WMU

Doskonała Nauka

# IX

# INTERNATIONAL STUDENTS' CONFERENCE OF YOUNG MEDICAL RESEARCHERS WROCLAW

## 30.03-01.04.2023

Studenckie Towarzystwo Naukowe Uniwersytetu Medycznego we Wrocławiu

STN

# BOOK OF ABSTRACTS

Studenckie Towarzystwo Naukowe Uniwersytetu Medycznego we Wrocławiu

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# *PROGRAM KONFERECJI*

## *Czwartek, 30 marca 2023*

*9:00-10:00* *Rejestracja*

*10:00-11:00* *Inauguracja Konferencji*

*11:00-11:15* *Przerwa kawowa*

*11:15-13:30* ***Sesje A-C:***

***SESJA A:*** *Sesja zabiegowa*
***SESJA B:*** *Sesja psychiatryczna*
***SESJA C:*** *Sesja farmaceutyczna*

*13:30-14:00* *Wykład firmy Solutions for Technology: Rozszerzona rzeczywistość w medycynie*

*14:00-15:00* *Warsztaty MedApp oprogramowanie CarnaLife Holo*

*15:00-15:30* *Spotkanie z przedstawicielami Szkoły Doktorskiej - PL*

*15:30-16:00* *Spotkanie z przedstawicielami Szkoły Doktorskiej - ED*

*16:00-16:30* *Przerwa kawowa*

*16:30-18:00* ***Sesje D-E:***

***SESJA D:*** *Sesja neurologiczno-radiologiczna*
***SESJA E:*** *Sesja kardiologiczna*

## *Piątek, 31 marca 2023*

*9:00-9:30* *Rejestracja*

*9:30-11:00* ***Sesje A-B:***

***SESJA A:*** *Sesja chorób zakaźnych i hepatologii*
***SESJA B:*** *Sesja pediatryczna*

*11:00-11:30* *Wykład: dr Max Brzezicki*

*11:30-12:00* *Przerwa kawowa*

*12:00-12:30* *Wykład: dr Agnieszka Olejnik*

*13:00-17:00* *Warsztaty*

*19:00-22:00* *Program rozrywkowy*

## *Sobota, 1 kwietnia 2023*

*10:00-10:30* *Rejestracja*

*10:30-12:00* ***Sesje A-B:***

***SESJA A:*** *Sesja nauk o zdrowiu i dentystyczna*
***SESJA B:*** *Sesja hematologiczno-onkologiczna*

*12:00-13:30* ***Sesje C-D:***

***SESJA C:*** *Sesja urologiczna*
***SESJA D:*** *Sesja nauk podstawowych*

*13:30-14:00* *Przerwa kawowa*

*14:00-15:30* ***Sesja E:***

***SESJA E:*** *Sesja medycyny sądowej*

*16:00-17:30* *Gala kończąca Konferencję*

*17:30-19:30* *Cocktail Party*

*Piękno naukowej przygody polega na tym,*
*że nigdy nie zabraknie dalszych znaków zapytania.*
*~ ks. prof. Michał Heller*

***Szanowni Państwo!***
***Drogie Koleżanki i Koledzy, Kochani Przyjaciele!***

**Z prawdziwą przyjemnością i wielką radością mam zaszczyt zaprosić Państwa i powitać na tegorocznym Święcie Młodej Nauki – na kolejnej już, IX Międzynarodowej Studenckiej Konferencji Naukowej Młodych Naukowców – IX International Students' Conference of Young Biomedical Researchers.**

Państwa obecność świadczy o tym, że zorganizowanie tej konferencji jest niezmiennie dobrym pomysłem, że wszyscy czekaliśmy na to niezwykłe spotkanie.

Piękny, gościnny i już niemal wiosenny Wrocław, ciekawe tematy Konferencji, a przede wszystkim My, Uczestnicy, stanowimy gwarancję udanego Spotkania, nie tylko pod względem naukowym i szkoleniowym, ale także towarzyskim.

**Konferencja nasza** tradycyjnie już zgromadzi grono Młodych Naukowców i Wspaniałych Nauczycieli Akademickich, którzy dołożą wszelkich starań, aby program naukowy wydarzenia pełen był najszerzej dyskutowanych w ostatnim czasie gorących tematów i kontrowersyjnych zagadnień ze wszystkich dziedzin medycyny, a sama Konferencja osiągnęła wysoki poziom naukowy i organizacyjny.

Jestem dumna i szczęśliwa, iż po raz kolejny Studenckie Towarzystwo Naukowe Uniwersytetu Medycznego we Wrocławiu organizuje **Międzynarodową Studencką Konferencję, która obejmuje wszystkie najważniejsze dziedziny medycyny zarówno klinicznej, jak i podstawowej, a jej imponująca interdyscyplinarność i wieloaspektowość budzi duże zainteresowanie oraz odzew ze strony Studentów i Młodych Naukowców zarówno w całej Polsce, jak i za granicą.**

**Nasze naukowe spotkanie** odzwierciedla cenną ideę popularyzacji i intensyfikowania pracy naukowej studentów i podnoszenia ich naukowych umiejętności i kompetencji poprzez udział w konferencji i publikacje przygotowanych przez nich tekstów w zbiorowym opracowaniu gromadzącym autorów stojących na początku swojej drogi naukowej.

**Konferencja** jest zachwycającym efektem twórczej pracy bardzo licznej grupy młodych naukowców. Z takiej też perspektywy należy uznać to wydarzenie jako wyjątkową sposobność do prezentacji własnych, autorskich pomysłów i badań młodych naukowców, w których wyrażają swoje zainteresowanie i zaangażowanie w różne dziedziny medycyny.

**Życzę Państwu**, aby konferencja spełniła nie tylko funkcję edukacyjną, ale również motywacyjną, dopingującą, inspirującą, a nawet uskrzydlającą Was na przyszłość na początku Waszej naukowej i zawodowej przygody z medycyną. Wierzę, że nasza Konferencja będzie stanowiła naukowy impuls do konstruktywnej wymiany poglądów i twórczej polemiki oraz forum rozważań i naukowych planów na przyszłość. Unikatowa możliwość studenckiego dyskursu i wielokierunkowego dialogu w dyscyplinie medycyna jest wydarzeniem bezcennym, ze wszech miar godnym zauważenia, wsparcia i kontynuacji.

Wrocław, marzec 2023

Prof. dr hab. Agnieszka Hałoń
Przewodnicząca Komitetu Naukowego i Organizacyjnego
**Pełnomocnik JM Rektora ds. Studenckiego Ruchu Naukowego**
**Uniwersytetu Medycznego we Wrocławiu**

*Natura odpowiada tylko wtedy, gdy się jej stawia właściwe pytania.*
*~ Niels Bohr*

***Drogie Koleżanki, Drodzy Koledzy!***

Mam zaszczyt powitać Państwa na IX Międzynarodowej Studenckiej Konferencji Młodych Naukowców oraz XXIV Ogólnopolskiej Konferencji Studenckich Kół Naukowych Uczelni Medycznych!

Po pięcioletniej przerwie, spowodowanej pandemią COVID-19 i zmianami strukturalnymi organizacji studenckich na naszej Uczelni, cieszę się, że wreszcie możemy spotkać się na tak dużym przedsięwzięciu!

Jako przewodniczący Studenckiego Towarzystwa Naukowego Uniwersytetu Medycznego we Wrocławiu pragnę podziękować Władzom naszej Uczelni, JM Rektorowi prof. dr. hab. Piotrowi Ponikowskiemu, za objęcie patronatem naszej konferencji.

Chciałbym również wyrazić wdzięczność Pani prof. dr hab. Agnieszce Hałoń, przewodniczącej Komitetu Naukowego oraz Komitetu Organizacyjnego i jednocześnie opiekunce naszej organizacji. Jej zaangażowanie i pomoc w organizacji konferencji były nieocenione.

Podziękowania składam także na ręce Pracowników Działu Spraw Studenckich i Centrum Kształcenia Podyplomowego, bez których pomocy konferencja nie mogłaby się odbyć.

Serdeczne podziękowania kieruję do wszystkich Patronów Honorowych oraz Partnerów tegorocznej Konferencji.

Na koniec, pragnę szczególnie podziękować Łukaszowi Gojnemu, byłemu Przewodniczącemu STN, który zawsze służył radą oraz wsparciem organizacyjnym i informacyjnym.

Mam nadzieję, że czas spędzony na Konferencji będzie dla wszystkich inspiracją do zgłębiania tajników medycyny i realnie przełoży się na zwiększenie zainteresowania prowadzeniem badań naukowych, najpierw w ramach studenckiej aktywności, w perspektywie zaś badań zmieniających paradygmaty – a tym samym cały medyczny świat!

Poza częścią naukową, będącą ucztą dla duszy każdego badacza, przygotowaliśmy dla Uczestników warsztaty, podczas których w maksymalnie praktyczny sposób będzie można się zapoznać z techniką wykonywania badania USG, histeroskopii oraz laparoskopii. Po całodziennych atrakcjach zachęcamy do spędzenia piątkowego wieczoru na spotkaniu w Kawiarence Naukowej, gdzie będzie można spokojnie porozmawiać z innymi Uczestnikami z całej Europy.

Mam nadzieję, że organizacja dziewiątej Konferencji będzie z sukcesem kontynuowana i stanie się ponownie tradycyjnym spotkaniem społeczności akademickiej, tak w formalny, jak i mniej formalny.

Raz jeszcze serdecznie witam Państwa na tegorocznej konferencji i życzę owocnych dyskusji oraz miłego spędzenia czasu we Wrocławiu!

Wrocław, marzec 2023 roku.

Karol Zagórski
Przewodniczący Studenckiego Towarzystwa Naukowego
Uniwersytetu Medycznego we Wrocławiu

# SURGERY SESSION
## (SESJA CHIRURGICZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**1. Combination of the real and virtual world in the operating room - mixed reality in orthopedics and traumatology of the musculoskeletal system.**

Krzysztof Starszak (krzysztof.starszak@gmail.com), Jakub Kasprzak, Maciej Otworowski, Weronika Starszak
**Tutor:** Andrzej Skalski 1,2, Paweł Łęgosz 3
1. Wydział Elektrotechniki, Automatyki, Informatyki i Inżynierii Biomedycznej, Akademia Górniczo-Hutnicza w Krakowie
2. MedApp S.A.
3. Klinika Ortopedii i Traumatologii Narządu Ruchu, Szpital
Kliniczny Dzieciątka Jezus, Warszawski Uniwersytet Medyczny

**2. Which technique for coronary calcifications?**

Kamila Florek (kamila.florek@student.umw.edu.pl), Bernadeta Malcharczyk, Elżbieta Bartoszewska, Oliwia Klimek, Szymon Biegała
**Tutor:** Piotr Kübler
Institute of Heart Diseases, Jan Mikulicz-Radecki University Teaching Hospital, Wroclaw Medical University, Wroclaw, Poland

**3. A successful management of a case of hereditary spherocytosis in anesthesia during major surgery: Case report**

Maksimilian Grasevič (grasevich.maksimilian@gmail.com), Lukas Strelkauskas
Lithuanian University of Health Sciences, Medical Academy, Faculty of Medicine; Lithuanian University of Health Sciences, Kaunas Clinics

**4. Periprosthetic infection and salvage of breast implant after primary breast augmentation**

Emilija Dedelytė (dedelyte.emilija@gmail.com),
**Tutor:** Domantas Rainys
Lithuanian University of Health Sciences

**5. Management of synovial sarcoma**

Tomas Rašinskis (tomas.rasinskis@gmail.com), Justė Ramonaitė, Vėtra Markevičiūtė, Mindaugas Stravinskas
**Tutor:** Vėtra Markevičiūtė
Lithuanian University of Health Sciences; Lithuanian University of Health Sciences; Lithuanian University of Health Sciences, Department of Orthopaedics and Traumatology; Lithuanian University of Health Sciences, Department of Orthopaedics and Traumatology

**6. To laparo, or not to laparo, that is the question.**

Andrzej Mrożek (andrzej.mrozek01@gmail.com),
**Tutor:** Maciej Antkiewicz, Dariusz Janczak
Klinika Chirurgii Naczyniowej, Ogólnej i Transplantacyjnej, USK Wrocław

**7. Surgical management of pelvic Ewing's sarcoma: a case report**

Justė Ramonaitė (justte.ramonaitte@gmail.com), Tomas Rašinskis, Vėtra Markevičiūtė, Mindaugas Stravinskas
**Tutor:** Vėtra Markevičiūtė
Faculty of Medicine, Lithuanian University of Health Sciences, Kaunas, Lithuania;
Lithuanian University of Health Sciences, Department of Orthopaedics and Traumatology, Kaunas, Lithuania

**8. Osteoporotic vertebral body fractures - the experience of a single center**

Marta Malicka (martam3945@gmail.com) 3, Marta Grelowska 3, Sonia Nogalska 1, Katarzyna Leszczyńska 1,2
**Tutor**: Paweł Tabakow 1
1 Klinika Neurochirurgii, Uniwersytecki Szpital Kliniczny we Wrocławiu
2 Zakład Patofizjologii Narządu Ruchu UMP
3 SKN przy Katedrze i Klinice Neurochirurgii

**9. Type 2 endoleaks treatment after aortic endovascular aneurysm repair**

Agata Wróblewska (agata.w419@gmail.com), Zuzanna Zalewska, Anna Szymańska, Andrzej Mrożek
**Tutor:** Maciej Antkiewicz
Klinika Chirurgii Naczyniowej, Ogólnej i Transplantacyjnej

**10. Is it possible for video games to develop surgical skills?**

Anita Froń (fron.anita@gmail.com), Urszula Tokarczyk
**Tutor:** Mariusz Koral
Wroclaw Medical University

### *POSTER SESSION*
### *(SESJA POSTEROWA)*

**11. Unstable hemodynamics in endoscopy suite- case report**
Darija Savinova (darija.savinova@gmail.com),
**Tutor:** Džiuginta Paulėkaitė, Aurika Karbonskienė
Department of Anaesthesiology, Lithuanian University of Health Sciences

## PSYCHIATRY SESSION
## (SESJA PSYCHIATRYCZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**12. Negative beliefs about antidepressants and their effect on person's willingness to consider treatment**
Ignas Planutis (ignas.planutis@gmail.com),
**Tutor:** Marius Karnickas
Vilnius University

**13. Psychiatric disorders in Huntington's disease**
Klaudia Włodarczyk (klaudia.wlodarczyk@student.umw.edu.pl), Mikołaj Palczewski
**Tutor:** Patryk Piotrowski
Wroclaw Medical University

**14. Psychogenic pruritus: a challenging condition in dermatology and psychiatry. A literature review**
Danielė Gertaitė (gertaite@gmail.com),
**Tutor:** Jorinta Jokubaitė
Vilnius University Hospital Santaros klinikos, Centre of Dermatovenerology; Vilnius University Faculty of Medicine, Clinic of Infectious Diseases and Dermatovenerology

### *POSTER SESSION*
### *(SESJA POSTEROWA)*

**15. Prevalence of eating disorders among Vilnius University students during the COVID-19 pandemic**
Miglė Vilniškytė (migle.vilniskyte@gmail.com), Gabrielė Petrauskaitė,
**Tutor:** Robertas Strumila, Kęstutis Kuzminskas, Alvydas Navickas
Vilnius University Faculty Clinic of Psychiatry

## PHARMACY SESSION
## (SESJA FARMACEUTYCZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**16. Pharmacogenetics of rivaroxaban**
Vladimír Doboš (vladimirdobos@icloud.com)
**Tutor:** Juraj Sokol, Jana Zolkova
Department of Haematology and Transfusion Medicine, National Centre of Haemostasis and Thrombosis, Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava, Kollarova 2, 036 59, Martin, Slovakia

**17. COVID-19 and indications for beta-blocker therapy after recovery**
Tomasz Jędrasek (tomyjedrasek@gmail.com),
**Tutor:** Jakub Gawryś
Department and Clinic of Internal and Occupational Diseases and Hypertension, Wroclaw Medical University

**18. The effectiveness of plant compounds in photodynamic therapy**
Martyna Nowak-Perlak (martyna.nowak-perlak@student.umw.edu.pl),
**Tutor:** Marta Woźniak, Piotr Ziółkowski
Department of Clinical and Experimental Pathology, Division of General and Experimental Pathology, Wroclaw Medical University, 50-368 Wroclaw, Poland

**19. Polymer cross-linking oil encapsulation for increased oxidative stability and drug incorporation**
Joanna Wojciechowska[1] (joa.wojciechowska@student.umw.edu.pl), Aleksandra Dyba[2,3]
**Tutor:** Anna Prescha[1], Karol Nartowski[2]
1 Student Scientific Club Dietetics and Food Science, Wroclaw Medical University, Wroclaw, Poland
2 Department of Drug Form Technology, Wroclaw Medical University, Wroclaw, Poland
3 Institute of Pharmacy, University of Innsbruck, Innsbruck, Austria
4 Department of Food Science and Dietetics, Wroclaw Medical University, Wroclaw, Poland

**20. Childfriendly 3D printed medigummies manufactured with FDM 3D Printing**
Marta Cielas (martacielas01@gmail.com), Julia Brożyna
**Tutor:** Marta Kozakiewicz-Latała, Karol Nartowski
Department of Drug Form Technology, Faculty of Pharmacy, Wrocław Medical University, Borowska 211, Wrocław, Poland

**21. Application of 3D printing in the formulation of pediatric drugs**
Julia Brożyna (julia.brozyna@student.umw.edu.pl), Marta Cielas
**Tutor:** Marta Kozakiewicz-Latała, Karol Nartowski
Department of Drug Form Technology, Faculty of Pharmacy, Wrocław Medical University, Borowska 211, Wrocław, Poland

**22. Influence of cholesterol on stability evaluation of liposomal nanoparticles formulations**
Paulina Pluder (paulina.pluder@student.umw.edu.pl), Paulina Piwek, Karolina Krajewska
**Tutor:** Karol Nartowski
Faculty of Pharmacy, Department of Drug Form Technology, Wroclaw Medical University, Borowska 211A, 50-556 Wroclaw, Poland

***POSTER SESSION***
***(SESJA POSTEROWA)***

**23. Personalized by 3D printing composite scaffolds to support bone regeneration**
Monika Lewandowska (monika.lew99@wp.pl),
**Tutor:** Marta Kozakiewicz-Latała, Karol Nartowski
Faculty of Pharmacy, Department of Drug Formulation Technology, Wroclaw Medical University

# NEUROLOGY & RADIOLOGY SESSION
## (SESJA NEUROLOGICZNO-RADIOLOGICZNA)

***ORAL SESSION***
***(SESJA USTNA)***

**24. A rare and rapidly progressive presentation of Cerebral Venous Sinus Thrombosis: a clinical report**
Anna Sławińska (anna.m.slawinska79@gmail.com), Marta Grelowska
**Tutor:** Marta Nowakowska-Kotas
Katedra i Klinika Neurologii Śląskiego Uniwersytetu Medycznego w Katowicach, SKN Neurologii Uniwersytetu Medycznego im. Piastów Śląskich we Wrocławiu

**25. Alzheimer's disease - new ways of pharmacotherapy**
Bernadetta Jakubowska (bernadetta.jakubowska@onet.pl), Izabela Kiebała
**Tutor:** Patrycja Pańczyszyn-Trzewik, Magdalena Sowa-Kućma
Department of Human Physiology, Institute of Medical Sciences, Medical College of Rzeszów University, Kopisto 2a, 35-315 Rzeszów.

**26. When a benign condition is called metastatic - a case report od metastatic pulmonary calcification**
Oliwia Ziobro (oliwia.ziobro@student.umw.edu.pl), Wiktoria Lewicka
**Tutor:** Anna Zacharzewska - Gondek
SKN Radiologii Ogólnej i Neuroradiologii UMW

**27. Neurofibromatosis type I**
Izabela Kiebała (izabelakiebala@gmail.com), Bernadetta Jakubowska
**Tutor:** Patrycja Pańczyszyn-Trzewik, Magdalena Sowa-Kućma
Department of Human Physiology, Institute of Medical Sciences, Medical College of Rzeszów University.

### *POSTER SESSION*
### *(SESJA POSTEROWA)*

**28. The influence of obesity on the multiple sclerosis development**
Aleksandra Roztoczyńska (roztoczynska.aleksandra@gmail.com), Aleksandra Jenć
**Tutor:** Krzysztof Balawender
Studenckie Anatomiczne Koło Naukowe, Kolegium Nauk Medycznych, Uniwersytet Rzeszowski

**29. Influence of vitamin D deficiency on the development of multiple sclerosis**
Aleksandra Jeńć (olkaaa10900@onet.pl), Aleksandra Roztoczyńska
**Tutor:** Krzysztof Balawender
Studenckie Anatomiczne Koło Naukowe, Kolegium Nauk Medycznych, Uniwersytet Rzeszowski

**30. The effect of green tea on the cerebral blood flow in the middle cerebral artery.**
Marta Grelowska 2 (martagrelowska@gmail.com), Joanna Dragan3, Monika Kisielewska 2, Monika Nowak 2, Emilia Wasilewska 4
**Tutor:** Marta Nowakowska-Kotas 1
1 Klinika i Katedra Neurologii Uniwersytetu Medycznego im. Piastów Śląskich we Wrocławiu;
2 SKN Neurologiczne, Uniwersytet Medyczny we Wrocławiu;
3 Wydział Biotechnologii, Uniwersytet Wrocławski;
4 Wydział Matematyki i Informatyki Uniwersytet Wrocławski

# CARDIOLOGY SESSION
## (SESJA KARDIOLOGICZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**31. Combined prognostic value of impedance cardiography and early repolarization pattern on ECG in decompensated chronic heart failure**
Andrius Ališauskas (andrius.alisauskas@lsmu.lt), Albinas Naudžiūnas1, Saulius Sadauskas1, Laima Jankauskienė1, Eglė Kalinauskienė1, Jonas Jucevičius1, Giedrė Vanagaitė2
**Tutor:** Albinas Naudžiūnas
1 Clinical Department of Internal Diseases, Medical Academy
2 Lithuanian University of Health Sciences

**32. Should troponin still be the golden standard biomarker in myocardial infarction diagnosis?**
Aleksandra Obszańska (aleksandra.obszanska@student.umw.edu.pl), Katarzyna Mazur, Kamila Florek, Julia Maj
**Tutor:** Piotr Kübler
Wroclaw Medical University

**33. Quality of life assessment using the Minnesota Living with Heart Failure Questionnaire: NYHA functional class correlation with questionnaire scores**
Estela Koženevskytė (estelamistela@gmail.com), Mažvydas Savickas
**Tutor:** Diana Žaliaduonytė
Hospital of Lithuanian University of Health Sciences

**34. Complicated cardio-cerebral infarction – could anything more have happened?**
Aleksandra Karcińska (aleksandrakarcinska@gmail.com),
**Tutor:** Karol Nowak, Jarosław Zalewski
Students' Scientific Group at the Department of Coronary Artery Disease and Heart Failure, Institute of Cardiology, Jagiellonian University Medical College in Krakow,

**35. Comparison of severly calcified lesions modifications**
Kamila Florek, Elżbieta Bartoszewska, Szymon Biegała (szymonbiegala02@gmail.com), Oliwia Klimek, Bernadeta Malcharczyk (bernadeta.malcharczyk@gmail.com)
**Tutor:** Piotr Kübler
Department of Heart Disease, Centre of Heart Disease, University Hospital Wroclaw, Wroclaw Medical University

### *POSTER SESSION*
### *(SESJA POSTEROWA)*

**36. Obstetric anaesthesia management of the patient with Marfan syndrome**
Augustė Žurauskaitė (augustezurauskaite@gmail.com),
**Tutor:** Vilda Baliulienė, Austėja Juškienė
Department of Anaesthesiology, Lithuanian University of Health Sciences Kaunas, Lithuania

# INFECTIOUS DISEASES AND HEPATOLOGY SESSION
## (SESJA CHORÓB ZAKAŹNYCH I HEPATOLOGII)

### *ORAL SESSION*
### *(SESJA USTNA)*

**37. Challenges in the treatment and management of HCV infected patient - case report**
Tomasz Jędrasek (tomyjedrasek@gmail.com), Aleksandra Obszańska
**Tutor:** prof. dr hab. Małgorzata Inglot, dr n.med. Katarzyna Fleischer-Stępniewska

**38. The level of knowledge about topic of acute sinusitis according to the latest guidelines in polish society - survey investigation**
Piotr Niemiec, Jakub Przegrałek, Wojciech Suchecki (wsuchecki881@gmail.com), Artur Cycoń
**Tutor:** dr Karolina Dorobisz
Wrocław Medical University

**39. Liver transplant in paediatric patient with hepatopulmonary syndrome caused by yet unknown metabolic disorder**
Katarzyna Faron, Małgorzata Faron (gfaron@interia.eu)
**Tutor:** prof. dr hab. Małgorzata Inglot
Wroclaw Medical University

**40. Difficulties in the treatment of chronic hepatitis B in a patient after hematopoietic cell transplantation (HCT)**
Hanna Aleksandrowicz (hania.aleks24@gmail.com), Julia Sokołowska
**Tutor:** prof. dr. hab. Małgorzata Inglot, lek. Elżbieta Orlicz

**41. Mysterious complications. A case of pneumonia and non-specific pleuritis after probable monkeypox virus infection**
Mateusz Bożejko (matbozejko@gmail.com)
**Tutor:** dr n.med. Bartosz Szetela
Wroclaw Medical University

**42. A preliminary report: HIV in female patients from Ukraine in Wroclaw, Poland**
Ignacy Tarski (ignacy.tarski@student.umw.edu.pl), Kinga Brawańska, Mateusz Bożejko, Daniel Fichte, Paulina Typek
**Tutor:** prof. dr hab. Małgorzata Inglot
Wroclaw Medical University

**43. Tuberculosis of the bones in the light of diagnostic and treatment processes in the past and today**
Aleksandra Faryś (olafarys2911@gmail.com), Zofia Rogala, Kinga Brawańska, Michał Krotliński, Paweł Dąbrowski
**Tutor: dr** Paweł Dąbrowski
Wroclaw Medical University

**44. Challenges in Diagnosis and Treatment of Hepatocellular Carcinoma: Case Report**
Adrianna Rosłoń (adrianna.roslon@student.umw.edu.pl), Aleksandra Kurowska
**Tutor:** prof. dr hab. Małgorzata Inglot
Wroclaw Medical University

**45. Bad luck or mainstream? Numerous occupational exposures in a single nurse in the context of low reporting of similar cases**
Karolina Olech (karolina.olech@student.umw.edu.pl), Mateusz Bożejko
**Tutor:** prof. dr hab. Małgorzata Inglot
Wroclaw Medical University

**46. Cholangiocarcinoma mimicking the PSC recurrence: a case report**
Marta Olszowy (marta.olszowy@student.umw.edu.pl), Igancy Tarski
**Tutor:** prof. dr hab. Małgorzata Inglot
Wroclaw Medical University

# PEADIATRICS SESSION
## (SESJA PEDIATRYCZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**47. Antibiotic-resistant bacteria in stool of pediatric patients with cancer: A single centre-expierence**
Anna Marija Maliskina (031856@rsu.edu.lv)
Rīga Stradiņš University, Latvia
**Tutor:** Liene Smane
Children's Clinical University Hospital, Latvia

**48. Association of dietary inflammatory index with recurrent respiratory tract infections in children**
Natalia Związek[1] (nataliaazwiazek@gmail.com), Daiva Gorczyca[2], James R. Hebert[3]
1 Student Scientific Club of Dietetics and Food Science Wroclaw Medical University,
2 Charité – Universitätsmedizin Berlin, corporate member for Freie Universität Berlin and Humboldt- Universität Berlin zu Berlin, Center for Chronically Sick Children Berlin;
3 Cancer Prevention and Control Program, University of South Carolina
**Tutor:** Anna Prescha
Department of Dietetics and Food Science, Wroclaw Medical University

**49. Staphylococcal scalded skin syndrome**
Ieva Apanavičiūtė (apanaviciute.ieva@gmail.com), Ugnė Šilkūnė
Lithuanian University of Health Sciences
**Tutor:** Rasa Brinkis
Lithuanian University of Health Sciences, Department of Neonatology

**50. Distal vaginal reconstruction in a teenage patient**
Olga Zawistowska (olga.zawistowska@op.pl), Iga Szymańska
Student Scientific Association of Gynecology and Obstetrics of the Medical University of Silesia
**Tutor:** Ewa Winkowska

**51. Dosis facit venenum - of reluctance to supplements and appreciation of simple solutions**
Kinga Brawańska (kinbraw2@gmail.com), Aleksandra Bruciak, Paulina Tomecka
SSG of Pediatric Nephrology, Wroclaw Medical University
**Tutor:** Kinga Musiał
Department of Pediatric Nephrology, Wroclaw Medical University

**52. Teenage patient with endometriosis and Chilaiditi syndrome**
Iga Szymańska (iga.180199@gmail.com), Olga Zawistowska
Student Scientific Association of Gynecology and Obstetrics of the Medical University of Silesia
**Tutor:** Ewa Winkowska

**53. Congenital esophageal and tracheal malformations: a case report**
Ugnė Šilkūnė (ugne.peciukaityte@gmail.com), Ieva Apanavičiūtė
Lithuanian University of Health Sciences, Faculty of Medicine, Kaunas, Lithuania
**Tutor:** Rasa Brinkis
Lithuanian University of Health Sciences, Department of Neonatology, Kaunas, Lithuania

# HEALTH SCIENCE AND DENTISTRY SESSION
## (SESJA NAUK O ZDROWIU I DENTYSTYCZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**54. Impact of PM 2.5 on diabetes-related health statistics in Poland from 2015 to 2017**
Ignacy Tarski (ignacy.tarski@student.umw.edu.pl), Anna Czernicka, Karol Zagórski
**Tutor:** Małgorzata Małodobra-Mazur
Molecular Techniques Unit, Wroclaw Medical University

**55. Orthodontic treatment in periodontal patients: a questionnaire study**
Skirgailė Bulotaitė (bulotaiteskirgaile@gmail.com), Apolinaras Zaborskis
**Tutor:** Eglė Zasčiurinskienė, Antanas Šidlauskas

**56. The Impact of Sweeteners on the Human Digestive System**

Katarzyna Wer (katarzyna.wer@student.umw.edu.pl)[1], Aleksandra Straś[2], Julianna Zielska[3], Aleksander K. Smakosz[4]
**Tutor:** Tomasz Sozański, Maciej Danielewski
1 Wroclaw Medical University, Faculty of Pharmacy, Student Research Group of Experimental and Clinical Pharmacology
2 Wroclaw Medical University, Faculty of Pharmacy
3 University of Zielona Góra, Collegium Medicum
4 Wroclaw Medical University, Faculty of Pharmacy, Department of Pharmaceutical Biology and Biotechnology

### *POSTER SESSION*
### *(SESJA POSTEROWA)*

**57. Impact of clear aligners treatment on masticatory muscles activation: a systematic literature review**

Smiltė Paldauskaitė (smiltepald@gmail.com), Roberta Lekavičiūtė
**Tutor:** Kristina Lopatienė
Department of Orthodontics, Faculty of Odontology, Medical Academy Lithuanian University of Health Sciences, Kaunas, Lithuania

**58. Reasons for the failure of fixed orthodontic retainers: a systematic literature review**

Roberta Lekavičiūtė (lekaviciute.roberta@gmail.com), Smiltė Paldauskaitė
**Tutor:** Kristina Lopatienė
Department of Orthodontics, Faculty of Odontology, Medical Academy Lithuanian University of Health Sciences, Kaunas, Lithuania

