



Summer Semester													
			20										
TOTAL per year:													
			20										
<p>Educational objectives:</p> <p>C1. Letting know students about different parameters describing physiological and pathophysiological conditions: basic like pulse, heart rate, blood pressure, BMI, WHR and more sophisticated such as rhythm in electrocardiography, results of echocardiography, and many other functional and imaging techniques including tomography and magnetic resonance.</p> <p>C2. Giving epidemiological data concerning cardiovascular diseases in specific age groups and educating on which method of evaluating is the best in specific situations (including most common diseases- coronary artery disease, arterial hypertension, heart failure)</p> <p>C3. Learning the differences between different methods of evaluation, that is, invasive vs. non-invasive tests, and letting know about the risk of specific test and informed patient's consent.</p> <p>C4. Paying attention to a problem of distinguishing pathophysiological changes from physiological variations (for example in populations of sportsmen, young people, women, people in advanced age).</p> <p>C5. Possibility to have some practical exercising and to become more skillful in specific laboratories starting from basic measurements (body mass, BMI, WHR, blood pressure) and in the end dealing with more sophisticated methods –practices with ECG recording, 24-ecg Holter monitoring, and ABPM- ambulatory blood pressure.</p>													
Education result matrix for module/course in relation to verification methods of the intended education result and the type of class													
Number of course education result	Number of major education result	Student who completes the module/course knows/is able to	Methods of verification of intended education results (forming and summarising)	Form of didactic class <i>**enter the abbreviation</i>									
K 01	B.W.25	Student understands the physical background of the processes taking place in imaging techniques – echocardiography, ultrasonography, tomography, magnetic resonance etc. student knows the medical nomenclature of anatomy, histology and embryology	Discussion	MC									
	A. W.1												
K02	B.W.19	Student explains problem of obesity and overweight and their impact on heart and vessels (increased atherosclerosis, BMI ad WHR measurement.	Discussion	MC									
	E.W.1												
K03	B.W.25	Student describes physiological and pathophysiological changes in parameters of cardiovascular system: blood pressure, heart	Discussion	MC									
	B. W.28												
	E.W.8												
	B.W.29												
	E.W.7												



K04	B.W.30	rate, and others such as HRV-heart rate variability, and heart rate turbulence-HRT in different electrocardiographic tests including stress tests	Discussion	MC
K05		Student explains major problems in geriatric population- increased arterial stiffness, frequent fluctuations of measureable parameters like blood pressure, the incidence of degenerative changes giving specific pathologies such as sick sinus syndrome (SSS), valvular diseases (aortic stenosis)		
K06	B. W.33	Student describes typical pathophysiological changes in patients with selected, common diseases (arterial hypertension, coronary artery disease, heart failure, arrhythmias eg. atrial fibrillation) and explains which methods of evaluation would be helpful in each case.	Discussion	MC
K07		Student explains problems of physiological and pathophysiological change in sportsmen and amateur sportsmen in cardiovascular system, and understands difficulties in differentiating physiology and pathophysiology		
		Student explains how data from tests can be transferred by longer distance with the use of telemedicine, for medical staff and for the patients, online platforms, apps, specific software, and/or with the use of mobile telephones and understands possibilities to transfer the data to medical centers where medical staff-doctor or a nurse may identify a problem		
S 01	B. U.1	-Student is able to use specific methods of evaluation of the cardiovascular system in different situations in specific age groups of patients with understanding which one is invasive or non-invasive	Evaluation of the practical ability to make the initial selection of the method of evaluation of pathophysiological changes in circulatory system	MC
S2	B.U.7 E.U.16	Student may characterize basic methods of determination of some parameters of circulatory system (blood pressure, pulse, heart rate) in physiological and pathophysiological situations and also more sophisticated methods as tomography and magnetic resonance.		MC
S3	B. U.10	Student performs basic noninvasive medical tests to evaluate cardiovascular system including blood pressure, taking pulse, BMI measurements and WHR.		MC
S4	B. U.8	Student resolves problems of differentiating parameters of cardiovascular system as functional, morphological, stationary and induced by specific factor (stress tests)		MC
			Evaluation of the simple analysis of the methods describing pathophysiological changes in circulatory system	
			Evaluation of the performing of basic measurements connected with circulatory system	



** L - lecture; SE - seminar; AC – auditorium classes; MC – major classes (non-clinical); CC – clinical classes; LC – laboratory classes; SCM – specialist classes (magister studies); CSC – classes in simulated conditions; FLC – foreign language course; PCP – practical classes with patient; PE – physical education (obligatory); VP – vocational practice; SS – self-study, EL – E-learning .

Please mark on scale 1-5 how the above effects place your classes in the following categories:
communication of knowledge, skills or forming attitudes:
Knowledge: .5...
Skills: ...3.

Student's amount of work (balance of ECTS points)

Student's workload (class participation, activity, preparation, etc.)	Student Workload (h)
1. Contact hours:	20
2. Student's own work (self-study):	6
Total student's workload	26
ECTS points for module/course	1

Comments Each absence must be made up, including rector's days or dean's hours.

Content of classes (please enter topic words of specific classes divided into their didactic form and remember how it is translated to intended educational effects)

Lectures

- 1.
- 2.
- 3.

Seminars

- 1.
- 2.
- 3.

