presentation:** A 3.5-year-old boy was admitted to the hospital presenting symptoms such as legs pain, abdominal pain,weight loss, fever and oral ulcers. During the physical examination, no enlarged lymph nodes or organomegaly were observed. Analysis of the complete blood count revealed leukocytosis (45770/mm3) with a peripheral blast count of 40% and CRP level of 31.8 mg/l. Following morphological, immunological and cytogenetic examination of the bone marrow, ALL was diagnosed.
The treatment commenced with intensive chemotherapy, leading to the remission of the disease. The boy was closely monitored and attended regular check-ups. However, at the age of 6.5, he presented to the pediatrician with symptoms of rhinitis. Upon examination, painless enlarged cervical lymph nodes were discovered, with no visible changes in the skin above them. The boy did not exhibit fever or weight loss. Further diagnostic procedures, including a neck ultrasound, revealed a heterogeneous nodular mass adjacent to the left lobe of the thyroid, displaying calcifications and increased vascularity on Color Doppler. The ultrasound suggested potential metastases to cervical lymph nodes.
A biopsy of the left lobe of the thyroid confirmed numerous groups of thyrocytes arranged in a papillary pattern, indicative of papillary thyroid cancer, categorized as Bethesda VI. Metastases were identified in the lymph nodes of the left central and left lateral compartments, with no evidence of metastasis in the lymph nodes of the right lateral compartment. Consequently, the patient underwent a modified left cervical lymphadenectomy.

**Conclusions:** This case highlights the importance of considering the possibility of secondary malignancies in pediatric patients with a history of cancer, emphasizing the need for continued vigilance and thorough evaluation even after successful treatment of the initial malignancy.

**Title:** Use of cochlear implantation and bone implantation in a 76-year-old patient: a case report.

**Authors:** NINA LIGNAR

**Tutors:** Prof. dr hab. n. med. i o zdr. mgr zarz. Piotr H. Skarżyński

**Affiliation:** Student research club at the Institute of Physiology and Pathology of Hearing in Kajetany and the Medical University of Warsaw

**Introduction:** Introduction
Hearing impairment is an increasingly serious problem affecting patients' quality of life. With the lengthening of human lifespan and increasing opportunities for active living for people of retirement age, there is a growing need for available treatment options for hearing loss in older people. This presentation covers a wide range of information describing a pioneering case.

**Case presentation:** Case Report
A medical database containing information about a 76 - years old patient who underwent surgery for bone and cochlear implant at the Institute of Physiology and Pathology of Hearing in Kajetany was analysed. A cochlear implant from MEDEL was implanted in the left ear and a bone implant from OTICON in the right ear. The results of tonal and verbal audiometry before and after the two implants were compared. Patient responses from the APHAB questionnaire were analyzed, Moreover, the discrimination rate of monosyllabic words in the left implant only results (second ear closed) in silence (signal level 65 dB) 55% in noise (SNR 10 dB) 15%. In the free-field speech audiometry test, the speech discrimination rate in HA in the right ear for the 65 dB level is 95%. In the free-field speech audiometry test, the speech discrimination rate in BAHA in the right ear band for a level of 65 dB is 75%. Comparing the results, we see an improvement for both ears.

**Conclusions:** The binaural implantation improved the patient's hearing and speech comprehension. It enabled him to communicate with his family and facilitated his daily functioning, which was found after analyzing the APHAB questionnaire completed by the patient.

**Title:** Surgical Management of Drug-Resistant Epilepsy Secondary to Dysembryoplastic Neuroepithelial Tumor Adjacent to Broca's Area in the Left Frontal Lobe – Case Report

**Authors:** Gabriela Kasza, Aleksandra Midro

**Tutors:** Olga Milczarek MD, PhD

**Affiliation:** Students' Scientific Group of Department of Pediatric Neurosurgery, Faculty of Medicine, Jagiellonian University Medical College, Kraków, Poland

**Introduction:** Dysembryoplastic neuroepithelial tumor (DNET) is a rare benign brain tumor characterized primarily by seizures resistant to antiepileptic drugs with additional neurological deficits being uncommon. Diagnosis typically relies on EEG and MRI scans, which commonly reveal lesions in the temporal lobe, often indicative of cortical dysplasia. The standard treatment approach often involves lobectomy with complete resection of the tumor resulting in seizure termination for many patients.

**Case presentation:** A 10-year-old girl was admitted to the pediatric neurosurgery department following an episode of loss of consciousness and generalized tonic-clonic seizures, which recurred shortly before admission. The patient was in good general condition and did not exhibit any alarming neurological symptoms or deficits. MRI imaging revealed a tumor in the left frontal lobe at the posterior part. Antiepileptic treatment was initiated and functional MRI and EEG were performed. Due to the proximity of the tumor and Broca's area, intraoperative awakening was planned to preserve language function. In the surgical treatment, a left-sided frontotemporal craniotomy was carried out, using the SAS technique (Sleeping-Awake-Sleeping). During the surgery, it was not possible to successfully awaken the patient for intraoperative speech assessment. The resection of residual focal lesions was performed under ultrasound guidance and intraoperative electrocorticography (ECoG). Postoperatively, the patient reported a localized headache in the left frontal area and paresthesia in the right foot, which resolved over time. However, she exhibited noticeable difficulties in generating words freely with reduced verbal fluency, though no other deviations were noted. Histopathology results revealed dysembryoplastic neuroepithelial tumor.

**Conclusions:** The prevalence of DNETs is low among the population, as they are often misdiagnosed or even remain undiagnosed. If resections are not performed and the tumor is not completely removed, then the patient is still at risk of experiencing the drug-resistant seizures. Early diagnosis and surgical removal significantly improve treatment success rates, although rare cases may demonstrate malignant transformation over time. Our case underscores the challenges associated with localizing tumors in complex areas such as the frontal lobe near Broca's area, highlighting the importance of precise surgical planning and the potential impact on patient outcomes.

**Title:** Benign Metastasizing Leiomyoma of the Lung: Diagnostic Process and Treatment Based on Three Case Reports and a Review of the Literature

**Authors:** Patryk Skórka , Kajetan Kiełbowski

**Tutors:** Małgorzata Wojtyś MD, PhD

**Affiliation:** Department of Thoracic Surgery and Transplantation, Pomeranian Medical University in Szczecin, 70-891 Szczecin, Poland

**Introduction:** Uterine myomas are the most common pelvic tumor in women. They are classified as benign tumors formed from smooth muscle cells of the uterus. They can sometimes spread to the lungs, forming nodular lesions detectable on chest X-ray. This condition, known as benign metastatic smooth cell myoma (BML), usually occurs in women with a history of hysterectomy or myomectomy.

**Case presentation:** We present three cases of BML demonstrating the diagnostic and therapeutic process. Two patients presented with the more common multinodular variant, while the other had a single mass, but all were symptom-free. The age of the presented patients at the time of BML diagnosis ranged from 46 to 53 years. The first patient was diagnosed with BML at the age of 50 and had undergone a supracervical hysterectomy 12 years before her diagnosis. The second female patient underwent a myomectomy at age 36, and was diagnosed with BML 17 years later, at age 53. The third patient had a hysterectomy with bilateral salpingo-oophorectomy at age 46, and she had lung lesions before the hysterectomy.