**59. Attitudes towards new generation smoking products**

Miglė Vilniškytė (migle.vilniskyte@gmail.com),
**Tutor:** Laura Nedzinskienė
Vilnius University Faculty of Medicine Department of Anatomy, Histology and Anthropology

**60. The influence of gut microbiota activity on human mental health**

Monika Kudaj (monika.kudaj@student.umw.edu.pl), Izabela Kudaj
**Tutor:** Paweł Dąbrowski
Wroclaw Medical University, Faculty of Medicine, Department of Human Morphology and Embryology, Department of Anatomy

## HAEMATOLOGY, ONCOLOGY AND INTERNAL MEDICINE SESSION
## (SESJA HEMATOLOGICZNO-ONKOLOGICZNO-INTERNISTYCZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**61. Comparison of the nutritional status of oncology and non-oncology patients after haematopoietic stem cell transplantation**

Agata Sozańska (sozanska.agata@gmail.com), Julia Mierzwińska-Mucha, Joanna Pieczyńska, Monika Mielcarek-Siedziuk
**Tutor:** Anna Prescha, Katarzyna Skórska-Bober
Wroclaw Medical University

**62. Influence of steroid therapy and diet on patients' body composition after hematopoietic stem cell transplantation depending on the severity of the graft versus host disease**

Julia Mierzwińska-Mucha (mmucha.julia@gmail.com), Agata Sozańska, Joanna Pieczyńska, Monika Mielcarek-Siedziuk
**Tutor:** Anna Prescha, Katarzyna Skórska-Bober
Wroclaw Medical University

**63. Case report of relapsed Philadelphia-negative B-cell precursor acute lymphoblastic leukemia successfully treated with inotuzumab ozogamicin and allogeneic hematopoietic stem cell transplantation from a HLA-mismatched unrelated donor followed by pre-emptive donor lymphocyte infusion**

Agnieszka Pelc (agnieszka.pelc@student.umw.edu.pl), Dawid Bukowiec, Maciej Majcherek,
**Tutor:** Anna Czyż
Wroclaw Medical University

**64. Multiple endocrine neoplasia type 1 (MEN1) syndrome**

Maja Gewald[1,2] (maja.gewald00@gmail.com), Marcelina Rybińska[1,2], Wafa Al-Batool[1,2] , Izabella Zarecka[1,2]
**Tutor:** Katarzyna Zawadzka, Aleksandra Jawiarczyk-Przybyłowska
1 Wroclaw Medical University
2 Endocrinology Students Scientific Club

**65. Multiple endocrine neoplasia type 2 (MEN2)**
Marcelina Rybińska[1,2] (marcelina.rybinska@gmail.com), Maja Gewald[1,2] , Wafa Al-Batool[1,2] , Izabella Zarecka[1,2]
**Tutor:** Aleksandra Jawiarczyk-Przybyłowska, Katarzyna Zawadzka
1 Wroclaw Medical University
2 Endocrinology Students Scientific Club

**66. IgG4-related disease in patient with orbitopathy - case report**
Hanna Nowakowska (ht.nowakowska@gmail.com), Justyna Drozdowska, Natalia Kuchenbeker
**Tutor:** Katarzyna Zawadzka, Aleksandra Jawiarczyk-Przybyłowska
SKN Endokrynologii przy Uniwersytecie Medycznym we Wrocławiu

**67. Repairment of injured obturator nerves during C1 hysterectomy (Querleu-Morrow classification) in two instances of cervical cancer- case reports**
Diana Woźnica (diana.woznica@student.umed.wroc.pl), Adrianna Rosłoń, Aleksandra Kurowska
**Tutor:** Tymoteusz Poprawski
DCO, Wroclaw Medical University

**68. Impact of visual-spatial ability on specific laparoscopic skills**
Karolina Cudzich (karolina.cudzich@student.umed.wroc.pl), Adrianna Rosłoń, Aleksandra Kurowska
**Tutor:** Piotr Lepka
Wroclaw Medical University

**69. Large-sized retroperitoneal sarcoma**
Hubert Szyller[1,2] (hermeszyller@gmail.com), Adrianna Rosłoń[1,2], Aleksandra Kurowska[1,2] , Diana Woźnica[1, 2], Mateusz Krotofil[1,2]
**Tutor:** Marcin Ziętek
1 Wroclaw Medical University
2 Studenckie Koło Naukowe Onkologii

### *POSTER SESSION*
### *(SESJA POSTEROWA)*

**70. The anticarcinogenic mechanism of metformin**
Łukasz Gądek[1,2] (l.gadek@student.umw.edu.pl), Klaudia Kłak[1,2]
**Tutor:** Ewa Sawicka
1 Students' Scientific Society at the Department of Toxicology
2 Faculty of Pharmacy, Wroclaw Medical University

**71. A Comparison of the anticancer potential of CBG and CBG-A on colon cancer cell line - in vitro studies**
Dorota Bęben[1] (dorota.biegas@student.umw.edu.pl), Oliwia Siwiela[1], Daniel Rzepka[2], Michał Graczyk[3,4]
1 Faculty of Pharmacy, Wroclaw Medical University, Wroclaw, Poland,
2 Biomi-Farm company, Poland,
3 Department of Palliative Care, Nicolaus Copernicus University in Torun
4 Collegium Medicum in Bydgoszcz, Poland
**Tutor:** Helena Moreira, Anna Szyjka, Ewa Barg

# UROLOGY SESSION
## (SESJA UROLOGICZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**72. Inguinoscrotal hernia of urinary bladder: a case report**
Vaiva Kručiūtė (vaiva.kruciute@gmail.com), Emilija Dedelytė
**Tutor:** Jonas Jurgaitis
Faculty of Medicine, Medical Academy, Lithuanian University of Health Sciences, Kaunas, Lithuania

**73. Antitumor effect of sorafenib and its complex with the drugs delivery system of supramolecular ribbon-like structures on bladder cancer cells**
Julia Rybak (julia.rybak@student.uj.edu.pl), Anna Misterka, Daniel Jankowski; Zuzanna Wadowska, Marta Kaczor-Kaminska,
**Tutor:** Malgorzata Lasota
SSG of Targeted Therapy and Supramolecular Systems, Jagiellonian University Medical College, Cracow, Poland
Chair of Medical Biochemistry, Jagiellonian University Medical College, Cracow, Poland

**74. Clinical assessment of the value of the sentinel node technique in patients with bladder cancer who underwent radical cystectomy with extended lymphadenectomy**

Bartłomiej Tyszkowski (bartek.tyszkowski99@gmail.com), Paweł Kiełb, Paweł Hackemer, Wojciech Krajewski, Łukasz Nowak, Mateusz Dzięgała
**Tutor:** Bartosz Małkiewicz, Tomasz Szydełko
University Center of Excellence in Urology, Department of Minimally Invasive and Robotic Urology, Wroclaw Medical University

**75. The role of intraoperative transesophageal echocardiography in the management of renal cell carcinoma with atrial thrombus – case report**

Krystian Mączka (krystian_maczka@wp.pl), Mikołaj Legieć, Jakub Sobieraj
**Tutor:** Maciej Łukasz Trzciniecki, Paweł Kowal
Department of Urology and Urological Oncology, Provincial Specialist Hospital, Wroclaw Poland,
Faculty of Medicine, Ludwik Rydygier Medical University in Bydgoszcz, Bydgoszcz, Poland, Faculty of Medicine, Wroclaw Medical University, Wroclaw, Poland

**76. Diagnostic value of radio-guided sentinel node detection in patients with prostate cancer undergoing radical prostatectomy with modified-extended lymphadenectomy**

Jakub Karwacki (jkarwacki12@gmail.com), Adam Gurwin, Paweł Kiełb,
**Tutor:** Bartosz Małkiewicz[1], Diana Jędrzejuk[2]
[1] University Center of Excellence in Urology, Department of Minimally Invasive and Robotic Urology, Wroclaw Medical University, 50-556 Wroclaw, Poland
[2] Department of Endocrinology, Diabetes and Isotope Therapy, Wroclaw Medical University, 50-367 Wrocław, Poland

**77. Artificial intelligence in prostate cancer**

Anita Froń (fron.anita@gmail.com), Alina Semianiuk, Uladzimir Lazuk
**Tutor:** Bartosz Małkiewicz
University Center of Excellence in Urology, Department of Minimally Invasive and Robotic Urology, Wroclaw Medical University

# BASIC SCIENCE SESSION
# (SESJA NAUK PODSTAWOWYCH)

## *ORAL SESSION*
## *(SESJA USTNA)*

**78. The influence of ketogenic diet on metabolism of cancer cells – literature review**

Natalia Janczyszyn[1] (natalia.janczyszyn@interia.pl), Tomasz Górnicki[1], Jakub Lambrinow[1]
**Tutor:** Piotr Dzięgiel[2], Jędrzej Grzegrzółka[2]
1. Student Research Club of Histology and Molecular Biology, Faculty of Medicine, Wroclaw Medical University
2. Division of Histology and Embryology, Department of Human Morphology and Embryology, Wroclaw Medical University

**79. Systematic literature review of molecular mechanisms of striae distensae**

Aleksandra Snopkowska[1] (olas999@gmail.com), Tomasz Górnicki[1], Jakub Lambrinow[1]
**Tutor:** Jędrzej Grzegrzółka[2]
1. Student Research Club of Histology and Molecular Biology, Faculty of Medicine, Wroclaw Medical University
2. Division of Histology and Embryology, Department of Human Morphology and Embryology, Wroclaw Medical University

**80. ADAR1 expression in different cancer cell lines and its change under heat shock**

Michał Fornalik (michalfornalik.contact@gmail.com), Anna Małkiewicz, Dominika Adamczak, Julia Pestka
**Tutor:** Bartosz Słowikowski
SKN Biochemii i Biologii Molekularnej, Department of Biochemistry and Molecular Biology, Poznan University of Medical Sciences

**81. Characterization and quality evaluation of decellularized pig liver scaffold structure**

Roshan Kumar Singh (contactroshanks@gmail.com), Maria Stefania Massaro[1], Lenka Červenková[1,2], Richard Palek[1,3], Jachym Rosendorf[1,3] and Miroslav Jiřík[1,4]
**Tutor:** Vladimira Moulisová[1], Václav Liška[1,3]
1. Laboratory of Cancer Treatment and Tissue Regeneration, Biomedical Center, Faculty of Medicine in Pilsen, Charles University, Prague
2. Department of Pathology, Third Faculty of Medicine, Charles University in Prague, Prague, Czech Republic
3. Department of Surgery, Faculty of Medicine in Pilsen, Charles University in Prague, Pilsen, Czech Republic
4. Department of Cybernetics, University of West Bohemia, Pilsen, Czech Republic

**82. Cytosine base editor BE3 efficiently introduces Recessive Dystrophic Epidermolysis Bullosa-causing mutations to Squamous Cell Carcinoma cells to obtain a model of a rare disease**

Katarzyna Balon[1] (katarzyna.balon@hirszfeld.pl), Virginia Llopis-Hernandez[2]
**Tutor:** Łukasz Łaczmański[1], Joanna Jacków-Malinowska[2]
1. Laboratory of Genomics and Bioinformatics, Institute of Immunology and Experimental Therapy, Polish Academy of Sciences, Wroclaw, Poland
2. St John's Institute of Dermatology, King's College London, London, UK

### *POSTER SESSION*
### *(SESJA POSTEROWA)*

**83. Anticancer potential of CBD and CBD-HQ on colorectal cancer cell line – in vitro studies**

Oliwia Siwiela[1] (o.siwiela@gmail.com), Dorota Bęben[1], Daniel Rzepka[3], Michał Graczyk[4,5]
**Tutor:** Helena Moreira[2], Anna Szyjka[2], Ewa Barg[2]
1. Faculty of Pharmacy, Wroclaw Medical University, Wroclaw, Poland,
2. Department of Medical Sciences Foundation, Wroclaw Medical University, Wroclaw, Poland,
3. Biomi-Farm company, Poland,
4. Department of Palliative Care, Nicolaus Copernicus University in Torun
5. Collegium Medicum in Bydgoszcz, Poland

**84. Potential of CBD, CBG and THC extracted from cannabis in the treatment of colorectal cancer – in vitro study**

Oliwia Siwiela[1] (o.siwiela@gmail.com), Dorota Bęben[1], Daniel Rzepka[3], Michał Graczyk[4,5]
**Tutor:** Helena Moreira[2], Anna Szyjka[2], Ewa Barg[2]
1. Faculty of Pharmacy, Wroclaw Medical University, Wroclaw, Poland
2. Department of Medical Sciences Foundation, Wroclaw Medical University, Wroclaw, Poland
3. Biomi-Farm company, Poland,
4. Department of Palliative Care, Nicolaus Copernicus University in Torun
5. Collegium Medicum in Bydgoszcz, Poland

**85. Assessing the neuroprotective effects of caffeinated coffee in the context of aluminium-induced neurotoxicity: Insights from PC12 cell culture model**

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**86. Mitoquinone mesylate (MitoQ) has a protective effect on perfused kidney by reducing apoptosis**

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## FORENSIC MEDICINE SESSION
## (SESJA MEDYCYNY SĄDOWEJ)

### *ORAL SESSION*
### *(SESJA USTNA)*

**87. Characteristics of asphyxia by strangulation in Lithuania**

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**88. Cheiloscopy – use of a forensic tool in sex distinguishing. Vahanwala and Pagares' hypothesis verification.**

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**89. The effect of tannins on postmortem changes**
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**90. Incidentally found hyperglycaemia at autopsy and its implication for the determination of cause of death: a case series**
Emilija Narvydaitė[1] (narvydaite.emilija@gmail.com),
**Tutor:** Sigitas Laima[1,2], Diana Vasiljevaitė[1,2],
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**91. Violation of sexual boundaries among academic students in Wroclaw**
Wiktoria Filipowska1, Sara Czerniecka[1] (czernieckasara@gmail.com), Gabriela Danel[1], Zuzanna Cudziło[1]
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**92. The importance of lung weight at autopsy in identifying Tuberculosis**
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**93. Suicide by multiple gunshot wounds to the head**
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# SURGERY SESSION
## (SESJA CHIRURGICZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**1. Combination of the real and virtual world in the operating room - mixed reality in orthopedics and traumatology of the musculoskeletal system.**

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**Introduction:** Mixed reality is a modern technology in which elements of the real and virtual world coexist and interact with each other. Holograms placed in space are used in many fields of medicine, including cardiology, cardiac surgery, orthopedics and traumatology of the musculoskeletal system. It is mainly used during treatment process to visualize medical image data in 3D.

**Aim:** The aim of this work is to present our own experience in the field of using mixed reality technology in orthopedics and traumatology operations of the musculoskeletal system and to review the latest literature on the latest achievements in the use of this technology.

**Materials and Methods:** Presentation of operations from the field of orthopedics and traumatology of the musculoskeletal system in which mixed reality technology was used, based on the authors' experience, with the use of their own materials, and a synthesis of information obtained in the course of the analysis of the latest literature in this field.

**Results:** Mixed reality technology (the authors used the CarnaLife Holo software by MedApp S.A.) is used in surgeries of various profiles and scopes of activity by orthopedists and traumatologists of the musculoskeletal system. There is also an increase of interest in this technology all over the world, including Poland.

**Conclusions:** Mixed reality technology is used in orthopedics and traumatology of the musculoskeletal system in many areas of this specialization. The authors' experience indicates a wide range of development opportunities for this innovative solution and they recommend searching for further applications for implementation in the clinical practice. Mixed reality can be used not only during surgery, but also for student and resident training, as well as and pre-operative planning.

**2. Which technique for coronary calcifications?**

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**Introduction:** Heart coronary artery calcifications involve the creation of calcium deposits in arterial wall and is a rising issue in the aging population nowadays. In order to maximize the treatment efficiency of percutaneous coronary intervention (PCI) and debulk the plaques, methods such as rotational atherectomy (RA), orbital atherectomy (OA) and coronary intravascular lithotripsy (IVL) were invented [1,2,3].

**Methodology:** We revised 49 peer reviewed articles available in Google Scholar database using keywords: rotational atherectomy, orbital atherectomy, coronary intravascular lithotripsy, coronary artery calcification.

**Results:** IVL catheter is a balloon-based device containing lithotripsy emitters which delivers uniformly distributed sonic waves which causes intraplaque calcium fractures. In contrast, OA and RA use a rapidly rotating burr to modify calcified plaques [4]. RA is a good choice for tight and heavily calcified lesions. However, the rotablator can cut the plaque only forward and it is possible to get its burr stuck, whereas OA advantage is the ability of the device to ablate forward and backward. OA is a good choice for debulking of larger vessels.In case of uncrossable lesions RA or OA are recommended, and in the patients with suboptimal balloon expansion - IVL might be nacassary [6]. Following studies assessed procedure efficacy as- 88,9% for OA according to ORBIT II trial, 100% for IVL consistent with CAD II trial and 92,5% in case of RA referring to ROTAXUS trial [7,8,9]. The same studies revealed 30-days MACE (Major Adverse Cardiac Events) prevalence in OA- 10,4%, IVL- 4,3% and RA- 5%. Currently ongoing ECLIPSE randomized trial may assess according to the newest data the strategy of OA usage compared to data present in ORBIT II trial from 2014 [10]. There is also a difference in specific for rotational devices complications such as perforation and no flow phenomenon occurrence and no presence of such events according to IVL. It is more frequently observed in RA (6- 15%) than in OA- 0,9%. No-flow phenomenon may be associated with produced during PCI particle size: in RA- 10-15 μm and in OA-2-3 μm [11]. RA is associated with a higher risk of 30 days/in-hospital MI, but was associated with a lower prevalence of coronary artery dissection and perforation. According to IVL only mild dissections were observed. There were no significant differences in the 1-year MACE - it occurred in an average of 15% of patients who underwent RA (from 13.2% to 26% depending on the study) [6,12,13], in 14,4% of patients after OA (11% to 16.4%) [13,14,15] and 13.2% according to IVL (ranging from 9.4% in Japan to 13.8% in US and Europe) [16,17]. OA is a cost-effective approach compared to RA due to performance improvement and lower rate of reinterventions [18,19]. According to comparisons of IVL and RA, there are data claiming that IVL is less expensive due to lower overall resource utilization [20,21].

**Conclusions:** There is no one certain method of calcified coronary artery modification prior to stent implantation and more quality randomized trials and meta-analysis are needed to compare their efficacy and complications. Every technique has his own advantages and disadvantages and we should try to choose proper method for particular patient.

### 3. A successful management of a case of hereditary spherocytosis in anesthesia during major surgery: Case report

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**Introduction:** Hereditary spherocytosis (HS) is a type of congenital hemolytic anemia, wherein atypical, sphere-shaped erythrocytes are prone to rupture and are less flexible in the circulatory system. HS mainly presents itself with anemia, hemolysis, that sometimes progresses to crisis, it causes a challenge for perioperative management of anesthesia. In some cases, hyperbilirubinemia adds to pigment gallstone formation with the risk of developing cholecystitis. It is recommended to correct anemia with blood transfusions before any major surgery and avoid surgical procedures altogether during a hemolytic crisis. It is also important to avoid any causes of hypoxia, hypothermia and acidosis as atypical erythrocytes are susceptible to those conditions. This case report represents a successful and uncomplicated perioperative management of a patient with HS during a major surgery.

**Case description:** A 21-year-old female with HS presented with nausea, watery diarrhea and abdominal pain. She was admitted to the department of hematology of Kaunas clinics due to suspected hemolytic crisis. Blood tests revealed progressing hyperbilirubinemia and anemia. An elective splenectomy was planned as a method of treatment due to progression of splenomegaly and episodes of hemolytic crises. Further progression of abdominal pain caught the attention of gastroenterologists – an ultrasound revealed dilated common biliary tract and a concrement in the gallbladder. Additionally, to splenectomy, cholecystectomy was planned adding up to a major surgery. Patient was consulted by an anesthesiologist – prolonged APTT (82-72.5 sec.) was found which had to be corrected prior to intervention. Scheduled surgery was delayed and attempts to reveal possible causes of hypocoagulation were made. However, extensive lab search revealed no specific cause, and elective surgery was performed. Patient was evaluated as ASA grade 3 and 1 g of tranexamic acid before and 2 units of FFP during the surgery were administered as a prophylaxis against hypocoagulation. 2 units of RBC were reserved for anemia correction. Apart from that perioperative management was largely uneventful – sinus bradycardia at the beginning of the surgery was adequately corrected with atropine, 3,5 L of crystalloid infusions with 3 g KCl 7.45% and 2.5 g $MgSO_4$ were administered with no episodes of hypoxia or hypothermia. After surgery 1.5 g cefuroxime and 0.5 g metronidazole were administered and thrombosis prevention was not recommended due to hypocoagulation. Postoperative care was uncomplicated – drainage revealed only a small portion of secretions, no fever and mild surgical site pain were present. The patient was subsequently discharged.

**Conclusions:** The described case showcases a patient with HS undergoing a major surgery – splenectomy and cholecystectomy. Perioperative management was done according with recommendations and clinical state. RBC was reserved for potential anemia correction, hypocoagulation was adequately managed with tranexamic acid and FFP infusions, electrolyte balance was maintained with according solution infusions and no hypoxia or hypothermia were present. Because of that postoperative care was uneventful and the patient was discharged. This case report underlies the importance of correct management of patients with HS and is an example of a successful outcome.

### 4. Periprosthetic infection and salvage of breast implant after primary breast augmentation

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**Introduction:** Breast implants are one of the most popular types of plastic surgery prostheses. Periprosthetic infection is one of the major complications that often results in implant loss. It is much more common in oncoplastic patients after breast reconstruction compared to patients after primary breast augmentation with implants. There is still a debate regarding various techniques and the clinical management of periprosthetic breast infection. This case report presents successful salvage of breast prosthesis.

**Case description:** A 29-year old woman presented with a 3x2 mm size lesion of postoperative scar. Further inspection revealed that the wound was deep, went through all the layers of the breast and the implant was exposed in the wound bed. There were no other clinical signs of infection except of wound desistance, granulation tissue in the subcutaneous layer and swelling around the wound. Medical history revealed that the patient had undergone breast augmentation with silicone gel prosthesis 6 weeks ago, postoperative period was fluent until the incidence. The patient informed that she was on holiday the previous week, was using sauna and swimming in a lake, subsequently she noticed a wound in the left breast and copious yellow exudate. An infection of the implant was suspected, and revision surgery was advised. The revision surgery under general anaesthesia was done the following day after examining the patient. A prophylactic dose of cefuroxime was given. The postoperative scar with inflamed surrounding tissue was excised and the implant was removed. Prosthesis was mechanically cleaned and immersed in 0.9 percent NaCl solution, 1 g of cefazolin, 80 mg of gentamicin, 1 g of clindamycin and 50% Betadine solution, the exposure time was 30 minutes. During the surgery the implant socket was revised, there was no purulent exudate, thus the decision to save the implant was made. The pocket was irrigated with the same solution as the implant, a vacuum drain was inserted. The prosthesis was reimplanted, and the wound was closed. After the surgery patient was treated with 7-day antibiotic therapy of cefuroxime and metronidazole. The wound bacterial culture came back negative. Postoperative recovery was uneventful and there were no further complications.

**Conclusions:** The described case report showcases 1-stage periprosthetic infection management and implant salvage using rigorous implant and breast pocket cleaning along with antibiotic therapy. The method used in this case can yield positive results and allow salvage of the implant when non-severe implant infection occurs early after breast augmentation.

### 5. Management of synovial sarcoma

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**Introduction:** Synovial sarcoma is a non-specific heterogenous malignant cancer of soft tissue sarcomas group, which is caused by changes in chromosomes. There are three morphologic subtypes: monophasic, biphasic and poorly differentiated. It is slow-growing, most commonly found in periarticular soft tissue of the extremities. It affects both sexes equally, median is 39 years old. To diagnose synovial sarcoma MRI and biopsy must be done. Treatment plan consists of surgical excision with negative margins, additionally radiotherapy or/and chemotherapy can be used. Five–year survival rate is between 59 and 75%, there is a chance of late recurrence, which usually metastasize to the lungs.

**Case description:** 47 years old man noticed a painful growing derivative in the right ankle area. Intralesional resection has been done without biopsy in community hospital. After six months, in February, 2021, patient came to our hospital. Palpable mass in the right ankle area was found during the inspection, except pain, no other symptoms such as atrophy of muscle, fever or weight loss were found. The patient was consulted by an orthopaedic oncologist due to a suspicion for a malignant tumor. A biopsy was performed, and the patient was diagnosed with biphasic high grade (G3) synovial sarcoma. Pulmonary and abdominal CT was normal. Multidisciplinary council decided to start neoadjuvant chemotherapy with doxorubicin and iphosphamid to reduce the size of tumor. In June, 2021, control MRI was performed, which have shown no response to chemotherapy. Transtibial amputation was performed due to soft tissue contamination of tumor by earlier intralesional resection. No complications were found, patient was discharged home. During follow-up consultations every 3-6 months no finds of local recurrence and metastasis were found.

**Conclusions:** This case report demonstrates necessity of early diagnose of synovial sarcoma to avoid amputation. Suspected tumor must be examined by orthopedic oncologist and biopsy must be done by him for an accurate diagnosis.

Keywords: soft tissue sarcoma, orthopaedics, cancer, biopsy, amputation.

### 6. To laparo, or not to laparo, that is the question.

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**Introduction:** The history of medicine, surgery in particular, has many breakthrough moments related to new discoveries and innovative technological progress. Laparoscopic access to the peritoneal cavity was initially used as a strictly diagnostic method. Today it allows for conducting extremely complex procedures, which was unimaginable several years ago. The introduction of new tech-niques and technologies to the treatment process results in the effects of their use, which are not always desirable. It is therefore worth taking a closer look at the beginnings and present of lapa-roscopy, and even trying to predict its development in the future.

**Methodology:** This work aims to evaluate available reviews and meta-analysis' literature knowledge available in free databases, as PubMed, Google Scholar, and compile research outcomes. The scientific arti-cles were analyzed and the following conclusions which are focused on laparoscopic surgery and all of its features were drawn.

**Results:** The results of the analysis are not unambiguous in the general distinction between open and laparoscopic methods. Often the results depend on the specific type of surgery. However, gen-eral conclusions can be drawn, such as shorter hospital stay and earlier return to activity after laparoscopic procedures. Interestingly, it turns out that the duration of the procedure plays a less and less important role and does not constitute statistical differences (with a few exceptions). There are also arguments for open access, including a shorter learning curve, which is not obvi-ous to define, and a lower rate of intra-abdominal complications.

**Conclusions:** The ability to access the abdomen with trocars and a camera opens up new diagnostic and thera-peutic possibilities. It allows patients to return to activity faster, which is a significant factor in returning to full physical and mental fitness. However, learning new techniques, especially so different from open surgery, takes time. Laparoscopic techniques cannot always solve the prob-lems encountered during the surgery, which may ultimately lead to conversion. Hence, we seek the answer to the question: to laparo, or not to laparo?

### 7. Surgical management of pelvic Ewing's sarcoma: a case report

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**Introduction:** Ewing sarcoma is a rare type of malignancy that occurs in bones or in the soft tissue around the bones. It can also metastasize to other areas of the body, including the bone marrow, lungs, kidneys. While Ewing's sarcoma can occur at any time during childhood, it most commonly develops during puberty when bones are growing rapidly. The pelvis is one of the primary sites of Ewing sarcoma and is associated with poorer prognoses than the extremities. Due to the rarity of this disease and limited data available, the prognostic factors of pelvic Ewing's sarcoma remain controversial.

**Case description:** 20 year-old woman was referred to our hospital due to severe left hip pain in July 2021. She complained of these symptoms for about half a year. The patient was consulted by an orthopedic oncologist due to a suspicion for a malignant tumor. In August 2021, magnetic resonance imaging (MRI) of lumbar spine and pelvis showed that a mass occupied left side of sacrum and left side of hip bone. It also was spread to the sacral canal and soft tissues. In September 2021, pulmonary computer tomography (CT) showed three solitary masses what were about 0,4 centimeter in diameter. Also, whole body positron emission tomography (PET) scan was done to assess the spread of disease - moderately metabolic left pelvis tumor and metabolic inactive neoplastic changes in the lungs. A biopsy was performed, and

the patient was diagnosed with Ewing sarcoma, G4. Chemotherapy was initiated by the Euro Ewing 2012 protocol. Three of the active drugs used include vincristine, etoposide and doxorubicin. In March 2022, PET scan was repeated to evaluate the dynamics: a tumor in pelvis area was significantly decreased to 7,1x7,1x4,2 cm but metabolic activity was still observed, new metabolically active foci were not detected. In May 2022, surgery was performed - a partial resection of the iliac wing, resection of 5 cm soft tissue adjacent to the tumor and a posterior sacral laminectomy was performed. Resection edges were clear. During the surgery blood vessels and nerves were preserved. Together with neurosurgeons, osteosynthesis was performed using the SOLAR system. Iliac wing, the vertebral bodies of L5 and S1 were fixed by screws and mutually reinforced with rods. Iliac bone defect was corrected by using two fibular allografts. Gluteal muscles were reconstructed. Histological examination confirmed the pre-operative clinical diagnosis – Ewing sarcoma pT2N0M1 G4 IVB. Necrosis > 99%. Postoperative radiation therapy was started after surgery, followed by a bone marrow transplant. At present, treatment of the patient is complete and there is no evidence to suspect relapse and metastasis. The functional results are great and follow-up and follow-up of the patient is applied every 3 months.

**Conclusions:** Ewing Sarcoma of the pelvis presents with relatively large tumors and a high rate of metastatic dissemination and therefore mortality. Early diagnosis, precise planning of the treatment, including chemotherapy, timing of the surgery and postoperative management leads to better outcomes of late stages of Ewing sarcoma.

### 8. Osteoporotic vertebral body fractures - the experience of a single center

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**Introduction:** Patients with osteoporosis often suffer multiple low-energy fractures. Vertebroplasty is the most common procedure among these patients. The procedure is characterized by a low degree of invasiveness and involves the introduction of bone cement which fills the collapsed structure of the vertebral body.

**Aim:** The study aims to present the characteristics of patients in one of the neurosurgery centers in Poland and to determine the results of the applied treatment.

**Materials and Methods:** Based on medical records, data on 57 patients (49 women and 8 men) were collected, among whom the mean age was 72.6 years (SD: 9.18). They were treated in the years 2020-2023 at the Department of Neurosurgery due to vertebral compression fractures of osteoporotic origin.

**Results:** Of the 57 patients with osteoporotic vertebral fractures, 47 received vertebroplasty treatment. 17 patients had at least one surgical intervention due to vertebral fractures in the past. 11 patients mentioned the injury lasting from a few hours to several months, which initiated pain. The most common location of the fractures was the Th12 and L1 vertebrae. Simultaneous fractures of more than one diaphysis occurred in every third patient with osteoporosis. During 47 vertebroplasty procedures, complications were observed in only 4 patients, while pain decreased or completely disappeared in all patients.

**Conclusions:** Vertebroplasty is an effective surgical method of treatment for compression fractures of the vertebral bodies in patients suffering from osteoporosis. It allows one to regain fitness and eliminate pain. In addition, the procedure is performed in a minimally invasive manner, which minimizes complications. It is noted, however, that patients who suffered osteoporotic vertebral fractures suffered similar injuries within a period of several months to 2 years, and the fractures are quite often multifocal.

### 9. Type 2 endoleaks treatment after aortic endovascular aneurysm repair

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**Introduction:** Endoleaks are the most common complication of endovascular surgery used to repair abdominal aortic aneurysms (AAA) by technique called endovascular aneurysm repair (EVAR). They can occur for a variety of reasons. Some can be induced by the graft itself, while others are caused by blood vessels emerging from the aneurysm sac. The most common type of endoleaks is type 2 (T2EL) and it is present when blood flows into the aneurysm sac from branches of the aorta or other stent vessels. Indications for the treatment of T2EL are expansion of the sacs diameter or persistent endoleak. In general, endoleak management consists of three main options: observation, endovascular therapy, and/or open surgery, but the last option is rarely used nowadays.