Practical classes

Practical classes

- 1- Basic and more advanced parameters to evaluate heart and vessels function – introduction, pulse, blood pressure, ultrasound tests, BMI, WHR. Discussing important anatomical characteristics of the heart and vessels helpful in diagnostics of physiological and pathophysiological changes. Measurements of BMI and WHR.
- 2– Discussing common cardiovascular diseases giving the highest mortality- coronary artery disease, arterial hypertension, heart failure. Evaluation od cardiovascular risk factors.
- 3-4 Surface electrocardiogram, and other types of electrocardiography. Discussing equipment, electrodes, preparation of patient to the test, problem of artifacts.
- 5–6 Description of ECG waves, segments and periods. Discussing more common types of arrhythmias, conduction disturbances, ischemic changes, overload – hypertrophies in ecg, in specific age groups of patients..
- 7-8 Basic pathologies in electrocardiography, discussion and exercising with ecg in cases where differentiation between physiology and pathophysiology is difficult.
- 9–ECG in patients with pacemakers, exercising on how differentiate it from other patients, and basic evaluation of pacemaker activity in electrocardiogram. Evaluation of pacemaker and cardioverter (ICD) as the tool to estimate parameters of circulatory system.
- 10-Exercise stress tests, bike vs. treadmill, 6-minute corridor test. Other stress tests –dobutamine stress test, exercise stress echocardiogram



- 11- Echocardiography (TTE-transthoracic), transesophageal echocardiography (TEE)
- 12 –Evaluation of endothelial function- FMD- flow mediated vasodilatation, IMT-intima media thickness, biochemical tests (nitric oxide, endothelin etc).
- 13- Parameters of cardiovascular system and telemedicine – up-to-date status, what it may bring to patients from different age groups -the elderly people vs young people.
- 14-Ultrasound examinations of the venous and arterial vessels, Doppler ultrasound.
- 15-Electrophysiology studies (EPS) of the heart.
- 16-Coronary angiography, coronary catheterization.
- 17-18 Cardiac computed tomography (CT), magnetic resonance imaging (MRI) of the heart and vessels with or without contrast agents –novel methods of cardiovascular imaging in modern medicine.
Discussing invasive and non-invasive tests in cardiology and contraindications to tests.
- 19-20 Practical tests in laboratory settings, exercising with ECG equipment, Holter ECG and ABPM-ambulatory blood pressure monitoring), practical exercising in blood pressure measurements.

Other

- 1.
 - 2.
 - 3.
- etc. ...

Basic literature (list according to importance, no more than 3 items)

1. Pathophysiology of Heart Disease: A Collaborative Project of Medical Students and Faculty (PATHOPHYSIOLOGY OF HEART DISEASE (LILLY). by Leonard Lilly (Author)
2. 12-Lead ECG: The Art of Interpretation 1st Edition . Tomas B. Garcia (Author), Neil Holtz (Author)
3. The Topol Solution: Textbook of Cardiovascular Medicine. by Eric J. Topol , Robert M. Califf, Eric N. Prystowsky , James D. Thomas , Paul D. Thompson

Additional literature and other materials (no more than 3 items)

1. The ESC Textbook of Cardiovascular Imaging. Second Edition. Edited by Jose Luis Zamorano, Jeroen Bax, Juhani Knuuti, Udo Sechtem, Patrizio Lancellotti, and Luigi Badano
2. Cardiac Pacemakers Step-by-Step: An Illustrated Guide. S. Serge Barold, Roland X. Stroobandt, Alfons F. Sinnaeve

Didactic resources requirements (e.g. laboratory, multimedia projector, other...)

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PowerPoint projector, blackboard'

ECG and Holter monitoring laboratory, ABPM (ambulatory blood pressure monitoring) laboratory, laboratory for basic measurements (scales, instruments for WHR measurement-tape measure, stethoscope, sphygmomanometer)

Preliminary conditions (minimum requirements to be met by the student before starting the module/course)

Basic information on anatomy of the heart, and its physiology

Conditions to receive credit for the course (specify the form, criteria and conditions of receiving credit for classes included in the module/course, admission terms to final theoretical or practical examination, its form and requirements to be met by the student to pass it and criteria for specific grades).

- Presence must be 100%
- In case of each absence including rector's days or dean's hours all the absences must be made up – preparation of the presentation or the essay



<ul style="list-style-type: none"> Final test passed 	
Each absence must be made up, including rector's days or dean's hours.	
Grade:	Criteria for course
Very Good (5.0)	obtaining result of 91-100 % in the final test
Good Plus (4.5)	obtaining result of 90-80 % in the final test
Good (4.0)	obtaining result of 70-80 % in the final test
Satisfactory Plus (3.5)	obtaining result of 61-70 % in the final test
Satisfactory (3.0)	obtaining result of 51% -60 % in the final test
Grade:	Criteria for exam (if applicable)
Very Good (5.0)	
Good Plus (4.5)	
Good (4.0)	
Satisfactory Plus (3.5)	
Satisfactory (3.0)	

Name of unit teaching course:	Department of Pathophysiology
Address	Ul. Marcinkowskiego 1, 50368 Wrocław
Phone	71 784 1245
E-mail	witold.pilecki@umed.wroc.pl

Person responsible for course:	Dr hab. n. med. Małgorzata Poręba
Phone	607860143
E-mail	malgorzata.poreba@umed.wroc.pl

<i>List of persons conducting specific classes:</i>	<i>degree/scientific or professional title</i>	<i>Discipline</i>	<i>Performer profession</i>	<i>Form of classes</i>
Małgorzata Anna Poręba	Dr hab. n. med.	medicine	physician	Classes non-clinical

Date of Syllabus development

23.05.2020.....

dr hab. n. med. Małgorzata Poręba
specjalista chorób wewnętrznych
KARDIOLOG
1563614

Syllabus developed by

Dr hab. n. med.

Małgorzata Anna Poręba MD PhD

Signature of Head of teaching unit

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KATEDRA PATOFIZJOLOGII
ZAKŁAD PATOFIZJOLOGII
Kardiologia

prof. dr hab. n. med. Witold Pilecki



Signature of Faculty Dean

Wrocław Medical University
Faculty of ...
Vice-Dean for English Studies
prof. Beata Sobieszczajska, PhD