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 for Clinical Medicine Clinics of the Cardiovascular Diseases			
Course unit title (ECTS credits, hours)	**Congenital Heart Defects: Diagnostics and Surgery** 6 credits (160 hours)			
Study method	**Lectures**	**Seminars**	**Consultations**	**Self-study**
Number of ECTS credits	**-**	-	2	4
Method of the assessment (in 10 point system)	Oral exam. 3 questions.			

PURPOSE OF THE COURSE UNIT

To learn about congenital heart defects anatomy and functional peculiarities, methods of diagnostics and surgical interventions, treatment of complications.

THE MAIN TOPICS OF COURSE UNIT

Surgery of congenital heart defects as an important part of the whole Heart surgery. Prevalence of patients with congenital heart defects is lower in comparison with patients with acquired heart diseases but surpasses them with variety of pathology and methods of treatment. Doctoral studies program covers principal congenital heart defects (CHD), clinical presentation, methods of diagnostics and treatment.
Historical review of treatment of CHD abroad and in Lithuania.
Classification of CHD. Peculiarities of haemodynamics. Relation between anatomical variations, haemodynamic changes and clinical presentation.
CHD diagnostics: electrocardiography (ECG), chest x-ray, cardiac echoscopy (ECHO), invasive methods (aortography, ventriculography, manometry of the heart chambers, calculation of pulmonary resistance), heart computer tomography (CT) scan, magnetic resonance image (MRI), laboratory tests.
Radiological invasive procedures: Rashkind septostomy, closure of patent arterial duct (PDA), aortopulmonary collaterals, balloon valvuloplasty of aortic and pulmonary valves, balloon angioplasty of aortic coarctation, closure of septal defects.
Peculiarities of cardiopulmonary bypass in CHD, ultrafiltration, extracorporeal membrane oxygenation (ECMO).
Implantable materials: auto-pericardium, homografts, "contegra" graft, polytetrafluorethylene (PTFE) grafts.
Fetal heart development, fetal blood circulation. Peculiarities of CHD in neonates and infants, diagnostics, treatment, post-surgical care. Patent arterial duct (PDA), anatomy, haemodynamics. PDA in premature neonates.
CHD requiring immediate care: total anomalous pulmonary venous return (TAPVR), hypoplastic left heart syndrome (HLHS), transposition of great arteries (TGA), coarctation of aorta (CoA), interrupted aortic arch, critical stenosis of aortic valve (AS).
Anatomy, classification, haemodynamics and clinical presentation of TAPVR, diagnostics and treatment.
Anatomy, haemodynamics and clinical presentation of HLHS, diagnostics and treatment, Norwood-1 type surgery, Sano modification.
TGA anatomy, classification, haemodynamics and clinical presentation. Diagnostics and surgical treatment of D-TGA. Methods of surgical repair: arterial switch

operation (Jatene), atrial switch methods (Senning, Mustard), surgeries at ventricular level (Rastelli, Nikaidoh).
Congenitally corrected transposition of great arteries (L-TGA), anatomy, haemodynamics and clinical presentation.
Tetralogy of Fallot (TOF), anatomy, haemodynamics and clinical presentation, diagnostics and surgical treatment – methods of palliative and complete repair. The significance of the reconstruction of the right ventricular outflow tract for the results of surgery. Peculiarities of TOF radical correction in adult patients.
Pulmonary atresia, major aortopulmonary collaterals. Use of pulmonary and aortic homografts.
Septal defects, atrial (ASD) and ventricular (VSD), anatomy, haemodynamics, clinical presentation, diagnostics and treatment. Paradoxical cerebral embolism. Pulmonary hypertension. Eisenmenger syndrome.
Atrioventricular septal defect (AVSD), anatomy, haemodynamics, clinical presentation, diagnostics and treatment.
Coarctation of aorta (CoA), anatomy, haemodynamics, clinical presentation in neonates, infants and adults, diagnostics and treatment.
Vascular rings (double aortic arch, pulmonary artery sling), treatment of oesophageal and tracheal compression.
Congenital stenosis of aortic valve, sub valvular aortic stenosis. Methods of surgical correction in neonates, adolescents and adults. Advantages and disadvantages of Ross surgery procedure.
Aneurysm of aorta, Marfan syndrome, Loeys-Dietz syndrome. Aortic valve sparring surgery (David, Magdi Yacoub). Shone's complex.
Ebstein anomaly, anatomy, haemodynamics and clinical presentation, diagnostics and surgical treatment.
Physiology of single ventricle circulation. Hemi Fontan and Fontan surgeries (Glenn procedure, classical, lateral tunnel, extracardiac conduit).
Heart and Heart Lung transplantation in CHD.

RECOMMENDED LITERATURE SOURCES

1. Warnes C.A. Adult Congenital heart disease. 2009. Willey-Blackwell.
2. Corno AF., Festa P. Congenital Heart Defects. Decision Making for Surgery. 2009, XII, 228 p.
3. Perloff JK, Child JS, Aboulhosn J. Congenital heart disease in adults (3rd Edition), 2009. Saunders Elsevier.
4. ESC Guidelines for the management of grow up congenital heart disease (new version 2010)
5. http://www.escardio.org/knowledge/guidelines/Management_of_Grown-Up Congenital_Heart_Disease.htm
6. Michael A. Gatzoulis. Diagnosis and Management of Adult Congenital Heart Disease: Expert Consult - Online and Print. Churchill Livingstone; 2 edition (November 15, 2010).
7. Mavroudis C., Backer C.L. Pediatric Cardiac surgery (4th edition), Wiley-Blackwell; (February 4, 2013).
8. Jonas R.A. Comprehensive Surgical Management of Congenital Heart Disease, second edition. CRC Press; (January 29, 2014).
9. Benjamin W. Eidem. Echocardiography in Pediatric and Adult Congenital Heart Disease. LWW; Second edition (November 5, 2014).
10. David S. Ezon. Atlas of Congenital Heart Disease Nomenclature: An Illustrated Guide to the Van Praagh and Anderson. Create Space Independent Publishing Platform; First edition (September 26, 2015).
11. Curt Daniels. Color Atlas and Synopsis of Adult Congenital Heart Disease. McGraw-Hill Education / Medical; 1 edition (August 13, 2015).
12. By Hugh D. Allen.:Moss & Adams' Heart Disease in Infants, Children, and

Adolescents, Including the Fetus and Young Wolters Kluwer Health; 9 edition (February 2, 2016).
CONSULTING LECTURERS
1. Coordinating lecturer: Virgilijus Tarutis (Prof. Dr.).
2. Artūras Lipnevičius (Dr.).
3. Rita Sudikienė (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