**Methodology:** This systematic review was based on available meta-analysis and reviews of free databases (PubMed and Google Scholar). After analyzing and comparing the literature the following conclusions about type II endoleak treatment after EVAR were reached.

**Results:** In all studies reintervention criteria was more than 5 mm sac enlargement. The two most often used methods of treatment are transarterial embolisation (TAE) and direct puncture of the aneurysm sac (DSP) that have approximately 90% technical success. Despite the fact that both of the methods are equally safe, some studies show higher effectiveness of DSP. Other considered techniques include percutaneous transcaval embolisation, laparoscopic and open surgical repair although their application is less common. The complications of the treatment are mainly re-endoleak with persistent sac growth and single cases of an aneurysm rupture. The data show a similar risk of the aneurysm rupture in cases of T2EL conservative and surgical treatment which should also be taken into consideration.

**Conclusions:** Due to lack of long term effectiveness research certain requirements for the type II endoleak treatment are still missing. Considering the comparatively low risk of rupture and possible spontaneous resolution some authors advise conservative management of the T2EL. In case of necessary intervention, a surgeon's individual experience and tools availability are determinants of procedure type.

### 10. Is it possible for video games to develop surgical skills?

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**Introduction:** Playing video games (VG) is one of the most appealing ways to pass time. VG share many similarities with surgeries; both require full attention, visual-spatial ability and manual dexterity. These features are particularly desirable in the areas of laparoscopic and robotic surgery. Is it possible to benefit from VG in the surgical field? Our literature review summarizes recent observations on this issue.

**Methodology:** The purpose of this study is to determine whether playing VG can develop surgical skills.A systematic literature search of PubMed from inception to January 01, 2018 was conducted, using synonymous terms for “video games” and “surgical skills”. All available original articles on VG and their impact on skills on any laparoscopic or endoscopic simulator were selected.

**Results:** A total of 657 participants from 13 studies were included. Articles were divided into 4 groups - laparoscopy, arthroscopy, plastic surgery, ophthalmic surgery.
The following aspects were evaluated: speed, precision, accuracy, improvement in time etc. A statistically significant association between playing a VG and better performance on laparoscopic simulators was demonstrated in 6 studies. Two articles showed a negative correlation between these activities.

**Conclusions:** It appears that VG experience may benefit surgical competence. It seems to reduce the time of the operation, have positive effects on accuracy and improve psychomotor skills. Gaming can be used as a warm-up or training exercise prior to surgical procedures. Although, no significant conclusions can be drawn without additional research on the subjects. The topic needs further investigation with an appropriate, homogenous group of subjects with standardized gaming experience.

## *POSTER SESSION*
## *(SESJA POSTEROWA)*

### 11. Unstable hemodynamics in endoscopy suite-case report

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**Introduction:** Intravenous (IV) amiodarone is often used for the treatment of atrial arrhythmias. Amiodarone restores sinus rhythm in critically ill patients with hemodynamically unstable atrial fibrillation (AF), also can be used for rate control in ill patients with AF with rapid ventricular response in whom the tachycardia is contributing to hemodynamic compromise. In this thesis, we present a case of unstable AF, which was controlled by using amiodarone.

**Case presentation:** A 73 years old woman presented to her local hospital because of nausea and weight loss, which had been bothering her for 2 months. She had also chronic AF as a concomitant disease. Computed tomography (CT) scan revealed malignant pancreatic tumor. She was transferred to our hospital for further care. The next day, 2000ml of gastric stasis was drained and the patient underwent oesophago-gastro-duodenoscopy (OGD) under general anaesthesia. During OGD patient demonstrated ventricular fibrillation (VF). Cardiopulmonary resuscitation was started, circulation was restored in 5 minutes and patient was transferred to intensive care unit (ICU). Tachysystolic AF (heart rate 200 beats per minute (BPM)) was found in ICU and 600 mg of amiodarone infusion was started with addition of 0,5mg of digoxin IV. Next day, whilst hemodynamics stable OGD attempted once more. Before the start of procedure, tachysystolic AF (HR 200BPM) was observed on the monitor and the procedure was abandoned. Hemodynamics was stabilised by digoxin IV and patient returned to the ICU. After two unsuccessful attempts of OGD, multidisciplinary team consisting of cardiologist, anesthesiologist and intensivist decided to saturate the patient with amiodarone before the procedure to slow down the HR<100 BPM. Patient had infusion of 450 mg IV during 30min, 1350 mg IV during next 24h. After reaching a HR <100 BPM OGD was repeated successfully. The next day patient was returned to her local hospital in stable condition.

**Conclusion:** Amiodarone is the most commonly prescribed anti-arrhythmic drug for patients with AF. This is due to its particular electrophysiological properties and anti-arrhythmic effects. Using amiodarone can help to stabilize hemodynamic and HR.

# PSYCHIATRY SESSION
## (SESJA PSYCHIATRYCZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**12. Negative beliefs about antidepressants and their effect on person's willingness to consider treatment**

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**Introduction:** Willingness to start antidepressant treatment and good adherence to it later on is important to improve therapeutic outcomes and to avoid relapse in patients suffering from depression. Studies show that pre-existing beliefs about antidepressants and public stigma attached to mental health can play an important role in non-adherence of taking this medication.

**Aim:** The aim of this study was to evaluate how strong are negative perceptions about antidepressants among participants of this study and how these perceptions influence person‘s willingness to consider starting antidepressant treatment.

**Materials and Methods:** This study included 383 adult participants from Lithuania, aged 18 to 72, who filled in questionnaire distributed using Facebook social network. Questionnaire included questions about personal history of usage of antidepressants and various statements with common negative believes about antidepressants which were selected after doing literature review on the topic. The participants of this study had to rate how much they agree with each statement using 5-point Likert scale. Participants were also asked to rate on the scale from 1 to 10 how willing they would be to consider taking antidepressants if they ever had depression and their doctor suggested it.

**Results:** 24% of participants agreed with a statement that once you start taking antidepressants, you will have to continue taking them for your whole life and 14% agreed that its common for antidepressants to cause irreversible side effects. Statistically significant negative correlation was found between how strong these beliefs were and person‘s willingness to consider taking antidepressant medication ($p<0.001$, correlation coefficient -0.142 and $p<0.001$, correlation coefficient -0.231 accordingly).

**Conclusions:** Statistically significant correlations were found between strength of negative beliefs about antidepressants and person‘s willingness to consider antidepressant treatment. Results emphasize the importance for doctors to provide accurate information and address concerns that patient might have about the treatment when prescribing antidepressants.

**13. Psychiatric disorders in Huntington's disease**

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**Introduction:** Huntington's disease (HD) is an autosomal-dominant, progressive neurodegenerative disorder with a distinct phenotype, including chorea and dystonia, behavioral difficulties, cognitive loss, and incoordination. The purpose of this work is to present the psychological profile of patients with Huntington's disease.

**Methodology:** A literature review was performed based on PubMed, ResearchGate and Google Scholar databases.

**Results:** Huntington’s disease is accompanied by a variety of neuropsychiatric symptoms, such as apathy, irritability, and depression. Poor temper control and irritability are amongst the most troublesome behavioral features of HD and are typically assessed using standardized self-report or informant-based irritability scales. Moreover, depressive symptoms, which can appear even in the prodromal stages of the illness, can worsen apathy and social disengagement, deteriorate cognitive function, contribute to functional decline, and worsen quality of life, demonstrating the need for early diagnosis and treatment. Furthermore, suicide ideation may coexist with depressive symptoms.

**Conclusions:** Due to a wide spectrum of mental dysfunctions, care of patients with Huntington’s disease should be personalised to ensure the best functioning adjusted to individual needs.

**14. Psychogenic pruritus: a challenging condition in dermatology and psychiatry. A literature review**

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**Introduction:** Psychogenic pruritus is described as itching without a known systemic or dermatological etiology. The three main categories of psychogenic pruritus are: a pruritic disease with mental consequences; a pruritic disease worsened by psychosocial factors; or a psychiatric disorder that causes pruritus. Managing patients with psychogenic itch can be challenging for dermatologists. In 2007, the French Psychodermatology Group proposed diagnostic criteria for psychogenic pruritus. However, many patients have ambiguous symptoms, making diagnosis difficult. As many patients can be reluctant to hear that their condition could have a psychological component, establishing a relationship with them is crucial. In the case of a patient complaining of pruritus, the standard work-up should always include a thorough anamnesis, a dermatologic exam, and any necessary laboratory or instrumental tests. The possibility of a diagnosis of psychogenic pruritus is considered if a somatic cause is not found. In cases of psychogenic pruritus and with respect to coexisting symptoms, treatment with H1-antihistamines, tricyclic antidepressants, tetracyclic antidepressants, selective serotonin reuptake inhibitors, antipsychotic drugs, anticonvulsants, and benzodiazepines can be initiated.

**Methodology:** The search for scientific publications was carried out in the following databases: “Academic search complete” (EBSCO), “Medline”, “PubMed” and “UpToDate”. Keywords combined in the search were “psychogenic itch”, “psychogenic pruritus”, “psychiatric itch”, “somatoform pruritus”, “functional itch disorder”, “non-organic pruritus”, “psychosomatic pruritus”, “functional pruritus” “diagnostic workup”, “diagnostic procedures”, “management” and “treatment”. Publications were selected for analysis according to the following criteria: 1) publication in English; 2) article published between 2015 and 2023. 18 scientific papers were chosen after a thorough evaluation of the scientific literature according to the established criteria. The descriptive analysis method was used to examine the data.

**Results:** Regarding the current literature available, uncertainties remain over the optimal methods for diagnosis and treatment of the psychogenic itch. Further large-scale

research is needed to collect evidence-based data for treating these patients.

**Conclusions:** Psychogenic pruritus might be challenging to diagnose, even for the most experienced clinicians. The proposed diagnostic criteria may be beneficial for establishing a correct diagnosis. A trusting partnership between the patient and the clinician can allow for a conversation about treatment options for psychogenic pruritus. For the best patient outcomes in these situations, a multidisciplinary approach with dermatologists and psychiatrists working together is vital.

## *POSTER SESSION*
## *(SESJA POSTEROWA)*

### 15. Prevalence of eating disorders among Vilnius University students during the COVID-19 pandemic

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**Objective.** To determine the prevalence of eating disorders among Vilnius University (VU) students during the COVID-19 pandemic.

**Methodology.** An anonymous online questionnaire was conducted between March and April 2022. It covered 179 students at different study levels from all VU departments. The survey consisted of 36 questions that were divided into separate blocks: general information, the SCOFF questionnaire (a five-item questionnaire designed as an eating disorder screening tool, where a score of 2 or more is considered as a cut-off point for the diagnosis of anorexia nervosa and bulimia nervosa), questions to assess emotional state and changes in lifestyle habits during the COVID-19 pandemic, and Rosenberg's self-esteem scale to assess the respondents' opinion about their body image. Statistical analysis was performed with Microsoft Excel and R Commander. The results were considered statistically significant at $p<0.05$

**Results.** The study involved 179 respondents from 15 VU faculties, 73.74% of them were women and 26.26% were men. The average age of the respondents was 21.97 years. 66 respondents (36.87%) scored 2 or more on the SCOFF questionnaire. Of these, 54 ( 81.82%) were female and 12 (18.18%) were male. Positive SCOFF scores (2 or more "Yes") are statistically significantly related to gender ($p<0.05$): women are more prone to eating disorders. Men with a positive SCOFF result were more likely to be overweight and obese, while men with a negative SCOFF result were more likely to be of normal BMI. Individuals with a positive SCOFF score were more likely to feel anxious during the COVID-19 pandemic (81.82%) than those with a negative SCOFF score (64.6%) ($p<0.05$). Also 86.36% of the respondents with a positive SCOFF result considered themselves as emotional eaters ($p<0.05$). 51.52% of all those with a positive SCOFF result reported that their emotional state was poor or very poor, while only 9.1% of those with a positive SCOFF result reported a good or excellent state, while only 16.81% of those with a negative SCOFF result reported a poor or very poor state, and 32.74% of the group with a good or excellent state reported poor or excellent emotional state ($p<0.05$). Eating disorders were correlated with emotional state: 27.65% of respondents reporting poor and 36.36% reporting very poor emotional state in the COVID-19 pandemic indicated that they thought they had an eating disorder. 46.21% of women chose silhouette 3 and 31.82% silhouette 4. Men mostly chose silhouettes 4 and 5, 53.19% and 27.66% respectively.

**Conclusions.** More than one third of the surveyed Vilnius University students have eating disorders. Among the respondents, eating disorders were more frequent in women. Male respondents with eating disorders were more likely to be overweight or obese. Respondents with eating disorders were more likely to report feeling anxious during the pandemic, more likely to consider themselves emotional eaters and more likely to report that their emotional state was poor or very poor during the pandemic. Among the respondents, the ideal body shape for women was a slimmer silhouette than for men.

# PHARMACY SESSION
# (SESJA FARMACEUTYCZNA)

## *ORAL SESSION*
## *(SESJA USTNA)*

### 16. Pharmacogenetics of rivaroxaban

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**Introduction:** Direct oral anticoagulants (DOACs) represent the group of non-vitamin K antagonist oral anticoagulants. They are used in various medical conditions, including atrial fibrillation (for ischemic stroke prevention), pulmonary embolism and deep vein thrombosis. Absence of continuous therapeutic monitoring, promising pharmacodynamic and pharmacokinetic properties and good safety profile are attributes which make this group of anticoagulants become more and more popular in daily practice of several specialists. However, serious bleeding and thromboembolic events of DOAC users have been reported. Interindividual variation in the plasma levels of DOACs is well known fact and the effect of genetic factors on the pharmacokinetics of DOACs has been investigated in several studies.

**Aim:** The goal of our study was to characterize and understand the impact of selected gene polymorphisms in rivaroxaban (a selective, reversible, factor Xa inhibitor) metabolizing enzymes.

**Materials and Methods:** Blood samples were taken 24 hours (rivaroxaban) after a previous drug dose administration (sample 1, at 7:00 am) for the assessment of the trough level and 2 hours after the drug dose administration (sample 2, at 9:00 am) for the assessment of the peak level. Anti-Xa activity (ng/L) of rivaroxaban was assessed using rivaroxaban calibrated anti-Xa chromogenic assays. The blood drawn from the antecubital vein, collected into vials prefilled with 1.95 mg/ml EDTA was used for the DNA analysis. Genomic DNA was extracted from peripheral blood leukocytes by SiMaxTM Genomic DNA Extraction kit (SBS Genetech Co., Ltd., China) according to the manufacturer's instructions. High-resolution melting analysis (HRM analysis) on LightCycler 480 II (Roche) was used for single nucleotide polymorphism (SNP) genotyping. One-way analysis of variance (ANOVA) was used for comparison among groups. P values less than 0.05 were considered statistically significant. Data were analysed with SPSS 22.0.0.0.

**Results:** Our study includes 40 patients (15 women, 25 men) with atrial fibrillation treated in Martin University Hospital with rivaroxaban for ischemic stroke or systemic embolization prevention. Beside rivaroxaban activity we also monitored renal and liver function, weight, chronic medication. Our results showed that the presence of two SNPs (rs1155002 and rs11572191) located within exon of CYP2J2 gene has a significant effect on the rivaroxaban concentration. In addition, patients (n=10) with selected SNP (rs28365095) within CYP3A5 gene had higher rivaroxaban concentration compared to patients without this mentioned polymorphism.

**Conclusions:** The presence of three selected SNPs (rs1155002, rs11572191 and rs28365095) localized in exon region of CYP2J2 or CYP3A5 gene is associated with higher rivaroxaban concentration. Our findings could have some important clinical implications (risk of bleeding, dosage…).

### 17. COVID-19 and indications for beta-blocker therapy after recovery

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**Introduction:** A Sars-CoV-2 infection can affect not only the respiratory system but also other organs, leading to frequent cardiovascular symptoms. Recent data shows that the most common comorbidities in patients infected with Sars-CoV-2 are arterial hypertension and cardiovascular diseases (CVD). Furthermore, patients who have recovered from COVID-19 may still experience symptoms and suffer from cardiovascular complications.

**Aim:** Our study aims to investigate whether patients with CVD require additional treatment with beta-blockers or changes in previous dosages after recovering from a Sars-CoV-2 infection.

**Materials and Methods:** We conducted a retrospective study of 70 patients (age above 18); 33 women and 37 men with CVD, hospitalized due to COVID-19 from October 2020 to february 2022 in a temporary ward of the Department and Clinic of Internal and Occupational Diseases and Hypertension in Wrocław. The aim of the study was to evaluate a profile of COVID-19 patients with CVD and to compare whether and how the dosage of beta-blockers changed before and after infection with Sars-CoV-2. We collected data on patient gender, age, medical history, medication taken before and after COVID-19, course of COVID-19, measurements of respiration rate, pulse rate, and blood pressure during Sars-CoV-2 infection. To perform statistical analysis, we used the Wilcoxon signed-rank test and the Mann Whitney U test.

**Results:** Selected study group of 70 patients was divided into two groups: the first (n = 50) without increase or initiation of beta-blocker therapy, the second (n = 20) with administration or increase of the dose. The Wilcoxon pair sequence test showed a significant difference between groups (before and after infection) with p = 0,000196. In the second group 6 patients were treated with beta-blockers before COVID-19 and a dose increase was recommended after they had recovered, 14 patients who had not taken beta-blockers before the infection were prescribed beta-blockers after recovery.

**Conclusions:** Our study suggests that patients with CVD may require additional treatment with beta-blockers or an increase in the previous beta-blocker dosage after recovering from a Sars-CoV-2 infection to address post-COVID-19 complications.

### 18. The effectiveness of plant compounds in photodynamic therapy

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**Introduction:** Cancer is one of the most common causes of death in Poland and in the world. Various methods are used in cancer therapy, such as chemotherapy, radiotherapy or surgical procedures involving the excision of a neoplastic lesion. Despite its effectiveness, surgical procedures cannot be used in all situations due to the location of the tumor and the presence of comorbidities in the patient that prevent the

procedure or operation. In addition, radiation and chemotherapy can be cytotoxic to healthy cells, cause side effects, and may not affect cells that have developed resistance.
**Methodology:** Recently, we can observe a significant increase in publications in which substances of plant origin, such as curcumin, hypercin or emodin, are the method of treating cancer. To increase the cytotoxic effect of natural compounds, they are increasingly combined with photodynamic therapy (PDT). This interesting technique involves the combination of a photosensitizer (PS) and irradiation. After excitation of a given PS, reactive oxygen species are formed in cancer cells, which contributes to the induction of cell death
**Results:** Bioactive compounds that have the potential to prevent and treat many diseases have been used for centuries and have attracted the attention of scientists due to their effects. This is evidenced by the multitude of studies, both in vitro and in vivo, and the increasing number of clinical trials. There are also more studies using phytotherapeutics and photodynamic therapy.
**Conclusions:** Many studies show the anti-cancer effects of plants and compounds or dyes found in them in combination with PDT. These substances are a new therapeutic trend in the treatment of patients. In addition, as already mentioned, photodynamic therapy can enhance the cytotoxic effect of phytotherapy. Thanks to this, a lower dose of the substance can be used, which will reduce the toxic effect on the body and result in fewer complications during therapy.

### 19. Polymer cross-linking oil encapsulation for increased oxidative stability and drug incorporation

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**Introduction:** Linseed and pomegranate seed oils contain many significant components with anti-inflammatory and antioxidative properties. However, the high percentage of unsaturated fatty acids causes notable susceptibility to oxidation. Encapsulation (e.g. using polymer cross-linking) aims to enclose unstable compounds in a polymer coating to protect them from oxidative conditions. Polyelectrolyte complexes from oppositely charged macromolecules of e.g. Na/Ca alginate and chitosan can be used to form a capsule shell, enabling colon-specific delivery. Both polymers are considered GRAS and are widely used for pharmaceutical applications.
**Aim:** The aim of this work was to develop an emulsion-based colon-targeted delivery system using polymer cross-linking for pomegranate and linseed oils in order to suppress the unsaturated fatty acid oxidation. Flufenamic acid (FFA) and quercetin (QRC) were used as model drugs to test the loading capacity of the capsules.
**Materials and Methods:** The encapsulation process was conducted according to Peniche et al. (2004) with modifications. The final formulation containing 5% Na alginate aqueous solution and 20% linseed/pomegranate oil was prepared by homogenization. Then, the drug loading capacity was tested for FFA and QRC. Emulsion viscosity and mean diameter of the dispersed phase were determined. Stability of the emulsion, critical during its processing, was evaluated with thermal cycling and centrifuge tests. The capsules were obtained through cross-linking of the alginate-based emulsion by drip feeding into a CaCl2 solution with a further coating step using chitosan. The capsule size during the drying process was monitored at ambient conditions. The final product was stored at RT in a desiccator until further analysis. The effectiveness of oil encapsulation, chitosan-coating process and drug encapsulation were verified using FTIR. DSC and TG analysis were used to evaluate the influence of encapsulation on oxidative stability of the oils.
**Results:** The emulsions were found stable during the processing time. DLS analysis allowed to distinguish one population of dispersed particles. The difference in viscosity of each formulation influenced the size of the capsules as the more viscous emulsions formed larger drops. Optimum capsule synthesis conditions were determined and the final formulation was used for FFA and QRC drug loading experiments. Dried capsules with linseed oil (1,57±0,06mm) and pomegranate seed oil (1,63±0,07mm) exhibited a narrow size distribution. FTIR spectroscopy results allowed to confirm oil encapsulation and effectiveness of chitosan-coating process as well as drug loading. The spectrum of synthesized capsules and α-linolenic acid shows peaks at 3010-3096 cm-1 corresponding to C=C group, 1700-1790 cm-1 (C=O), 2854-2925 cm-1 (C-H). Isothermal DSC analysis at 120°C demonstrated that linseed oil has undergone oxidative changes, while capsules showed no sign of degradation for 12 hours.
**Conclusions:** Encapsulation of unsaturated oils into alginate-based polymer capsules was proven successful during the study. Introducing modifications of emulsion composition requires verification of stability and validation of encapsulation process. Oil-loaded chitosan-coated alginate capsules may be used as potential carriers for lipophilic drugs or functional foods. Further NMR spectroscopy studies are planned to gain insight into the local interactions in the drug/oil/polymer systems.

### 20. Childfriendly 3D printed medigummies manufactured with FDM 3D Printing

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**Introduction:** The current approaches for adjusting drug doses to pediatric patients, involve segmenting drugs by opening capsules, cutting and crushing tablets as well as mixing the powders with food to mask the taste and texture. These approaches are both inconvenient and pose the risk of possible drug overdose or ineffective therapy.[1] 3D printing is an innovative method to produce personalized drugs with tailored dosage, shape and release profile.
**Aim:** The aim of proposed project was to obtained non-commercial filaments via HME (hot melt extrusion) which will be used as a matrix to incorporate the API (active pharmaceutical ingredient) and produce chewable pills and tablets in an acceptable form with personalized dose for pediatric population. The model drug used in this study was amlodipine, that is used in the pharmacotherapy of hypertension.
**Materials and Methods:** Hydroxypropyl cellulose (HPC, Klucel EF HPC Ashland), Polyethylene glycol (PEG 1000, Fluka AG, Buchs AG ), food dye , amlodipine (Pol-Aura) were used. Filaments for 3D printing were prepared using twin

screw hot melt extruder and a series of placebo prints were produced using the Builder Premium Small 3D printer. The software Tinkercad was used to design a 3D model of a teddy bear as an oral form of the drug and the adjustment of printing properties was performed in Ultimaker Cura 4.12.1 software. The received filaments and tablets were subjected to thermal stability studies after the HME process and 3D printing using TGA and DSC. The structural changes that may occur during the fabrication process were studied using PXRD and ATR-FTIR. Texture Analyzer (Texture equipped with Three Point Bend Rig) was used to analyze the flexibility of HME produced filaments.

**Results:** During the study, three blends of polymer and plasticizer (95:5, 90:10 and 90:20 wt%) were tested to determine the formulation with the most suitable properties for processing in 3D printing. The formulation with 20%wt PEG was found to be too flexible, causing the filament to wind up on the feed rollers in the printer's extruder. It was possible to print a series of teddy bear prints from the 10% content and 5 % formulation, so additionally a filament with 0,32 wt% food dye was produced to give an attractive color for children. The formulation with the optimum plasticity properties turned out to be 5 % content and it was selected as the matrix for the selected model drug. Prints were carried out with infill sizes of 10%, 20%, 30%, establishing a characteristic grid inside causing the printed bear to be more flexible.

**Conclusions:** The produced blends of polymer/excipients and polymer/excipients/drug were able to obtain thermally stable flexible filaments that were printable. The use of 3D printing aided by graphic design and the ability to print with different infill easily allowed the plasticity of the final drug form to be adjusted from hard to flexible forms.

## 21. Application of 3D printing in the formulation of pediatric drugs

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**Introduction:** One of the major challenges facing mass drug production is manufacturing of drugs for patients with special needs . Pediatric patients, due to intensive growth or physiological changes in drug absorption and distribution, require continuous adjustment of therapy to changing physiological characteristics. The lack of personalized medicines can result in the occurrence of adverse effects, an aversion to the medications taken, and reduced success of the therapy. An important consideration when designing a formulation for the pediatric population is its taste and appearance. 3D printing may overcome these challenges, enabling to customize dose, shape and release profile of a manufactured drug formulation.

**Methodology:** Additive Manufacturing (AM) is the process enabling to produce objects from 3D model data , usually layer upon layer, as compared to subtractive manufacturing methodologies. AM commonly known as 3D printing (3DP) . AM was initially used for prototype manufacturing, but due to its repeatability, it has found biomedical applications including manufacturing of personalized dosage forms. The most commonly used methods involved extrusion-based technologies:

Fusion Deposition Modeling (FDM), where filaments manufactured via Hot Melt Extrusion (HME) are processed to form objects of desired shape and size.

Semi-Solid Extrusion (SSE) involves the extrusion of a gel or paste-like material via a syringe-based printhead to create the desired object.

**Results:** An attractive appearance and accessible taste were achieved in the 3D printed indomethacin loaded Starmix®-flavored jelly drug dosage forms presented by Scottaris et al.2 The studies confirmed effective release of 80% of the designed dose within 60 min regardless of the shape of printed objects. Formulation extruded in various shapes and with pleasant taste are attractive for young patients. Tablets in doughnut 3 shape that use caffeine in a form of citrate salt are an example of effective taste masking in an attractive form. Januskaite et al.4 in their study compared manufactured pediatric formulations made with FDM and SSE techniques, among others. A study presented on a group of children showed that the ability to chew the drug form was the first choice feature surpassing appearance. SSE 3DP may become an alternative to manual manufacturing of children's medications in pharmacies in accessible and personalized dosage form. Chatzitaki et al5. reported starch-based ink with incorporated isoniazid for manufacturing of personalized dosage forms . Starch as a safe and low-cost substance made it possible to produce a soft dosage form that overcomes the swallowing difficulties.

**Conclusions:** Extrusion-based 3DP may be an innovation in personalized medicines production. The ability to produce a drug with a specific shape, size and dose may increase the success of therapy. The 3DP method makes it possible to produce a pediatric formulations that contain more than one drug allowing to decrease the amount of tablets taken daily by patients. Soft dosage forms that contain flavoring agents manufactured using SSE are promising novel formulations enabling to mask bitter taste and facilitating intake of the drug without the need to swallow.

## 22. Influence of cholesterol on stability evaluation of liposomal nanoparticles formulations

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**Introduction:** Development of novel anticancer therapies is one of the grand challenges in modern medicine. Anticancer drugs used in chemotherapy are poorly soluble and unstable in aqueous solutions. Also, the selectivity of these drugs is low, therefore they can cause many side effects and systemic toxicity. Encapsulation of drugs inside nanocarriers (e.g. liposomes), may help to overcome these issues. By surface modification with specific ligands, these systems can be targeted to a selected receptor located on the cancer cell membrane. In recent years, many liposomal formulations have become commercially available (e.g. Doxil, AmBisome). Consequently, to ensure safe therapy, it is crucial to increase the stability of liposomes during storage. The physical stability of lipid vesicles can be affected by a number of factors, such as its integrity, size distribution, unsaturated fatty acid groups or fluidity of the membrane, namely the content of cholesterol. Defects in lattice structure can lead to liposome fusion, aggregation and leakage of encapsulated drug. The standard way to check the physical stability of liposomes is to measure their average size, as well as their size distribution. Therefore, these parameters should be included in the stability analysis.

**Aim:** The aim of the study was to investigate the stability of model liposomes with and without the addition of cholesterol, as it is a critical regulator of lipid layer dynamics and can stabilize the lipid membrane. The study investigated the effect of liposome stability during storage at different temperatures.

**Materials and Methods:** Liposomes were synthesized using thin lipid film hydration method followed by extrusion. Liposomal formulations were prepared using phospholipids

(DOPC - 1,2-dioleoyl-sn-glycero-3-phosphocholine, DOPS - 1,2-dioleoyl-sn-glycero-3-phospho-L-serine) and cholesterol in different molar ratios 3. Vesicles were formed by extrusion through filters with a pore size of 0,1 μm, using an Avanti Mini - Extruder. To assess the effect of the temperature on the stability of nanoparticles, preparations were stored at 2-8 °C and at room temperature. The size of the particles was determined using DLS. Measurements were made at 25 °C with a fixed angle of 137°.

**Results:** Liposomes of about 100 nm in size were synthesized. The materials had a narrow particle size distribution and were characterized by stability during storage. The effect of the number of extrusions on particle size was confirmed, reaching a plateau of approximately 30 extrusions. The addition of cholesterol to the formulation increased particle size and prolonged vesicle stability during storage.

**Conclusions:** The study showed that DOPC:DOPS liposomes, stored at room temperature, remain stable throughout the study period, unlike liposomes stored at 2-8 °C. By introducing cholesterol into the lipid bilayer, liposomes of increased physical stability were formed.

## *POSTER SESSION*
## *(SESJA POSTEROWA)*

### 23. Personalized by 3D printing composite scaffolds to support bone regeneration

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**Introduction and aim of the work:** Reconstructive medicine is an interdisciplinary field that combines the principles of engineering and life sciences to enable the regeneration and restoration of tissue and whole organ function. One of the most important aspects that play a role in the performance and function of biomaterials is their porosity. For materials with the same chemical structure, the level of porosity is crucial for tissue integration, implant compatibility and biofunctionality regardless of the target tissue. 3D printing technology (3DP) by providing the ability to form shapes with unique geometries from biocompatible materials makes it possible to treat and regenerate damaged tissues by producing composite scaffolds to fit bone defects [1]. The aim of the proposed project is to develop new PLGA-based materials with incorporated active substance, with controlled geometry and pore size as personalized materials to facilitate bone formation.

**Material and Methods:** Poly(lactic-co-glycolic acid) (PLGA), hydroxyapatite (HA) in powder (HAI), paste (HAII) and meloxicam (MEL) were used to prepare the scaffolds of different porosity. Twin screw hot melt extruder (HME) was used for filaments manufacturing. Scaffolds were printed using the FDM 3D printer. Prior to 3DP processing the materials were subjected to thermal stability studies (TGA, DSC). The structural changes of APIs that may occur during the fabrication process were assessed with PXRD and FTIR. The API content was determined by HPLC. The release and degradation study was carried out using the Erweka flow-through apparatus (USP Apparatus 4), and PBS as a medium. The elasticity of the produced filaments was tested using texture analyser. Determination of the cytotoxicity of the composites was carried out using mouse fibroblasts and enabled determination of cell survival on the materials.