**Conclusions:** Immunohistochemical studies of postoperative materials showed positive staining of spindle cells with antibodies against desmin and smooth muscle actin, as well as estrogen and progesterone receptors. The final histopathological diagnosis was pulmonary BML. All patients are stable and symptom-free: two after two years of follow-up and one after six months of follow-up

**Title:** Double Spinal Cord Stimulators (SCS) with different types of stimulation implanted percutaneously: Case Report and Review of the Literature

**Authors:** Igor Andjelić, Dr. n med. Wojciech Ślusarczyk, Maciej Laskowski, Marta Kwiatkowska, Agnieszka Koperczak

**Tutors):** Dr. n med. Wojciech Ślusarczy

**Affiliation:** Studenckie Koło Naukowe przy Klinice Neurochirurgii Katedry Neurochirurgii, Wydział Nauk Medycznych w Katowicach, Śląski Uniwersytet Medyczny w Katowicach

**Introduction:** Spinal cord stimulation (SCS), a neuromodulation technique used since 1967 to treat persistent, drug-resistant neuropathic pain, was initially based on the gate control theory put forth by Melzack and Wall in 1965. It is based on usage of an electric impulse to depolarize the large myelinated A fibers of the spinal cord's dorsal columns, which activates the inhibitory interneuron of the substantia gelatinosa. This stimulation causes paresthesia to appear over the painful area, which relieves the pain. The initial electric waveform is called tonic and consists of steady stimulation with a frequency typically between 40 and 60 Hertz and an amplitude high enough to cause paresthesia over the painful area. Two types of no-paresthesia stimulation, BURSTDR™ and 10 kHz High Frequency (HF) stimulators, demonstrated improvements for failed back surgery syndrome (FBSS) with predominant, refractory back pain and were superior to tonic stimulation.

**Case presentation:** A 51-year-old male patient admitted to the Department of Neurosurgery of Medical University of Silesia in Katowice in 2016 reported pain accompanied by a tingling sensation in the lumbosacral region that radiated to posterolateral part of his right buttock, thigh and calf reaching down to the first toe. He also complained of pain in his left buttock and difficulty with urination and defecation, which could be associated with opioid use.
On physical examination, a decrease in exteroceptive sensation covering both buttocks and posterolateral portion of the right lower limb was observed. There was no paresis. The patellar reflex was diminished on the right side and Achilles tendon reflexes were bilaterally weak. Furthermore Lasègue's sign was positive in both limbs – at 30 degrees in the right leg and at 15 in the left. The FABER test was also positive in the right hip joint. Patient’s gait was correct and he didn’t limp while walking on heels and toes. The patient reported no pain on palpation in the lumbosacral region, however there was a slight restriction of movement due to pain. Laboratory testing revealed no important abnormalities. The patient also suffered from inflammatory bowel disease (remission), sensorimotor polyneuropathy, hypogonadotropic hypogonadism and vitamin D deficiency.
The patient was diagnosed with discopathy and in 2016 underwent lumbar discectomy L4/L5 to treat symptomatic discopathy, which resulted in pain relief.
However symptoms returned after six months. There was pain in the lumbar region, radiating to the posterolateral side of the thigh and lower leg up to the first toe of the right foot. Generally, pain was mostly on the right side. The MRI examination revealed progressive discopathy compared to the examination from 2016, so he was diagnosed with recurring lumbar discopathy. The patient was

then reoperated – widened refenestration L4/L5 from the right side, excision of adhesions and scar tissue, decompression of meninges and spinal nerve with right-side foraminotomy were performed. The surgery was followed by alleviation of symptoms, which yet again recurred after two weeks.
Due to the characteristic and location of the pain the patient was qualified for SCS treatment. In 2021 Spinal Cord Stimulator (SCS) Stim Wave for High Frequency stimulation (Neuro Optimal) was placed epidurally at Th8-10. The patient reported substantial improvement after stimulation- the VAS(visual analog scale) was on lumbar region 2, and lower limb also 2 (pain reduction of 90%). After two weeks there was a sudden exacerbation of his symptoms, especially in the lumbar region (VAS on lumbar region was 9, and lower limb 2). Over subsequent weeks, there was a progressive decrease in the efficacy of the stimulation. Pain relief persisted at a level of 20% in the lumbar segment and 50% in the right lower limb. Despite multiple attempts at program change and confirmation of electrode location on X-ray, there was no improvement. The patient described the efficiency of the stimulation in pain relief as 50% in the right lower limb and 10 % in the lumbosacral region. The patient underwent treatment in a pain clinic for 2 years, during which time he took high doses of opioids and pregabalin.
In February 2023, after the decision of the council, he was qualified for the implantation of the BURSTDR™ stimulator. SCS BURSTDR™ implantation surgery can be divided into two main stages - electrode implantation with intraoperative stimulation and after 14 days of test stimulation with an external pulse generator, the implantation of the final pulse generator which is placed under the skin of lumbosacral region. During the first stage, the epidural electrode Octrode Abbot was implanted at Th8-10 and then connected to an external stimulator. After 14 days of stimulation, which resulted in a reduction in VAS scores (VAS on the lumbar region was 5, and the lower limb was 5), the proper SCS Proclaim XR Abbott was implemented, and the patient was discharged home. The patient had follow-up visits after 1 month, 3 months, and then 6 months after the second and final stage of burst SCS implantation. At each visit, the patient reported VAS values of 5-6 in the lumbosacral region (before BURSTDR™ stimulation was 9) and 0 in the right lower limb (before BURSTDR™ stimulation was 2). During the correction of the current text, the patient attended a scheduled follow-up appointment at the neurosurgical outpatient clinic where the X-ray scans were performed.
Currently, the patient has completely discontinued HF. According to the patient, BURSTDR™ stimulation has replaced the need for using HF stimulation entirely. It was decided, in consultation with the patient, to keep the HF stimulator in case of a pain exacerbation, and additional HF stimulation might be required. It is also worth noting that there was a 55% reduction in tramadol use, and the usage of pregabalin was completely discontinued.

**Conclusions:** BURST and other/HF types of stimulation use different mechanisms to suppress pain. Patients may respond better to one particular stimulation mechanism, and the other can be ineffective. Tonic stimulation creates sodium ions spikes with potassium hyperpolarization. During the BURSTDR™ stimulation, the sodium spikes fires in groups, which are called bursts. It rides on the plateau of calcium depolarization, followed by periods of dormancy. Generally, according to the literature, BURSTDR™ generates a stronger molecular nervous system response than other

stimulations. Moreover, it provides patients with relief not only from their physical discomfort but also significantly alleviates the emotional distress that often accompanies such pain.
In the case of our patient, better improvement in pain relief was noticed after implementing BURSTDR™ stimulation than HF stimulation. The HF stimulation was effective only for 2 weeks which can be seen in the VAS scores. We suspect that adaptation to high frequency has occurred. There was no shift of electrode placement which was confirmed on X-Ray. The representative of the company performed extensive diagnostics to assess whether the pulse generator and electrode were working properly, but they reported no such malfunction.
It was decided that the HF simulator would not be removed because this procedure carries the risk of many complications caused by the presence of adhesions between the electrode and the dural sac. Additionally, the device is anchored to the fascia muscles. It is also worth mentioning that the patient experienced a 20% improvement in pain in his right lower limb which is the result of HF stimulation. The concept of changing stimulation waveforms therapy is generally applied procedure, which is also supported by various studies and reviews. Moreover when replacing the battery of a tonic stimulator from Abbott, the protocol typically involves upgrading the stimulation type from tonic to burst. This change is due to advancements in newer generations of stimulators, which are considered improvements over their predecessors.
Considering the neurophysiological mechanism of BURSTDR™ stimulation, it appears to have greater efficacy compared to other types of stimulation and is more frequently preferred by patients. BURSTDR™ outperforms tonic stimulation, offering clinical superiority by modulating medial thalamo-cortical pathways, impacting both the analgesic and affective dimensions of pain. This evidence advocates for uniform outcome metrics in neuromodulation research, highlighting burst SCS's therapeutic potential.

