

TDK TOPICS
Semmelweis University
Heart and Vascular Center - Cardiology Department
(2024/2025)

1. Evaluation of the mechanisms and non-pharmacological treatment of arrhythmias.
(Prof. Béla Merkely M.D., Ph.D., D.Sc., Klaudia Vivien Nagy M.D., Ph.D., assistant professor)
2. Role of electrocardiography in non-invasive cardiac screening of athletes.
(Prof. Béla Merkely M.D., Ph.D., D.Sc.; Orsolya Kiss M.D., Ph.D., assistant professor)
3. Possible cardiac indications of MRI examination.
(Prof. Béla Merkely M.D., Ph.D., D.Sc.; Prof. Hajnalka Vágó M.D., Ph.D.)
4. Resynchronisation therapy of chronic heart failure – actual questions.
(Prof. Béla Merkely M.D., Ph.D., D.Sc.; Valentina Kutyifa M.D., Ph.D., assistant lecturer; Annamária Kosztin M.D., Ph.D. assistant professor)
5. The role of tissue Doppler echocardiography in cardiac resynchronisation therapy.
(Prof. Béla Merkely M.D., Ph.D., D.Sc.; Valentina Kutyifa M.D., clinical physician; Annamária Kosztin M.D., Ph.D. assistant professor)
6. The influential factors of the acute coronary syndrome
(Dávid Becker M.D., Ph.D., professor; Réka Skoda M.D. Ph.D. student)
7. Ventricular dyssynchrony and arrhythmic risk assessment in patients with dilated cardiomyopathy using cardiac magnetic resonance imaging and ultra-high frequency ECG
(Csilla Czibalmos MD, PhD, assistant professor; Roland Papp M.D., clinical physician)
8. Cardio-oncology in clinical practice
(Zsófia Drobni M.D., Ph.D. clinical physician, Prof. Béla Merkely M.D., Ph.D., D.Sc.)
9. Cardiovascular toxicities associated with immunotherapy
(Zsófia Drobni M.D., Ph.D. clinical physician, Prof. Béla Merkely M.D., Ph.D., D.Sc.)
10. Evaluating Acute and Chronic Coronary Artery Disease in Patients with Atrial Fibrillation
(Zsófia Drobni M.D., Ph.D. clinical physician)
11. Functional and morphological assessment of the right heart in cardiac diseases using 3D echocardiographic techniques
(Alexandra Fábán, M.D., PhD., cardiology resident; Attila Kovács M.D. Ph.D., assistant professor)
12. Application of human stem cells in 3D tissue engineering: spheroid and organoid cell cultures
(Földes Gábor, M.D., Ph.D., D.Sc., associate professor; Orsolits Barbara, Ph.D., research fellow)
13. Human induced pluripotent stem cell-derived cardiovascular cells in patient-specific toxicology assays
(Földes Gábor, M.D., Ph.D., D.Sc., associate professor; Orsolits Barbara, Ph.D., research fellow; Bors Luca Anna, Ph.D., research fellow)
14. Use of bioreactor for culturing Human induced pluripotent stem cells

(Földes Gábor, M.D., Ph.D., D.Sc., associate professor; Orsolits Barbara, Ph.D., research fellow; Bors Luca Anna, Ph.D., research fellow)

15. Bioinformatics as a tool in cell research: use of machine learning to analyse images from high-content screening microscopic systems.

(Bors Luca Anna, Ph.D., research fellow; Földes Gábor, M.D., Ph.D., D.Sc., associate professor)

16. Novel options of cell and gene therapy in regenerative cardiology

(Földes Gábor, M.D., Ph.D., D.Sc., associate professor; Orsolits Barbara, Ph.D., research fellow; Bors Luca Anna, Ph.D., research fellow)

17. Endovascular treatment of vascular complications at cardiological interventions.

(Prof. László Gellér M.D., Ph.D.)

18. Role of catheter ablation in the treatment of Ventricular Tachycardia

(Prof. László Gellér M.D., Ph.D.; Klaudia Vivien Nagy M.D., Ph.D., assistant professor)

19. Ablation treatment of cardiac arrhythmias: new indications, new techniques.

(Prof. László Gellér M.D., Ph.D. Vivien Klaudia Nagy M.D., Ph.D., assistant professor)

20. Conduction System Pacing in Clinical practice

(Prof. László Gellér MD., PhD, DSc).