**Results:** Six formulations for processing via HME (including PLGA, PLGA + MEL, PLGA + HA, PLGA + HA + MEL) were prepared. Two scaffold designs with different geometries (1000 μm and 500 μm porosity) were developed and printed using the FDM technique for each formulation. Using scanning electron microscope, the actual dimensions of the pores in scaffolds – 1000 μm and 500 μm - were confirmed. The uniformity of API content in all materials was confirmed. Thermogravimetric analysis showed a minor mass loss of approximately 1% (PLGA + MEL - -0.99%; PLGA + HAI + MEL - -0.81%, PLGA + HAII + MEL - -70%). Gradual degradation of the materials in PBS was observed over 5 weeks of experimental time. The cytotoxicity of the printed material was at a low level, and after 72 h, cell survival was highest.

**Discussion and conclusions:** The results indicated that developed formulations were thermally stable enabling their processing via HME and 3DP FDM method. The flexibility of the 3D printing process allowed individualization of the drug dose, scaffold size and porosity.

References:

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# NEUROLOGY & RADIOLOGY SESSION
## (SESJA NEUROLOGICZNO-RADIOLOGICZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**24. A rare and rapidly progressive presentation of Cerebral Venous Sinus Thrombosis: a clinical report**

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**Introduction:** Cerebral venous sinus thrombosis (CVST) is a rare yet serious medical condition, characterized by the formation of a blood clot in the cerebral venous sinuses that drain blood from the brain. CVST can cause a range of non-specific symptoms, including headache, seizures, and vision problems. It is more common in women than in men, and certain risk factors, such as pregnancy, oral contraceptives, and genetic conditions that increase blood clotting, may increase the likelihood of developing CVST. Treatment typically involves anticoagulation therapy to prevent further clotting and, in severe cases, interventions such as thrombectomy or decompressive craniectomy may be necessary. Prompt diagnosis and treatment are important for a good outcome, as CVST can lead to serious complications, including brain damage and death.

**Case description:** We present the case of a 38-year-old female with a history of alcohol use disorder, who was transferred to the Neurology Department with a complaint of loss of consciousness accompanied by wheezing. During transport to the hospital, the Medical Rescue Team observed two seizures. On neurological examination several abnormal findings including quadriplegia, increased muscle tone in the right limbs, bilateral hyperreflexia, and a positive Babinski sign on the left side were found. A CT scan of the head revealed multifocal intracerebral hemorrhage, with dominance on the left side, and a lumbar puncture revealed clear cerebrospinal fluid with a slightly elevated protein level and no other abnormalities. Laboratory tests showed leukocytosis, hyponatremia, hyperglycemia, increased CRP level, and a significant increase of d-dimers. Despite treatment with antibiotics and valproic acid, heparin sc., seizures persisted, and the patient's condition progressively deteriorated. The patient was transferred to the ICU due to respiratory failure, and mechanical ventilation with analgosedation continued. A central venous catheter was inserted, and a benzodiazepine and levonor infusion was started. Additionally, the patient received catecholamines, fluids and electrolytes, mucolytic drugs, antithrombotic prophylaxis, prophylaxis for gastrointestinal bleeding, and anti-oedematous treatment. However, the patient's condition did not improve. An angio-CT of the head performed 9 days after admission to the ICU revealed thrombosis of the superior sagittal, transverse sinuses (right and partially left), and the right sigmoid sinus. Despite intensive treatment, the patient's condition continued to deteriorate, and ultimately, she was declared brain dead. Two series of clinical trials were conducted to prove permanent and irreversible brain death. The primary cause of death was multifocal cerebral hemorrhage, with cerebral edema due to cerebral sinus thrombosis.

**Conclusions:** This case report highlights the complexity and severity of cerebral venous sinus thrombosis (CVST), a rare but potentially life-threatening condition. The patient's medical history, including alcohol use disorder, neurological symptoms, and laboratory findings, led to the diagnosis of CVST with multifocal intracerebral haemorrhage. Despite prompt treatment, the patient's condition continued to deteriorate, and ultimately, she was declared brain dead. This case emphasizes the importance of prompt diagnosis and implementation of antithrombotic treatment despite intracranial haemorrhage to prevent further deterioration of the patient's condition and improve their chances of recovery.

**25. Alzheimer's disease - new ways of pharmacotherapy**

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**Introduction:** Alzheimer's disease (AD) is a chronic, progressive neurodegenerative disease characterized by impairments in memory, intellectual performance, speech and behavior. The condition is not only classified as a dementing disease, but is also its most common cause. Indicators of AD are deposits of amyloid beta peptide (Aβ42) in the brain, forming plaques and neurofibrillary tangles (NFTs), composed of hyperphosphorylated tau. They lead to neuronal death, the weakening of synaptic connections and the loss of normal signaling in the specific area of the brain where the lesions are located. The causes of AD are not fully understood. It is a multifactorial disease in which both genetic and environmental factors play an important role.

**Methodology:** Current methods of detecting AD rely on testing the patient's mental performance in close collaboration with the medical team. The patient should also be consulted by a neurologist, psychiatrist and internist to exclude other causes of the observed symptoms. A correct and detailed diagnosis of AD is essential to starting pharmacotherapy that focuses on relieving symptoms and slowing down cerebral dementia. Commonly used drugs include: galantamine, rivastamine and donepezil. Adequate psychological support is very important in the treatment process, because almost 50% of patients diagnosed with AD also suffer from depression.

**Results:** A promising form of AD therapy seemed to be treatment with the monoclonal antibody Aducanumab (BIIB037), which targets β-amyloid deposits and, as a result, reduces their content in the brain. However, it has not been approved by the European Medicines Agency (EMA) due to side effects, including: puncture hemorrhage, cerebral edema and white matter neurotoxicity in a significant number of patients. Importantly, the partial effectiveness (about 2/3 of patients) in AD of this therapy prompted further clinical trials and gives hope for finding the gold standard of treatment.

**Conclusions:** The subject of this study is to present the current state of research of new drug therapy solutions for the treatment of AD.

## 26. When a benign condition is called metastatic - a case report od metastatic pulmonary calcification

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**Introduction:** Metastatic pulmonary calcification (MPC) is a rare metabolic lung disease characterised by calcium depositions due to systemic mineral imbalance. Chronic kidney disease (CKD) or end-stage renal disease (ESRD) is one of the most common causes of hypercalcaemia and hyperphosphataemia, which result from secondary hyperparathyroidism. However, other benign and malignant conditions may lead to such mineral serum changes as well. MPC is asymptomatic in most cases and it is rarely diagnosed antemortem. Computed tomography, particularly high-resolution computed tomography (HRCT) of the lungs, plays an important role in the detection of MPC findings, which include ground-glass opacities and partially calcified nodules or consolidations, predominantly in the upper and middle lung zones. The correct radiological diagnosis is crucial to avoid unnecessary treatment and/or invasive procedures.

**Case description:** We present a case of MCP found incidentally in an asymptomatic 42-year old patient with long-term chronic kidney disease, with a previous history of tuberculosis treatment, who was qualified for the third kidney transplantation. The initial chest X-ray was obtained, which discovered ca. 3 cm nodular opacity in the left upper lung pole. Further diagnostic process was conducted in HRCT, which revealed bilateral, diffuse, centrilobular ground-glass nodules and opacities as well as heterogeneous, high-density areas distributed throughout the lungs, predominantly in the upper lobes. Additional radiological feature of calcium-phosphate imbalance was found, such as advanced generalized bone atrophy in the thoracic spine with strong sclerotisation of vertebral endplates (called “rugger jersey spine”), which is regarded as a distinctive image for secondary hyperparathyroidism.

**Conclusions:** MPC is a rare and benign condition that results from calcium deposition in the normal pulmonary parenchyma and interstitium and may develop in patients with end-stage chronic kidney disease. The radiological presentation of MPC might cause diagnostic uncertainty, therefore, it is necessary for radiologists to know this pattern. From a clinical point of view, it is crucial to be aware that despite the fact that the condition is called metastatic, it is a relatively benign lung disease with a generally good long-term prognosis.

## 27. Neurofibromatosis type I

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**Introduction:** Neurofibromatosis type 1 (NF1) is one of the most common inherited genetic diseases, affecting about 1 in 3,000 people. NF1 is inherited in an autosomal dominant manner, although about half of affected individuals have sporadic cases due to a new mutation in the NF1 gene.

**Methodology:** NF1 is a multisystem disorder in which some features may be present at birth, but most are age-related manifestations. There is full penetrance in the disease (i.e., any person with a pathogenic change in the NF1 gene will exhibit some NF1 features), although expression is extremely variable, even in members of the same family. Currently, the disease is diagnosed when 2 of the following symptoms are found: 1) café-au-lait spots, 2) freckles and hyperpigmentation in areas of the body inaccessible to light, 3) Lisch nodules, 4) neurofibromas, 5) optic pathway gliomas (OPG), 6) characteristic bone lesions, and 7) the presence of NF1 in first-degree relatives. Cutaneous pigmentary manifestations are the most common and best recognized features of NF1 in children.

**Results:** Cutaneous neurofibromas are benign and do not require removal unless they are symptomatic. Rapid growth, particularly in a subcutaneous or plexiform neurofibroma, may mandate biopsy or excision, because that may signify malignant degeneration. Surgical excision, laser, and electrocautery have been commonly used. For inoperable tumors, other modalities have been used such as targeted genetic treatment. There are potential new therapies, primarily for the neoplastic aspects of NF1, which are currently in clinical trials.

**Conclusions:** The purpose of this paper is to review the clinical criteria necessary for diagnosis, the main clinical and developmental manifestations, and guidelines for monitoring and interventions to maximize the health and quality of life of the affected child.

## *POSTER SESSION*
## *(SESJA POSTEROWA)*

### 28. The influence of obesity on the multiple sclerosis development

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**Introduction:** Multiple sclerosis (MS) is the most common chronic inflammatory disease of the central nervous system with devastating social and economic consequences. Population studies have provided evidence that the prevalence of MS is increasing worldwide. A similar trend was observed in obesity and metabolic syndrome According to the latest research, it has been shown that obesity shares an inflammatory component with most chronic diseases.

**Methods:** In order to achieve the aim, the most important electronic databases (PubMed, Google Scholar, Embase, and Science Direct) were searched for articles published in the English language mostly from 1 January 2010 to the present involving human subjects.

**Results:** A corellation has been shown between high BMI in young adults (aged 18-25) and an increased risk of MS, which was observed more often in women than in men. In addition, the research results show a direct impact on the incidence of obesity in childhood and the development of multiple sclerosis in adulthood, as well as the beneficial effect of weight loss on the course of this disease.

**Conclusion:** Based on available epidemiological data, obesity in early life appears to be strongly associated with a higher risk of MS development, independent of other risk factors. Although much research has been done on the pathophysiology of obesity, MS, their possible common mechanism, and the role of adipokines, further studies are needed in order to explain what remains unknown.

### 29. Influence of vitamin D deficiency on the development of multiple sclerosis

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**Introduction:** Vitamin D is fat-soluble and its main function is to regulate calcium and phosphate metabolism. The vitamin D receptor is present in most of the body's nucleated cells, and its role in the pathomechanism of the ongoing processes is still being discovered. The optimal concentration of vitamin D is understood to be between 31-50 ng/ml for adults. The three main sources of vitamin D are ultraviolet radiation, diet and supplementation. The skin, through solar radiation, provides 90% of the body's demand for vitamin D. Epidemiological studies suggest that in the general population there is a cause and effect chain between latitude, sun exposure, vitamin D levels and the risk of developing multiple sclerosis.

**Methodology:** A 5-year longitudinal MS cohort study was conducted at the University of California in San Francisco. Participants had clinical evaluations, brain MRI, and blood draws annually. From the overall cohort, there was evaluated patients with clinically isolated syndrome or relapsing-remitting MS at baseline. 25-OH-D3 measurements were reviewed annually for association with subsequent gadolinium-enhanced T2 and T1-weighted changes, relapses, and EDSS disability. Each 10 ng/mL higher vitamin D level was associated with less subsequent disability. Higher vitamin D levels were associated with a lower but not statistically significant risk of recurrence.

**Results:** A total of 2,362 3T brain MRI scans were acquired from 469 subjects. In multivariate analyses, each 10ng/ml higher 25-hydroxyvitamin D level was associated with a 15% lower risk of a new T2 lesion. and a 32% lower risk of a gadolinium-enhancing lesion.

**Conclusions:** Vitamin D levels are inversely related to multiple sclerosis activity. An adequate level of vitamin D is necessary for each of us, and early supplementation in SM patients can significantly affect the course and progression of the disease, as well as the development of disability.

## 30. The effect of green tea on the cerebral blood flow in the middle cerebral artery.

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**Introduction:** Green tea, in addition to taste, provides the body with many substances essential for its proper functioning. Thanks to the content of polyphenol compounds, including epigallocatechin gallate (EGCG), the primary green tea polyphenol, and other catechins, this tea has valuable antioxidant and chemoprotective properties. According to research conducted in the Rotterdam Study, there are indications that the consumption of 375 ml of green tea per day significantly reduces the risk of coronary heart disease compared to non-drinkers. Clinical studies also show that the supply of 300 mg of EGCG has a positive effect on the function of the vascular endothelium. This allows us to assume that the content of polyphenols in green tea, which affect the blood flow in the cerebral vessels, may be the cause of the already experimentally demonstrated positive effect of green tea on learning and remembering.

**Aim:** The aim of the study is to determine the effect of polyphenols contained in green tea leaf extract (Camellia sinensis) on blood flow in the middle cerebral artery and vascular reserve measured as cerebral vasoreactivity using the transcranial Doppler ultrasonograph fTCD method.

**Materials and methods:** The subjects underwent transcranial Doppler ultrasonography (TCD) using a SONARA/TEK device with a 2 MHz transducer just before and 1.5 hours after taking a tablet containing 1 x 2 tablets. (600 mg) of a dietary supplement containing green tea leaf extract (Camellia sinensis). To rule out pathology, a baseline ultrasound of the cephalic arteries was performed using an ESAOTE X8 ultrasound scanner with a 5-12 MHz transducer.

**Results:** The study involved 22 people (11 men and 11 women) with an average age of 24.33 (min. 20; max. 29; SD 2.86). A statistically significant (P = 0.045072) decrease in the mean breath-holding index (BHI) was observed after ingestion of a tablet containing green tea leaf extract.

**Conclusions:** The effect of polyphenols contained in the extract of green tea leaves (Camellia sinensis) was observed, consisting in dilating cortical vessels. This is confirmed by the findings of other researchers who found in animal models that green tea and catechins isolated from it significantly inhibit the activity of the angiotensin-converting enzyme (ACE) and improve endothelial function by activating endothelial NO synthase (eNOS).

# CARDIOLOGY SESSION
## (SESJA KARDIOLOGICZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**31. Combined prognostic value of impedance cardiography and early repolarization pattern on ECG in decompensated chronic heart failure**

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**Introduction:** Chronic heart failure (CHF) is a disorder of the heart in which structural and/or functional heart disease impairs the heart's ability to fill with blood or pump it out properly at rest and/or during exercise. In developed countries, the prevalence of CHF in the general population is around 1–2%, among people aged 75 years and older, the prevalence of CHF reaches ≥ 20%. The overall 5-years survival rate of CHF patients is 56.7%, and 10-years survival rate is only 34.9%. Transthoracic impedance cardiography (ICG) is a safe, non-invasive, cheap, simple test, not requiring special training, and it is a reliable method for evaluating the hemodynamics of the cardiovascular system, which is also valuable in the diagnosis and prognosis of CHF. The prevalence of early repolarization pattern (ER) on electrocardiogram (ECG) in the general population is 1–46%, while in the population of patients with CHF, it is 12–14%. Although for many years the ER was considered benign, in recent years there has been an increasing number of studies demonstrating the association of ER with sudden cardiac death in previously healthy individuals or those with pre-existing structural heart disease. There are also some new studies that substantiate the association of ER with CHF progression and worse outcomes. However, such studies are only performed in the Asian population, where the prevalence of ER is higher than in the Caucasian population.

**Aim:** To evaluate the prognostic value of ICG and ER on ECG in CHF

**Materials and Methods:** The study included 301 patients (166 men and 135 women) hospitalized for CHF decompensation. CHF diagnosis was confirmed according to the current guidelines. The patients underwent standard tests, 6-minute walk test (6MWT) and ICG at enrollment and on the day of discharge.

**Results:** The median age of the patients was 76 years (63.5–81.0). The median age of women was 80 years (75–83), and of men–70 years (60–79). At enrollment, 31 patients (10.3%) had confirmed ER. During a median follow-up period of 18 months, a total of 128 (42.5%) cardiac-related deaths were observed, of which 23/31 (74.2%) were in the ER group and 105/170 (38.9%) were in the non-ER group (p<0.001). The ER group had more readmissions than the non-ER group did at 6-months (2 [1–2] vs. 1 [1–2]; p=0.001) and 12-months (3 [2–4] vs. 2 [1–3]; p<0.001). Thoracic fluid content (TFC) ≥37.35 1/kΩ, left ventricular ejection fraction (LVEF) ≤39%, amino terminal pro-brain natriuretic peptide (NT–proBNP) serum concentration ≥3606.11 mg/mL, and total distance walked during 6MWT ≤332.5 meters resulted in more re-hospitalizations in the first 6 months after the patient's discharge from the hospital (2 [1–2] vs. 1 [1–2], 2 [1–2] vs. 1 [1–2], 2 [1–2] vs. 2 [1–2] vs. 1 [1–2], respectively), all p<0.05. ER on ECG (hazard ratio [HR] 2.587; 95% confidence interval [CI] 1.644–4.072; p<0.001), NT–proBNP serum concentration ≥3606.11 mg/mL (HR 5.104; 95% CI 3.326–7.832; p<0.001), TFC ≥36.9 1/kOhm (HR 4.604; 95% CI 2.701–7.849, p<0.001), LVEF ≤40% (HR 4.942; 95% CI 2.825–8.647; p<0.001), systolic time ratio (STR) ≥0.375 (HR 1.892; 95% CI 1.262–2.838, p=0.002), and New York Heart Association (NYHA) class IV (HR 4.46; 95% CI 2.56–7.76, p<0.001) were independently and significantly associated with cardiac death.

**Conclusions:** The combination of ER, LVEF ≤40%, NT–proBNP ≥3606.11 mg/mL, TFC ≥36.9 1/kOhm, STR ≥0.375, and NYHA class IV provides an incremental prognostic value for cardiac-related death in patients with CHF.

**32. Should troponin still be the golden standard biomarker in myocardial infarction diagnosis?**

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**Introduction:** Consistent with the 4. Universal Definition of Myocardial Infarction - the term "acute myocardial infarction" should be used in the case of acute myocardial injury with clinical features of acute myocardial ischaemia, if there is an increase and/or decrease in blood cTn concentration with at least one value above URL at the 99th percentile and at least one of the additional 5 clinical criteria is met. In patients with elevated cTn levels, clinicians must distinguish whether the patient has had non-ischaemic myocardial injury or one of the subtypes of myocardial infarction. There are another reasons for the increase in the level of cardiac troponins as: hypoxia, chronic renal failure, hypothyroidism, i.e. conditions that are not synonymous and often far from a recent myocardial infarction.Therefore, the aim of our review was to compare the competitiveness of new biomarkers in relation to cardiac troponin, which is the "gold standard" in the diagnosis of myocardial infarction, especially in terms of specificity, release kinetics and sensitivity.

**Methodology:** This analysis was based on data published in the PubMed database after 2018 on the latest research on innovative biomarkers in the diagnosis of myocardial infarction.

**Results:** We compared the following markers with cTn: miRNA-208 and miRNA-499, hFABP. Our work, also includes the technical and financial analysis of the potential introduction of an innovative marker for the diagnosis of myocardial infarction according to new guidelines, having in mind how the globalization of its use will impact price. All of mentioned biomarkers were more sensitive than cTn in first 3 hours, but each one has lower specificity. Although those markers have additional prognostic functions such as 30 days death risk or risk of Left Ventricle disfunction.

**Conclusions:** Troponin should still be the golden standard in myocardial infarction diagnosis, but we should consider adding other biomarkers to diagnostic process to have better visualization of patients prognosis.

**33. Quality of life assessment using the Minnesota Living with Heart Failure Questionnaire: NYHA**

**functional class correlation with questionnaire scores**

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**Introduction:** Cardiovascular diseases are one of the most causes leading to death in the developed countries, including Lithuania and Poland. In Poland, cardiovascular disease is the most common cause of death for men over 45 and women over 70 years of age, and in Lithuania CD are the leading cause of death among women and men, accounting for 65% of deaths among women and 48% among men. That's why it is important to observe a quality of life of patients living with heart failure, one the most common CD, and its' impact factors.

**Aim:** The purpose of the research was to compare the NYHA functional class with the MLHFQ scores and evaluate the impact of risk factors to questionnaire scores for a better understanding of heart failure patients' quality of life during and 6 months after hospitalization.

**Materials and Methods:** The study population consisted of 76 patients (67% male and 33% female) with heart failure (HF) treated at the Kaunas Hospital of the Lithuanian University of Health Sciences. During the hospitalization period, patients' medical histories and Minnesota Living with Heart Failure Questionnaire (MLHFQ) scores were analyzed. We also gave additional questions to better determine risk factors and to evaluate the NYHA functional class of HF patients. After six-month MLHFQ scores and additional questions were made by phone call. Statistical analysis was performed using IBM SPSS 27.0 software package. The strength of the association between different measurements was evaluated by Spearman's correlation coefficient and Chi-square test.

**Results:** The average age of HF patients was 75±12 years. The distribution of patients according to NYHA functional class was: class II (12%), class III (29%), and class IV (59%). We performed statistical analysis to observe the dependence of NYHA functional class and MLHFQ results. The first follow-up mean score was 44±14 and after six months was 41±13. Observed changes in the questionnaire scores were statistically significant and also correlated with the NYHA class both after the first ($X^2$=12.861, df=4, $p<0.05$) and second follow-up ($X^2$ =17.588, df=6, $p<0.05$). In our research, only smoking had a statistically significant negative impact to the MLHFQ score and quality of life over 6 months ($X^2$=12.542, df=4, $p<0.05$). The highest percentage of patients with worsened questionnaire results were current smokers (44%; pack-years mean 25±17), and the highest percentage of improved prognosis were former smokers (43%) or non-smokers (41%).

**Conclusions:** Our results show a strong correlation between NYHA class and MLHFQ scores. Both were related to one another during hospitalization and after 6 months follow-up. Smoking had a significant impact in MLHF and NYHA classes, resulting former smokers had a worse MLHFQ result.

## 34. Complicated cardio-cerebral infarction – could anything more have happened?

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**Introduction:** The concomitant occurrence of acute myocardial infarction and stroke is called cardio-cerebral infarction (CCI). This condition is rare therefore there are no evidence-based guidelines for the management of those patients. American Heart Association and American Stroke Association indicate an approach that includes intravenous alteplase at the dose appropriate for cerebral ischemia, and then percutaneous coronary angioplasty and stenting if needed.

**Case description:** A 51-year-old male patient with a history of smoking, and insulin-dependent diabetes mellitus type 2 presented to the hospital with left arm weakness and left-sided central facial paresis. The last time patient was seen without symptoms was 4 hours earlier. Two days before the admission the patient had severe retrosternal pain which he neglected. A neurological examination revealed central face palsy on the left side and paresis with sensory disturbances in his left hand. He had no reflexes in his lower limbs. Computed tomography showed focal brain ischemia in the right cerebellar hemisphere. Occlusion of the right middle cerebral artery was visible in the angio-CT. Due to exceeding the time window typical pharmacological thrombolysis could not be applied. The patient's electrocardiogram revealed ST-elevation in the precordial leads. In the laboratory tests, high-sensitive troponin (hsT) and creatine-kinase MB (CK-MB) were above the normal limits. Emergent bedside transthoracic echocardiography showed reduced LVEF (35%) and segmental akinesis in the apex, intraventricular septum, anterior and lateral wall. Moreover, a large narrow-pedunculated, ballotable structure that looked like a clot was observed in the left ventricle. The patient was disqualified from surgical removal of the ventricular thrombus. Conservative treatment with two subcutaneous administrations of low-mass weight heparin daily was applied. On the second day of admission, the patient's clinical status deteriorated and new neurological deficits appeared. CT scan revealed a hypodense area in the right hemisphere, in the posterior insula, and posterolateral part of the frontal lobe. In the following transthoracic echocardiographies the diameters of the structure in the left ventricle were gradually decreasing. During further days of hospitalization, the patient was diagnosed with the lower limbs' embolism. To prepare the patient for thrombectomy, planned coronarography was performed. It revealed three-vessel coronary artery disease including the left artery descending, left circumflex artery, and right coronary artery. The cardiac percutaneous revascularization was abandoned according to scheduled vascular surgery and sepsis. One month after admission, the patient was transferred to the Intensive Care Unit (ICU). He was in a serious condition, intubated, and put on a ventilator. The Patient underwent mechanical thrombectomy and angioplasty of the right leg arteries. Unfortunately, the patient developed septic shock and the right lower extremity has been amputated. In control echocardiography, the diagnosis of left ventricular aneurysm of the apex was made. In further days the patient's condition deteriorated again. After seventy-one days of hospitalization the patient died due to cardiac arrest.

**Conclusions:** Different pathogenesis, severe potential complications, and little time to make a decision create challenges in the management of CCI. CCI requires careful evaluation as it is a serious clinical situation with high mortality.

### 35. Comparison of severly calcified lesions modifications

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**Introduction:** Coronary artery calcification involves the creation of calcium deposits in the arterial walls and is a rising issue in the modern world.aa In order to maximize treatment efficiency and debulk the plaques, methods such as rotational atherectomy (RA), orbital atherectomy (OA) and coronary intravascular lithotripsy (IVL) were invented [1,2,3].

**Aim:** The aim of this study is to analyze the differences between calcified lesions modification methods used before stent implantation- RA, OA and IVL- according to their mechanism of action, treatment decision algorithm, short and long term complications as well cost difference [4,5].

**Methodology:** We revised 49 peer reviewed articles available in Google Scholar database using keywords: rotational atherectomy, orbital atherectomy, coronary intravascular lithotripsy, coronary artery calcification.

**Results:** IVL catheter is a balloon-based device containing lithotripsy emitters and thanks to that it delivers uniformly distributed sonic waves which causes intraplaque calcium fractures. In contrast OA and RA use a rapidly rotating burr to modify calcified plaques [4]. RA is a good choice for tight and heavily calcified lesions. However, the rotablator can cut the plaque only forward and it is possible to get its burr stuck, whereas OA advantage is the ability of the device to ablate forward and backward. OA is a good choice for debulking of larger vessels.In case of uncrossable lesions RA or OA are recommended, and in the event of suboptimal balloon expansion, IVL is needed [6]. Following studies assessed procedure efficacy as- 88,9% for OA according to ORBIT II, 100% for IVL consistent with CAD II and 92,5% in case of RA referring to ROTAXUS [7,8,9] . The same studies revealed 30-days MACE (Major Adverse Cardiac Events)prevalence in OA- 10,4%, IVL- 4,3% and RA- 5%. Currently ongoing ECLIPSE randomized trial may assess according to the newest data the strategy of OA usage compared to data present in ORBIT II trial from 2014 [10]. There is also a difference in specific for rotational devices complications such as perforation and no flow phenomenon occurrence and no presence of such events according to IVL. It is more frequently observed in RA (6-15%) than in OA- 0,9%. There may be association between particle size in RA-10-15 μm, OA-2-3 μm [11]. RA is associated with a higher risk of 30 days/in-hospital MI, but was associated with a lower prevalence of coronary artery dissection and perforation. According to IVL only mild dissections were observed. There were no significant differences in the 1-year MACE- it occurred in an average of 15% of patients who underwent RA (from 13.2% to 26% depending on the study). [6,12,13], in 14,4% of patients after OA (11% to 16.4%) [13,14,15] and 13.2% according to IVL (ranging from 9.4% in Japan to 13.8% in US and Europe) [16,17]. OA is a cost-effective approach compared to RA due to performance improvement and lower rate of reinterventions [18,19]. According to IVL and RA there are comparisons, claiming that IVL is less expensive due to lower overall resource utilization [20,21].

**Conclusions:** There is no one certain method of calcified coronary artery modification prior to DES implantation and more quality randomized trials and meta-analysis are needed to compare their efficacy and complications[4]

## *POSTER SESSION*
## *(SESJA POSTEROWA)*

### 36. Obstetric anaesthesia management of the patient with Marfan syndrome

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**Introduction:** Marfan syndrome (MS) is an inherited connective tissue disorder involving cardiovascular, musculoskeletal and ocular systems. Pregnant women with MS have a high risk of aortic aneurysm that can progress to dissection due to the hemodynamic and hormonal changes during pregnancy. Therefore delivery of such patients requires a multidisciplinary care.

**Case Description:** 29 years old patient at 35 weeks of gestation was admitted to the hospital for further treatment tactics. She was diagnosed with MS since 11 years old and had syndrome-specific vision impairment, long fingers and joint hypermobility. A transthoracic echocardiogram revealed prolapsed mitral valve with moderate mitral valve regurgitation. Mitral valve dysfunction was established and it could cause heart rhythm disorders. Ascending aorta was mildly dilated (< 40 mm). Multidisciplinary team discussed the patient's condition and tests and it was decided that a Caesarean section should be performed with the precise hemodynamic monitoring in order to avoid hypertension. Caesarean section under spinal anaesthesia was performed. Monitoring during anaesthesia: electrocardiogram, pulse oximetry, non-invasive blood pressure. There were no spinal placement failures, no failed responses to analgesia and no respiratory or hemodynamic adverse events. Treatment with Metoprolol 25 mg x 1 was continued after the delivery. The goals of anaesthetic management during labor include minimizing hemodynamic stress resulting from increases in blood pressure and cardiac output.

**Conclusion:** The primary aim of intra-partum management of these patients is to reduce the cardiovascular stress of labor therefore Caesarean section with spinal anaesthesia was preferred to minimize the hemodynamic changes. Decisions regarding the optimal anesthetic care during delivery should be considered on an individual basis by a multidisciplinary team. Adequate beta blocker therapy during pregnancy is essential.

# INFECTIOUS DISEASES AND HEPATOLOGY SESSION
## (SESJA CHORÓB ZAKAŹNYCH I HEPATOLOGII)

### *ORAL SESSION*
### *(SESJA USTNA)*

**37. Challenges in the treatment and management of HCV infected patient - case report**

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**Introduction:** The development of direct-acting antivirals (DAAs) in 2011 was a significant breakthrough in HCV therapy. New treatment regimens offer excellent efficacy and sustained virologic response (SVR) above 90%. Even though this course of treatment offers notable success it might be affected by various factors, such as effectiveness of the health care system, accessibility of the therapy and patient compliance.

**Case description:** The subject of our study is a 50 year old male. In August 2016 the patient was recognized with chronic alcoholism and HCV infection. The combination of the factors mentioned above lead to the diagnosis of liver cirrhosis. Despite being qualified to the DAA-s therapy, the patient decided to ignore medical recommendations. In March 2018 the patient was diagnosed with hepatocellular carcinoma (HCC) and was admitted to 24 weeks treatment consisting of Sofosbuvir and Ribavirin. The lack of improvement led to continuation of therapy with Epclusa (sofosbuvir/velpatasvir) until liver transplant in 2019. Following the surgery the patient neglected post-transplant recommendations and in 2021 was administered to the hospital with symptoms of decompensated liver cirrhosis, related to HCV infection. The applied Vosevi (sofosbuvir / velpatasvir / voxilaprevir) treatment resulted in SVR.