**Title:** Diagnostic and Therapeutic Challenges in a Complex Presentation of Peritoneal and Pleural Effusion with Suspected Malignancy

**Authors:** Marek Łobaziewicz, Patryk Janda

**Tutors:** dr n. med. Wojciech Milanowski

**Affiliation:** Maria Sklodowska-Curie National Research Institute of Oncology, Krakow Branch

**Introduction:** General fatigue, weight loss, recurrent fevers should always be a warning signal for us and direct our differential diagnosis towards malignant diseases. Nevertheless, extreme caution should be exercised during diagnostics as some clinical conditions manifest themselves through similar symptoms and may perfectly imitate the neoplastic process and mislead physicians. The aim of the present report is to describe a very rare case of the peritoneal and pleural effusion in the course of tuberculosis (TB) mimicking malignancy.

**Case presentation:** A 68-year-old male, with no history of hospitalization for chronic conditions, presented with significant weight loss, general weakness, fatigue, and recurrent fever. Initial assessments indicated dehydration, cachexia, elevated inflammatory markers and D-dimers, iron and vitamin D deficiencies, hypoalbuminemia, and thrombocytosis. Imaging showed pleural and peritoneal effusions, along with a cluster of lymph nodes up to 12mm in size in the right supra-diaphragmatic fat pad. The patient underwent a surgical consultation, which concluded that there are currently no indications for surgical intervention. A PET/CT scan showed diffuse metabolic activity in the peritoneum and focal activity in the pleura, prompting concerns for a neoplastic process. Despite the severe condition of the patient and the absence of cancer cells in the drained fluid, a decision was made to proceed with exploratory laparoscopy. The procedure, which thoroughly examined the changes, led to suspicions of tuberculosis, with histological findings further suggesting miliary tuberculosis, and the absence of any neoplastic tissue. Subsequently, the patient was directed to a specialized center for TB treatment, which concluded successfully.

**Conclusions:** A thorough diagnostic approach, considering a wide range of potential causes, is crucial in cases with nonspecific clinical presentations, where infectious etiologies, such as tuberculosis may mimic neoplastic diseases. Early diagnosis and intervention are crucial for a favorable outcome, as evidenced by the successful completion of TB treatment in this patient. This case emphasizes the need for comprehensive evaluation and the consideration of infectious etiologies in the differential diagnosis of pleural and peritoneal effusions.

**Title:** Pylorus-preserving pancreaticoduodenectomy as preferred surgical treatment of the right-sided retroperitoneal epithelioid fibrosarcoma – a case report

**Authors:** Olga Wilk, Ignacy Kosterski-Spalski

**Tutors:** dr Radosław Pach MD, PhD

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**Introduction:** Retroperitoneal fibrosarcoma (RPFS) is an extremely rare malignancy considering both its histological type and location. Aiming for clearance of the disease, surgery involving the complete en bloc resection of the tumor along with involved organs and structures is the cornerstone of the RPS treatment. Size, location and vital organs' involvement poses a challenge for successful treatment.

**Case presentation:** The patient is a 33-year-old man with an extensive tumor in the epigastric region, adjacent to duodenum and head of pancreas, who was admitted to the University Hospital in Cracow for a planned surgical treatment. During the pancreatoduodenectomy performed, an advanced 20-centimeter tumor in the pancreaticoduodenal groove was excised. The tumor was supplied with a richly developed collateral circulation involving veins of the whole epigastrium, however any hallmarks of metastasis were absent. As the tumor did not involve the stomach, pylorus-preserving pancreaticoduodenectomy was performed. The expected preservation of normal gastric emptying is the main advantage of this technique. Pancreatico-enteric anastomosis was not performed due to low cohesiveness of the pancreatic stump. Postoperatively, the pancreatic fistula was treated conservatively by application of prolonged surgical drainage. A superficial infection required wound therapy, providing a positive clinical response. The histopathology study found sclerosing epithelioid fibrosarcoma of retroperitoneal space, with malignant infiltration of the pancreas and duodenal wall (pT4N0M1). The patient was again admitted to the hospital for a T-tube removal. Currently, the patient remains under follow-up in the National Oncology Institute in Warsaw. For further treatment, radiotherapy is planned, as chemotherapy has not shown to be effective in RPFS.

**Conclusions:** Retroperitoneal sarcoma belongs to the largest tumors, while fibrosarcoma tumors' size typically ranges from 3 cm to 8 cm, making the patient's 20cm tumor abnormally large. Lack of pain of soft tissue swelling might have delayed the diagnosis. The reported patient was way below the peak incidence age. Lack of metastasis is also atypical in typically highly malignant RPS. For right sided tumors, pancreaticoduodenectomy is rarely performed (1.4% of cases). The pylorus-preserving pancreaticoduodenectomy was performed due to the tumor location. RPFS remains a formidable challenge in the realm of oncological surgery.

**Title:** The Impact of Super-Super-Obesity on Prolonged Hospitalization Following Appendectomy: A Case for a Six-Weeks Stay

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**Introduction:** Acute appendicitis stands as one of the foremost causes necessitating urgent abdominal surgery. Obesity presents as one of the most common factors contributing to postoperative complications following appendectomy. Obesity hinders surgical access, increasing the risk of issues like wound dehiscence, infections, and intra-abdominal abscesses. Thus, specialized and prolonged treatment measures to ensure successful recovery and minimize further health risks.

**Case presentation:** A 66-year-old man with super-super-obesity (BMI 62.87) was presented with lower abdominal pain and vomiting lasting for four days. Following a comprehensive examination and ultrasound revealing an enlarged appendix, an open appendectomy was performed. A periappendicular abscess containing gangrenous and perforated retrocaecal appendix was discovered. Appendectomy and abscess drainage were performed. One week after the surgery, subcutaneous evisceration and a newly-formed intra-abdominal abscess were also diagnosed, prompting the decision to reoperate on the patient. During the surgery, a full-length fascia separation and a 4 cm diameter intra-abdominal abscess were discovered. The identified necrosis of the fascia and resistant bacteria (Klebsiella pneumoniae and Enterobacter cloacae) grown in the culture posed challenges in further selecting surgical and medical treatment, as approximating the wound borders was unfeasible. Thus, it was decided to drain the recurrent intra-abdominal abscess and use negative pressure wound therapy. The clinical state also deteriorated due to secondary hypoproteinemia and hypoalbuminemia. After performing five necrotomies of the wound with subsequent changing of negative pressure wound therapy dressings, applying appropriate antibacterial treatment and with the collaboration of rehabilitation and nutritional specialists, the surgical wound healed and the patient was discharged with a subcutaneous drain 44 days after admittance to hospital.

