

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

Scientific Area/eas, Field/ds of Science	Medical and Health Sciences (M 000): Medicine (M 001)			
Faculty, Institute, Department / Clinic	Faculty of Medicine Institute of Clinical Medicine Clinic of Children Diseases			
Course unit title (ECTS credits, hours)	Paediatric Cardiology 6 credits (160 hours)			
Study method	Lectures	Seminars	Consultations	Self-study
Number of ECTS credits	-	1	1	4
Method of the assessment	<p>Presentation and evaluation of the report: the report is presented on a target topic, which is coordinated with the coordinating lecturers (the doctoral student must analyze, review and present the latest scientific publications related to the respective topic). Criteria for evaluating the report (minimum readable score - 5): (a) relevance, novelty and relevance of the material submitted (2 points); (b) general structure and scope of the report, clear presentation of the knowledge, reasoning, brevity and specificity (2 points); (c) Summary, presentation and justification of conclusions (1 point); (d) raising problematic issues, presenting the application of the reviewed knowledge in the dissertation (3 points); (e) organization of visual aids, ability to participate in a discussion, management of questions, oratory skills (2 points).</p>			

PURPOSE OF THE COURSE UNIT

To know aetiology, pathogenesis, hemodynamic, clinical presentation, contemporary laboratory and instrumental tests necessary to diagnose, to treat and to control efficacy of treatment, methods of primary and secondary prevention of uncommon as well as common cardiovascular diseases in children. Promote interdisciplinary cooperation with colleagues from of different paediatric specialties', holistic approach to long-term care for children with chronic cardiovascular disease.

THE MAIN TOPICS OF COURSE UNIT

Peculiarities of the development, clinical examination and treatment of the cardiovascular system in children. The hemodynamic of foetus and new-born. The methodology of examination of cardiovascular system in children: physical examination, electrocardiogram (any type); ultrasound; exercise testing; radiology: chest X-ray, computed, nuclear magnetic resonance, and positron emission tomography – indications, possibilities, semiotics; cardiac catheterization. Prenatal diagnostics of congenital heart diseases.

Congenital heart diseases: classification, haemodynamic, diagnostics, methods of correction, prognosis. Defect with increased pulmonary haemodynamic: atrial septal defect, ventricular septal defect, atrioventricular septal defect, patent ductus arteriosus. Defects with pressure overload: preductal and postductal aortic coarctation, aortic stenosis, pulmonary stenosis, hypoplasia of left heart, aortic arch hypoplasia. Combined defects: single ventricle, *cor triartratum*. Anomalies of coronary arteries. Tetralogy of Fallot. The complex of transposition and anomalous drainage of pulmonary

veins. Cardiosurgery and the possibilities of invasive transcatheter therapy for congenital heart diseases.

Genetic syndromes and congenital heart diseases: Down's and other trisomy's, Turner syndrome, Marfan and Ehlers-Danlos syndromes, Holt-Oram syndrome, William's Beuren syndrome, velocardiofacial syndrome - heart disorders associated with them. The prolapse of mitral valve.

Acquired heart defects: etiology, classification, hemodynamics, clinic, diagnosis, treatment, prognosis. Rheumatic fever and Rheumatic heart disease: diagnosis, treatment, primary and secondary prevention. Infective endocarditis: diagnosis, treatment, prevention. Acquired aortic, pulmonary, mitral and tricuspid valve defects.

Inflammatory and inherited heart diseases: diagnosis and treatment. Myocarditis, pericarditis, primary and secondary cardiomyopathies. Inherited arrhythmias: syndromes of ventricular preexcitation, channelopathies. Sudden cardiac death.

Arrhythmia. Classification and etiology of heart rhythm and conduction disorders. Tachyarrhythmias: reentry and ectopic automatism in atrial, atrioventricular with additional pathway, ventricular tachycardia. Atrial and ventricular extrasystoles: classification, etiology, diagnosis, treatment. Electrophysiology treating tachyarrhythmias: indications, principles of performance, efficacy, possible complications. Bradyarrhythmia: sinus node dysfunction atrial, atrioventricular and bundle branch blocks. Implantation of cardiac pacemaker and defibrillator cardioverter: indications, principles of performance, long term health care peculiarities.

Arterial hypertension: etiology, classification according to the patient's age, pathogenesis, diagnosis, treatment goals, prevention; lesions of target organs; Essential hypertension: epidemiology due to patients' age, clinical picture, treatment; Secondary arterial hypertension: epidemiology and etiology due to patient's age, clinical and diagnostic features, differentials, treatment goals. Hypertensive emergencies (s. acute arterial hypertension, hypertensive crisis) in children.

Pulmonary hypertension: etiology, pathogenesis, classification, clinical presentation, diagnosis, strategy of treatment, prognosis.

Hypotension and syncope: etiology, pathogenesis, classification, clinical presentation, diagnosis, differential diagnosis, treatment, prevention. Clinical assessment of arterial hypotension. Syncope-like conditions: epilepsy, pseudosyncope, falls in children, prolonged disturbances of consciousness. management of child after transient loss of consciousness.