21. Special techniques in resynchronization therapy

(Prof. László Gellér M.D., Ph.D.; Levente Molnár M.D., clinical physician)

22. New electrophysiological methods.

(Prof. László Gellér M.D., Ph.D.; István Osztheimer M.D., assistant professor)

23. Identification and analysis of prognostically important factors in acute coronary syndrome patients treated with percutaneous coronary intervention

(István Hizoh, MD, PhD, associate professor)

24. The ALPHA score – comparative validation

(István Hizoh, MD, PhD, associate professor)

25. Mortality prediction algorithms for patients undergoing primary percutaneous coronary intervention

(István Hizoh, MD, PhD, associate professor)

26. Non-invasive diagnosis and follow-up of heart diseases in childhood and infancy.

(Prof. Krisztina Kádár M.D., Ph.D., external collaborator)

27. Long-term follow-up of the Kawasaki disease.

(Prof. Krisztina Kádár M.D., Ph.D., external collaborator)

28. Fetal Cardiology

(Prof. Krisztina Kádár M.D., Ph.D., external collaborator)

29. Right ventricular adaptation in elite athletes.

(Tímea Kováts M.D., Ph.D., assistant professor)

30. Characterization of response to Cardiac Resynchronization Therapy

(Valentina Kutyaifa M.D., assistant lecturer; Vivien Klaudia Nagy M.D., Ph.D., assistant professor; Annamária Kosztin M.D., Ph.D. assistant professor)

31. Coronary artery in-stent restenosis formation, investigation and treatment possibilities
(Péter Márton Kulyassa M.D., assistant lecturer; István Ferenc Édes M.D., PhD. associate professor)
32. The role of novel echocardiographic techniques in the assessment of long term prognosis in patients undergoing transcatheter aortic valve implantation
(Bálint Károly Lakatos MD, Ph.D assistant professor, Mihály Ruppert MD, Ph.D assistant professor)
33. Coronary CT angiography for atherosclerotic plaque quantification and characterisation.
(Pál Maurovich-Horvat M.D., Ph.D., M.P.H. associate professor, Judit Simon M.D., Ph.D fellow)
34. Cardiac CT imaging in structural heart disease
(Pál Maurovich-Horvat Pál M.D., Ph.D. M.P.H., associate professor, Bálint Szilveszter M.D. PhD., assistant professor)
35. Assessment of the function of the atria in elite athletes by speckle tracking echocardiography
(Andrea Ágnes Molnár M.D.,Ph.D., Cardiologist)
36. The effect of the 3D echocardiographic analysis of mitral valve prolapse on the surgical implementation and the efficiency of mitral valve repair.
(Andrea Nagy MD PhD assistant professor, Kálmán Benke MD PhD assistant professor)
37. Arrhythmic mitral valve prolapse
(Andrea Nagy MD PhD, assistant professor, Csilla Czibalmos MD, PhD, assistant professor, Astrid Apor MD assistant professor)
38. The investigation of the prognostic role of right ventricular strain following cardiopulmonary resuscitation
(Bettina Nagy M.D., PhD Student; Bálint Lakatos M.D., PhD.,assistant lecturer; Prof. Endre Zima M.D., PhD.)
39. In vivo animal models in investigation of ischemic stroke.
(Prof. Zoltán Nagy M.D., Ph.D., D.Sc.)
40. Role of MMP-9 in evolution of reperfusional cerebral damage.
(Prof. Zoltán Nagy M.D., Ph.D., D.Sc.)
41. NOGO system and cerebral plasticity.
(Prof. Zoltán Nagy M.D., Ph.D., D.Sc.)
42. Antithrombotic and antiarrhythmic therapy in patients with atrial fibrillation
(István Osztheimer M.D.; assistant professor; Adorján Vida M.D. resident)
43. Diabetic cardiomyopathy – development of new treatment strategies in rat models
(Tamás Radovits MD, PhD, associate professor)

