

**DESCRIPTION OF COURSE UNIT FOR DOCTORAL STUDIES
AT VILNIUS UNIVERSITY**

Scientific Area/eas, Field/ds of Science	Medical and Health Sciences M 000, Medicine M001			
Faculty, Institute, Department/Clinic	Faculty of Medicine Institute for Clinical Medicine Clinics of the Cardiovascular Diseases			
Course unit title (ECTS credits, hours)	Transcatheter Diagnostics and Treatment Methods of Cardiovascular Diseases 6 credits (162 hours)			
Study method	Lectures	Seminars	Consultations	Self-study
Number of ECTS credits	-	-	2	4
Method of the assessment (in 10 point system)	Introduction and assessment of the presentation. The presentation to be delivered on a topic as being coordinated with the lecturers (a PhD student has to analyse, review and present the most recent research publications related with the topic in question by providing examples of clinical cases). Assessment criteria of the presentation: a reflected topic in question (0,3 x an assessment in a 10-point grading scale), reviewed the most recent literature (0,3 x an assessment in a 10-point grading scale), illustrated by quality and proper examples (0,4 x an assessment in a 10-point grading scale). An arithmetic sum of all three grades constitutes a final grade.			
PURPOSE OF THE COURSE UNIT				
To deepen knowledge about principles of transcatheter intervention (TCI) methods for cardiovascular diseases along with the treatment optimization possibilities.				
THE MAIN TOPICS OF COURSE UNIT				
<ul style="list-style-type: none"> • Transcatheter diagnostics of coronary heart diseases (CHD) for assessment expansion of changes in coronary arteries in patients with hemodynamically significant coronary artery stenosis. • Identified advantages and shortages of puncture site for various interventional coronary procedures, the efforts to avoid puncture site complications choosing radial artery puncture more often, both planned and extra diagnostic/treatment procedures. • Application of flow intracoronary tests (e.g. fractional flow reserve - FFR) for the verification of the doubtful angiographically visible stenosis, for the hemodynamic stenosis assessment along with the result as obtained following the percutaneous coronary intervention (PCI) and for the establishment of stenting in accordance with the values as being received following the procedure's flow in the stented coronary artery. • The assessment of the diagnosed risk of the patients with angiographic CHD as well as indications of PCI. • Transcatheter treatment of CHD by applying various treatment methods including percutaneous balloon angioplasty, stenting (ordinary and drug-eluting stents, dissolving stents). Optimal indications for the implantation of drug-eluting stents. A comparison of various drug-eluting stents to prevent restenosis. A comparison of drug-eluting stents in diverse situations having already PCI in place by using a simple stent („bare metal stent“) and the patient returns with clinically 				

significant restenosis. A participation in multicentre trials concerned with comparison of PCI with drug-eluting stents and diverse treatment methods of bifurcation stenoses – applying as per randomization protocol established the envisaged stenting method (T-stenting, V- stenting, Culotte, Crush, etc.). A participation in multicentre trial applying PCI or aortocoronary bypass surgery to patients with left coronary artery stenosis and/or triple vessel disease.

- Preclinical studies of CHD by using invasive research methods – intravascular (intracoronary) ultrasound method, drug provocation tests (intracoronary acetylcholine provocation testing; assessment criteria of this testing). An assessment of coronary and other artery endothelial dysfunction established to patients with coronary heart diseases comparing transcatheter diagnostic data with other modern endothelial function diagnostic methods. Explanation of risk factors related with endothelial dysfunction, evaluation of their correctional possibilities.