**Conclusions:** This clinical case emphasizes the significance of comorbidities in appendicitis management, particularly super-super-obesity. Acute appendicitis usually requires urgent surgery and subsequent postoperative care, with individual factors influencing the timeline. High-grade obesity increases the risk of complications, necessitating specialized care. Overall, comprehensive management is crucial in optimizing outcomes and minimizing risks associated with appendicitis and its complications, especially in high-risk patients.

**Title:** Successful Treatment of Bilateral Renal In-Stent Thrombosis after Branched Endovascular Aneurysm Repair (BEVAR)

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**Introduction:** Branched Endovascular Aneurysm Repair (BEVAR) has become the standard procedure for managing aortic aneurysms, involving renal and visceral arteries' origins. This method entails the insertion of stents into the vascular lumen to protect the aneurysm against growth and rupture. One potential complication is the thrombosis of the branches, leading to organ ischaemia. Given the presence of two kidneys, each with a renal branch, bilateral thrombosis can result in life-threatening anuria.

**Case presentation:** We present the case of 61-year-old man with a suprarenal aortic aneurysm, detected during routine abdominal ultrasound examination. The patient underwent BEVAR with consequently implanted aortic stentgraft with branches to both renal arteries, the superior mesenteric artery and the celiac trunk. Post-surgery, the patient experienced flaccid paralysis of the lower half of the body, left upper limb paresis, and partial paresis of the right upper limb, due to spinal cord hematoma. One month post-surgery, deep vein thrombosis developed, treated with low molecular weight heparin. Four months later, the patient presented with anuria and elevated renal parameters. Computed tomography angiography (CTA) revealed chronic thrombosis of the right branch and subacute thrombosis of the left. Endovascular unblocking of both renal stentgrafts was performed, with additional stentgrafts implanted in both renal branches. Post-procedure, the patient regained diuresis, with gradual improvement over subsequent days, along with decreased renal parameters levels. Follow-up CTA at 6 months showed patency of all stentgrafts, including renal branches. The patient, in good condition was advised hydration, rehabilitation and a follow-up at the vascular surgery outpatient clinic. Treatment included an angiotensin receptor blocker and antiplatelet medication among other medicines.

**Conclusions:** : BEVAR may lead to various short and long-term complications, including thrombosis of stentgraft branches. Endovascular treatment proves to be effective regardless of the duration of the branch thrombosis.

**Title:** Near Infrared Imaging in Enhancing the Quality of D2 Lymphadenectomy in Open Gastrectomy for Advanced Gastric Cancer- a Case Report of Two Patients

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**Introduction:** Surgical treatment remains the mainstay of treatment in advanced gastric cancer (GC). Lymph node dissection is a crucial step of radical gastrectomy and remains critical for the outcome. D2 lymphadenectomy currently recommended for advanced GC includes lymph node stations 1-12 according to Japanese Gastric Cancer Association.

Indocyanine green (ICG) is a fluorescent dye used for imaging of vessels, bile ducts and tissue perfusion. Recent research has shown promising results of lymph node imaging in radical surgery for GC. To our best knowledge, this is the first paper describing the technique and preliminary results of ICG-NIR verified open lymphadenectomy with intraoperatively subserosally administered ICG.

**Case presentation:** This paper describes the protocol of ICG-NIR in two subsequent patients undergoing radical gastrectomy for GC.

Patient 1: 57-year-old female with G3, cT3N+M0 gastric adenocarcinoma. Additionally, G1 pancreatic neuroendocrine tumor (NET). Neoadjuvant FLOT chemotherapy administered prior to surgery. BMI 36

Patient 2:76-year-old female with G3 T2N0M0 gastric adenocarcinoma. Neoadjuvant FLOT chemotherapy administered prior to surgery. BMI 25

Patients received subserosal Verdye® ICG solution within the first 30 minutes after incision. A baseline fluorescence was confirmed. The D2 lymphadenectomy was performed in a conventional fashion. Stryker SPY-PHI ® system was used to search D2 lymph node stations for missed lymph nodes. Gross specimen and recovered nodes were recorded ex vivo and marked. The confounders were identified and remedies included in the protocol (e.g. background fluorescence). The final operation site was recorded. Clinical data was collected and reviewed.

**Conclusions:** ICG-NIR in open surgery proved to be feasible and convenient. Our protocol can be used in further research into oncological benefit in a larger study group. We aim to put results from large laparoscopic trials in the context of open surgery for GC typical for western countries and investigate the impact of age (cutoff point 70 years).

**Title**: Early Diagnosis of Uveitis-Glaucoma-Hyphema Syndrome: A case report

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**Introduction:** Uveitis-glaucoma-hyphema (UGH) syndrome is a rare postoperative complication of cataract surgeries, accounting for less than 1% of all reported cases. It generally goes undiagnosed for several years after surgery, because of its clinical manifestation mimicking other oculopathies. At diagnosis, the patient usually presents with signs of chronic uveitis and glaucoma.

**Case presentation:** A 70-year-old man presented to the Ophthalmology Clinic with reduced visual acuity in the right eye (OD), photophobia and eye pain persisting for the last 5 days. The patient's ocular history includes episodes of herpetic keratitis during childhood and cataract surgery using the mini-nuc cataract extraction technique in the OD one-and-a-half years prior, with an intraocular lens (IOL) being placed in the ciliary sulcus. The patient's best-corrected visual acuity (BCVA) was 0.2 for OD and 0.9 for the left eye (OS) using the Snellen chart. OD anterior segment examination (ASE) revealed light conjunctival congestion, a postherpetic corneal macula, keratic precipitates, endothelial oedema, fine hyphema, an iris with extensive superior defects and temporal atrophy areas, a temporally stretched pupil, and an infero-temporally off-centered posterior chamber IOL in close contact with the iris. The IOL's optic equatorial zone was visible through the iris defects. OS ASE revealed a slightly opalescent lens nucleus. Intraocular pressure was 17 mm Hg in both eyes (OU). Fundus examination of OU revealed no significant abnormalities. Optical Coherence Tomography examination uncovered a vitreomacular traction syndrome in the OD. Blood tests and radio-imaging investigations were unremarkable. The diagnosis of UGH syndrome was established. The patient was treated with systemic and topical corticosteroids. Evolution was favorable and at the 2-week reevaluation, the patient's BCVA was 0.6 (OD), and no endothelial oedema, precipitates or hyphema were present.

**Conclusions:** The diagnosis of UGH syndrome generally gets delayed due to its clinical similarity with other oculopathies (trauma, vascular abnormalities etc.). This case highlights that – in case of timely presentation of the patient and an intimate IOL-iris contact visible during the slit-lamp examination – the early diagnosis of UGH syndrome becomes possible, thus preventing chronic uveitis and glaucoma.

**Title:** Rare Case Of Angiomatous Meningioma In Young Adult

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**Introduction:** Meningiomas are the most prevalent primary intracranial tumors, arising from the brain meninges. Among subtypes, angiomatous meningiomas stand out as rare and highly vascular (comprising more than 50% of the entire mass). Radiologically, they present challenges in differentiation from other subtypes, potentially leading to misinterpretations. However, positive EMA staining confirms their meningothelial origin. Surgical resection, complicated by rich vascularity, remains the primary treatment approach.