**Conclusions:** Our case highlights the importance of patient compliance and challenges of HCV infection treatment. Presented study emphasized the vast range of factors that should be taken into consideration when deciding the course of treatment. Non-medical aspects of therapy need to be acknowledged.

**38. The level of knowledge about topic of acute sinusitis according to the latest guidelines in polish society - survey investigation**

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**Introduction:** Acute rhinosinusitis (ARS) is an infectious disease that is one of the ten most commonly diagnosed diseases in Poland. It is also the fifth most common reason for prescribing antibiotics by primary health care physicians. It is estimated that in European countries, the frequency of ARS among adults is two to five episodes per year. Data from Poland seem to confirm European trends. In Polish society, there are many misconceptions about the symptoms and treatment of acute rhinosinusitis. Cases of illness are often misinterpreted by patients themselves, making it difficult to determine the scale of the problem and take appropriate medical and preventive action.

**Aim:** ARS is a serious public health problem due to the enormous direct and indirect costs for healthcare systems worldwide, making it necessary to understand how this disease is perceived by society. This can help in planning appropriate interventions that contribute to increased awareness, knowledge, and recommendations in the population through educational campaigns or advertising. This can ultimately lead to a decrease in incidence, an increase in medical consultations, and an improvement in the epidemiological status of the population. However, it is also important to reduce the social costs associated with complications and inadequate treatment.

**Materials and Methods:** The study involved 416 people. The age of the study participants ranged from 18 to 72 years. Men accounted for 21.7% of the participants, while women accounted for 78.3%. The survey asked questions about the level of education, place of residence, and employment. The respondents were recruited in a variety of ways. For older people, access was facilitated through a paper version. The survey began with a definition of acute rhinosinusitis, followed by questions about demographics and knowledge of the concept of ARS, self-diagnosis, and treatment.

**Results:** The concept of acute rhinosinusitis (ARS) is known to the majority of respondents. The percentage of respondents who recognized a given symptom as a symptom of ARS corresponded largely to the frequency of occurrence of that symptom in actual patients. Over 57% of those surveyed would self-medicate, and 43% declared that they would not visit a doctor. Almost 53,4% of participants would go to work even if they are ill. The percentage of respondents who would use antibiotics was alarmingly high -19,3%. Most respondents (29,3%) stated they have ARS 2 or 3 times a year.

**Conclusions:** The surveyed individuals correctly identified the etiologic factors. The most commonly used self-medication treatments were consistent with the latest EPOS guidelines. Vitamin C was a frequently chosen therapy, which may be due to the established belief that it is an effective treatment for ARS. A significant proportion of respondents who self-administer antibiotics do so without any proper indication, which could have serious consequences. The behavior of the sick individuals was epidemiologically irresponsible. Polish society requires comprehensive educational efforts to improve self-awareness and reduce the incidence of ARS. Knowledge of risk factors seems to be based more on intuition than on reliable and proven scientific methods. Often, social contacts or "getting cold" are recognized by participants as the main reasons for the occurrence of common cold.

**39. Liver transplant in paediatric patient with hepatopulmonary syndrome caused by yet unknown metabolic disorder**

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**Introduction:** Hepatopulmonary syndrome (HPS) is a rare serious condition characterized by hypoxemia due to dilated intrapulmonary vasculature. It can develop in any patient with chronic or acute liver disease or portal hypertension. The criteria for diagnosing HPS are partial pressure of oxygen ($PaO_2$) <80 mm Hg while breathing room air, or alveolar-arterial oxygen gradient ($A\text{-}aO_2$) ≥ 15 mm while breathing room air, $A\text{-}aO_2$ >20 mm Hg in patients over 64 years of age. Another criteria is pulmonary vascular dilatation as shown by positive contrast-enhanced echocardiography or by

radioactive lung-perfusion scanning (showing brain shunt fraction >6%).
**Case description:** A then 15-year-old male patient admitted to Instytut „Pomnik – Centrum Zdrowia Dziecka" (IP CZD) in Warsaw for liver transplantation (LTx), earlier that year demonstrated trouble breathing, especially in a vertical position (paO2 <70 mmHg) and required constant oxygen therapy for 6 months. He presented a history of idiopathic chronic liver disease (CLD) first reported at the age of 3 with high percentage of fibrosis and steatosis, assumed to be associated with an undiagnosed metabolic disorder. Alström syndrome was thought to be the underlying cause, but it was later excluded in genetic testing. CLD was later exacerbated by chemotherapy during treatment of Acute Lymphoblastic Leukemia (ALL), treated between 08.2007 and 05.2010 in Paediatric Oncology and Hematology Clinic in Wroclaw, currently in remission. Those factors, as well as previous pneumonia treated in 2008, later lead to HPS with rarely seen in paediatric patients shunt fraction over 30%. After both pulmonary fibrosis and restrictive cardiomyopathy were ruled out, the patient was qualified for LTx. The transplantation, which took place in 09.2010 was successful, but a long term complication appeared in the form of an anastomotic biliary stricture of 4 mm, manifesting in bilirubin levels heightened to 10,5 mg/dL [0,2-1,2], treated with a series of 5 consecutive endoscopic retrograde cholangiography (ERC) procedures (10.07.2012 - 26.04.2013) in which stricture dilation is followed by the placement of progressively larger stents. All the procedures resulted in significant improvement and patient, now 28-years-old, is in an overall good state, under the supervision of the transplantation clinic in University Clinical Hospital in Wroclaw.
**Conclusions:** LTx is a therapeutic method that is the only effective way of treating breathing problems induced by HPS. We need to be aware of the fact that the trigger of hypoxemia in children may not only be cardiopulmonary causes but also HPS.

### 40. Difficulties in the treatment of chronic hepatitis B in a patient after hematopoietic cell transplantation (HCT)

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**Introduction:** Chronic hepatitis B is a disease lasting more than 6 months, caused by HBV (hepatitis B virus) infection. Its DNA exists in an integrated form in the genome of hepatocytes (and other cells) and in an episomal form – cccDNA (covalently closed circular DNA). The natural course of hepatitis B takes on different phases depending on the presence of specific antigens and antibodies in the blood and the severity of viremia. Infection is referred to as latent when HBs antigen and HBV DNA are undetectable in the blood. Nevertheless, reactivation of the virus can occur due to the presence of HBV cccDNA, especially in immunocompromised states, such as those caused by biologic or immunosuppressive treatment or chemotherapy.
**Case description:** A 31-year-old man with long-standing HBV infection, after allogeneic bone marrow stem cell transplantation for acute lymphoblastic leukemia (performed at the Department of Hematology, Blood Tumors and Bone Marrow Transplantation at the Jan Mikulicz University Clinical Hospital in Wroclaw), presented to the Infectious Diseases Outpatient Clinic at the J. Gromkowski Regional Specialized Hospital in Wroclaw. The patient, then in remission, required triple immunosuppression with mycophenolate mofetil, cyclosporine and prednisone. In addition, chemotherapy according to the PALG ALL-6 protocol was used for tumor treatment induction. The goal of the outpatient clinic visit was to optimize the treatment of hepatitis B due to the increase of HBV DNA copies in the blood. A change of antiviral drug from entecavir to tenofovir was made. After a week, due to persistently high viral load and a systematic increase in aminotransferase activity, the decision was made to hospitalize the patient and initiate steroid therapy, which was continued for another 13 months until normal transaminase activity was achieved. At the same time, sustained antiviral treatment with tenofovir enabled viral load negativity.
**Conclusions:** Reactivation of chronic latent HBV infection is a significant problem in patients undergoing immunomodulatory therapies. A prominent risk group are hematooncologic patients, especially after allogeneic hematopoietic cell transplantation, due to the need for both chemotherapy and immunosuppressive drugs. Despite the existence of recommendations for the prevention of reactivation of HBV infection, the complexity of treatment in analogous cases requires individualization of the therapeutic process depending on the patient's clinical condition, his comorbidities and the pharmacotherapy already in use. The goal of treatment remains the normalization of biochemical markers of hepatitis and the pursuit of seroconversion to anti-HBe in HBeAg(+) patients. Furthermore, it is worth mentioning, that there is no correlation between the clinical picture of the disease (patient's well-being, abnormalities on physical examination) and the stage of the disease, reflected in laboratory tests.

### 41. Mysterious complications. A case of pneumonia and non-specific pleuritis after probable monkeypox virus infection

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**Introduction:** The first cases of monkeypox (mpox) in humans were described in 1970. The disease became more widely known by spring 2022, when a significant number of cases occurred in Europe and North America. The first case in Poland was reported on June 10, 2022.
**Case description:** A 34-year-old man having sex with men (MSM) presented to an outpatient clinic on June 15th 2022 due to malaise, fever and sore throat. Physical examination revealed umbilical vesicles on an erythematous surface, located mainly in the genital area, as well as redness of the oral and pharyngeal mucosa, and cervical, axillary and inguinal lymphadenopathy. A diagnosis of probable case of monkeypox was made based on the epidemiological situation at the time and the characteristic clinical picture. Symptoms resolved in two weeks. On August 15, 2022, the patient was urgently admitted to the hospital for suspected bacterial pneumonia. Empirical antibiotic therapy with ceftriaxone and vancomycin was administered. Although the etiology of the pneumonia was not diagnosed, the empirical treatment proved effective and symptoms resolved within a week. However, on August 29, the patient was readmitted to the hospital for chest pain; he was found to have fluid in the left pleural cavity. Despite thoracocentesis performed twice, the exudative fluid continued to accumulate in the left pleural cavity. The patient was transferred to the pulmonology department, where a drainage of the left pleural cavity was inserted. Numerous diagnostic tests were performed, including bacteriological, mycological and serological tests, but the etiology of pleuritis was not established. Despite only symptomatic treatment, the patient's condition began to improve, so it was possible to remove the drain from the pleural cavity. The patient was discharged from the hospital in good general condition on September 16, 2022. However, the etiology of the non-specific pleuritis he developed remains unknown.

**Conclusions:** The patient developed severe pneumonia, followed by non-specific pleuritis, within two months after the incident of most likely monkeypox. The sudden onset of such conditions in a previously healthy young man is not typical and prompts consideration of a potential additional cause for these disorders. A link between monkeypx virus (MPXV) infection and the pulmonary disorders that followed cannot be excluded. The overall clinical picture indicates that the pneumonia in this case was most likely of bacterial etiology. Secondary bacterial pneumonia as a complication of monkeypox in humans has already been described. More mysterious is the etiology of non-specific pleuritis. It cannot be excluded that it had a viral etiology. To date, several cases of viral pleuritis in the course of MPXV infection in animals have been described, but to the best of my knowledge, no such complication in humans has been described so far. It should also be noted that even if MPXV infection was not the direct cause of pulmonary disorders in the case described, it could have contributed to them indirectly. The adverse effects of MPXV on immune function have already been widely described. The described case indicates the need for further research into the effects of MPXV on various tissues and organs. It also indicates that it is necessary to follow-up patients after MPXV, due to the possibility of serious and previously unknown complications.

### 42. A preliminary report: HIV in female patients from Ukraine in Wroclaw, Poland

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**Introduction:** Human Immunodeficiency Virus (HIV) is one of leading health problems in the world, including East Europe. The virus causes an infection which ultimately results in acquired immunodeficiency syndrome (AIDS) with severe outcomes for patients. After 24 February 2022 Poland saw an influx of refugees from war-stricken Ukraine. Some of the people came to Wroclaw seeking shelter then, some of them came earlier. After a surge in patients Wroclaw HIV-net saw a spike in HIV patients. In this abstract we present the results of a survey of ukrainian female HIV-patients treated in Wroclaw.
**Aim:** To determine the patterns of HIV infection, associated infections and reproductive health in HIV-positive ukrainian female patients treated in Wroclaw.
**Materials and Methods:** The anonymous questionnaire consisted of 43 questions with particular emphasis on HIV infection and reproductive health. Data extracted was used to create a database, which, in turn, served as a material for statistical analysis. Questionnaires were distributed in two HIV outpatient clinics in Wroclaw in January 2023 (at Koszarowa 5 and Wszystkich Swietych 2). Questionnaires were collected from January to March 2023.
**Results:** A total of 55 questionnaires were collected. Three of them were excluded ([1] filled out by a man, [2, 3] were incomplete). Mean age was: 40.6 years with median: 40. Mean year of moving into Poland: 2021 with median: 2022. Predominant reason (34/52, 65%) for migration to Poland was seeking refuge from war. 36/50 (72%) are working, no one is working as a prostitute. 31/51 (60.8%) have a regular partner. 16/31 (51.6%) women's regular partners have a HIV infection, while 2/31 (6.5%) doesn't know whether their regular partner is HIV-positive. 33/44 (75%) always uses a condom during an intercourse. 2/52 (3.8%) did use HIV pre-exposure prophylaxis (PrEP) before the HIV diagnosis. 50/51 (98%) had been consulted by a gynaecologist at least once and 47/51 (92.2%) had a cervical smear in the past 3 years. 28/49 (57.1%) have been infected with HIV during an intercourse with a man; 1/49 (2%) from her mother during birth, while 20/49 (40.8%) does not know how infection occurred. 6/50 (12%) was treated because of tuberculosis. 4/40 (10%) infected at least one of her children with HIV, while no one from respondents breastfed her children after diagnosis.
**Conclusions:**
• A large percent of respondents was treated for tuberculosis, which supports the data from literature underlining the existence of need for widened diagnostics and antimycobacterial prophylaxis in the population of HIV patients from Ukraine.
• Despite earlier diagnosis, 5% of the ever-pregnant respondents infected their children with HIV highlighting the importance for prophylaxis for children and pregnant women diagnostics and treatment.
• HIV was contracted despite the use of PrEP in both respondents using the method sparking the questions of the right use of the prophylaxis and/or compliance issues.
• High percentage of respondents who did not know how they were infected shows problems with testing, detection and reducing HIV transmission in population.

### 43. Tuberculosis of the bones in the light of diagnostic and treatment processes in the past and today

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**Introduction:** Cases of tuberculosis of the bones are continuously being reported, despite the significant decrease in morbidity in comparison to the beginning of XX century. Extrapulmonary tuberculosis is currently one of the most important opportunistic infections observed during AIDS disease. Primary pulmonary tuberculosis is not necessary to infect the human skeleton. Only about a half of patients with diagnosed tuberculosis have symptoms of pulmonary tuberculosis as well. Mycobacteria commonly use the haematogenous spread to colonize bones and joints. The best known form of tuberculosis of the bones is Pott's disease - tuberculosis localizated in vertebral bodies - which appears unspecifically. Mycobacteria could also settle in the joints, especially in younger patients, because of rich vascularity in bone epiphysis during their growth.
**Methodology:** The aim of this research is to present the disease that is tuberculosis of bones in historical terms and to discuss current diagnostic and therapeutic methods. The research of knowledge was held on online platforms such as PubMed, NCBI (National Center of Biotechnology Information), ResearchGate and in Wroclaw Medical University Library. The analysis was conducted on available research papers dating from 1927 to 2022. The work used photographs of pathologically altered bones and joints from the collection of the Anatomical Museum of Wroclaw Medical University.
**Results:** Bone tuberculosis is a current health problem of society induced by the Mycobacterium tuberculosis. After a period of decrease in morbidity in the XX century we observe the rising number of tuberculosis patients which is commonly correlated with the epidemic of AIDS. However, the discoveries made in many fields of medicine have allowed for the improvement of diagnostic and therapeutic methods. Medical imaging tests, such as computed tomography or magnetic resonance imaging have enabled the diagnosis of tuberculosis lesions at a much earlier stage. Microbiological tests use an automatic culture system, which shortens the growth time in mycobacterium laboratory. Quick and precise molecular techniques are commonly used in tuberculosis detection. Introduction of BCG vaccination in 1921 prevented many potential patients from death. Detection of illness in an

earlier stage and advanced pharmacotherapy methods are correlated with decline in number of deaths as a result of bone tuberculosis.
**Conclusions:** Bones tuberculosis is still a part of the contagious profile of the human population. As in previous centuries there is a group of notably predisposed patients, most of them have an immunological deficiency. Modern diagnostic and pharmacotherapy methods definitely improved the detectability and curability of patients suffering from bone tuberculosis. Despite this fact, we should be aware of imminent changes in treatment directives. Adjustment should be conducted because of increase in commonness of refractoriness patients to rifampicin curation.

### 44. Challenges in Diagnosis and Treatment of Hepatocellular Carcinoma: Case Report

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**Introduction:** Hepatocellular carcinoma is the most common type of primary liver cancer in the adult population. The combination of certain factors, such as alcoholic cirrhosis and hepatitis b or c infection, particularly increases the risk of cancer transformation. The standard for early detection of HCC is ultrasound and the level of the cancer marker AFP. The final diagnosis is based on the CT or MRI image and the result of the histological examination. Liver resection or transplantation gives the best chance of cure. Systemic therapy should be considered in patients who are not eligible for surgical treatment or whose disease has progressed following such treatment. Cirrhosis of the liver is a contraindication to resection in many cases, so there are alternative methods such as injection of alcohol into the tumor, cryosurgery, thermoablation, and TACE arterial chemoembolization.
**Case description:** The presentation describes a clinical case of a patient treated for chronic hepatitis B. In addition, a history of cirrhosis of mixed etiology was found. The patient experienced an increase in alpha-fetoprotein at week 52 of antiviral therapy. The level of the cancer marker increased steadily, but no neoplastic lesion was observed in imaging studies. The first outbreak of malignancy was detected one year after an increase in alpha-fetoprotein.
**Conclusions:** In our work, we will focus on the difficulties in diagnosing and treating early forms of hepatocellular cancer in patients with risk factors.

### 45. Bad luck or mainstream? Numerous occupational exposures in a single nurse in the context of low reporting of similar cases

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**Introduction:** We report the case of a nurse who had four occupational exposures to potentially infectious material between December 2020 and June 2022.
**Case description:** In two of the four cases, the source patient was known and found to have a negative HIV screening test; therefore, the patient did not receive pharmacological post-exposure prophylaxis for HIV infection. However, in the other two cases, the exposures involved needlesticks from a medical waste bag and the source patients were unknown. Therefore, post-exposure prophylaxis in the form of antiretroviral drugs was implemented after each of these two exposures. While using these medications after the first exposure, the patient developed weakness and dyspeptic symptoms; there was also a significantly elevated concentration of diastase in the urine. After changing the antiretroviral drugs used, these symptoms disappeared, and there was also normalization of diastase levels. When the drugs were applied after a new exposure, these symptoms were no longer observed.
**Conclusions:** The case described here provokes the question of whether such a large number of occupational exposures in one person over a period of eighteen months is the result of an unfortunate coincidence, or is rather a real picture of the overall situation in which a significant number of exposed health care workers do not report exposures. The results of a number of studies conducted on health care workers in Poland suggest that the percentage of unreported occupational exposures can range from 21% to 86%. In studies conducted in other countries we reviewed, the possible non-reporting rate oscillates between 23.3% and 86.9%. Reasons given by health care personnel for refraining from reporting exposures include the belief that the patient is at low risk of infection and not infectious, lack of time, fear of testing, ignorance of procedures, and fear of negative evaluation by superiors. This suggests that urgent steps should be taken to improve the reporting of occupational exposures to potentially infectious material among health care workers in Poland and awareness of the problem in the health care system.

### 46. Cholangiocarcinoma mimicking the PSC recurrence: a case report

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**Introduction:** Primary sclerotic cholangitis (PSC) is a chronic, progressive disease of a bile duct system of unknown origin, most probably autoimmune, and a frequent concomitant to IBD. PSC leads to many health problems, such as liver cirrhosis and its failure, a higher chance for many cancers, including cholangiocarcinoma (CCA). CCA is a rare cancer difficult to diagnose and treat, which incidence in PSC patients is 10-1000 times higher than in the general population. In this case report we describe a patient with severe comorbidity suffering from a CCA developed 7 years after liver transplant due to PSC concomitant to UC.
**Case description:** A 31-year-old male patient was burdened with a number of conditions. In 2006 UC and in 2010 PSC was diagnosed along with a chronic kidney disease (GFR ~53) and a chronic anaemia. Numerous bile duct prosthesis replacements were performed between 2010 and 2015. Progression of PSC resulted in a need of a liver transplantation which was performed in 12.2015 in Department of Vascular, General and Transplant Surgery of University Clinical Hospital in Wroclaw. Since then, the patient received tacrolimus (TAC) as the only immunosuppressant treatment. Parallel to TAC, the patient received ursodeoxycholic acid. On 09.2016 results of liver biopsy showed subacute transplant rejection - implementation of mycophenolate mofetil to therapy, in addition to TAC, yielded good results. In 12.2016 exacerbation of UC began – it proved to be resistant to non-invasive treatment. Finally, a proctocolectomy with pouch reservoir formation was performed in 11.2017. In 10.2019 USG of liver and bile ducts was performed and showed no pathologies except for a small cyst in hilum of liver. On cholangio-MR examination from 01.2020, intrahepatic bile ducts were narrow in peripheral segments, wider in perihilar segments then narrow in the hilum. Ducts had irregular outlines. The conclusion was that there was a recurrence of PSC. After a steep increase in bilirubin in 01.2021 another NMR of liver and bile ducts was

performed in 03.2021 and showed similar findings to that from 01.2020 but for the greater irregularities in outlines of ducts. In 04.2021 a prosthesis was inserted into bile ducts resulting in alleviation of symptoms associated with high bilirubin. In 10.2021 there was a first replacement of prosthesis, after infection and a steep increase in bilirubin with signs of liver encephalopathy, resulting in improvement of patient's condition. On 21.03.2022 the patient was admitted to SPWSZ in Szczecin in order to investigate recurring stenosis of extrahepatic bile ducts with concomitant infections and for a possible qualification for a retransplant of a liver. On 29.03.2022 ECPW in order to get a biopsy and a cytology swab was performed. A histopathological examination of a patient's common bile duct biopsy revealed a malignant neoplasm - a distal CCA in adenocarcinoma variation. The patient was disqualified from Whipple surgery and referred to ablations of the tumour – first in 06.2022, second in 08.2022. The patient is currently receiving a palliative chemotherapy – gemcitabine and cisplatin.

**Conclusions:** CCA can mimic the PSC recurrence and be easily omitted, especially in young patients. Extensive cancer vigilance is vital in patients with a long story of PSC and UC. UC of high activity is a serious problem in graft recipients management.

# PEADIATRICS SESSION
# (SESJA PEDIATRYCZNA)

## *ORAL SESSION*
## *(SESJA USTNA)*

### 47. Antibiotic-resistant bacteria in stool of pediatric patients with cancer: A single centre-expierence

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**Introduction:** Antibiotic-resistant bacteria are associated with increased morbidity and mortality in children with cancer. About 20-25% of patients with febrile neutropenia have microbiologically confirmed septicemia, the majority of which are caused by bacteria. Gram-positive bacteria are the most frequently isolated. However, gram-negative organisms are becoming more prevalent with a worrying trend toward increasing resistance to multi-drugs. Pathogens have been found to colonize the gastrointestinal tract before infection. Therefore, stool cultures have been considered to predict systemic infection.

**Aim:** The present study was conducted to assess the prevalence of antibiotic-resistant bacteria in stool cultures of cancer patients at presentation to the hospital. The results were correlated with blood cultures when patients developed septicemia.

**Materials and Methods:** This was a retrospective cohort study conducted at the Children's Clinical University Hospital in Latvia. We retrospectively reviewed the medical records of pediatric cancer patients in hospital from January 2022 to December 2022. We investigated 35 pediatric cancer patients. Acute lymphoblastic leukemia (15), acute myeloid leukemia (6), and solid tumors (12), lymphomas (2) were the largest groups of patients. A total of 91 colonization stool samples were taken. When patients developed a fever of ≥38 °C, had an increase in the CRP level, or had other symptoms of infection, blood cultures were drawn from both central and peripheral venous catheters. Subsequently, they received ceftazidime and amikacin combination as the first-line empiric antibacterial regimen. The bacterial specimens from stool were cultured on blood agar plates. The fungal stool specimens were cultured on SG agar plates. The stool yeast specimens were cultured on selective chromogenic media. Data analysis was performed using SPSS 26.0 software. Descriptive statistics was used (proportions expressed as percentages). Chi square or Fisher exact test was used to figure out the statistical significance of the differences in prevalence of dependent variables between the strata of independent variables. Results were considered as statistically significant if $p<0.05$.

**Results:** The patients' mean age was 6.01 years, with a standard deviation of 4.07 and a median of 5.0. *Enterococcus faecium* was found in 33% (*N* = 30) of stool samples, *Clostridium species* in 28,6% *(N = 26)*. *Enterococcus faecalis* in 20% (*N* = 18) and other enterococci were found in 27 % (*N* = 25) stool samples. The distribution of the obtained staphylococcal cultures was as follows: *coagulase-negative staphylococci* was found in 2.2% (*N* = 2*)* of stool samples, *Staphylococcus aureus* 19.3% *(N* = 6*)* and *Staphylococcus hominis* in 1of the examined samples. Two types of streptococci were obtained. *Streptococcus viridans* accounted for 8.7% *(N* = 8*)* of samples and 1% *(N* = 1*) Streptococcus anginosus*. Non-ESBL-producing *Escherichia coli* was found in 33% of samples *(N* = 30*)*. Followed by *Klebsiella species* 22% *(N* = 20*)* and *Pseudomonas aeruginosa* 8.7% *(N* = 8*)*. In 26% of samples, stool culture also showed fungi, with *Candida albicans* predominance *(N* = 12*)*. Beta-lactamase producing microorganisms were found in 13 of the 35 children included in the study. The most common bacteria associated with extended-spectrum beta-lactamases (ESBL) producing resistance founded in stool samples was *Escherichia coli* that was positive in 16,5% samples (*N* = 15). There also were 2,2% (*N* = 2) of positive cultures of AmpC β-lactamase producing *Escherichia coli*. Followed by ESBL-producing *Klebsiella pneumoniae* that was found in 5,5% of stool samples (*N* = *5*). AmpC β-lactamase producing *Citrobacter freundii* was found in 4,4% (*N* = 4) samples. There was also ESBL-producing *Klebsiella oxytoca* 2,2% cases (*N* = 2). AmpC β-lactamase-producing *Enterobacter cloacae* found only in one culture from a patient with AML. Positive blood cultures were observed in eight of 41 patients. In four cases the microorganisms identified in the blood culture were the same as those obtained in the stool culture. In two cases ESBL-producing *Escherichia coli* was revealed in both samples. One patient had non-ESBL-producing *Escherichia coli* in blood and stool. For the other patient the *Enterococcus faecalis* was revealed both in the stool and blood cultures. In the other four cases, the causative agent of septicemia was not identified by stool culture.

**Conclusions:** Emerging resistance to antibiotics continues to whittle away the treatment options for opportunistic infections in immunosuppressive patients. The stool cultures affected the choice of antimicrobial therapy in a total of three infection episodes in this study. Stool cultures may contribute to determining the infection epidemiology and the antibiotic resistance pattern of hematooncology department. Additionally, it is beneficial to culture routinely significant resistant bacteria such as VRE, ESBL, or carbapenemase producing organisms.

### 48. Association of dietary inflammatory index with recurrent respiratory tract infections in children

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**Introduction:** Respiratory tract infections are the most common cause of children's morbidity in the world. Children with recurrent respiratory tract infections (RRI) frequently use health care services and antibiotics, undergo surgical procedures and are at risk for asthma in early life. Both, malnutrition and excessive nutrition may increase frequency of infections in children. Moreover, numerous data demonstrate the involvement of dietary components in inflammatory and immune processes. However, to date no studies have investigated the relation between RRI in children and the inflammatory potential of their diet.

**Aim:** The aim was to assess the inflammatory potential of diet measured using dietary inflammatory index (DII) in children suffering from RRI as well as evaluate the impact of DII on RRI risk.

**Materials and Methods:** Fourty-four children with RRI aged 3-16 years and 44 healthy children (control group) aged 2.5-17 years were enrolled in the study. Dietary intake was assessed using a 7-day dietary recall. The anthropometric data and medical history were also collected. The food records were analyzed using the computer program Dieta 6.0 and the obtained dietary data were used to calculate DII scores according to Knan et al. (2018). DII included 27 food parameters, to each of them inflammatory score was given based on its literature-derived effects on various inflammatory markers. The intake of food parameters was compared to population based food consumption database.
**Results:** Children with RRI were characterized by significantly higher DII in comparison with control group (0.26 vs -0.92). Moreover, a significant difference in the distribution of BMI percentiles was observed between the groups with a higher proportion of subjects over 75th percentile of BMI in the RRI group. A BMI above the 75th percentile and no breastfeeding in infancy were significantly asso-ciated with disease risk (OR = 2.14 and 3.31, respectively). In contrast, breastfeeding longer than 6 months was linked to reduced RRI risk (OR = 0.38). There was an opposite association between DII values and the the incidence of RRI (OR = 0.27 vs 2.33 for first and third tertile, respectively). Moreover, fiber intake was also favorably associated with the risk of developing the disease (OR = 0.76 for the highest tertile).
**Conclusions:** An anti-inflammatory diet expressed as DII values as well as a high fiber intake seem to be important elements in the prevention of RRI in children, while the absence or short duration of breastfeeding and excessive body weight were found to be factors predisposing to RRI. Our study indicates that assessing the inflammatory potential of diet and nutritional status may be crucial for determining comprehensive interventions in RRI, as well as for establishing rational preventive management.

### 49. Distal vaginal reconstruction in a teenage patient

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**Introduction:** Obstructive defects of the vagina completely or partially prevent the evacuation of menstrual blood. Above the obstruction due to the accumulation of it, stasis hematomas form in the vagina, uterus and fallopian tubes. The most common obstructive defect is hymen obstruction. Other less common ones that completely prevent the evacuation of menstrual blood include agenesis of the distal part of the vagina.
**Case description:** A 13-year-old patient with primary amenorrhea was admitted to the Pediatric Gynecology Department for distal vaginal reconstruction and evacuation of hematocolpos. These conditions were accompanied by a syndrome of developmental defects (mutation on chromosomes 4 and 5) and psychomotor developmental delay. The patient also underwent atrial septal defect II and strabismus surgeries. She was taking growth hormone due to short stature. Her first menstruation probably occurred in June 2022, as at that time she experienced severe lower abdominal pain, which was recurrent, last occurring in November, 13 days before surgery. An abdominal ultrasound showed a heterogeneous lesion of 35 mm in diameter in the vagina, consistent with hematocolpos. No pathological areas were found in the appendages. During the procedure, the mucosa of the vagina was incised. Then, under the control of ultrasound, a tunnel reaching the proximal segment of the vagina was dissected. Under the control of ultrasound, the hematocolpos was punctured and 150ml of hemolyzed blood was aspirated. The edges of the proximal vaginal segment were pulled down and sutured to the edges of the vestibule of the vagina. The reconstructed vagina was 8 cm long and 1 cm wide. A ½ size Vagiwell dilator was recommended and follow-up in hospital every 3 weeks.
**Conclusions:** Agenesis of the distal part is a rare obstructive defect of the vagina, due to which menstruation occurs covertly until surgical correction. It often accompanies other developmental defects. Surgery is necessary - complete excision of the septum and anastomosis of the mucosa of the proximal part (above the septum) with the mucosa of the distal part (below the septum), which prevents serious complications, the beginning of which can be stasis hematomas. Keywords: Gynecology; Vagina; Anastomosis, Surgical; Amenorrhea; Hematocolpos

### 50. Dosis facit venenum - of reluctance to supplements and appreciation of simple solutions

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**Introduction:** Pleiotropic effects of vitamin D improve myocardial contractility, decrease systolic blood pressure values (achieved by affecting RAAS), and regulate calcium-phosphate metabolism. The intake of supplements in doses exceeding WHO recommendations results from the media-driven campaign on alleged widespread vitamin D deficiency. Nevertheless, both excess and scarcity of this metabolite in serum may have deleterious effects.
**Case description:** A 17-year-old boy, suffering from mite allergy and recurrent epistaxis due to allergy-driven nasal lesions, was suspected of hyper-IgE syndrome. During hospitalization at the Department of Pediatrics and Allergology this diagnosis was excluded and the patient was qualified for allergen-specific immunotherapy. Occasional mild erythrocyturia required nephrological consultation before implementation of immunotherapy. Simultaneously, the patient began the treatment of acne with isotretinoin under the dermatological supervision. Meanwhile, the pediatrician suggested supplementation of vitamin D due to the low 25(OH)D concentration. The recommended dose was then increased - first by the dermatologist, and then by the patient who eventually took up to 8000 IU/day for four months. The subsequent hospitalization in the Department of Pediatric Nephrology revealed increased concentrations of serum creatine and vitamin D metabolites - 25(OH)D and 1,25(OH)D. The supplementation was discontinued, whereas isotretinoin treatment was suspended because of potential risk of developing glomerulopathy. A series of urinalyses revealed moderate erythrocyturia. Further diagnostics excluded immunological, infectious, and metabolic causes of haematuria. Renal ultrasound did not indicate any abnormalities. Three months later, on a follow-up hospitalization, renal function parameters and serum vitamin D metabolite concentrations returned to normal values. Control urinalyses showed a range from absence of erythrocytes to massive erythrocyturia in examinations performed in two consecutive days. Careful history taking revealed temporal coincidence between periodic massive erythrocyturia and masturbation.
**Conclusions:** Vitamin D supplementation requires the control of metabolite serum concentrations. The physiology of puberty is essential for the differential diagnostics of the symptoms appearing in this developmental period.