44. Investigation of left ventricular hypertrophy induced by endurance training in a rat model
(Tamás Radovits MD, PhD, associate professor and Attila Oláh MD, PhD, assistant lecturer)
45. Investigation of cardiac effects of acute exhaustive exercise stress in a rat model
(Tamás Radovits MD, PhD, associate professor and Attila Oláh MD, PhD, assistant lecturer)
46. Investigation of electrophysiological aspects of sports cardiology in rat models
(Attila Oláh MD, PhD, assistant lecturer and Tamás Radovits MD, PhD, associate professor)
47. Aging-associated cardiovascular dysfunction and nitro-oxidative stress
(Tamás Radovits MD, PhD, associate professor)
48. Investigation of novel cardioprotective therapies on animal models of ischemia/ reperfusion
(Tamás Radovits MD, PhD, associate professor)
49. Experimental heart transplantation studies
(Tamás Radovits MD, PhD, associate professor and Kálmán Benke MD, resident)
50. Investigation of physiological and pathological myocardial hypertrophy in small animal models
(Tamás Radovits MD, PhD, associate professor and Attila Oláh MD, PhD, assistant lecturer)
51. Investigation of right ventricular alterations induced by endurance training in a rat model
(Attila Oláh MD, PhD, assistant lecturer and Tamás Radovits MD, PhD, associate professor)
52. Investigation of microvascular function and dysfunction in different pathophysiological conditions
(Attila Oláh MD, PhD, assistant lecturer)
53. Investigation of novel treatment options for heart failure in rat models.
(Tamás Radovits MD, PhD, associate professor)
54. Novel options for large vessel replacement
(Tamás Radovits MD, PhD, associate professor)
55. Investigation of vascular function in heart diseases
(Tamás Radovits MD, PhD, associate professor)
56. Comparison of the pathophysiological and hemodynamic aspects of chronic heart failure with different etiologies in rats
(Mihály Ruppert MD Ph.D assistant professor, Tamás Radovits MD, PhD, associate professor)
57. Investigation of pressure unloading-induced myocardial reverse remodeling in rat models
(Mihály Ruppert MD Ph.D assistant professor, Tamás Radovits MD, PhD, associate professor)
58. The role of microRNA in different cardiovascular pathologies
(Mihály Ruppert MD Ph.D assistant professor, Tamás Radovits MD, PhD, associate professor)
59. The role of novel biomarkers in the assessment of long term prognosis in patients undergoing transcatheter aortic valve implantation

(Mihály Ruppert MD, Ph.D assistant professor, Bálint Károly Lakatos MD, Ph.D assistant professor)

60. The application of the distal radial artery puncture during coronary and vascular interventions
(Dr. Ruzsa Zoltán PhD, associate professor)
61. Cardiological aspects of peripheral artery disease
(Dr. Ruzsa Zoltán PhD, associate professor)
62. Ischemic and reperfusion injury during myocardial infarction
(Dr. Ruzsa Zoltán PhD, associate professor)
63. Development of a new impedimetric method to measure platelet adhesion.
(Pál Soós M.D., Ph.D., assistant professor, external collaborator; Dr. med. habil. Kőhidai László M.D., Ph.D., associate professor)
64. Genetic prognostic markers of myocardial ischaemia and infarction.
(Zsolt Szelid M.D., Ph.D., assistant professor, external collaborator)
65. Genetic polymorphisms associated with the cardiovascular system in athletes.
(Zsolt Szelid M.D., Ph.D., assistant professor, external collaborator)
66. The role of the psychosocial factors in the outcome of heart surgical interventions.
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
67. Monitoring during caritis surgery
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
68. Frailty assessment and long term outcome in cardiac surgery, vascular surgery and transplantation
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
69. Endocrine aspects of cardiac surgery and transplantation
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
70. Hepatic dysfunction and outcome after transplantation
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
71. Hepatic vein flow patterns and outcome after cardiac surgery
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
72. Autoimmune disease and heart transplantation
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
73. Immune aspects of the transplantation
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
74. Osmotic and electrolyte changes after heart transplantation
(Andrea Székely M.D., Ph.D. DSc, Professor of Anesthesia)
75. Prognostic value of quantified coronary plaque volume as obtained by CT angiography
(Bálint Szilveszter M.D., Ph.D., assistant professor)