**Case presentation:** We present a case of a 27-year-old man who experienced a convulsive attack and following underwent surgical resection due to a brain formation on the convex surface of the right frontal lobe. The morphoimmunohistochemistry showed an angiomatous meningioma, classified as CNS WHO Grade I. Postoperatively, the patient experienced mild hemiparesis and persistent epilepsy. Six months after the surgery, an MRI imaging revealed a polycyclic formation measuring 2.4 x 2.0 x 1.4 cm at the excision site. A craniotomy of the right temporal region and resection of the recurrent tumor were performed. The morphoimmunohistochemistry was consistent with an atypical meningioma, classified as CNS WHO Grade II.

**Conclusions:** This case underscores the intricate surgical challenges. Despite the initial resection, the subsequent recurrence as a WHO Grade II atypical meningioma emphasizes the surgical complexity heightened by the tumor's vascularity and the potential for recurrence.

This case report highlights the diagnostic complexities and evolution of meningiomas, especially in young adults, emphasizing the importance of accurate pathology assessments and frequent postoperative monitoring.

Our research holds significant importance due to the publication of highly reliable radiological and pathoanatomical images. These images, limited in existing literature, enhance the depth and precision of treating young adults with meningiomas. By providing a comprehensive visual repository, our work advances current understanding and also serves as a reference for future research and clinical applications.

**Title:** Possible Susac's Syndrome associated with Pembrolizumab treatment: A case report

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**Introduction:** Pembrolizumab is an immune checkpoint inhibitor that works by inhibiting the PD-1 T-cell receptors, thereby promoting an immune response against the tumor. One adverse effect with a prevalence of 0,26% is endothelial dysfunction, sometimes resulting in atherosclerotic plaque instability, possibly leading to Susac's syndrome (SuS).

**Case presentation:** An 87-year-old woman presented to the Ophthalmology Clinic with sudden onset of blurry vision in her right eye (OD) for the past two weeks and bilateral hearing loss for the last two months. Patient history reveals left broncho-pulmonary adenocarcinoma (T4N3M1) treated with Pembrolizumab since March 2023, Pemetrexed, Carboplatin and zoledronic acid, left ventricular heart failure stage NYHA II, ischemic cardiomyopathy, stage II high blood pressure and right fascicular block. The best corrected visual acuity was 1 for both eyes, and the slit lamp examination revealed no abnormalities in the anterior segment. Fundus examination of the OD revealed a white, oedematous area on the lower temporal vascular arcade with a filiform infero-temporal retinal artery, indicating an arterial occlusion. An embolus was also noticed in the trunk of the lower branch of the central retinal artery on the surface of the optic papilla. Optical coherence tomography of the macula revealed hyperreflectivity of all retinal layers from the retinal nerve fiber layer to the outer plexiform layer, consistent with the extent of ischemia. The diagnosis of possible SuS was established. The patient was referred to a neurologist to assess the risk of stroke, an ENT specialist for further evidence to support the claim, and an oncologist, for reassessment of the treatment.

**Conclusions:** We present a case where Pembrolizumab might be involved in vascular complications, such as SuS, due to its role in endothelial dysfunction. SuS often goes undiagnosed, due to the typical clinical triad (encephalopathy, retinal artery branch occlusion and hearing loss) only manifesting in 13–30% of cases. In a patient with cardiovascular disease, the use of Pembrolizumab should be thoroughly controlled through periodic ophthalmological, neurological and ENT investigations, in order to diagnose SuS early, and avoid further complications.

**Title:** Benign Pancreatic Lesion Mimicking Pancreatic Tumor

**Author:** Karolina Saveikaitė[1], 6th year; Deimantė Lazauskaitė[2] 5th year

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**Introduction.** Pancreatic imaging has an essential role in the early diagnosis and staging of pancreatic disease. However, there is a range of inflammatory, pseudotumoral, and benign lesions that may mimic pancreatic malignancy with an incidence rate of 5.2%. Herein, we report a case of a pancreatic inflammatory lesion misdiagnosed as pancreatic cancer.

**Case presentation.** A 69-year-old woman was admitted to the Department of Surgery due to recurrent abdominal pain. Contrast-enhanced abdominal CT was performed and revealed a hypodense 31x24x22 mm lesion in the pancreatic uncinate process, in contact with the duodenum and superior mesenteric artery. CT findings suggested pancreatic neoplasm. An abdominal MRI was performed for clarification, which showed the same findings as CT. To confirm the diagnosis of pancreatic tumor the endoscopic ultrasound-guided fine-needle aspiration biopsy was planned, but due to non-visualized tumor, the biopsy was not performed. The treatment plan was discussed at the Multidisciplinary Team Meeting, and it was decided to perform pancreatic resection, considering CT and MRI findings. The patient underwent pancreaticoduodenectomy. The histopathology of the resected specimen revealed moderate fibrosis and neutrophil infiltration with no sign of neoplastic lesions. The postoperative course passed with complications of necrotic pancreatitis and pancreatic fistula, postoperative diabetes. Complications were treated with percutaneous CT-guided catheter drainage. The patient was discharged on day 45 after the surgery.

**Conclusions.** An accurate preoperative diagnosis of pancreatic cancer has to be established and differentiated from other pancreatic lesions for better patient outcomes.

**Title:** Swift Progression of Advanced Colorectal Cancer

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**Introduction:** Several decades ago, colorectal cancer was infrequently diagnosed. Nowadays, it is the world's fourth most deadly cancer with almost 900,000 deaths annually. As the disease only becomes symptomatic at an advanced stage, worldwide organized screening programs are being implemented, which aim to increase early detection and reduce morbidity and mortality of colorectal cancer.

**Case presentation:** A 69-year-old female was admitted to the Emergency Clinical County Hospital of Cluj-Napoca due to exertional dyspnea and fatigue. The patient was known to have type 2 diabetes mellitus, hypertension, dyslipidemia, and obesity grade 1. Despite the lack of specific symptoms and no distinct physical examination, laboratory tests showed abnormal liver function tests with hypertransaminasemia, elevated levels of bilirubin, gamma-glutamyl transferase, alkaline phosphatase, and inflammatory markers. Abdominal ultrasound identified several hepatic lesions suggestive of metastasis. A later performed colonoscopy identified a circumferential and stenotic tumor in the transverse colon. The biopsy results confirmed a poorly differentiated colon adenocarcinoma (G3). Subsequently, the patient decided to leave the hospital against medical advice. In no more than a week, the patient suffered a cardiac arrest. Unfortunately, the resuscitative efforts couldn’t save her, and the autopsy report showed a pulmonary embolism as the cause of death, an ileo-cecal tumor, as well as several liver and pulmonary metastases.

**Conclusions:** Taking into consideration the patient’s advanced colon cancer stage with liver and pulmonary metastases and the lack of specific symptoms, this case gives physicians a great perspective regarding the importance of colonoscopy screening programs, urgency of early detection and intervention to prevent further complications and fatal outcomes.

**Title**: A Case Report: Challenges In Surgical Treatment Of Mccune-Albright Sydrome Deformations

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**Introduction:** McCune-Albright syndrome (MAS) is a rare condition associated with somatic genetic change in a gene called GNAS and affects skin, bones and endocrine system. Typical triad of MAS is fibrous dysplasia (FD), precocious puberty, and cafe-au-late spots. Cafe-au-late spots are usually the first sign of MAS. FD can cause various complications, include pain, limp or fractures. Endocrine system disorders may cause precocious puberty especially in girls, thyroid lesions with possible hyperthyroidism, excess growth hormone. Other symptoms may be subcutaneous calcification, osteogenesis, facial bones deformations. In this case report, we describe a 60-year-old woman with MAS and challenges related with surgical treatment of symptoms.