## 51. Teenage patient with endometriosis and Chilaiditi syndrome

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**Introductions**: Endometriosis is a disease in which cells similar to those in the endometrium grow outside the uterus. Due to the lack of characteristic symptoms, diagnosis is delayed for an average of 4-10 years after the first symptoms appear. Endometriosis is estimated to occur in 4-17% of girls. The ectopic endometrium shows anatomical and functional similarity with normal tissue.
**Case description**: A 15-year-old girl was admitted to the Pediatric Gynaecology Department for diagnostic laparoscopy due to suspected endometriosis. The patient complained of severe pain during menstruation unresponsive to analgesic treatment and prolonged menstrual bleeding. She was diagnosed with Chilaiditi syndrome when she was 8 years old. She underwent 4 laparoscopies (including colopexy, rectal biopsy, resection of part of the colon with colonic anastomosis) and had peritonitis.
**Conclusions**: Endometriosis and Chilaiditi syndrome are rare diseases. Both lead to a poor quality of life. The diagnosis is not straightforward due to their uncharacteristic symptoms. However, prompt diagnosis and introduction of treatment to reduce pain should be pursued.

## 52. Staphylococcal scalded skin syndrome

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**Introduction:** Staphylococcal scalded skin syndrome (SSSS) is exfoliative skin disease that mostly affects newborns but can also occur in older children. This syndrome is caused by exotoxins produced by Staphylococcus aureus. The severity of the disease varies from being a localized skin lesion to a more extensive generalized condition, characterized by cutaneous erythema followed by desquamation of the epidermal layer of the skin. Prompt antibacterial treatment is essential for good prognosis.
**Case description:** A six-day-old full-term newborn admitted to emergency room with erythematous scalded lesions all over the body which started around navel two days ago, without history of trauma or burns after birth. During the examination, painful scalded skin was observed on the torso, face, limbs and perineum. Body temperature was normal. Other body system examinations were normal. Blood tests showed elevated CRP and a left shift in leukogram. In case of severe condition and suspected SSSS the patient was hospitalized to Neonatal Intensive Care Unit. Blood and skin cultures were taken, empiric treatment with gentamicin and oxacillin was started. After skin culture came positive to oxacillin sensitive Staphylococcus aureus, treatment with gentamicin was stopped. Blood culture was negative. Symptomatic treatment included paracetamol, morphine, midazolam, intravenous fluids and enteral nutrition. Skin care with emollients for dry patches and chlorhexidine solution for moist areas was recommended by dermatologist. The treatment was effective and skin condition improved, weeping areas became dry, inflammatory markers decreased. Enteral nutrition was discontinued and breast milk was started. After 9 days, the newborn was transferred to the neonatal unit in stable condition, skin erythema kept decreasing, no new lesions were found. The erythroderma completely decreased after 16 days, and the newborn was discharged home.
**Conclusions:** This case report demonstrates that SSSS may be an emergency case in neonate. Early diagnosis and appropiate treatment can prevent mortality and complications.
Keywords: bacterial infection; newborn; infant; antibiotics; Staphylococcus aureus

## 53. Congenital esophageal and tracheal malformations: a case report

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**Background**: The esophagus and trachea develop very early in the fetus as the foregut tube divides. Failure of development can cause tracheoesophageal fistula and esophageal atresia. These congenital malformations of the trachea and esophagus include a wide assembly of anomalies with a broad spectrum of symptoms such as respiratory distress, choking, and failure to pass a nasogastric or endotracheal tube. Early diagnosis and treatment require interprofessional teamwork.
**Case report:** A preterm male infant was born to a healthy mother gravida 1 para 1born via spontaneous vaginal delivery at 31 weeks of gestation, with a birth weight of 1470 grams. Esophageal atresia was suspected antenatally. The Apgar score was of 1– 1 at 1 and 5 minutes, respectively. The infant was born unresponsive and not breathing, the resuscitation was started.
Positive pressure ventilation with a T-piece resuscitator was started at a rate of 60 breaths per minute, however, there were no chest wall movements and no breathing sounds were heard on auscultation. During laryngoscopy there was a visible obstacle beyond the vocal cords, the neonatologists were unable to insert an endotracheal tube of 2.5 and 3 cm diameter deeper than 6 cm into mouth. Tracheal obstacle made pulmonary ventilation impossible. Chest compressions were continued as long as neonatologists were sure that the airway was closed and there was no way to restore breathing. After 20 minutes of resuscitation, the infant died.
The autopsy was performed. During the morphological examination, there was determined that the newborn had multiple congenital malformations including esophageal atresia with tracheoesophageal fistula, severe laryngeal stenosis, and horseshoe kidney.
**Conclusions**: This case report demonstrates that congenital tracheal and esophageal malformations may cause airway obstruction and may be a fatal condition in neonates.
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# HEALTH SCIENCE AND DENTISTRY SESSION
## (SESJA NAUK O ZDROWIU I DENTYSTYCZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**54. Impact of PM 2.5 on diabetes-related health statistics in Poland from 2015 to 2017**

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**Introduction:** Air pollution is one of a leading health problems across the world. It consists of a number of different pollutants such as SO2, CO, PM10 and PM 2.5. A recent meta-analysis shows PM 2.5 levels association on type II diabetes mellitus (T2DM) and gestational diabetes (GD). There are no current studies regarding the existence of a link between PM 2.5 and type I diabetes mellitus (T1DM). In this paper authors conduct a statistical analysis to reveal an existence of a correlation between PM 2.5 levels in Poland and diabetes associated healthcare statistics in Poland.

**Aim:** The aim of the study is to determine an existence of a correlation between PM 2.5 levels and diabetes-related health statistics in Poland using available data.

**Materials and Methods:**

*Source of air quality data* The data was extracted from public records of polish Chief Inspectorate for Environmental Protection (https://powietrze.gios.gov.pl/pjp/archives#; date of access: 21.01.2023). Then a model based on the data was constructed to extrapolate and calculate the yearly mean PM 2.5 level for each of the 16 voivodeships of Poland.

*Source of healthcare statistics* The data was extracted from public records of polish National Health Fund (https://shiny.nfz.gov.pl/cukrzyca/; date of access: 28.02.2023 and https://basiw.mz.gov.pl/mapy-dla-30-grup-chorob/; date of access: 25.11.2022)

*Statistical analysis methods* R project application was used for statistical analyses. A linear regression was calculated based on the combined data from three years (2015, 2016, 2017). Because the data comes from 16 voivodeships it was an insufficient sample to conduct a linear regression. Thus, a combined data from three years was used. Due to autocorrelation of data, the Newey-West estimator with a lag of 16 was used. For most of our data, the assumptions of linear regression regarding the normal distribution of residuals or linearity of residuals are not met. Some of models have outliers due to really small number of patients per 100000 citizens in voivodeships like Podlaskie, Warmińsko-Mazurskie and Małopolskie.

**Results:** The linear regression model of the relationship between the number of patients with the main diagnosis of diabetes who received specialist health services and PM 2.5 levels model showed a significant correlation - using the Newey-West estimator t statistic=10.055, p value <0.005. For comparison, using the least squares estimator t statistic=3.034, p-value <0.05. Linear regression models showed no significant correlation (p-value >0.05) between yearly mean PM 2.5 levels and:

hospitalisations with main diagnosis of the groups for diabetes of adults and paediatric diabetes for women, men and combined sexes.

number of patients with main diagnosis of the groups for diabetes of adults and paediatric diabetes for combined sexes.

**Conclusions:**

For every increase in a yearly mean PM 2.5 concentration by 1 µg/m3 the number of patients per 100,000 people who were provided with outpatient specialist services in any given voivodeship increased by 34.

Results of the study show a new potential tool to foresee the healthcare needs of population.

Caution is needed in explaining the variation in number of patients as the models help to explain only part of variability.

No correlation in other statistical groups does not eliminate the existence of the correlation - both available air quality and healthcare statistics data were of poor-quality undermining the statistical analyses.

**55. Orthodontic treatment in periodontal patients: a questionnaire study**

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**Introduction:** Periodontitis is a chronic inflammatory disease caused by many etiological factors (main ones being plaque and aggressive host's immune response). Periodontitis is widespread in the world and has affected about 50%. Teeth supporting and surrounding tissue loss and destruction causes loss of clinical attachment level and progressive tooth loss. Furthermore, it decreases occlusal height which in turn affects pathologic tooth migration (PTM), especially in anterior segments. This negatively impacts smile aesthetics, leads to impaired function, worsened quality of life, psychosocial well-being and general health. Treatment of periodontitis, especially advanced stages, is usually multidisciplinary, including a team approach, where orthodontic treatment has an important role in the overall rehabilitation of occlusion. Literature about subjects' with advanced stages periodontitis, understanding and willingness to seek orthodontic treatment is lacking.

**Aim:** The study aimed to determine subjects' with advanced stage periodontitis willingness to receive orthodontic treatment.

**Materials and Methods:** A full periodontal-orthodontic examination and questionnaire study was performed on 96 subjects ≥30 years, with advanced periodontitis. The questionnaire included 44 questions: demographic, dental, health related habits, self-perceived overall and oral health, knowledge of periodontitis, and attitude toward orthodontic treatment.

**Results:** More than half (67.7%) of subjects had stage III periodontitis. Only 9.4% of subjects had not had primary malocclusion. Class II malocclusion was the most common in subjects. 16% of subjects had orthodontic treatment before and almost half of the subjects had periodontal treatment before. Greater than 50% of subjects expressed willingness to receive orthodontic treatment. The foremost reasons for seeking orthodontic treatment were keeping their own teeth in good condition (29.6%), enhancing their beauty and functionality (16.7%) and both above motives – 53.7% . Nonetheless, many of the subjects were apprehensive about the price of the treatment. The greatest interest in orthodontic treatment reported subjects, who were systemically healthy, younger than 40 years, and had stage IV and grade C periodontitis ($p<0.05$). Subjects' knowledge about periodontal disease and interest in orthodontic treatment was significantly associated (OR=5.9, p=0.02). Also, there was a significant correlation between the clinical judgment of the need for orthodontic treatment and self-interest in orthodontic treatment (OR=2.9, p=0.01).

**Conclusions:** OT piqued the interest of more than half of the subjects. Age, oral health, and knowledge about periodontitis

all significantly predicted interest in orthodontic treatment. To preserve the natural dentition, it is crucial for both the dental community and elderly subjects to be informed of orthodontic treatment options in the advanced stages of periodontitis.

## 56. The Impact of Sweeteners on the Human Digestive System

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**Introduction:** The growing concerns about the adverse effects of saccharose, sucrose and glucose-fructose syrups consumption led to an increased trend of sugar-free foods intake. As such sweetening agents with lower calorie content per gram and frequently many times higher sweetening intensity compared with sucrose are consumed on a regular basis. Despite being considered safe for consumption and generally well-tolerated, their effects on the composition of human microbiota, intestinal epithelium and severity of adverse effects are yet to be evaluated. The aim of this review is to discuss the evidence supporting the effects of nonnutritive sweeteners, both synthetic and natural sweeteners as well as nutritive sweeteners on the human digestive system.
**Methodology:** This systematic review adhered to the Preferred Reporting Items for Systematic Reviews and MetaAnalysis (PRISMA) guidelines. An electronic database search was conducted using PubMed, Google Scholar and JSTOR (as of 2 January 2023 ). The search terms included all combinations of the keywords concerning the research topic.
**Results:** Data analysis showed that many sweetening agents affect the digestive system, either by inducing changes in the composition of gut microbiota, or contributing to intestinal cell damage. To our knowledge, saccharin, sucralose, steviol glycosides, neohesperidin dihydrochalcone, lactitol and xylitol affect the composition of human microbiota. The following sweeteners: isomalt, maltitol, lactitol, and xylitol are characterised by prebiotic properties and increase the numbers of Bifidobacteria. The most common side effects reported by consumers are: nausea (acesulfame K, aspartame, saccharin), vomiting (aspartame, saccharin), diarrhoea (saccharin, polyols). Sweeteners are also not deprived of serious adverse effects, as some of them may contribute to intestinal cell damage. The detrimental effects of these substances include increased intestinal permeability (Acesulfame K, Aspartame, Sucralose, Saccharin, Neotame), modified inflammatory response (Acesulfame K, Sucralose, Cyclamates, Steviol glycosides), cell death induction or decreased viability (Aspartame, Saccharin, Neotame). Furthermore, sweetening agents may impede functions of crucial organs - pancreas (Acesulfame K), liver (Aspartame, Sucralose, Saccharin, Steviol glycosides) or kidneys (Aspartame, Sucralose, Saccharin, Steviol glycosides). Some of them also negatively affect carbohydrate metabolism (Saccharin, Steviol glycosides) and water-mineral balance (Glycyrrhizin). As there is no clear evidence for sweeteners to be advised or not for use on a regular basis, further research on their health impact should be undertaken.
**Conclusions:** The effects of sweeteners on gut microbiota have not been fully understood. Currently it is known that some sweetening agents induce changes in microbiota composition and alter functions of crucial organs. Further studies are needed to define whether the changes observed in the intestinal microbiota in animals are present in humans and to study the effects of sweeteners for which evidence is not available so far. With the increasing trend of sweeteners consumption there is an urgent need of new well-designed, long-term, double-blind, placebo-controlled, randomised clinical trials with appropriate doses and adequate subject sizes to evaluate the impact of sweeteners on the digestive system.

## *POSTER SESSION*
## *(SESJA POSTEROWA)*

### 57. Impact of clear aligners treatment on masticatory muscles activation: a systematic literature review

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**Introduction:** Clear aligners therapy (CAT) is the most popular orthodontic treatment for people who seek an invisible treatment [1]. However, patients frequently worry that the pain they will experience during orthodontic treatment will negatively impact their quality of life. This worry frequently results in functional limitations, particularly in the masticatory function [2].

**Aim:** To analyze the impact of clear aligners treatment on masticatory muscles activation.

**Methods**: A systematic literature review was performed according to PRISMA statement. The search with keywords “clear aligners”, “masticatory muscles”, “orthodontics” was performed between February 5 and February 10 in PubMed, Google Scholar, ScienceDirect. Of the 979 results, only those which identified the impact of clear aligners treatment on masticatory muscles activation were collected. 24 articles were assessed for eligibility, 7 of them were included in this review. Inclusion criteria: research articles published less than 5 years ago, studies in English language, prospective clinical studies, controlled and randomized clinical trials. Exclusion criteria: pilot studies, systematic reviews, case reports or series. The quality of each study was evaluated using the Appraisal tool for cross – sectional studies and was analyzed by two authors.

**Results:** In 7 studies, 164 patients with CAT were included. In 6 studies masticatory muscles activation was observed with surface electromyography test (sEMG) [3, 4, 5, 7, 8]. Other studies used pressure pain thresholds (PPTs) [6] and chewing efficiency tests [9]. According to one study, the sEMG activity of the anterior temporalis and masseter muscle was analyzed during CAT. The sEMG activity showed no significant difference on temporalis muscle ($p > 0,05$), but there was a significant reduction of the masseter muscle at mandibular rest position after one month of treatment ($p < 0.05$) [3]. Increment of EMG activity of masseter muscle was also recorded in another study. The major increase in EMG activity was by using the dummy aligner (152%; P \0.001) and first active aligner (155%; P \0.001). However, during the second active aligner stage, the activity of the masseter significantly decreased [4]. On the other hand, one study showed no significant correlation of muscle activity in patients during CAT ($p > 0.05$) [5]. In addition, the masticatory muscle soreness was studied with the PPTs test. Mild muscle soreness was noticed by all aligners ($p < 0.05$). Compared to dummy aligner, the first active aligner produced less soreness ($P < 0.001$) [6]. The masticatory muscle activity was also studied while sleeping with a clear aligner. During four recording nights the contractions of masticatory muscles were similar, but it was not statistically significant ($p > 0.05$) [7]. In patients with CAT the muscular function was evaluated. The analysis showed stable or improved percentage overlapping coefficient (POC) of temporalis and masseter muscles in aligner occlusion and decreased POC in centric occlusion ($p > 0,001$) [8]. The masticatory function of patients with clear aligners was analyzed by chewing efficiency test. The study showed that chewing with or without clear aligners had no significant difference ($p > 0.05$) [9].

**Conclusion:** The masticatory muscle activation can be affected during orthodontic treatment with clear aligners therapy. However, there is no significant evidence that clear aligners therapy is a predisposing factor for masticatory function.

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## 58. Reasons for the failure of fixed orthodontic retainers: a systematic literature review

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**Introduction:** Teeth typically return to their primary positions on their own after orthodontic treatment [1]. Fixed retainers are used for the prevention of relapse [2]. They are invisible, fixed in place, and appear to be safe over the long term for the majority of patients, therefore, they are usually well accepted. However, fixed retainers might be linked to failure, like detachment or fracture [3]. There are benefits and drawbacks to each retention strategy, which has a variety of methods [4].

**Aim:** The aim of this study is to evaluate the reasons for the failure of fixed orthodontic retainers.

**Methods:** The protocol of the systematic review is according to PRISMA requirements. The electronic search was performed from 2 March till 9 March in databases: PubMed, Google Scholar, ScienceDirect. Following keywords were used: fixed retention, lingual retainer, and bond failure. Inclusion criteria for the articles were: published less than 5 years ago, in vitro and in vivo studies, written in English, evaluating reasons for the failure of fixed orthodontic retainers. Exclusion criteria: pilot studies, case reports, systemic or literature reviews, meta-analysis. Eligible literature was assessed for the risk of bias using the Appraisal tool for cross–sectional studies and was critically appraised by two authors.

**Results:** A total of 979 initially identified articles were found and full texts of 36 articles were read and assessed for eligibility, 7 of them were included in this review. In all studies, 565 fixed orthodontic retainers were used. Three studies were performed in vitro [1, 6, 8] and four in vivo [4, 5, 7, 9]. Reasons for the failure of fixed orthodontic retainers were observed by testing different types of composites [1], orthodontic wires [4, 5, 6], and retainer placing techniques [7, 8, 9]. Composite type effect on retainer adhesion was evaluated in one study. Flowable nanocomposite showed a lower mean detachment force and higher total failures compared to orthodontic resin ($P<0.05$) [1]. The failure rate was also analyzed between CAD/CAM and lab-based groups using multistranded stainless steel (SS) wires, and SS Ortho-FlexTech wires. It varied from highest to lowest for the lab (43.8%), CAD/CAM (25%), and control group (14.3%), but it was not statistically significant ($P=0.19$) [4]. A significant difference was found between fiber-reinforced composite (FRC) (42.94%) and SS retainers (42.94%) failure rate ($P=0.012$) [5]. In addition, retainers can be affected by vertical load, which has a significant effect on the failure of bonded retainers ($P<0.05$). The flat braided wire had a higher debonding force compared to FRC [6]. Different retainer placing techniques can also lead to failure [7, 8, 9]. In patients, the effect of direct and indirect bonding was evaluated. Direct bonding had a lower failure rate (4.17%) compared to indirect bonding with the same adhesive (6.67%). However, no significant association was established ($P>0.05$) [7]. Universal adhesive reported less detachments compared to the traditional orthodontic primer ($P<0.05$) [8]. Sandblasting (11.8%) effect on the risk of failure was also evaluated, but it was not significant compared to the non-sandblasting group (11.3%) ($P=0.88$) [9].

**Conclusion:** The main reasons for the failure of fixed orthodontic retainers are detachment and fracture. It can be caused by different factors, including wire types used for the construction of bonded retainers, methods and materials used for placing, and the influence of debonding force.

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### 59. Attitudes towards new generation smoking products

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**Objective.** To identify the biological and social factors influencing the attitudes of the Lithuanian population towards nicotine-containing products as a public health problem.

**Methodology.** An anonymous voluntary survey was carried out in 2020 with 642 people of all ages (18-89 years): 500 (77.9%) women and 142 (22.1%) men. Of these, 283 (44.1%) were smokers, 234 (36.4%) had never smoked and 125 (19.5%) had quit smoking. A questionnaire based on attitudes towards new smoking methods was used for the survey. The data was processed with SPSS 17.00 software. The statistical significance of the difference in results between groups was determined using the $\chi 2$ test and the difference in data was considered statistically significant ($p<0.05$).

**Results.** The mean age of the respondents was 28.36 ± 11.74 years. A statistically significant correlation was found between smoking and the perception that e-cigarettes are a healthier choice than conventional cigarettes ($p<0.001$). Among the respondents, 81.8% of smokers 'strongly agree' that e-cigarettes are a healthier choice than conventional cigarettes, and 56.7% of those who say they 'agree' with this statement. 34% of e-cigarette smokers report that they have started smoking e-cigarettes as a healthier alternative to cigarettes. Meanwhile, non-smokers make up the majority of respondents who "strongly disagree" with the statement, 43.5%, and non-smokers make up 44.8% of those who disagree. A statistically significant association was found between smoking and the perception that combustible tobacco products are a healthier choice than regular cigarettes ($p<0.001$): among those who "strongly agree" with the statement, smokers account for 78.4% and among those who do not agree, 58.9%. Among smokers, 39.7% of those who smoke combustible tobacco reported having started smoking it as a healthier alternative to cigarettes. There was a statistically significant association between smoking and the perception that smoking of combustible tobacco products in public places should be restricted ($p<0.001$): 78.5% of smokers who 'strongly disagree' with this statement are smokers, although 40.7% of smokers reported having learned about combustible tobacco products from people who smoke in public places. A statistically significant correlation was found between smoking and the perception that e-cigarette smoking in public places should be restricted ($p<0.001$): 77.9% of those who "strongly disagreed" and 66.2% of those who "disagreed". Albeit 18% of e-cigarette smokers found out about e-cigarettes when they saw smokers in public places.

**Conclusions.** A statistically significant correlation was found between smoking and the perception that next-generation smoking methods (combustible tobacco, e-cigarettes) are a healthier choice than conventional cigarettes, i.e. smokers are more likely to consider next-generation smoking methods to be healthier. These results can be interpreted as marketing of smoking tobacco and e-cigarettes to smokers, positioning these smoking methods as healthier alternatives to cigarettes. A statistically significant association was also found between smoking and the perception that smoking of combustible tobacco products and e-cigarettes in public places should be restricted, i.e. smokers are more likely to oppose restrictions on combustible tobacco and e-cigarettes in public places. Smokers' lack of awareness of how their introduction to the new and rapidly growing smoking methods began may also contribute to these results.

### 60. The influence of gut microbiota activity on human mental health

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**Introduction:** According to the estimates of the World Health Organization, by 2030 depression will be the most common disease in the world. The review paper presents the importance of intestinal microflora and its impact on human mental health.

**Methodology:** Scientists studied the ability of intestinal microbes to synthesize neurotransmitters, short-chain saturated fatty acids, in particular butyric acid, as well as the role of microbiota in the expression of endocannabinoid receptors.

**Results:** Our analysis shows a strong correlation between microbiota activity and the prevention of depressive states. Studies show that the intestinal microbiota is able to produce both stimulating and inhibiting neurotransmitters and affect neuroprotection by producing SCFA.

**Conclusions:** Probiotic therapy of specific bacterial strains, prebiotic therapy with sodium butyrate and promoting an appropriate diet rich in fermented food may lead to the prevention of depressive states as well as maintaining good mental health of the population.

# HAEMATOLOGY, ONCOLOGY AND INTERNAL MEDICINE SESSION
## (SESJA HEMATOLOGICZNO-ONKOLOGICZNO-INTERNISTYCZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**61. Comparison of the nutritional status of oncology and non-oncology patients after haematopoietic stem cell transplantation**

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**Introduction:** Hematopoietic stem cell transplantation (HSCT) has been used for many years to treat various malignant and nonmalignant diseases with damaged or defective bone marrow or immune system. Patients after HSCT are at high risk of malnutrition. Nutritional status may be affected by complications of the underlying disease, the HSCT procedure itself, or post-transplantation treatment. Increased need for nutrients following HSCT is particularly threatening for patients in the developmental period. Moreover, oncological patients may already be malnourished before transplantation.

**Aim:** The aim of the study was to compare the nutritional status of oncological and non-oncological patients after HSCT.

**Materials and Methods:** The study group consisted of 270 pediatric patients who had undergone hematopoietic stem cell transplantation at least two years previously. All of them were patients of the Department of Bone Marrow Transplantation, Oncology and Pediatric Hematology "Przylądek Nadziei" in Wrocław. Patients were divided into 3 age groups. Nutritional status was assessed on the basis of biochemical blood parameters, anthropometric measurements using the InBody apparatus, a caliper and a measuring tape. Physical activity was assessed on the basis of International Physical Activity Questionnaires (IPAQ). The assessment of the diet was carried out in 202 patients from the entire study group using a three-day, 24-hour dietary recall and a frequency-based nutritional interview.

**Results:** In the 3-9 year-old group, oncological patients had statistically significantly higher concentrations of vitamin D3 in the blood than non-oncological patients. In the age group over 18 years, statistically significantly higher concentrations of triglycerides of total cholesterol and LDL cholesterol were found in oncological patients than in non-oncological patients. The greatest deficiencies in the intake of nutrients and minerals were observed in oncological patients aged 10-17 years, and the least in non-oncological patients aged 3-9 years. In all age groups, non-oncology patients had higher IPAQ values. Across all groups, higher levels of total protein and albumin in the blood were associated with an increase in muscle tissue, body water, and weight. The increase in the concentration of lipids and uric acid in the blood was associated with an increase in anthropometric parameters, indicating an increase in the content of adipose tissue. Anthropometric parameters indicating an increase in body fat were associated with lower concentrations of vitamin D3, folic acid, HDL cholesterol, lymphocytes, leukocytes, vitamin B12, and calcium.

**Conclusions:** Despite the passage of time since HSCT, both in oncological and non-oncological patients, biochemical tests showed malnutrition in the majority of the examined people. This phenomenon deepened with the age of the patients. The intake of nutrients, minerals, and vitamins was at a similar level in oncological and non-oncological patients, regardless of age. Diet affects anthropometric parameters in a similar way in both oncological and non-oncological patients.

**62. Influence of steroid therapy and diet on patients' body composition after hematopoietic stem cell transplantation depending on the severity of the graft versus host disease**

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**Introduction:** Hematopoietic stem cell transplantation (HSCT) is a life-saving procedure that helps many patients regain health. However, it is fraught with a high risk of post-transplantation phase complications occurring. One of them is graft versus host disease (GvHD), which often requires pharmacotherapy with glucocorticoids (GCs). Long-term systemic GCs use, especially in high doses, is a direct cause of side effects that may impair the functioning of the patients' organs and systems, which directly affects the patient's nutritional status and body composition. Assessment of patients' nutritional status is an extremely important element of medical care after undergoing the HSCT procedure.

**Aim:** The aim of the study was to evaluate the effect of steroid therapy and nutrition on the body composition of pediatric patients after HSCT, depending on the severity of graft versus host disease.

**Materials and Methods:** The study group consisted of 270 pediatric patients of the Department of Paediatric Bone Marrow Transplantation, Oncology and Haematology "Przylądek Nadziei" in Wrocław who underwent HSCT. Depending on the degree and severity of GvHD, patients were assigned to three groups, and then they were divided into three age subgroups. The assessment of patients' nutritional status was based on anthropometric measurements made with the InBody device, a measuring tape and a skinfold caliper. Additionally, blood biochemical parameters were used in the assessment. Moreover, a group of 202 patients from the study group underwent three-day, 24-hour dietary recall and frequency nutritional interviews.

**Results:** The comparison of patients without GvHD with mild and severe GvHD in three age groups showed differences in anthropometric measurements, blood biochemical parameters, as well as differences in nutrient intake. In all groups of patients with GvHD, the most frequently reported positive correlations included the lipid profile, glucose, insulin, homocysteine, and uric acid levels, as well as body fat content, body weight, BMI, WHR, arm and shoulder blade fat-skinfold thickness, and waist and hip circumferences. In all age groups, there were numerous statistically significant correlations between the intake of nutrients and vitamins and anthropometric measurements.

**Conclusions:** The use of glucocorticoid therapy and the severity of GvHD affect patients' diet and biochemical indicators of nutritional status. GC therapy and the severity of GvHD are related to the amount of muscle tissue and the amount of water in the teenage patients' bodies. In this group of patients, a distant consequence of steroid therapy is the disturbance of carbohydrate and cholesterol metabolism. The supply of minerals, vitamins, and fiber, regardless of the age group, affects body composition. Patients who have

undergone HSCT should be educated on diet and supplementation, both in the initial period after transplantation and in the long-term context. They should be provided with long-term medical and dietary care.

### 63. Case report of relapsed Philadelphia-negative B-cell precursor acute lymphoblastic leukemia successfully treated with inotuzumab ozogamicin and allogeneic hematopoietic stem cell transplantation from a HLA-mismatched unrelated donor followed by pre-emptive donor lymphocyte infusion

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**Introduction:** Remarkable advances has been achieved during the last years in the field of targeted immunotherapies for acute lymphoblastic leukemia (ALL). Great progress has also been made in allogeneic hematopoietic stem cell transplantation (alloHSCT) from donors partially mismatched in antigens of the human antigen leukocyte antigen (HLA) system, thanks to a novel approach to preventing graft-versus-host disease (GvHD). The advent of monoclonal antibodies, including naked anti-CD20 antibodies, anty-CD19 bispecific T-cell engager blinatumomab, and anti-CD22 antibody-drug conjugate (ADC) inotuzumab ozogamicin (InO) is changing the management landscape of the B-cell precursor (BCP) ALL, which traditionally relied on chemotherapy-based approaches. Historically, in the era of chemotherapy, the prognosis of adult patients with relapsed or refractory (R/R) ALL was very poor. The remission rate after relapse did not exceed 30-40% and a median survival time was less than 6-8 months, even in patients who achieved a second remission and received alloHSCT. InO offers the novel approach of an ADC specifically delivering the potent chemotherapy drug calicheamicin to CD22-expressing cells. It is noteworthy that CD22 is expressed on leukemic blasts in >90% of BCP-ALL patients, and InO has shown impressive results in terms of high response rates and a high likelihood of proceeding to alloHSCT in R/R ALL.