76. Left ventricular reverse remodelling assessed by cardiac CT is associated with improved patient outcomes following transcatheter aortic valve implantation
(Bálint Szilveszter M.D. PhD., assistant professor)
77. Pericoronary adipose tissue attenuation by CT angiography: Diagnosis and prognostic value
(Bálint Szilveszter M.D. PhD., assistant professor, Melinda Boussoussou, M.D. Ph.D. fellow)
78. The role of coronary CT angiography in chronic coronary syndrome
(Bálint Szilveszter M.D. PhD., assistant professor, Adam Jermendy, M.D., Ph.D., assistant lecturer)
79. Machine learning-based prediction of left and right ventricular function from echocardiographic videos
(Márton Tokodi M.D. Ph.D., assistant professor; Attila Kovács M.D. Ph.D., assistant professor)
80. Characterization of myocardial tissue properties on echocardiographic images using novel image analysis techniques
(Márton Tokodi M.D. Ph.D., assistant professor; Attila Kovács M.D. Ph.D., assistant professor)
81. 4D MR flow measurement in congenital heart disease
(Attila Tóth M.D., assistant lecturer; Olga H. Bálint M.D., Ph.D., specialist)
82. MRI examination of heart.
(Prof. Hajnalka Vágó M.D., Ph.D.; Attila Tóth M.D., assistant lecturer)
83. New method for characterization of heart muscle with cardiac MRI.
(Prof. Hajnalka Vágó M.D., Ph.D.,; Attila Tóth M.D., assistant lecturer)
84. Investigating the Outcomes of Out-of-Hospital Cardiac Arrest in Elderly and Vulnerable Populations
(Dr. Boldizsár Kiss, Cardiology Resident, PhD Candidate, Dr. Endre Zima, PhD, University Professor)
85. Examining Prognostic Factors of In-Hospital and Out-of-Hospital Resuscitation and Intensive Hypothermic Treatment of Post-Cardiac Arrest Syndrome
(Dr. Bettina Nagy, PhD Candidate, Dr. Boldizsár Kiss, Cardiology Resident, PhD Candidate, Dr. Endre István Zima, PhD, University Professor)
86. The Significance of First Responders and Early Defibrillation in Long-Term Survival in Out-of-Hospital Cardiac Arrest
(Dr. Dénes Kiss, PhD, Cardiology Resident, Dr. Endre István Zima, PhD, University Professor)
87. Prognostic Factors in Cardiopulmonary Resuscitation: Modeling and Predicting Patient Outcomes Using Machine Learning
(Dr. Ádám Pál-Jakab, Cardiology Resident, PhD Candidate, Dr. Boldizsár Kiss, Cardiology Resident, PhD Candidate, Dr. Endre Zima, PhD, University Professor)
88. Regional Determinants of Out-of-Hospital Cardiac Arrest Outcomes: Analysis of Regional Inequalities and Access to Emergency Services
(Dr. Ádám Pál-Jakab, Cardiology Resident, PhD Candidate, Dr. Endre Zima, PhD, University Professor)
89. Applying Health Informatics Solutions for Real-Time Monitoring and Data-Driven Decision Support in Out-of-Hospital Cardiac Arrest Cases

(Dr. m Pl-Jakab, Cardiology Resident, PhD Candidate, Dr. Endre Zima, PhD, University Professor)

90. Impact of Extreme Meteorological Conditions on Out-of-Hospital Cardiac Arrest
(Dr. Bettina Nagy, PhD Candidate, Dr. Endre Zima, PhD, University Professor)

91. Effect of Environmental, Spatial, and Temporal Factors on Cardiac Etiology of Cardiac Arrest
(Dr. m Pl-Jakab, Cardiology Resident, PhD Candidate, Dr. Bettina Nagy, PhD Candidate, Dr. Endre Zima, PhD, University Professor)

92. Pathomechanism, Risk Stratification, Diagnosis, and Treatment of Acute and Chronic Heart Failure:
Investigation of the Prognostic and Diagnostic Significance of Oxidative and Nitro-Oxidative Stress and PARP Activation
(Dr. Endre Zima, PhD, University Professor, Dr. Levente Molnr, Clinical Specialist, Dr. Tams Brny)

93. Examination of the Therapeutic Efficacy and Safety of Levosimendan in Heart and Kidney Failure
(Dr. Boldizsr Kiss, Cardiology Resident, PhD Candidate, Dr. Endre Zima, PhD, University Professor)

94. Study of the Effects and Side Effects of Inotropic and Vasoactive Agents
(Dr. Endre Zima, PhD, University Professor)

95. Cardiogenic Shock and Multiple Organ Failure
(Dr. Endre Zima, PhD, University Professor)

96. Investigation of Cardiogenic Shock and Infectious-Septic Transformation
(Dr. Endre Zima, PhD, University Professor)

97. Use of Catecholamines in Circulatory Failure Post-Resuscitation, Cardiogenic Shock
(Dr. Bettina Nagy, PhD Candidate; Dr. Endre Zima, PhD, University Professor)

98. Invasive Circulatory Physiology Monitoring Techniques in the Volume and Catecholamine Treatment of Shock States
(Dr. Boldizsr Kiss, Cardiology Resident, PhD Candidate, Dr. Endre Zima, PhD, University Professor)

99. Telecardiology Monitoring Options for Patients with Pacemakers and Implantable Cardioverter Defibrillators
(Dr. Bettina Nagy, PhD Candidate, Dr. Endre Zima, PhD, University Professor)

100. Experiences with Device-Based Treatment of Hypertension Using Baroreflex Activation Therapy
(Dr. Endre Zima, PhD, University Professor, Dr. Pter Perge, PhD, Cardiology Specialist)