**Case presentation:** Starting since 2013, a 50-year-old woman with MAS, also having bone deformities, subcutaneous calcification spots, short stature was operated. Subcutaneous calcium deposit removal was performed on her right foot. In 2014 she complained of intermittent pain in her right leg after intense walk, sensor disorder below the knee, lack of range of motion. X-Ray was performed and calcifications on extensor muscles of femoris was noticed and removal operation of vastus medialis muscle was performed. An operation was successful, and the patient was discharged home after post-operative treatment. In 2017, calcium deposit removal of her lower back was performed. In 2019, a woman arrived at the hospital with a pain in her left knee joint and calf, impaired mobility, discomfort while wearing shoes. Decision was made to remove subcutaneous calcifications surgically. The calcifications were removed from subcutaneous tissue and by making an additional incision in patellar projection, the prepatellar bursa and exostosis were removed. In 2024 patient arrived with a pain in her left thigh and right Achilles tendon. X-Ray showed calcifications on the calcaneus and distal part of the Achilles tendon. Due to complains of decreasing life quality calcifications removal operation again was performed. Post-operative physiotherapy and NSAIDs were prescribed, and the patient was discharged home.

**Conclusions:** MAS is a rare disease that worsens the quality of life of the individual and requires constant surgeries. This is a challenge not only for the patient, but also for the surgeon.

**Title**: Challenges of perioperative management of patients with DIEP flap breast reconstruction

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**Tutor:** Adrian Pașcu, MD (2),(3)

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**Introduction:** Deep inferior epigastric artery perforator (DIEP) flap is considered to be the gold standard for autologous breast reconstruction. This technique uses the patient's skin and fatty tissue from the lower abdomen to reconstruct the breast, having a higher positive outcome and fewer post-surgery complications compared to its alternatives. Particular attention should be paid to the selection of the patients suitable for this procedure, along with the post-surgery management of the flap, as presented in this case report.

**Case presentation:** A 50-year-old woman diagnosed with breast cancer in 2021, who underwent neoadjuvant chemotherapy, modified radical mastectomy, adjuvant radiotherapy and ongoing endocrine therapy, applied for a breast reconstruction surgery consultation. The patient's BMI (25.7kg/m2), lack of previous major abdominal surgeries and status of non-smoker supported the decision of DIEP-flap reconstruction.
All the preoperative measures were taken to ensure the success of the procedure, including a CT angiography, showing the preferred Inferior Epigastric Artery perforator at 4.2cm to the right and 1.5cm below the umbilicus. After the final assessment, the patient was taken to the OR where the DIEP-flap was dissected and detached together with the artery and vein, used for the reconstruction of the breast, with the vessels sutured by micro-anastomosis to the internal mammary artery and vein. Intraoperative angiography using indocyanine green helped check the vascularization of the flap. Postoperative, the administration of anticoagulants was maintained to prevent thrombosis.
The patient spent two days in the ICU where an inspection of the flap was performed every two hours by assessing the color, the drain liquid and the consistency of the flap through palpation. The capillary refill time and temperature were noted, with additional thermography being performed. The patient's hemoglobin level, blood oxygenation and arterial pressure were constantly monitored while being kept under supervision for 14 days, until her discharge.

**Conclusions:** The DIEP-flap procedure is a time-consuming surgery but with spectacular results, having the particular benefit of preserving the rectus abdominis muscles and lowering the risk of abdominal hernia. The patient's selection criteria and follow-up are crucial, otherwise, complications such as hematomas, thrombosis of the vessels, or necrosis of the flap can occur.

# SYSTEMATIC REVIEW POSTER SESSION

Elżbieta Paszek, MD, PhD
Magdalena Koperny, MD, PhD
Joanna Zając, MD, PhD
Paweł Matusiak, MD, PhD

## Sessions coordinators:

Grzegorz Sochań

Katarzyna Kubińska

**Title**: The interplay between adipose tissue and immune cells

**Authors:** Martyna Niemiec

**Tutors:** Anna Tylutka PhD

**Affiliation:** Collegium Medicum University of Zielona Góra

**Background:** Obesity is now considering as a worldwide epidemic and according to WHO, 2,5 billion adults were overweight and among these 890 million were obese. Overall obesity is associated with reduction of quality of life and a strong risk factor of insulin resistance, cardiovascular diseases or type 2 diabetes mellitus. Adipose tissue is the most important link between immune cells and immune disorders. Changes in the phenotype of immune cells that occur at the local and systemic level as a result of metabolic stress are common in obese elderly people. The non-inflammatory cell phenotype is replaced by cells with an inflammatory phenotype, such as M1 macrophages, Th1, Th17, CD8+ T cells, which secrete pro-inflammatory cytokines such as IL-1β, IL-6, IL-17 and IFN-γ.

**Methodology:** The pubmed database have been searched 2005-2024 using key words: aging, aging and immune system, aging and cytokine levels.

**Main results:** Van der Weerd in the group of morbidly obese people showed that the number of T lymphocytes was statistically significantly higher ($p<0.01$) than to lean individuals, but plasma levels of IFN-γ, IL-4, and IL-17A, cytokines respectively associated with Th1, Th2, or Th17 subpopulations, were similar in morbidly obese and lean subjects. Research conducted by Tylutka et al. 2024 showed that the CD4/CD8 ratio included in the immune risk profile (IRP) was the highest in the group with obesity (2.2 ± 1.0), and the lowest in those with normal body mass (0.9 ± 0.6). In turn O'Rourke showed that obese patients demonstrated an increased frequency of CD3+CD4+ T-cells (mean difference 12%, $p=0.004$), and a decreased frequency of CD3+CD8+ T-cells.

**Conclusions:** Obesity, factors such as hyperglycemia, dyslipidemia and insulin resistance have been shown to further modulate circulating T cell subtypes by increasing the ratio of Th1 to Th2 cells. With obesity, the higher Th1 cell frequency promotes pro-inflammatory M2 macrophages and insulin resistance. Th2 cells produce less IL-4, which is a promoter of insulin sensitivity, while also causing anti-inflammatory M2 macrophage levels to decline. Clarifying the mechanisms of T cell subtypes in adipose tissue inflammation is expected to provide new strategies for the treatment of obesity.

**Title**: Mortality in Aortic Valve Replacement in Open Heart Versus Transcatheter Interventions – A Systematic Review

**Authors:** Bota Cătălin-Andrei

**Tutors:** -

**Affiliation:** Iuliu Haţieganu University of Medicine and Pharmacy, Cluj-Napoca

**Background:** Transcatheter aortic valve replacement (TAVR) is a less invasive alternative to surgical aortic valve replacement (SAVR), preferred for high-risk patients. Both methods treat aortic stenosis, each with its own advantages and disadvantages. This review compares mortality between the two procedures at the 1 and 5-year post-operative.