**Case description:** Here, we present the case report of a patient, age 49, who has been remaining for two years in the third complete remission (CR) of BCP-ALL after treatment with chemotherapy, InO, alloHSCT and donor lymphocyte infusion (DLI). The patient was diagnosed with BCP-ALL in November 2018. The initial treatment was standard chemotherapy, consisting of remission induction and consolidation, followed by maintenance therapy according to the Polish Adult Leukemia Group protocol. The patient was not treated with alloHSCT in CR1 due to undetectable measurable residual disease (MRD) measured by flow cytometry and a favorable prognosis. After one year of continuous CR, in January 2021 a relapse of ALL was diagnosed with 76% of CD22+ lymphoblasts revealed by bone marrow examination. The patient received two cycles of InO and achieved second CR with negative MRD. Due to the COVID-19 diagnosed in previously identified matched unrelated donor (MUD), it was not possible to perform alloHSCT at the scheduled time. A second relapse occurred in August 2021. InO was administered again allowing to achieve a third MRD-negative CR. The decision was then made to proceed to alloHSCT from the only available MUD, incompatible in the two HLA antigen. Allotransplant was performed in November 2021 with modern GvHD prophylaxis based on the use of post-transplant cyclophosphamide given in high doses after infusion of allogeneic HSC. Despite incompatibility in HLA antigens between donor and patient, GvHD was not observed after transplantation. Due to the detection of positive MRD after alloHSCT, post-transplant immunosuppressive treatment was reduced very quickly and DLI was applied. MRD eradication was achieved, and the patient has been remaining for more than a year in MRD-negative CR, without significant post-transplant complications.

**Conclusions:** The presented case report of recurrent BCP-ALL illustrates highly effective modern personalized immunotherapy of hematologic malignancy and the possibility of crossing the HLA barrier in allogeneic HSCT.

### 64. Multiple endocrine neoplasia type 1 (MEN1) syndrome

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**Introduction:** Multiple endocrine neoplasia syndrome type 1 (MEN1) is a rare genetic disorder that is inherited autosomal dominantly. MEN1 is familial in 80-95% of cases and in 5% of cases the disease is caused by a de novo mutation. MEN 1 syndrome usually manifests itself in the 4th-5th decade of life. The cause of this disease lies in the mutation of the MEN1 gene, which encodes a suppressor protein - menin. Lack of synthesis of this protein leads to the development of multiple proliferative lesions in the form of hyperplasia, adenomas and carcinomas in the endocrine glands - e.g. pancreas, gastrointestinal tract, parathyroid glands and pituitary. We are going to present the case of a patient whose diagnosis of MEN-1 syndrome was made during the diagnosis of hyperparathyroidism.

**Case description:** 52- years old women was admitted to the Endocrinology Department to extend the diagnostic of the hyperparathyroidism, which was diagnosed randomly about 3 years ago by a leading endocrinologist - checks for multinodular goiter. After admission medical history has revealed genetically confirmed MEN 1 syndrome in patient's cousins - two brother's daughters. Moreover, patient's brother died at age 56 due to pancreatic cancer and there was the history of pancreatic and thyroid malignancy in family members. While hospitalization there was confirmed primary hyperparathyroidism. There was a hypoechoic focal lesion in the lower pole of the left lobe ( dimensions: 11x4mm), and two hypoechoic focal lesions (6x4mm and 11x5mm) below the right pole of the left lobe. The lesions were richly vascularized and may have corresponded to parathyroid glands. Scintigraphic examination (Tc+MBI) showed a focus of increased tracer accumulation from the back of the right lobe of the thyroid gland (may correspond to adenoma/hypertrophy of the right parathyroid gland) and a average accumulation of Tc+MBI complex in the left lobe cast (hypertrophy of the lower left parathyroid gland). On suspicion of MEN 1 syndrome, despite the absence of any abnormalities abdominal ultrasound image, abdominal CT scan was performed. The CT reveal 1.5cm in size pancreatic lesion, possibly corresponding to a pancreatic neuroendocrine tumor. Pituitary MR imaging showed no pathologic structures in the pituitary-hypothalamic region. Hormonally normothyroidism, anterior pituitary lobe normal. Hormonal activity of the pancreatic lesion was excluded. In order to extend the diagnosis of the pancreatic lesion, PET-FDG was performed. No pathologic radioimmunoassay activity. A Ga-68 DOTATATE scan was performed, which confirmed a neuroendocrine lesion in the head of the pancreas, in addition to 2 small lesions in the pancreas < 1 cm. The patient was qualified for surgical

treatment of hyperparathyroidism. The pancreatic lesions were left for observation, biopsy of pancreatic lesions scheduled. Men 1 syndrome was genetically confirmed. At the present time 3 patient's daughters are waiting for genetic testing.
**Conclusions:** The diagnosis of MEN 1 syndrome dramatically changes the diagnostic and therapeutic management of patients. The diagnostic and therapeutic management requires individual and careful analysis of the entire clinical picture and observation of the patient for life. First-degree relatives should undergo genetic testing for MEN1 gene mutations.

### 65. Multiple endocrine neoplasia type 2 (MEN2)

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**Introduction:** Multiple endocrine neoplasia type 2 (MEN2) is a rare autosomal dominant inherited syndrome, caused by germinal mutation of RET gene. It is characterized by medullary thyroid carcinoma (MTC), which is usually the first symptom, the tendency to the coexistence of pheochromocytoma (PCC) and primary parathyroid hyperplasia. MEN2 is classified into MEN2A or MEN2B depending on the location of mutation occurring in RET protooncogene. In both types MTC and PCC are present, however, in MEN2A there is a significant risk of hyperparathyroidism whereas in MEN2B mucosal neuromas and marfanoid habitus are observed. The first line of therapy is surgical treatment.
**Case description:** A 35-year-old female was admitted to the Endocrinology Department due to high blood pressure (230/160 mmHg) with paroxysmal headaches, congestive sweats, nausea, vomiting and large bilateral masses (8,5 x 7,4 x 9,3 cm in right adrenal field, 3,7 x 3,1 x 3,7 cm in left adrenal field; resembled as pheochromocytomas) described in the abdominal ultrasound. Additionally higher levels of NTproBNP and left ventricular concentric hypertrophy were present. Laboratory tests revealed high vanillin-malic acid concentrations of daily urine collections 28.27 mg/day (reference values 0-6.6 mg/day). The values of metanephrines were 3920.29 ug/day and 6974.59 ug/day (reference values 0-320 ug/day). Additional tests reveal high calcitonin level (563pg/ml (normal up to 11.5 pg/ml) and increase parathormone concentration (99.7 pg/ml (reference values of 11- 57 pg/ml). Thyroid function was normal. Thyroid ultrasound showed a homogeneous parenchymal structure with normal echogenicity and the presence of a left thyroid nodule with ACR-TIRADS 5. CT scan of the abdomen and pelvis showed a large tumour in the right adrenal field (8.45 x 8.1 x 10 cm) of heterogeneous density with dense fluid spaces occupying more than half of the lesion volume, having a network of enhancing vessels. PET-CT with FDG showed a metabolically active proliferative process in the thyroid gland and metabolically mild nodular lesions of both adrenal glands. In addition, a nodule of the left lower lobe without increased metabolism was found. 68Ga-DOTATATE scintigraphy was performed, which showed no focal elevated radioiodine accumulation characteristic of a neuroendocrine tumour with high expression of somatostatin receptors. The patient was referred for a targeted fine-needle aspiration biopsy of the thyroid. Atypical thyrocytes were present in the BACC, whose morphology and immunohistochemical profile are consistent with medullary thyroid carcinoma type [Thy VI] according to the Bethesda system. The patient was admitted to the Department of Oncologic Surgery for treatment. There was bilateral adrenalectomy and complete removal of the thyroid gland and central neck lymph nodes. The patient's genetic test results revealed a pathogenic variant (c.1900T>A; p.Cys634Ser) in the RET gene in a heterozygous pattern, which, in combination with the clinical picture and imaging and laboratory tests, gives a diagnosis of MEN2 syndrome.
**Conclusions:** Taking into account the clinical picture and course of the disease in young patients diagnosed with pheochromocytoma of the adrenal glands, it is necessary to extend the diagnosis to include the other components of MEN 2 syndrome and genetic examination, also the family members.

### 66. IgG4-related disease in patient with orbitopathy - case report

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**Introduction:** IgG4-related disease is a chronic, fibro-inflammatory condition characterized by lymphoplasmatic infiltration of IgG4-positive cells and storiform fibrosis, frequently involving elevation of serum IgG4. Among various manifestations of the disease there could be an ophthalmic region affected which is clinically presented as proptosis, inflammation and pain that may mimic Graves' orbitopathy.
**Case description:** A sixty-one-year-old female, refugee from Ukraine, was admitted to the endocrynology clinic with suspected of Graves' orbitopathy. She suffered from bronchial asthma, hypertension and five years ago had been treated for Graves' orbitopathy with intravenous routes of glicocorticosteroids in Ukraine. On admission proptosis, eyelids and conjuctivas redness as well as eyelids swelling and lacrimation were presented. Blood tests revealed euthyreosis and absence of thyroid stimulating hormone (TSH) receptor antibodies (TRAB). In thyroid ultrasound multiple nodules were found, although the gland was not enlarged. Based on clinical examination and the patient's past medical history, she was qualified for treatment with intravenous glucocorticosteroids routes which relieved the symptoms. During hospitalization additional tests showed elevated IgG4 serum range and orbital MRI revealed enlarged extraocular muscles and lacrimal glands which raised suspicion of IgG4-related disease. The histological examination of lacrimal glands confirmed the diagnosis and the treatment was reduced to small dose of oral prednisone.
**Conclusions:** IgG4-related disease should be considered as a differential diagnosis of Graves' orbitopathy, especially in euthyroid patient without TSH receptor antibodies.

### 67. Repairment of injured obturator nerves during C1 hysterectomy (Querleu-Morrow classification) in two instances of cervical cancer-case reports

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**Introduction:** Obturator nerve is a mixed nerve that is a part of lumbical plexus. It is the only lumbical plexus's branch that partially is located in lesser pelvic. Taking that into consideration, the obturator nerve can be injured during pelvic lymphadenectomy. Obturator nerve damage is a rare

complication of hysterectomy (it occurs in 0.02% of these procedures).
**Case description:** In our research we are going to present two cases of obturator nerve injuries that had taken place during C1 hysterectomy (Querleu-Morrow classification). Both patients were hospitalised because of Ib (FIGO classification) cervical cancer.
**Conclusions:** In those cases repairment was carried out in two different ways. In the first instance the nerve was stitched in end-to-end method, and in the second case both ends of the nerve were stitched to the iliopsoas muscle.

### 68. Impact of visual-spatial ability on specific laparoscopic skills

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**Introduction:** The actual potential of a laparoscopic procedure, beyond equipment constraints, depends on the precision and specific skills of a surgeon. One of the factors positively affecting the acquisition of such skills is the stereoscopic vision ability, which will be summarized and explained in this poster.
**Aim:** The analysis of the relationship between the level of psychomotor skills in participants without any laparoscopic experience and the results obtained over time (learning outcome) of performing specific laparoscopic exercises such as camera navigation, hand-eye coordination and bimanual coordination.
**Materials and Methods:** Our conclusions are based on the results of research carried out on Wrocław Medical University students who had no previous laparoscopy experience. In the first stage of the analysis, an assessment was conducted for baseline psychomotor skills using a battery of the Vienna Test System (VTS). Then, the level of competence in basic laparoscopic skills: camera navigation, hand-eye (HE) coordination and bimanual (Bi) coordination was assessed on The Laparoscopic Skills Testing and Training model (LASST). Their skills were verified on the first, third, fifth and seventh day of the study.
**Results:** The analysis of the data revealed statistically significant positive correlations between spatial vision and camera navigation (r = 0.397) and hand-eye coordination (r = 0.390) both in the final result and on the first day of the study.
**Conclusions:** Presented data lead us to main conclusions: the level of the acquired skills for stereoscopic vision is a significant factor that determines predispositions and final results of the laparoscopy training. Furthermore, it indicates that spatial-vision is a skill that should be developed as a part of medical training.00

### 69. Large-sized retroperitoneal sarcoma

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2 Studenckie Koło Naukowe Onkologii
**Introduction:** Soft tissue sarcomas are a relatively rare, heterogeneous group of cancers with high aggressiveness, but less likely to metastasize than carcinomas. Retroperitoneal sarcomas are most often found accidentally during casual imaging diagnostics, and because they cause non-specific symptoms or remain asymptomatic, they often reach considerable size.
**Case description:** A 70-year-old patient came to the urology clinic with a suspicion of a tumor of the left kidney, which was placed in another centre. He is chronically ill with arterial hypertension, bronchial asthma and hypothyroidism, which are pharmacologically compensated under the supervision of a physician. He had a history of nocturia three/four times a night, a weak urine stream in which he did not notice blood or experience urgency. He also reported a fall from a ladder 8 months ago, which he associated with the existing ailments. In the family history, he reported cancer of the reproductive organs in his mother. The patient had previously been referred for a computed tomography scan performed by another center, which described changes in the area of
**Conclusions:** Radical tumor resection remains the recommended treatment option. The tumor is usually not confined by the fascia and can easily infiltrate surrounding structures. This often requires multi-organ resection.

## *POSTER SESSION*
## *(SESJA POSTEROWA)*

### 70. The anticarcinogenic mechanism of metformin

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The cellular mechanisms responsible for the therapeutic effects of metformin are still not fully understood. Metformin is one of the most frequently used drugs in the treatment of type II diabetes mellitus and insulin resistance as well as in Polycystic Ovary Syndrome (PCOS). Studies of patients struggling with type II diabetes have shown a lower incidence of cancer in those treated with metformin compared to the ones treated with sulfonylurea derivatives. Chemically, metformin is a biguanide derivative - 3-(diaminomethylidene)-1,1-dimethylguanidine, and it's still widely studied effects include sensitisation of the body's tissues to insulin, increased peripheral glucose consumption and reduced hepatic gluconeogenesis, leading to reduced glucose secretion. It has also been reported that a significant inhibition of fatty acid oxidation and a decrease in blood LDL and VLDL fractions occur.

In vitro studies have shown that the activity of metformin against gastric adenocarcinoma cells (AGS) includes induction of the 5'AMP-activated kinase - AMPK, which results in activation of the apoptosis pathway, resulting in inhibition of tumour growth. A glucose-dependent oncostatic effect against breast cancer cells has also been demonstrated. Under normal glycaemic conditions, there was activation of AMPK and inhibition of cell signalling pathways responsible for protein synthesis and cell proliferation. The results obtained may indicate a potential anticancer effect of metformin related to the induction of AMP-activated protein kinase 5'AMP (AMPK) which may positively contribute to the reduction of cancer risk in patients with type II diabetes. Moreover, hematological malignancies in which metformin has been used include: chronic lymphocytic leukaemia, chronic myelogenous leukaemia, acute lymphoblastic leukaemia, acute myeloid leukemia and multiple myeloma. As an example, in chronic myelogenous leukaemia, metformin is expected to overcome imatinib resistance by activating the extrinsic pathway, inducing autophagy.

The study authors indicate that metformin could find potential use as an adjunctive pharmacotherapy in the treatment of cancer patients with type II diabetes but in the absence of contraindications to the use of biguanide derivatives and interactions with chemotherapy as well as ongoing pharmacotherapy, however further multidirectional in vivo and in vitro studies in this direction should be conducted.

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### 71. A Comparison of the anticancer potential of CBG and CBG-A on colon cancer cell line - in vitro studies

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**Tutor:** Helena Moreira[1], Anna Szyjka[1], Ewa Barg[1]

**Introduction:** Colorectal cancer is, right after lung cancer, the largest cause of cancer deaths according to the WHO for the year 2020.[1] Cannabinoids derived from cannabis have shown promise in treating several cancers, which may help improve these statistics.[2] [3] In the present study we compare the effect of two cannabinoids: CBG-A and CBG. CBG-A (cannabigerolic acid) is an acidic precursor of CBG (cannabigerol), meaning that CBG-A is converted to CBG in a process called decarboxylation. [4] Decarboxylation is a chemical reaction that occurs when hemp is heated, roasted or vaporized. This process removes the carboxyl group from CBG-A, which converts it into CBG. [5] CBG is a non-psychoactive compound that is thought to have several potential health benefits, including anti-inflammatory and analgesic properties [6] which is particularly useful in cancer treatment.

**Aim:** This study was designed to evaluate the anticancer effects of two cannabinoids, CBG and CBG-A, on colon cancer cell line (SW480). The main objective was to compare the ability of these compounds to reduce cell viability and induce cell death in colon cancer cells. To better understand the anticancer capabilities of these compounds, their effect on ROS levels was measured by the DCF-DA test.. The overall goal of the study was to add to the expanding knowledge of the potential of cannabis in the treatment of colon cancer.

**Materials and Methods:** CBG and CBG-A isolated from hemp were provided by Biomifarm company. Concentrations of 1.5, 3, 6, 8, 10 and 12 µg/ml were tested on SW480 colon cancer cells. The MTT assay was used to evaluate cytotoxicity and calculate the IC50 value. The DCF-DA assay was used to assess the level of intracellular reactive oxygen species (ROS). In addition, the effect of the compounds on colon cancer cell viability was assessed using 3D spheroid culture.

**Results:** The calculated IC values were 7,693 µg/ml and 8,242 µg/ml for CBG and CBG-A, respectively. CBG showed higher ROS levels at doses of 3, 6 and 10 µg/ml in the DCF-DA assay compared to CBG-A. Dead cells were detected in 3D spheroid cultures at the concentrations 8 µg/ml and upward for CBG and at the concentration 10 µg/ml and upward for CBG-A. In the case of CBG-A scattering of cells forming the spheroid (disruption of the spheroid structure) was also observed, which was not observed in spheroids with CBG. However, CBG, unlike CBG-A, had a more noticeable effect on cell death in 2D cell culture.

**Conclusions:** In SW480 colon cancer cells, CBG and CBG-A both showed the ability to reduce cell viability. Compared to CBG-A, CBG was more effective in inducing cell death. The increased levels of ROS in CBG-treated cells suggest that oxidative stress may be a contributing factor to CBG-induced cell death. More research is needed to fully understand the processes underlying the therapeutic effects of CBG and CBG-A on colorectal cancer, although these results suggest its potential utility in this regard.

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# UROLOGY SESSION
## (SESJA UROLOGICZNA)

### *ORAL SESSION*
### *(SESJA USTNA)*

**72. Inguinoscrotal hernia of urinary bladder: a case report**

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**Introduction:** Inguinoscrotal herniation of the urinary bladder is a rare condition that occurs in only 1–4% of inguinal hernia cases. This condition usually develops in overweight men over 50 years of age. Due to the rarity of the condition, often atypical symptoms, or their absence - the inguinal bladder hernia is diagnosed in less than 7% of cases in the preoperative period. The aim of this report is to present a clinical case and to review the diagnostic methods of inguinoscrotal herniation of the urinary bladder.

**Case description:** A 50-year-old male patient presented to the Emergency Department because of hematuria lasting two weeks. Physical examination revealed a large scrotum and non-retracting inguinal hernia was suspected. According to patient anamnesis, 15 years ago patient experienced abdominal trauma and for recent 10 years must compress scrotum area in order to urinate (Mary's symptom). Computed tomography (CT) of the abdomen and pelvis revealed inguinoscrotal urinary bladder herniation. Patient was hospitalized in the Urology Department, surgical treatment was determined. Patient was operated under general anesthesia. During the surgery the urinary bladder was positioned back to its anatomical position after splitting the oblique muscles. Lichtenstein hernioplasty and percutaneous epicystostomy was performed. There were no post operative complications. Percutaneous epicystostomy was removed after 1 month.

**Conclusions:** Inguinal hernia of the bladder is is a rare condition that often is unrecognized until surgical interventions. Failure to recognize this condition in the preoperative period may be associated with bladder and urinary tract damage during surgery or various urological complications.

**73. Antitumor effect of sorafenib and its complex with the drugs delivery system of supramolecular ribbon-like structures on bladder cancer cells**

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**Introduction:** Supramolecular structures are increasingly used as drug carriers for cancer therapy. An example of such compounds is Congo red (CR). The incorporation of a drug into a carrier can decrease its toxicity, enhance targeted transport into the cell, and increase the solubility of the drug in water.

**Aim:** The aim of the study was to investigate the importance of PDGFR expression in a bladder cancer cell line, together with the in vitro evaluation of the effect of the drug alone and the drug in a complex with a carrier on bladder cancer cells.

**Materials and Methods:** Electrophoresis, DLS and UV-VIS spectroscopy were used to analyse the formation of complexes. The effect of sorafenib on tumour cell proliferation was evaluated using the MTS assay. cell viability was assessed by FACS analysis.

**Results:** The optimal carrier-drug molar ratio was determined and a preliminary evaluation of complex formation was made. The experiments revealed that the investigated compounds inhibited the proliferation of bladder cancer cells in a dose- and time- dependent manner. FACS analysis independently showed that tested compounds induced apoptosis.

**Conclusions:** Supramolecular systems can provide targeted delivery of therapeutic agents and may in the future be used in targeted anticancer therapy.

**74. Clinical assessment of the value of the sentinel node technique in patients with bladder cancer who underwent radical cystectomy with extended lymphadenectomy**

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**Introduction:** Currently used methods of detecting nodal metastases in the course of bladder cancer are characterized by low sensitivity. Bilateral extended pelvic lymphadenectomy is a recognized element of surgical treatment, however, its exact scope remains a matter of debate.

**Aim:** Clinical assessment of the value of the sentinel node technique in patients with bladder cancer who underwent radical cystectomy with extended lymphadenectomy.

**Materials and Methods:** The study included 66 patients who underwent radical cystectomy with bilateral extended lymphadenectomy, additionally using the sentinel node technique – SLN.

**Results:** The presence of nodal metastases was found in 23 patients. 229 sentinel nodes detected in 63 patients (95.35%) - average 3.44 sentinel nodes per patient (range 0-9)

**Conclusions:** The SLN technique is characterized by a high percentage of false negative results and low specificity, which means that it can currently be used only as an adjunct to lymphadenectomy, and not as a basic method for assessing the nodal status of patients with bladder cancer.

**75. The role of intraoperative transesophageal echocardiography in the management of renal cell carcinoma with atrial thrombus – case report**

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**Introduction:** Renal cell carcinoma is a common disease, and clear cell renal cell carcinoma is the most common histological type. Renal cell carcinoma has a tendency to infiltrate the venous system including the inferior vena cava and the right atrium of the heart.

**Case description:** We present the cases of two patients with renal cell carcinoma with stage IV tumor thrombus according to the Mayo classification, who underwent surgery under transesophageal echocardiography guidance.
**Conclusions:** Apart from standard imaging methods used in renal cancer with tumor thrombus reaching the right atrium of the heart, we consider transesophageal echocardiography to be a very useful tool in the diagnostic work-up, patient monitoring, and selection of appropriate surgical technique.

## 76. Diagnostic value of radio-guided sentinel node detection in patients with prostate cancer undergoing radical prostatectomy with modified-extended lymphadenectomy

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**Introduction:** In many malignancies, sentinel lymph node dissection (SLND) is being used as a nodal staging tool. We prospectively evaluated the diagnostic value of radio-guided sentinel lymph node (SLN) detection in patients with prostate cancer (PCa).
**Aim:** This study aimed to investigate the reliability of the radio-guided SLN detection technique for perioperative localization of LNs metastases as well as to map lymphatic drainage patterns of the prostate.
**Materials and Methods:** Forty-three patients with intermediate- or high-risk cN0cM0 PCa at conventional imaging underwent radical prostatectomy with modified-extended pelvic lymph node dissection (mePLND). A day before the planned surgery, a Tc-99m nanocolloid was injected into the prostate under the control of transrectal ultrasonography (TRUS). Preoperative single-photon emission computed tomography (SPECT-CT) imaging and intraoperative gamma-probe were used to identify SLNs. All positive lesions were excised, followed by mePLND. The excised lymph nodes (LNs) were then submitted for histopathological examination, which was used as a reference for the calculation of diagnostic parameters of the SLN technique for SPECT-CT and the intraoperative gamma-probe.
**Results:** In total, 119 SLNs were detected preoperatively (SPECT-CT) and 118 intraoperatively (gamma-probe). The study revealed that both SLN detection techniques showed a sensitivity of 90% and a specificity of 6.06%. The negative predictive value (NPV) was 66.67%. SLN technique would have correctly staged nine of 10 patients, which is the same result as in the case of limited LND. However, it allowed the removal of all metastatic nodes only in four of them. SLND would have comprised 69.7% of preoperatively detected LNs, and removed 13 out of 19 positive LNs (68.42%), respectively.
**Conclusions:** Radio-guided SLND has a low diagnostic rate and is a poor staging tool. ePLND remains the gold standard in nodal metastases assessment in PCa. Our study indicates that lymphatic drainage of the prostate and actual metastasis routes may vary significantly.

## 77. Artificial intelligence in prostate cancer

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**Introduction:** Prostate cancer is the most common cancer in male population. Accurate diagnosis and staging of prostate cancer are critical for selecting the optimal treatment strategy for patients. Artificial Intelligence (AI) techniques have emerged as promising tools to aid in the diagnosis, treatment planning, and monitoring of prostate cancer.
**Methodology:** We conducted a thorough search for original and review articles using the PUBMED/Scopus database until May 2022. Our search included several terms related to artificial intelligence, machine learning, neural networks and prostate cancer. The selection was made with the consensus of the authors.
**Results:** There are several types of AI that can be categorized based on their level of intelligence, functionality and application. The most common forms of AI are as follows: Machine Learning (ML), Deep Learning (DL), Neural Networks (NNs) and Computer Aided Diagnosis (CAD). CAD systems can detect prostate cancer by analyzing image features, such as texture, shape, and intensity, and comparing them to known patterns or models of normal tissue. DL has a similar role focusing on prediction using multilayer neural network algorithms. NNs consist of interconnected computer processors called "neurons", that have the ability to learn from their experiences in the training environment. NNs can be used to establish the lymph node status in patients with PCa or detect and analyze potential biomarkers. ML uses mathematical algorithms to identify patterns in data, making it a supporting tool for clinical decision-making concerning treatment options and general outcomes. AI systems can achieve high levels of accuracy in detecting and diagnosing prostate cancer; in certain cases, AI accuracy exceeds that of medical professionals.
**Conclusions:** AI techniques have the potential to revolutionize the diagnosis, treatment and monitoring of prostate cancer. The use of AI in prostate cancer care is expected to increase in the future, leading to improved patient outcomes and better overall management of this disease.

# BASIC SCIENCE SESSION
## (SESJA NAUK PODSTAWOWYCH)

### *ORAL SESSION*
### *(SESJA USTNA)*

**78. The influence of ketogenic diet on metabolism of cancer cells – literature review**

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**Introduction:** According to WHO, cancer is the second leading cause of death in the world. As social awareness of the risk posed by oncogenic factors increases, simultaneously increases the interest in natural anticancer properties. Research on the impact of diet on cancer is becoming more and more popular not only among scientists and physicians but patients as well. Diet is a known, modifiable cancer risk factor. An example of dietary behaviour leading to increasing the amount of ketone bodies is the so-called ketogenic diet. In this article we present current state of knowledge about the effect of ketone bodies on the metabolism of cancer cells. Providing a large amount of fatty acids with food, while lowering blood glucose levels, induces metabolic changes leading to ketogenesis – the formation of ketone bodies. Ketone bodies are intermediate metabolites of fatty acids. These are the following chemical compounds: 3-hydroxybutyric acid (BHB), acetoacetic acid and acetone. These compounds are completely oxidised, leaving no by-products, which makes them a source of significant amounts of energy for the body. Cancer cells are characterised by increased expression of genes that encode proteins responsible for invasion and migration leading to metastasis.
**Methodology:** The aim of this study was to present a systematic review of the literature on selected molecular mechanisms associated with inflammation and metastasis occurring in conditions of ketogenic diet. The materials were taken from the online medical knowledge database *PubMed*. Articles were searched using the following keywords: ketogenic diet, cancer, inflammation, 3-hydroxybutyric acid. The results were identified on the basis of abstracts and fullpapers as well as English-language original papers conducted both in vivo and in vitro.
**Results:** Studies show that elevated BHB level in the cell environment induced inhibition of MMP-9. MMP-9 and MMP-2 are metalloproteinases, a group of enzymes, proteins, that are involved in the reconstruction of the cell matrix. They participate in physiological processes, for example the angiogenesis. Metalloproteinases are overexpressed in the many types of cancers and cause excessive degradation of type IV collagen, which can allow the cell migration and facilitate metastases. Studies on mouse models of pancreatic cancer and glioma show that BHB has anti-inflammatory properties and may inhibit the migration of glioma cells. Induction of inflammation, suppression of immune response and angiogenesis are factors that create a conducive environment for cancer cells. BHB also inhibits inflammatory processes by inhibiting NF-κB, which affects the expression of pro-inflammatory genes.
**Conclusions:** Recent study shows the effect of a ketogenic diet on the alleviation of side effects of chemotherapy used to treat cancer. The ketogenic diet used as an adjuvant in multifactorial therapy may be a promising way to reduce the toxicity of therapy and improve the patient's quality of life during cancer treatment. It should be mentioned that there is still insufficient data on this subject worldwide. The results of described experiments indicate that the role of ketogenic diet used by patients' needs further more detailed research.

**79. Systematic literature review of molecular mechanisms of striae distensae**

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**Introduction:** Striae distensae (SD), commonly known as stretch marks, are a form of dermal scarring first appearing on the skin as erythematous or violaceous, then hypopigmented, atrophic linear striations. Undoubtedly, they are a significant problem that affects many social groups. Stretch marks can appear during puberty and in people with rapid weight change. They are also a side effect of corticosteroid use. Current studies show that up to 88% of pregnant women suffer from stretch marks during pregnancy, which makes them the largest group at risk of developing SD due to the accompanying hormonal changes. Despite the high availability of many therapeutic options, there is still no efficient method of dealing with stretch marks that would be safe for each patient and bring satisfactory results. Therefore, new treatment strategies based on the pathomechanism of SD formation are sought.
**Methodology:** In this study, we aimed to give a systematic literature review on selected molecular mechanisms underlying the transformation of healthy skin into dysfunctional skin with SD. The research was carried out of the biggest and most popular online medical knowledge database *MEDLINE* to find articles published in or before February 2023, using the keywords of striae distensae, stretch marks and gene expression. The results were then manually identified based on titles, abstracts, and full-texts, including English-language original papers in case of molecular differences between skin with and without stretch marks.
**Results:** Fifty-five articles were identified, with 6 being eligible for quality assessment. Clinical observations suggest that procollagen and fibronectin gene expression is significantly decreased in stretch marks, compared to healthy skin. However, the results of published studies on the regulation of the elastin gene are contradictory. The study, where a microarray analysis was performed, shows that the expression of genes involved in extracellular matrix (ECM) remodelling such as matrix metalloproteinase (MMP) genes is higher in SD. At the same time, decreased expression of MMP natural inhibitors genes was noticed. Depending on the evolutionary phases of striae distensae, the expression of different genes involved in the mechanisms of stretch mark formation was observed.

**Conclusions:** There are a few significant changes occurring in the skin affected by stretch marks that can be used as treatment points. Exploring the pathogenesis of SD from a genetic perspective may become a research hotspot in the future, which might be beneficial for formulating an effective clinical strategy. However, still little is known about the pathomechanism of SD formation and further investigation needs to be done in order to find new treatment options that would be safe for all patients, including pregnant women.