Acute and chronic heart failure: etiology, pathogenesis, clinical presentation, diagnosis and differential diagnosis, tactics of treatment. Heart transplantation: indications, contraindications, long-term care of transplant patients. Cardiogenic shock.

Prevention of cardiovascular morbidity and mortality in childhood: groups of risk, appropriateness of universal screening, long-term care of patients at risk, treatment and lifestyle recommendations.

Clinical pharmacology of medications used to treat cardiovascular disorders in children: antihypertensive, antiarrhythmic drugs, inotropics, diuretics, modulators of myocardial metabolism, manipulators of the ductus arteriosus: administration and dosing in children.

RECOMMENDED LITERATURE SOURCES

1. Gil Wernovsky MD, FAAP, FACC, Robert H. Anderson BSc, MD, PhD (Hon), FRCPath, FRCS Ed (Hon), Krishna Kumar MD, DM, Kathleen Mussatto PhD, RN, Andrew N. Redington MD, James S. Tweddell MD and Justin T. Tretter MD. Anderson's Pediatric Cardiology, i-iii. Anderson's Pediatric Cardiology; <https://www.clinicalkey.com/#!/content/book/3-s2.0-B9780702076084001059?indexOverride=GLOBAL>

2. Srivastava S, Printz BF, Geva T, Shirali GS, Weinberg PM, Wong PC, Lang P; Society of Pediatric Cardiology Training Program Directors; American College of Cardiology; American Academy of Pediatrics; American Heart Association. Task Force 2: Pediatric Cardiology Fellowship Training in Noninvasive Cardiac Imaging. SPCTPD/ACC/AAP/AHA. *Circulation*. 2015 Aug 11;132(6):e57-67. doi: 10.1161/CIR.000000000000193. Epub 2015 Mar 13
3. www.thecardiologyadvisor.com
4. <https://www.escardio.org/Guidelines>
5. Guidelines for the Management of Congenital Heart Diseases in Childhood and Adolescence. *Cardiol Young*. 2017 Jun;27(S3):S1-S105. doi: 10.1017/S1047951116001955.
6. Flynn JT, Kaelber DC, Baker-Smith CM, Blowey D, Carroll AE, Daniels SR, de Ferranti SD, Dionne JM, Falkner B, Flinn SK, Gidding SS, Goodwin C, Leu MG, Powers ME, Rea C, Samuels J, Simasek M, Thaker VV, Urbina EM; SUBCOMMITTEE ON SCREENING AND MANAGEMENT OF HIGH BLOOD PRESSURE IN CHILDREN. Clinical Practice Guideline for Screening and Management of High Blood Pressure in Children and Adolescents. *Pediatrics*. 2017 Sep;140(3):e20171904. doi: 10.1542/peds.2017-1904. Epub 2017 Aug 21.
7. Hansmann G, Koestenberger M, Alastalo TP, Apitz C, Austin ED, Bonnet D, Budts W, D'Alto M, Gatzoulis MA, Hasan BS, Kozlik-Feldmann R, Kumar RK, Lammers AE, Latus H, Michel-Behnke I, Miera O, Morrell NW, Pielek G, Quandt D, Sallmon H, Schranz D, Tran-Lundmark K, Tulloh RMR, Warnecke G, Wähländer H, Weber SC, Zartner P. 2019 updated consensus statement on the diagnosis and treatment of pediatric pulmonary hypertension: The European Pediatric Pulmonary Vascular Disease Network (EPPVDN), endorsed by AEPC, ESPR and ISHLT. *J Heart Lung Transplant*. 2019 Sep;38(9):879-901. doi: 10.1016/j.healun.2019.06.022. Epub 2019 Jun 21.
8. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. *Br J Sports Med*. 2020 Dec;54(24):1451-1462. doi: 10.1136/bjsports-2020-102955.
9. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, Carty C, Chaput JP, Chastin S, Chou R, Dempsey PC, DiPietro L, Ekelund U, Firth J, Friedenreich CM, Garcia L, Gichu M, Jago R, Katzmarzyk PT, Lambert E, Leitzmann M, Milton K, Ortega FB, Ranasinghe C, Stamatakis E, Tiedemann A, Troiano RP, van der Ploeg HP, Wari V, Willumsen JF.
10. Balci BK, Goynumer G, Biliciler-Denktaş G. Fetal cardiac anomalies. *J Fetal med* 2018, 5:167-183.
11. Patel N, Narasimhan E, Kennedy A. Fetal cardiac US. *RadioGraphics* 2017,37:1290-1303.

CONSULTING LECTURERS

1. Coordinating lecturer: Odeta Kinčinienė (Assist. Prof. Dr.).

2. Ramunė Vankevičienė (Assist. Prof. Dr.).

3. Skaistė Sendžikaitė (Assist. 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