- The patients with acute coronary syndromes, treatment tactics – an optimization of the TCI. Advantages of the primary percutaneous coronary intervention over fibrinolytic therapy in patients with an acute ST-elevation myocardial infarction. A participation in studies applying innovative drugs being injected into coronary arteries to reduce a myocardial infarction zone as well as enhance recovery and prognosis of the patients after the myocardial infarction. An application of thrombolytic methods in presence of an acute myocardial infarction with aim at optimizing the removal of thrombus from the coronary “infarct-related” artery: it is foreseen to compare the treatment results of thrombectomy extraction catheters with angiolysis “Angiojet” system. With the emergence of innovative equipment of thrombus removal, a possibility has been established to compare the obtained results with them. Efforts to reduce the time interval from the patient’s admission to the hospital to the opening of the “infarct-related” artery. A work analysis of the catheterization laboratory by discussing the obtained results for their improvement, optimizing the used material during the course of diagnostic and treatment procedures to reach the maximum economic impact. A participation in discussions by choosing the selection of the supplies of various manufacturers in accordance with the envisaged criteria for the material as used in the procedures of interventional cardiology such as the supplied introducers, sheaths, quality assessment of the PCI balloons and stents according to the manufacturer’s characteristics to ensure the best quality/price ration.

- Improvement of transcatheter diagnostics of other heart diseases, e.g. hypertrophic obstructive cardiomyopathy being attuned with angiographic, manometric and contrast echocardiography methods; a selection of optimal treatment tactics.

- Transcatheter diagnostic and treatment procedures of renal arteries to patients with secondary arterial hypertension being difficult to correct.

- Transcatheter diagnostic possibilities of pulmonary arterial thromboembolism, their place in modern cardiology.

- Indications for intraaortic balloon contrapulsation, clinical application and optimization.

- Transcatheter pathology treatment of valves by implanting the valve (stent).

- Balloon valve valvuloplasty’s place and significance in the modern clinical practice.

- Innovative transcatheter treatment methods by performing valve annuloplasty.

- Application of pressure measurement in cardiac chambers in modern clinical practice, measurement of pulmonary artery occlusion pressure, cardiac output measurement by using invasive methods and result interpretation.

- Indications and observation of the procedures are being performed by multispecialty team (interventional cardiologists, interventional radiologists,

vascular surgeons, ultrasound diagnostic specialists, anesthesiologist and cardiac surgeons).

RECOMMENDED LITERATURE SOURCES

1. Percutaneous and Minimally Invasive Valve Procedures. A Scientific Statement From the American Heart Association Council on Cardiovascular Surgery and Anaesthesia, Council on Clinical Cardiology, Functional Genomics and Translational Biology Interdisciplinary Working Group, and Quality of Care and Outcomes Research Interdisciplinary Working Group / Rosengart T. et al. *Circulation* 2008;117:1750-1767.
2. Percutaneous Valve Therapies – Medscape Reference_2021
3. Ionizing Radiation in Cardiac Imaging. A Science Advisory from the American Heart Association Committee on Cardiac Imaging of the Council on Clinical Cardiology and Committee on Cardiovascular Imaging and Intervention of the Council on Cardiovascular Radiology and Intervention / Gerber T. et al. *Circulation*. 2009;119:1056-1965.
4. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 Appropriate Use Criteria for Cardiac Radionuclide Imaging / Hendel R. et al. *J Am Coll Cardiol* 2009;53(23):2201–2229.
5. Grossman & Baim's Cardiac Catheterization, Angiography, and Intervention 2020 ISBN/ISSN 9781496386373.
6. Textbook of Interventional Cardiology. 8th ed. by Eric Topol, Paul Teirstein, ISBN 9780323568142_2019
7. ESC/EACTS GUIDELINES ON MYOCARDIAL REVASCULARISATION 2018
8. American College of Cardiology - <http://www.cardiosource.org/>; Journal of the American College of Cardiology: Cardiovascular Interventions Online - <http://interventions.onlinejacc.org>

CONSULTING LECTURERS

1. Coordinating lecturer: Audrius Aidietis (Prof. Dr. HP).
2. Giedrius Davidavičius (Prof. Dr.).

APPROVED:

By Council of Doctoral School of Medicine and Health Sciences at Vilnius University:
29th of September 2022

Chairperson of the Board: Prof. Janina Tutkuvienė