**Methodology:** The research was conducted on PubMed using the search terms 'valve replacement', 'surgical', 'transcatheter', and 'mortality'. Articles from 2018-2024 were included, concerning all-cause mortality at 1 or 5 years post intervention as main outcome and using both last-generation TAVR and SAVR. Excluded studies involved those with pacemakers, other valvulopathies and heart dysfunctions. Bias risk was not assessed.

**Main results:** From the initially selected 44 studies, 4 studies involving 4305 patients met the inclusion and exclusion criteria. At the 1-year mark, Toff et al. (2022) observed a 43% higher all-cause mortality in SAVR patients, with 30 deaths in SAVR compared to 21 in TAVR out of a total 913 patients (P=0.23). At the 5-year mark, Van Mieghem et al. (2022) demonstrated comparable mortality rates between TAVR and SAVR, favoring surgery with 4.2% fewer deaths out of a total 443 deaths among a cohort of 1660 patients. Gleason et al. (2018) also reported similar all-cause mortality between the procedures, slightly favoring TAVR with 0.2% fewer deaths within a cohort of 750 patients, with 392 total deaths (P=0.50).

**Conclusions:** Our study suggests that TAVR provides similar clinical outcomes to surgery after 5 years. Although one-year mortality was lower in TAVR, it's unclear if health decline reflects heart failure or aging with comorbidities. Statistical significance was not achieved. Further research with extended follow-up is warranted to clarify differences in outcomes.

**Title**: The Neuroprotective Potential of SGLT2 Inhibitors: A Review of Their Role in Neurological Disorders

**Authors:** Jakub Jucha, Konrad Kaleta, Dominik Zając, Dominik Wróbel

**Tutors:** Beata Bujak-Giżycka MD, PhD; Barbara Lorkowska-Zawicka MD, PhD

**Affiliation:** Student scientific group of Clinical Pharmacology Jagiellonian University Medical College

**Background: S**odium-glucose cotransporter 2 inhibitors (SGLT2i) have become essential in the management of Type 2 Diabetes Mellitus (T2DM) by facilitating glucose excretion in proximal tubule of the nephron and improving glycemic control. Beyond those effects, emerging evidence suggests neuroprotective properties, possibly beneficial to a range of conditions. The aim of this review was to explore the usage of SGLT2 inhibitors, focusing on their effects on the central and peripheral nervous systems, and their therapeutic potential in disorders like Alzheimer's disease (AD), Parkinson's disease (PD), autism spectrum disorder, epilepsy, depression, cardiac autonomic neuropathy and numerous additional neuropathological conditions.

**Methodology:** A comprehensive systematic review was conducted. Multiple databases, predominantly PubMed and Google Scholar, were searched for studies published up to January 2023, using keywords and terms related to SGLT2i and various neurological and neuropsychiatric conditions. Both randomized controlled trials and observational studies were included to capture a broad spectrum of data. Due to particularity of the problem, review articles were also analyzed and the search scope was extended to references cited within the articles, ensuring a thorough examination of the available literature.

**Main results:** Type 2 Diabetes Mellitus (T2DM) and metabolic dysregulation play significant roles in AD and other cognitive impairments, accelerating neurodegeneration and affecting up to 80% of patients with AD. In individuals with prediabetes, intervention with empagliflozin demonstrated significant enhancement of hypothalamic insulin sensitivity compared to placebo. Similar associations between T2DM and PD highlight their potential in improving mitochondrial function, reducing oxidative stress, and attenuate progression. Moreover, SGLT2i were found to upregulate Sirtuin 1 protein, further suggesting neuroprotective capabilities. These medications are also associated with mitigating nerve atrophy, particularly impacting sensory functions and autonomic regulation often associated with decreased atrophy of the vagus nerve. This results in improved parasympathetic modulation of heart rate and systolic blood pressure.

**Conclusions:** In summary, the predominant neuroprotective mechanisms of SGLT2i stem from their interference in progression of diverse neurodegenerative processes associated with their therapeutic action in addressing T2DM. Consequently, effective management of the primary disease facilitates the attenuation of subsequent neurological complications through an indirect pathway.

**Title**: Lumbosacral transitional vertebrae as a risk factor for low back pain: a meta-analysis

**Authors:** Maksymilian Osiowski, Aleksander Osiowski, Kacper Stolarz, mgr Tomasz Kozioł, lic. Katarzyna Baran

**Tutors:** Dominik Taterra, MD

**Affiliation:** Ortho and Spine Research Group, Poland; Department of Orthopedics, Orthopedics-Rehabilitation University Hospital in Zakopane, Poland

**Background:** Lumbosacral transitional vertebrae (LSTV) is a congenital spine anomaly in which the enlarged transverse proccess of fifth lumbar vertebrae can fuse with first sacral segment forming sacralisation or lumbarisation. Low back pain (LBP) has the highest prevalence globally among musculoskeletal conditions and is the leading cause of disability worldwide. Various authors tried to investigate the relationship between LSTV and LBP in their local populations with different results but the correlation remained unclear. Aim of this study was to unambiguously determine if LSTV can independently cause pain of the lower back.

**Methodology:** Two databases (Pubmed and Embase) were searched for clinical-control studies in which authors analyzed prevalence of LSTV in both control group (without low back pain) and in a study group (with low back pain). Search terms such as: ,,lumbosacral transitional vertebrae", ,,sacralisation", ,,lumbarisation", ,,LSTV", ,,Bertolotti syndrome", ,,lumbosacral transitional segment" were implemented to find elligible articles which resulted in screening 2152 records by 3 independent researchers. Only studies where patients had non-specific low back pain with no underlying pathology were included. Pooled odds ratio was calculated using Comprehensive meta-analysis v4 programme under random effects model.

**Main results:** Our meta-analysis included 12 studies with 9910 patients. Pooled odds ratio turned out to be 1,35 (95%CI 1.15-1.58) which means that existence of LSTV significantly increases the chances of low back pain. Additional data shows prevalence of LSTV in symptomathic population at 18.9% (95%CI=0.15-0.23) while in asymptomathic population at 13.1% (95%CI=0.11-0.15) which confirms the correlation.

**Conclusions:** Our study is the first to unequivocally show an association between LSTV and LBP globally. LSTV is an independent and significant risk factor for lower back pain. When examining a patient suffering from low back pain, it is important to keep lumbosacral transitional vertebrae in mind as a potential seperate cause of pain, especially when there is no other apparent pathology visible on diagnostic imaging. If LSTV is present in such a patient, surgical treatment to resect the enlarged transverse processes of the lumbosacral junction is worth considering.

**Title**: The role of the gut microbiota in the prevention and treatment of Alzheimer's disease.

**Authors: Magdalena Kurpiel,** Milena Gawlińska, Kamila Proszkowiec, Martyna Ziomek, Aleksandra Guzda, Daria Furman, Gabriela Florek

**Tutors:** Joanna Chłopicka, MD

**Affiliation:** Students Scientific Group of Food Chemistry and Nutrition

**Background:** Alzheimer's disease is a neurodegenerative disease that causes cognitive and memory decline. The gut microbiome has been shown to affect the gut-brain axis, which is associated with effects on the progression of the disease. Increased permeability of the blood-brain and intestinal barrier due to microbiota dysbiosis may mediate the pathogenesis of this disease.