101. Experimental and Clinical Development and Validation of Defibrillator Shock Waveform and Feedback Devices to Improve Resuscitation Quality
(Dr. Endre Zima, PhD, University Professor, Dr. m Pl-Jakab, Cardiology Resident, PhD Candidate)

102. Investigation of Electric Shock and Potentially Associated Arrhythmias
(Dr. Endre Zima, PhD, University Professor)

103. Cardiology, Cardiac Surgery, and Intensive Therapy Treatment of Heart Failure and Arrhythmia Disorders: Consensus-Based Treatment Strategies for Borderline Cases
(Dr. Endre Zima, PhD, University Professor, Dr. Mariann Németh, Clinical Specialist, PhD Candidate)
104. Arrhythmological Complications and Treatment Options of Infective Endocarditis
(Dr. Endre Zima, PhD, University Professor, Dr. Mariann Németh, Clinical Specialist, PhD Candidate)
105. Infective Endocarditis in TAVI Patients: Risk, Prevention, Treatment
(Dr. Endre Zima, PhD, University Professor)
106. Anesthetic Perioperative Preparation and Safety of Minimizing Focus Searches in TAVI Patients
(Dr. Endre Zima, PhD, University Professor, Dr. Éva Straub, Anesthesiology Specialist)

Military Hospital – State Health Center
(1134 Budapest, Károly Róbert krt. 44)

1. Cardiac implantable electronic devices in the treatment of heart failure and arrhythmias.
(Gábor Duray M.D. Ph.D.)
2. Role of zero fluoro invasive cardiac electrophysiology in the treatment of cardiac arrhythmias
(Gábor Duray M.D. Ph.D.)
3. Clinical use of the intracardiac pacemaker capsule.
(Gábor Duray M.D. Ph.D.)
4. Novel treatment options in atrial fibrillation
(Gábor Duray M.D. Ph.D.)
5. Klinische Erfahrung mit dem Sondenloden Herzschrittmachertherapie.
(Gábor Duray M.D. Ph.D.)
6. Strahlungs dosisreduzierung beim Kathethertherapie von Herzrhythmusstörungen.
(Gábor Duray M.D. Ph.D.)
7. Activation and inhibition of platelets in coronary atherothrombosis.
(Róbert Gábor Kiss M.D., Ph.D., honorary professor)
8. Regular physical activity, sport activity and the heart
(Prof. István Préda M.D., Ph.D., D.Sc.)

Gottsegen National Cardiovascular Center
1096 Budapest, Haller u. 29.)

9. Stem cell transplantation in the clinical practice.
(Prof. Péter Andréka M.D., Ph.D.)
10. Percutan interventional techniques.

(Prof. Péter Andréka M.D., Ph.D.)

11. Assessment of paravalvular aortic regurgitation
(Tünde Pintér M.D., Ph.D.)
12. Pregnancy and heart disease.
(Olga Hajnalka Bálint M.D. Ph.D.)
13. Non-pharmacological treatment of atrial fibrillation: medium- and long-term results.
(Zsófia Nagy M.D., Ph.D.,)
14. Isolation of vena pulmonalis by cryoballoon in the treatment of paroxysmal atrial fibrillation.
(Zsófia Nagy M.D., Ph.D.,)
15. Endothelial dysfunction: clinical significance and search modalities.
(Attila Mohácsi M.D., Ph.D., honorary associate professor)
16. The role of genetic polymorphisms in the patho-mechanism of atherosclerosis.
(Attila Mohácsi M.D., Ph.D., honorary associate professor)
17. FFR in everyday practice
(Zsolt Piróth M.D., Ph.D.)
18. The clinical value of post-PCI FFR measurements
(Zsolt Piróth M.D., Ph.D.)
19. Long-term outcome of percutaneous interventions of the unprotected left main coronary artery.
(Zsolt Piróth M.D., Ph.D.)
20. The role of 3D echocardiography in monitoring different interventions.
(András Temesvári M.D., Ph.D.)
21. Long-term prognosis of pulmonal homograft surgery in adults.
(András Temesvári M.D., Ph.D.)
22. Characterization of cardiovascular diseases using artificial intelligence-based image analytics
(Márton Kolossváry M.D., Ph.D.)
23. Diagnostic efficacy of coronary CT angiography in chronic and acute coronary syndromes
(Márton Kolossváry M.D., Ph.D.)
24. Invasive assessment of the coronary microvasculature
(Zsolt Piróth M.D., Ph.D.)
25. Diagnostic efficacy of TAVR CT based imaging biomarkers in aortic stenosis.
(Márton Kolossváry M.D., Ph.D.)