### 80. ADAR1 expression in different cancer cell lines and its change under heat shock

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**Introduction:** The RNA-editing enzyme ADAR1 is responsible for the adenosine-to-inosine posttranscriptional modifications and inhibition of IFN-mediated apoptosis and the response to cellular stress factors. All activities of this protein affect the regulation of gene expression, including those involved in cell cycle regulation, cell division, and apoptosis. Multiple studies have reported its role in cancer. High expression of ADAR1 is associated with poorer survival of oncological patients.

**Aim:** The aim of the study was to assess the differences in ADAR1 expression among various cancer cell lines and check whether it changes under cellular stress factors such as heat shock.

**Materials and Methods:** Cell culture was performed, and baseline ADAR1 expression was assessed in various tumor lines using RT-qPCR and Western-Blot. The change in expression under heat shock was evaluated in A549 and Calu-1 cell lines using the same methods.

**Results:** The study has shown significant differences in ADAR1 expression among different cancer cell lines, with the highest mRNA expression in HCT116 and the lowest in HGC, while the highest protein expression in MCF-7 and the lowest in HGC. There was no statistical significance in the change of the ADAR1 expression under heat shock in both mRNA and protein levels.

**Conclusions:** ADAR1 is expressed differently among various cancer cell lines, and heat shock does not alter its expression. However, more extensive studies are required to assess whether the expression is tissue conservative and if other stress factors may influence its level in the cell.

### 81. Characterization and quality evaluation of decellularized pig liver scaffold structure

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**Introduction:** Liver Tissue Engineering is a new innovative strategy to cope with two problems: the need for physiological models for pharmacological research and the lack of donor organs for transplantation. Decellularized scaffolds provide an ideal three-dimensional habitat for cell repopulation. However, quality assessment criteria for the 3D structure of scaffolds are fairly fragmented. As a result, we set out to create reliable structural evaluation methods for decellularized pig liver scaffolds.

**Aim:** The project aims to develop and characterize decellularized pig liver scaffold and understand the structure-function relationship in vitro by assessing early cell-matrix interactions.

**Materials and Methods:** Decellularization was performed by 1% TritonX-100, 1% and 0.25% SDS. ScaffAn software was used for quantitative analysis of high-resolution slide scans of HE stained scaffold sections from pig livers to compute variables that describe the sinusoidal network structure. The degree of preservation of certain matrix proteins (collagen type IV, collagen type I, fibronectin, laminin, elastin, and vitronectin) in the decellularized scaffold was checked by immunofluorescence and Western Blot analysis. Initial DNA quantification was done, and proteomic analysis is still being done to figure out which proteins are present. For cell-scaffold interaction the following cell types were used HepG2, HUVEC, and HDFs, as well as proliferation and early adhesion. Immunofluorescence staining of selected dECM proteins was combined with specific cell integrin's to gain information about the cells' ability to sense extracellular signals.

**Results:** The decellularization procedure generated a translucent white scaffold with gross anatomical features of native liver. HE staining confirmed the absence of nuclei and cytoplasmic content, and DNA content was less than 50ng/mg. Cell-matrix adhesion is crucial for researching cell motility and ligand interactions, HepG2 and HUVEC cell lines were used for early adhesion assay; histological evaluation revealed HepG2's presence in the parenchymal space. Tissue sections were stained with selected antibodies to verify the distribution of components in ECM. Immunofluorescence staining in co-localization experiments showed colocalization along the presumptive surface and sinusoidal space.

**Conclusions:** Decellularized porcine liver scaffolds preserve majority of the natural physiological ECM and retain intact vascular network while efficiently removing nuclear and cellular components. We also sought to learn more about the scaffold's structure and cell-scaffold interaction in order to contribute to the further development of protocols and successful scaffold repopulation.

## 82. Cytosine base editor BE3 efficiently introduces Recessive Dystrophic Epidermolysis Bullosa-causing mutations to Squamous Cell Carcinoma cells to obtain a model of a rare disease

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**Introduction:** Recessive Dystrophic Epidermolysis Bullosa (RDEB) is an inherited skin blistering disorder caused by mutations in the COL7A1 gene encoding collagen type VII protein. Aggressive Squamous Cell Carcinoma (SCC) complicating RDEB is the main cause of mortality among these patients, as surgical intervention is the only currently recommended treatment. Studying pathobiology and developing targeted drugs in rare genetic disorders (such as RDEB) is often hampered by inaccessibility of patient material or relevant cell and animal models. Keywords: Cytosine base editor; Recessive Dystrophic Epidermolysis Bullosa; Squamous Cell Carcinoma.

**Aim:** The aim of this study was to create a cell model for RDEB-associated SCC, using commercially available SCC cell line and CRISPR/Cas9 cytosine base editor (BE3) for precise introduction of patient-specific mutations in COL7A1 gene, by changing targeted cytosines to thymines (C>T), creating premature termination codons.

**Materials and Methods:** Mutations causing severe form of RDEB have been screened for availability of guide RNAs (gRNAs) able to introduce those mutations using cytosine base editor. After careful considerations, c.1732C>T (p.Arg578Ter) and c.4894C>T (p.Arg1632Ter) were selected and gRNAs targeting those loci were designed using RGEN BE-Designer Tool. Mutations in the COL7A1 gene were introduced to cultured cells of SCC cell line MET1 using Lipofectamine, mRNA encoding BE3 and either one of two designed gRNAs. Various ratios of gRNA to base editor mRNA were tested to assess their influence on editing efficiency and optimize transfection conditions. Three to five days post transfection cells were harvested and used for DNA and protein extraction. Editing efficiency was assessed using Sanger sequencing and analyzed with the EditR tool available online. Collagen type VII (Col7) expression was measured in Western Blot assay.

**Results:** Editing efficiency proved to be ratio-dependent with 2:1 ratio of gRNA to BE3 mRNA yielding lowest (24%) and 1:5/1:7 resulting in highest (66%) percentage of modified cells. Both selected gRNAs, targeted at introducing c.1732C>T and c.4894C>T mutations to COL7A1 gene, achieved similar results, editing around 60-70% of treated MET1 cells. Col7 protein levels in bulk populations of MET1 cells showed significantly decreased expression of COL7A1 gene product, even though overall achieved editing efficiency in introducing recessive mutations was less than 70%.

**Conclusions:** CRISPR/Cas9 cytosine base editor BE3 is a potent tool for precise genetic manipulations on a single-nucleotide level, allowing for efficient introduction of C to T (and effectively G to A) mutations. Editing efficacy of BE3 delivered as mRNA greatly depends on the ratio of guide RNA to base editor mRNA. Obtained cell models will serve to better understand the RDEB- SCC pathobiology and find novel treatment options. Targeting COL7A1 in MET1 cells (from SCC cell line) with BE3 constitutes a promising method to model RDEB-associated SCC for future drug screening and gene therapy development. Further research will focus on off-target editing analysis utilizing high-throughput sequencing and comparing mRNA with protein as available forms of base editors' delivery.

## *POSTER SESSION*
## *(SESJA POSTEROWA)*

### 83. Anticancer potential of CBD and CBD-HQ on colorectal cancer cell line – in vitro studies

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**Introduction:** Colorectal cancer (CRC) is an increasingly common cause of death both in Poland and worldwide. Its severe course is due to the aggressive nature of CRC cells showing high drug and immune resistance, which makes treatment much more difficult and worsens the prognosis of patients. In the last decade, interest in cannabis-derived substances has increased significantly due to their high anticancer potential. Cannabinoids, substances contained in cannabis (Cannabis indica Lam.), have an affinity for cannabinoid receptors and, in addition to their anticancer effects, exhibit analgesic and sedative activities, which are particularly important in the treatment of oncology patients. The CBG-HQ formulation is a cannabinoid extracted from cannabis that develops under natural conditions with constant exposure to the atmospheric agents. Such a process, where only a small part of the CBD will be converted into CBD-HQ, can take several years. Laboratory conditions allow this form of cannabidiol to be obtained in just a few days.

**Aim:** The purpose of this study is to compare the anticancer effects of cannabidiol (CBD) and its oxidized form hydroxy quinone cannabidiol (CBD-HQ) on a colon cancer cell line (SW480). To investigate their antiproliferative properties and effects on viability in 2D and 3D culture as spheroids. The work also aims to verify anti- or pro-oxidative properties. Our studies of CBD-HQ on 2D and 3D CRC cell cultures will outline its anti-tumor profile compared to the best-known cannabinoid, CBD.

**Materials and methods:** The anti-cancer potential of cannabinoids was explored using the colorectal cancer cell line SW480. Cells were cultured in recommended and supplemented culture media DMEM F-12. Samples of CBD and CBD-HQ were provided by BiomiFarm. The tested concentrations of the cannabinoids were as follows: 1.5, 3, 6, 8, 10 and 12 µg/ml. Assays were performed in 2D cultures: the MTT assay based on the assessment of cell metabolic activity to evaluate cytotoxicity and the DCF-DA assay to evaluate the content of reactive oxygen species in the cell to estimate anti- or pro-oxidant properties. Cytotoxic effects were further assessed in 3D spheroid culture giving an overview of the penetration properties of the applied cannabinoid preparations into the tumor.

**Results:** The results of the MTT test were converted into an IC50 value (half maximal inhibitory concentration) for each compound. CBD had an IC50 of 4,128 µg/ml, while CBD-HQ had the IC50 at 8,003 µg/ml. According to the DCF-DA test, The amount of ROS relative to the control sample was about 74 - 82% for CBD and about 66 - 70% for CBD-HQ. Both compounds tested showed an antioxidant effect relative to the control sample. CBD-HQ had a minimally stronger antioxidant effect than CBD. In 3D culture, it was shown that CBD-HQ had a stronger anticancer effect than CBD. At concentrations of 10 and 12 µg/ml, almost all cells forming the culture were dead, such a strong anti-cancer effect was also noticed with CBD but only at a concentration of 12 µg/ml.

**Conclusions:** The results show an anti-cancer effect for both substances, with CBD showing minimally better anti-cancer potential in 2D culture and CBD-HQ showing better anti-cancer effects in 3D culture. In addition, the lack of pro-oxidant properties with the current anti-cancer potential is beneficial, as we do not expose the body to mutations caused by the formation of reactive oxygen species during use. Both cannabinoids have the potential for further research to be implemented into anti-cancer therapy for colorectal cancer.

### 84. Potential of CBD, CBG and THC extracted from cannabis in the treatment of colorectal cancer – in vitro study

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**Introduction:** Colorectal cancer (CRC) is the second cause of cancer deaths in Poland. CRC is characterized by rapid, uncontrolled growth, as well as the tendency to metastasise. Due to the aggressive nature of the tumor, the primary method of treatment remains chemotherapy combined with surgery and radiotherapy, which has a positive effect in only some patients. Cannabinoids – substances derived from cannabis show affinity to cannabinoid receptors, analgesic and sedative effects, which are particularly important in oncology treatment, in addition to the high anti-cancer potential itself.

**Purpose:** The anti-cancer potential of cannabinoids was explored using the colorectal cancer cell line SW480. Cells were cultured in recommended and supplemented culture media DMEM F-12. Samples of CBD, CBG and THC were provided by BiomiFarm. The tested concentrations of the cannabinoids were as follows: 1.5, 3, 6, 8, 10 and 12 µg/ml. Assays were performed in 2D cultures, i.e. the MTT assay based on the assessment of cell metabolic activity to evaluate cytotoxicity and the DCF-DA assay to evaluate the content of reactive oxygen species in the cell to estimate anti- or pro-oxidant properties. Cytotoxic effects were further assessed in 3D spheroid culture giving an overview of the penetration properties of the applied cannabinoid preparations into the tumor.

**Materials and methods:** The anti-cancer potential of cannabinoids was explored using the colorectal cancer cell line SW480. Cells were cultured in recommended and supplemented culture media DMEM F-12. Samples of CBD, CBG and THC were provided by BiomiFarm. The tested concentrations of the cannabinoids were as follows: 1.5, 3, 6, 8, 10 and 12 µg/ml. Assays were performed in 2D cultures, i.e., the MTT assay based on the assessment of cell metabolic activity to evaluate cytotoxicity and the DCF-DA assay to evaluate the content of reactive oxygen species in the cell to estimate anti- or pro-oxidant properties. Cytotoxic effects were further assessed in 3D spheroid culture giving an overview of the penetration properties of the applied cannabinoid preparations into the tumor.

**Results:** The results of MTT assay were converted to an IC50 (half maximal inhibitory concentration) factor value for each compound. The lowest IC50 (4,13 µg/ml) value was calculated for CBD indicating that it was the most potent inhibitor of cell proliferation among the cannabinoids tested. CBG preparation alone had an IC50 value of 7,64 µg/ml. However, the combination of the two cannabinoids had the best cytotoxic effect with an IC50 value of 3,92 µg/ml, suggesting their potential synergistic effect. THC also demonstrated anti-cancer properties with the IC50 value of 5.26 µg/ml. However, THC in combination with CBD showed significantly lower effect compared to CBD alone (IC50=5.41µg/ml). Adding THC to CBG positively affected the effects of these cannabinoids and resulted in a decrease in the IC50 for CBG from 7.64 µg/ml to 5.84 µg/ml. In addition, CBD and CBG alone or in combination maintained similar ROS levels of 72 - 97% relative to the control, while THC had a ROS amount of about 45%, indicating its significant antioxidant effect. The addition of THC to CBD and CBG resulted in a decrease in ROS to about 60-69% In 3D spheroid culture, significant changes in cell viability were seen at concentrations of 10 and 12 µg/ml of CBD solutions. For CBG, these changes were observed from any concentration above 8 µg/ml, but the anti-cancer effect is much stronger at 12 µg/ml after the CBD than after the CBG. THC showed the weakest effect on cell viability.
**Conclusions:** The noticeable cytotoxic effect of the tested substances on cancer cells demonstrates the anticancer potential of cannabinoids against CRC cells. Cannabinoids have the potential to be implemented into existing anticancer therapies as adjunctive treatments. More research needs to be done on this topic. Nevertheless, the resulting research may influence the development of alternative therapies to reduce patient discomfort during standard therapy.

## 85. Assessing the neuroprotective effects of caffeinated coffee in the context of aluminum-induced neurotoxicity: In-sights from PC12 cell culture model

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**Introduction:** Alzheimer's disease is one of the most common neurodegenerative diseases. It is believed that aluminum and its compounds may act as environmental factors accelerating the development of the disease. On the other hand, numerous reports have documented the neuroprotective effects of caffeine-containing coffee.
**Methods:** To verify the protective effect of caffeinated coffee on the neurotoxicity of aluminum compounds, a PC12 cell culture model was designed, which was treated with aluminum maltolate. The cells were cultured in a medium containing different concentrations of the test compounds for 24 hours. Cell survival rates were calculated based on the MTT assay, and levels of reactive oxygen species (ROS) were measured using the DCF-DA assay in the analyzed systems.
**Results:** It was shown that the simultaneous addition of coffee with caffeine concentrations of 5 and 80 µg/mL increased cell survival rates nearly twofold compared to cells cultured with aluminum maltolate at a concentration of 100 µM ($p < 0.001$). Using the DCF-DA assay, it was also demonstrated that the ROS levels in these experiments were significantly lower than in the aluminum maltolate group (100 µM) ($p < 0.001$).
**Conclusions:** The obtained preliminary results confirmed the neuroprotective properties of caffeinated coffee, analyzed in the context of the development of neurodegenerative diseases through the protective effect of coffee on PC12 cells in response to aluminum compound-induced neurotoxicity. Additionally, it was shown that daily dietary habits may have a crucial role in the development of neurodegenerative diseases.

**86. Mitoquinone mesylate (MitoQ) has a protective effect on perfused kidney by reducing apoptosis.**

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**Background:** Ischemia-reperfusion (IR) is a pathological prosses that can be divided into two stages: circulatory arrest and successive blood flow restoration. IR occurs during kidney transplantation, while organ is taken from donor's body, stored and transplanted to acceptor. Warm ischemia, the time after blood stoppage and before organ resection, might be crucial for graft condition. Kidneys from deceased donors after cardiac arrest (DCD) are more vulnerable to the effects of ischemia-reperfusion injury, because of prolonged warm ischemia time compared to donors after brainstem death (DBD). Possible reason is an increased oxidative stress that damages cells and induces cell death. Mitoquinone mesylate (MitoQ) is a strong mitochondria-targeted antioxidant that downregulates the excess amount of reactive oxygen species (ROS).

**Aim of the study:** We evaluated the effect of MitoQ administrated to perfusion buffer during hypothermic machine perfusion of kidney graft on injury and oxidative stress markers, pro-apoptotic proteins (caspase 3 and caspase 9) and activated Akt.

**Methodology:** Isolated Wistar rat kidneys were excised immediately (DBD) or after 30 min of warm ischemia (DCD), flashed and perfused with buffer for 22 hours in hypothermic environment (4 °C; perfusion system the EMKA Technologies, France) with or without MitoQ (DCD + MitoQ). The level of KIM-1, ROS/RNS and concentrations of caspase 9, caspase 3 and phosphorylated Akt (pAkt) were measured in kidney tissue homogenates. Total Akt and pAkt ratio was calculated to determine active form of Akt protein.

**Results:** DCD rats have significantly higher KIM-1 and ROS/RNS concentrations ($p<0.05$) in kidney tissue compared to DCD rats. MitoQ significantly decreased concentrations of KIM-1 and ROS/RNS ($p<0.05$). Both pro-apoptotic caspases (casp 3 and casp 9) were elevated in DCD group and MitoQ administration reduced their concentration in kidney tissue. We detected high level of activated Akt protein and its decrease when MitoQ was added.

**Conclusion:** Warm ischemia time plays a curtail role in oxidative stress status of kidney graft and induces increased apoptosis. MitoQ targeting the mitochondrial ROS, reduces apoptotic cell death and protects kidney graft during hypothermic perfusion. Therefore, MitoQ is a good candidate for preconditioning of transplanted kidney and reduction of ischemia-reperfusion associated injury.

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# FORENSIC MEDICINE SESSION
## (SESJA MEDYCYNY SĄDOWEJ)

### *ORAL SESSION*
### *(SESJA USTNA)*

**87. Characteristics of asphyxia by strangulation in Lithuania**

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**Introduction:** Strangulation is a traumatic injury that occurs as a result of mechanical force applied externally to the neck and surrounding structures. As a type of asphyxia, these injuries may result in decreased cerebral oxygen delivery either by compression of cervical blood vessels, or tracheal occlusion. Death rapidly ensues without the removal of compressing forces. Strangulation asphyxia can happen when it is done by hands, by ligature or by hanging. Hanging is by far the most common type of suicide in Lithuania. The majority of cases analyzed in this study are asphyxia by hanging.

**Aim:** The purpose of this study was to describe and compare decedent demographic characteristics in cases of strangulation asphyxia between the years 2018 and 2022.

**Materials and Methods:** Data from The State Forensic Medicine Service were used to do a retrospective analysis of strangulation asphyxia characteristics. The study included 144 autopsy cases between years 2018 and 2022. The selected cases were analyzed by age, sex, toxicology report findings, as well as the month of death to assess seasonality. Statistical analysis was performed using Microsoft Excel and R-commander.

**Results:** This study analyzed 144 selected strangulation cases examined at The State Forensic Medicine Service in Vilnius from 2018 to 2022. 84% (N = 121) of the decedents were men; 16% (N = 23) were women. The mean age was 50.37 ± 16.45 years for men and 62.57 ± 19.53 years for women. In total 53.47% (N = 77) of people were sober prior to death and 46.53% (N = 67) people were intoxicated. The mean alcohol concentration in all decedents found was 1.95 ± 0.82‰. 45.83% (N = 66) of males examined had alcohol in their system in comparison to 21.74% (N = 5) of females. The months of death were also compared but no trend can be seen.

**Conclusions:** A few differences between sexes were found. Men make up the majority of strangulation asphyxia cases. It is noticeable that men die from asphyxia by strangulation at a significantly younger age than their women counterparts. Males are also more likely to be intoxicated prior to death. The time of the year does not play a role in people who die from strangulation asphyxia.

**88. Cheiloscopy - use of a forensic tool in sex distinguishing. Vahanwala and Pagares' hypothesis verification.**

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**Introduction:** By the end of the 20th century Vahanwala and Pagare came up with the hypothesis that the lip print can differ due to one's sex. To do so they used Suzuki's classification. The hypothesis, if true, can be useful during solving crimes. Although, the researches that verify this particular topic are not clear.

**Aim:** The main aim of this piece is to verify the hypothesis basing on Polish population.

**Materials and Methods:** Over 50 males and females (20-27 y.o.) took part in the research by giving their lip prints on the dactyloscopy foil. The passive method of collecting lip prints was used.

**Results:** The research is still in progress but the results shows up promising.

**Conclusions:** There is a significant positive correlation between the lip print type and sex.

**89. The effect of tannins on post-mortem changes**

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**Introduction:** Post-mortem color changes within bone tissues are a source of information about the environment of the deposition of remains for anthropologists and archaeologists. Knowing how environmental factors modify the decomposition of animal tissues is important in estimating the time from depositing a carcass to finding it.

**Aim:** Natural tannins contained in wood may be an important factor influencing the quality and pace of post-mortem changes. In order to investigate the effect of proanthocyanidins on post-mortem changes in soft tissues and bone tissues, a study was carried out using domestic pig ribs.

**Materials and Methods:** Bones covered with soft tissue were placed in aquariums in a humid environment inside three boxes made of various types of wood (pine, beech, oak), and in clean water, and a 2% solution of tannic acid. After 10 months, the condition of the soft tissues was described, and the color changes on the bones surface were assessed using the Munsell® Soil Color Chart.

**Results:** As expected, the color changes visible on the bone tissue vary depending on the type of wood the box was made of. The soft tissue underwent the transformation into adipocere in all samples, but not to the same extent.

**Conclusions:** Further research is required to explain the differences in the quality of changes in soft tissues and in the brightness of color changes. These observations may become a pretext for further research.

**90. Incidentally found hyperglycaemia at autopsy and its implication for the determination of cause of death: a case series**

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**Introduction:** Hyperglycaemia is a condition in which the blood glucose level is higher than 6.9 mmol/L on an empty stomach and higher than 10.0 mmol/L 2 hours after a meal. Severe hyperglycaemia is dangerous and is associated with increased mortality in different patient groups. A study showed that the 90-day mortality rate in patients with severe hyperglycaemia in the emergency department is almost 15%. Another 5-year study conducted in Thailand showed an

overall mortality of 8.4% in hyperglycaemic crises. The incidence of hyperglycaemia has risen sharply over the past two decades due to increased obesity, reduced activity, and an ageing population, and is expected to continue to rise. With the increasing number of diagnosed and undiagnosed cases of diabetes, hyperglycaemia may become an even more common cause of sudden death in the future. A consistent strategy for post-mortem blood glucose testing may not only help to identify the cause of sudden unexplained death but also to improve the understanding of diabetes, its detection, and risk factors.

**Case description:** 14 autopsy cases in which significantly elevated blood glucose levels were found incidentally were analyzed. The hyperglycaemia found ranged from 25.7 mmol/l to 37 mmol/l. The age of the deceased in this case series ranged from 0 months (newborn) to 86 years, and the mean age of all subjects was 35.8125 years. The gender distribution was similar, with 8 (~57%) female subjects and 6 (~43%) male subjects. The analysis of the autopsy data showed that all these cases can be divided into 2 main groups: 1 - individuals with hyperglycaemia as the main cause of death (diagnosis according to the International Classification of Diseases: a disorder of carbohydrate metabolism, unspecified, E74.9), and 2 - individuals with another diagnosis as the main cause of death, and hyperglycaemia was a secondary autopsy finding. A comparison of the groups showed that the number of subjects was the same in both groups - 7 (50%) and 7 (50%). The mean age of the first group was ~34.34 years and in the second group - approximately 37.29 years. In the first group, there were 6 (~86%) females and 1 (~14%) male. In the second group, there were 2 (~29%) females and 5 (~71%) males. Asphyxia was the most common underlying cause of death in the second group.

**Conclusions:** The determination of glucose concentration in cases of sudden death is significant in the investigation of unexplained deaths. A significant increase in glucose concentration found at post-mortem examination may be the main cause of death. Also, severe hyperglycaemia may be a secondary autopsy finding that is not a direct cause of death.

## 91. Violation of sexual boundaries among academic students in Wroclaw

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**Introduction:** For a long time, sexual violence and harassment have been prevalent public health issues. They have been frequently present also at universities, often resulting in major consequences which affect the victims. That multidisciplinary problem concerns specialists of many fields, medical examiners and forensic doctors being one of them. According to Polish government's statistics from 2018, 40,7% of students have experienced sexual misconduct since the beginning of their studies.

**Aim:** Current study examines the problem of violation of sexual boundaries in the group of students and postgraduate students from different universities in Wroclaw, and graduates who finished their education up to five years ago.

**Materials and Methods:** The data includes 267 responses submitted via online survey form. Participants were selected by non-random sampling (snowball method). The research regards only particular forms of sexual violence and harassment.

**Results:** Analysis revealed that 72,85% of respondents reported being victims of one of forms included in the research of violation of sexual boundaries. Moreover, 58,82% suffered from more than one of them. During the course of their higher education, 18,55% students from universities in Wroclaw experienced one of included forms of sexual violence and harassment. At universities and outside them, the most prevalent forms of sexual harassment were: unwanted innuendoes and making somebody uncomfortable by getting closer or leaning over them. Both are unphysical forms of sexual abuse. Even so, cases of nonconsensual touching (excluding touching genital area) at universities were almost as frequent as the ones listed above. In half of the cases, the perpetrator was a male teacher whereas the most significant group of victims were female students. What should be noted, although the majority of researched occurrences at universities had witnesses (81,25%), most of those situations were not reported. It was either due to witnesses' opinion considering the incidents being not significant enough or their fear of possible negative consequences.

**Conclusions:** Current study shows that sexual violence and harassment are large-scale problems at Polish universities. Many separate research programs reveal an increasing frequency of cases. The variety and specificity of occurrences which can be regarded as violation of somebody's sexual boundaries are extensive. Many of them can be disregarded by both witnesses and victims, hence the underestimated data and reports. Therefore more analysis should be conducted to give a broader view of this subject.

## 92. The importance of lung weight at autopsy in identifying Tuberculosis

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**Introduction:** Tuberculosis (TB) is one of the most prevalent infections in the world, with 10.6 million people falling sick in 2021 and 1.6 million dying from the disease. The risk of contracting tuberculosis among medical laboratory workers and forensic pathologists is well known, with an estimated occupational risk of TB 100-200 times higher than the general population. However, due to sometimes incomplete medical histories, the presence of infectious disease may be unknown or unrecognized at the time of autopsy or later.

**Aim:** Our aim was to compare lung weights between those who died suddenly and those who died of pulmonary tuberculosis and to determine whether the difference is significant in clinical practice.

**Materials and Methods:** This research was designed as a retrospective study comparing 100 cases of pulmonary tuberculosis with a control group of 415 sudden death cases using data from the State Forensic Medicine Service of Lithuania. The cases were assessed by the cause of death, and the weight of the lungs was compared between two groups. The collected data was processed using R software. Spearman's correlation coefficients were assessed. A weak correlation was defined as r–values < 0.39; a moderate – from 0.40 to 0.69; a strong – > 0.70. Additionally, 95% confidence intervals were calculated. Differences with p–values < 0.05 were considered significant.

**Results:** In the control group, mean right lung weight was 624.7 g, mean left lung weight 530.9 g. The weights of left and right lung were statistically significantly different ($p < 0.05$). In the group with pulmonary TB, the mean weight of the right

lung was 977.4 g, the mean weight of the left lung was 831.5 g. Left and right lung weights were statistically significantly different in the TB group ($p < 0.05$). When comparing the control and pulmonary TB groups, the weights were statistically significantly different ($p < 0.05$) for both left and right lungs. Males and females in the control group had statistically significantly different weights of both left lung (603.9 g vs 442.2 g, $p < 0.05$) and right lung (711.8 g vs 525.3 g, $p < 0.05$). Furthermore, we used Spearman's rank correlation test to determine the correlation coefficient between left and right lung weights: the result is $r = 0.9$, $p < 0.05$, indicating a very strong correlation between the weights. When investigating the connection between age and lung weight, $r = -0.13$; $p < 0.05$ shows a very weak negative correlation between age and right lung weight, and $r = -0.15$; $p < 0.05$ with left lung weight. Looking for a correlation between human height and lung weight, a moderate association between right lung weight and height ($r = 0.396$, $p < 0.05$) and left lung weight and height ($r = 0.394$, $p < 0.05$) was found.

**Conclusions:** According to our study, the lung weights of the pulmonary tuberculosis group were statistically significantly higher than those of the control group. Some patients die without being treated or even knowing they have tuberculosis. Because mycobacteria are highly virulent and stay viable even after formalin fixation, the forensic pathologist who is unaware of the infection is at high risk of contracting tuberculosis. If increased lung weights or hardenings are discovered during autopsies, extreme caution is advised due to the possibility of tuberculosis. It is important to note that taller individuals may have heavier lungs.

## 93. Suicide by multiple gunshot wounds to the head

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**Introduction:** Suicide by firearm is the second most common method of suicide in Lithuania and makes up approximately 3% of all suicides in the country. In most cases (approx. 90%), the number of gunshot wounds in suicide cases is one, as the head is the most common region of entry wounds having over 90% mortality risk depending on the type of firearm. Multiple gunshot wounds are rare (3% of cases) and are a topic of high interest in the field of forensic medicine - the challenge of such cases being in differentiation between homicide and suicide. Multiple gunshot wounds, especially to the head region, usually are the result of homicide, which leads to significance of determining whether the autopsy findings allow to differentiate and identify suicide attempts.

**Results:** The case presented here concerns a 68-year-old male with medical history of stage III prostate cancer, who was discovered at his home with gunshot wounds to the head. At the start of the forensic examination, a CT scan of the head was performed, which is not the routine procedure and was used in scientific interest to compare and evaluate results of radiological examination with a physical autopsy. CT scan images did not clarify the sequence of the injuries and the attempts to determine directions of the shots were inconclusive. Physical autopsy was carried out, and injuries identified by external and internal examination of the corpse. Autopsy provided the following conclusive results: Wound No. 1 consisted of an irregular star-shaped 2.5 cm long entrance wound at the lower surface of the chin (one of the least common entry wound locations, comprising 2-10% of cases) which was surrounded by subcutaneous haemorrhage measuring 3x6 cm. The wound track passed through the lower jaw into the tongue and through the hard palate, extending through the upper jaw, the nasal bones and the nasal part of the frontal bone, passing through the aforementioned structures after the first shot without interfering with vital structures, with an irregularly circular 1.5 cm long exit wound in the middle of the forehead. Wound No. 2 consisted of an irregular star-shaped entrance wound in the right temporal area (the most common location in firearm suicide attempts, 41-67% of cases), surrounded by subcutaneous haemorrhage, with soft tissue, bone structures and blood visible in the wound. The projectile coursed through the right temporal bone into the cranial cavity and in the temporal lobe of the left hemisphere of the brain, also causing multiple fractures of the base of the skull with an irregular star-shaped 2.5 cm long exit wound at the border of the left parietal and temporal bones, which was determined to have been fatal. The medical forensics laboratory data revealed that both entrance wounds were made at close range, as evidenced by the soot associated with firearm discharge in and around the entrance wounds, and irregularity of wound edges reflecting the effect of gas emitted during discharge of a firearm. The wounds also contain traces of metallization of copper and lead.

**Conclusions:** This case suggests that radiological examination of the corpse, in this case a CT scan of the head, while potentially useful, was unable to reliably replace physical autopsy, which remains a comprehensive forensic examination with the most accurate results.

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