**Methodology:** A literature review based on the BMC (Biomed Central), MDPI,PUBMED and ScienceDirect databases.

**Main results:** The association between fecal calprotectin levels, age, progression of Alzheimer's disease (AD) and various biomarkers and cognitive assessments was examined. Calprotectin was found to increase with age and was higher in participants with AD Aβ+. In the AD Aβ+ group, calprotectin correlatedwith amyloid load on the brain. 16S rRNA sequencing analysis revealed enrichment in Bacteroides. There was a significant reduction in amyloid plaques and neurofibrillary pathology in the brains of 3×Tg mice lacking microbiota compared to mice with natural microbiota. These results suggest significant variation in the composition of the gut microbiota in MCI and AD patients compared to controls, which may have an impact on the development of Alzheimer's disease.

**Conclusions:** A growing body of research indicates how the digestive system and gut microbiota disorders affect slow changes in the brain through the gut-brain axis. The gut microbiota has the ability to produce neurotransmitters that can influence the relationship between brain neurochemistry and brain disorders such as mood, cognitive function, and behavior. Changing the composition of the gut microbiota is becoming a new direction in research to treat neurodegenerative diseases, including Alzheimer's disease. Probiotics, prebiotics and the Mediterranean diet may further help improve cognitive function and inhibit the development of dementia.

**Title**: Predictors for spinal deformity after resection of intradural spinal cord tumors via posterior approach: systematic review and meta-analysis

**Authors:** Maciej Szyduczyński, Natalia Anna Koc, Johannes Korneliussen, Osar Landé

**Tutors:** Grzegorz Miękisiak MD, PhD, Tomasz Szmuda MD, PhD

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**Background:** Intradural spinal cord tumors make up 40% of all primary spinal cord tumors. The treatment method typically involves tumor removal using techniques like laminectomy, laminoplasty, or laminotomy. Post-surgery, spinal deformity (SD) arises in roughly 10% of adult cases, with a significantly higher occurrence, up to 100%, seen in pediatric patients. This study aims to pinpoint the risk factors associated with SD following the resection of intradural spinal cord tumors using a posterior approach.

**Methodology:** We conducted a systematic review following the with PRISMA guidelines. Utilizing databases PubMed, Web of Science, and Scopus, we employed keywords such as "laminoplasty","laminotomy","laminectomy","tumor","resection","spinal deformity","kyphosis","intradural","intramedullary", and "extramedullary". Odds ratios (OR) were estimated for dichotomous variables, and mean differences were calculated for continuous variables.

**Main results:** Our review identified eleven retrospective studies encompassing a total of 715 patients, with an average age of 17.1 years. Out of these, 183 patients developed postoperative SD. Younger age (25 years or below; OR=4.03; p<0.0001; 13 years and below; OR=3.72; p=0.003;) was linked to a higher risk of SD development. Patients in the age group >5 and ≤21 were at increased risk of developing SD in the non-fusion subroup only. Preoperative SD strongly predicted postoperative SD (OR=12.19; p=0.0007), particularly pronounced in the non-fusion subgroup (OR=22.14; p<0.00001). Furthermore, involvement of the thoracolumbar junction increased the risk of SD (OR=3.11; p=0.04). In the fusion subgroup specifically, surgery spanning at least 3 spinal levels raised the risk of SD (OR=9.18; p=0.02). Additionally, in the non-fusion subgroup, an intramedullary tumor location emerged as a significant risk factor for postoperative SD (OR=3.67; p=0.04).

**Conclusions:** Factors contributing to postoperative SD include younger age, preexisting spinal deformity, involvement of the thoracolumbar junction during surgery, decompression across at least 3 spinal levels, and intramedullary tumor location. These discoveries offer valuable guidance for clinicians in devising optimal surgical approaches for patients at elevated risk of developing spinal deformity.

**Title**: Programmed death receptor and tumor-associated macrophages as potential aims for therapy in Krukenberg tumor

**Authors:** Oliwia Borowska, Natalia Kawczyńska

**Tutors:** prof. Grażyna Gromadzka

**Affiliation:** IMMUNIS Scientific Circle, Faculty of Medicine, Collegium Medicum, Cardinal Stefan Wyszyński University

**Background:** Krukenberg tumor (KT) is the name of a cancer metastasis located in the ovary or Douglas' space, most often originating from gastrointestinal cancer, less often from breast cancer and other organs. It most often occurs in premenopausal women. The prognosis in CT is unfavorable. The greatest difficulty in the treatment of KT is the high stage of the cancer at the time of diagnosis. The treatment of choice in KT is surgery. The aim of this study is to discuss new, promising methods of KT treatment.

**Methodology:** The work is based on a literature review using the following databases: PubMed NCBI, Google Scholar, as well as other scientific resources.

**Main results:** Currently, research aimed at developing effective methods of KT treatment focuses on searching for molecules whose expression may be the target of immune therapy. A molecule with such potential is PD1 (programmed death molecule 1), which participates in inhibiting the anti-tumor immune response. PD-1/PD-L1 inhibitors show effectiveness in metastatic tumors. Studies on KT have shown that the primary tumor influences the immune environment in metastases, and positive PD-L1 expression was associated with better or worse prognosis in KT of various origins.
The tumor immune microenvironment also includes tumor-associated macrophages (TAMs), which mediate tumor progression through the secretion of exosomes and cytokines, and by influencing immunosuppression. TAMs also induce resistance to radio- and chemotherapy. This concerns macrophages polarized to the M2 type and is associated with promoting tumor growth and unfavorable prognosis. Therefore, therapeutic approaches aimed at modifying the TAM phenotype are being developed as new strategies for treating cancer, including KT.

**Conclusions:** Both PD-L1 and TAM molecules offer hope for the development of new therapies because they are strongly associated with tumor progression and its response to treatment. More extensive research is needed to help understand the processes influencing the tumor microenvironment. Their results may be useful in planning/monitoring treatment of patients with KT.

**Title**: What is the effectiveness of various methods of preventing and treating obesity in children and adolescents – a literature review.

**Authors:** Weronika Ciszek, Weronika Pawlik

**Tutors:** Urszula Stepaniak, PhD

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**Background:** The prevalence of childhood and adolescent obesity has been a major worldwide health and public health problem for decades. In recent years, there has been a significant increase in obesity among children and adolescents in Poland. Obesity is associated with increased risk of type 2 diabetes, heart diseases including CVD risk. It could also affect bone health, reproduction and the quality of living.
The aim of the study was to access the effectiveness of various methods of preventing and treating obesity in children and adolescents.

**Methodology:** We conducted systematic review of the effectiveness of various methods of preventing and treating obesity in children and adolescents.
Independently conducted systematic literature search through Medline, PubMed, Embase published to 2022.
Keywords used in the search include: ("childhood obesity" and " adolescent obesity") and ("childhood overweight") and (pediatric obesity") or ("prevention") or ("bariatric surgery") or ("effectiveness") or ("lifestyle)".

**Main results:** There is scientific evidence that it is effective to prevent and treat obesity in children and adolescents by: (1) education (home- and school-based), (2) improving diet, (3) physical activity and physical literacy, (3) vitamin D supplementation, (4) lifestyle interventions, (5) pharmacotherapy, (6) surgery (e.g. bariatric surgery).

**Conclusions:** The use of evidence-based methods that effectively prevent and treat obesity in children and adolescents is extremely important from the perspective of public health in stopping the obesity pandemic and reducing it's long-term consequences for the health of individuals and society.