

**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 Internal Medicine, Family Medicine and Oncology			
Course unit title (ECTS credits, hours)	Obesity, Metabolic Syndrome, and Basics of Diabetology 5 credits (135 hours)			
Study method	Lectures	Seminars	Consultations	Self-study
Number of ECTS credits	-	-	1	4
Method of the assessment (in 10 point system)	<p>Doctoral course unit will be assessed during the exam, where PhD student will have to provide written and oral answers to 3 open questions and solve one clinical case. Final exam score will be calculated as an arithmetical mean of all four scores. Assessment of each question/clinical case will be based on 10 points grading system:</p> <p>10 points – excellent knowledge and capabilities; 9 points – very good knowledge and capabilities; 8 points – good knowledge and capabilities; 7 points – average knowledge and capabilities; 6 points – satisfactory knowledge and capabilities; 5 points – poor knowledge and capabilities; 4 points – does not meet minimal requirements</p>			
PURPOSE OF THE COURSE UNIT				
<p>To provide knowledge about the regulation of metabolism, obesity-specific disorders of adipokine secretion, research-relevant methods for assessing body composition, metabolic parameters and insulin resistance, pathophysiological consequences of obesity, mechanisms linking obesity, metabolic syndrome and diabetes mellitus, medical and surgical treatment of obesity. To acquaint with the modern approach to the most important factors in the etiopathogenesis of the development of diabetes, classification of diabetes, the causes and prevention of complications, the modern approach to diabetes treatment. To promote an interdisciplinary, holistic approach to the problems of obesity, metabolic syndrome and diabetes, modern methods of diagnosis and treatment of these conditions in order to solve individual problems of doctoral topics in different fields of medicine.</p>				
THE MAIN TOPICS OF COURSE UNIT				
<p><i>Pathophysiology, evaluation, and treatment of obesity.</i> Obesity assessment methods used in clinical research, prevalence of obesity. Principles of metabolism and body weight regulation, the influence of adipokines and other biologically active substances on appetite and basal metabolism. Biologically active substances secreted by adipocytes, their role in the development of pathological conditions associated with obesity. Consequences of obesity, their pathogenesis, the most common disorders associated with obesity: insulin resistance and type 2 diabetes, reproductive system disorders, cardiovascular diseases, sleep apnea, non-alcoholic hepatic steatosis. Modern methods of obesity treatment.</p>				

Etiopathogenesis and consequences of metabolic syndrome. Modern diagnostic criteria, prevalence, causes, risk factors of metabolic syndrome. Pathophysiological mechanisms of metabolic syndrome development. Influence of insulin resistance on the development of metabolic syndrome. Consequences of metabolic syndrome demonstrated in clinical research. Methods of prevention and treatment of metabolic syndrome.

Regulation of glucose metabolism. Insulin biosynthesis, secretion, effects on various cells of the body. Hormones and their action involved in glucose metabolism. Modern methods for assessment of insulin resistance. Prediabetic conditions, their classification, diagnosis, and methods of diabetes prevention.

Classification, etiopathogenesis, and principles of diabetes mellitus treatment. Epidemiology of diabetes mellitus, modern etiological classification. The main types of diabetes, their diagnosis, methods of differential diagnosis. A modern approach to the etiopathogenesis of type 1 and type 2 diabetes mellitus. Influence of genetic and environmental factors on the development of different types of diabetes. Individualized goals of the treatment of diabetes. Non-pharmacological treatments for diabetes, scientific evidence of the effects of physical activity and nutrition correction. Principles of treatment of type 1 diabetes. Modern insulin preparations, their pharmacodynamic and pharmacokinetic properties. Modern technologies used in the management of type 1 diabetes. A modern approach to the treatment of type 2 diabetes. Classes of non-insulin antidiabetic medications, their mechanisms of action. Pleiotropic effects of modern antidiabetic medications. Hypoglycemia in diabetes: frequency in epidemiological studies, consequences, treatment, and prevention.

Pathogenesis, prevention, and treatment of diabetic complications. Acute complications of diabetes (diabetic ketoacidosis, hyperglycaemic hyperosmotic state): mechanisms of development, clinical manifestations, diagnosis, and treatment. Relationships between the development of chronic diabetes complications and glycemic control parameters. Pathogenesis, classification, prevention and treatment of chronic diabetes complications. Associations of diabetes with cardiovascular disease. Effects of antidiabetic treatment on cardiovascular risk.

RECOMMENDED LITERATURE SOURCES

1. Melmed S, Koenig R, Rosen C, Auchus R, Goldfine A. Williams Textbook of Endocrinology. 14th ed., 2019
2. Wass J, Wiebke A, Semple R. Oxford Textbook of Endocrinology and Diabetes. 3rd ed., 2021
3. Holt R.I.G, Cockram C, Flyvbjerg A, Goldstein B.J. Textbook of Diabetes. 5th ed., 2017
4. Holt R.I.G, Hanley N.A. Essential Endocrinology and Diabetes 2021
5. Davies M.J, D'Alessio D.A, Fradkin J, Kernan W.N, Mathieu C, Mingrone G, Tsapas A, Rossing P, WexlerDJ, Buse J.B. Management of Hyperglycemia in Type 2 Diabetes, 2018. A Consensus Report by the American Diabetes Association (ADA) and the European Association for the Study of Diabetes (EASD). Diabetes Care 2018;41:2669–2701 | <https://doi.org/10.2337/dci18-0033>
6. Holt R. I.G., DeVries J. H, Hess-Fischl A, Hirsch IB, Kirkman MS, KupaT, Ludwig B, Nørgaard K, Pettus J, Renard E, Skyler J.S, Snoek F.J, Weinstock R.S, Peters A.L. The Management of Type 1 Diabetes in Adults. A Consensus Report by the American Diabetes Association (ADA) and the European Association for

the Study of Diabetes (EASD). Diabetes Care 2021;44:2589–2625 |
<https://doi.org/10.2337/dci21-0043>

7. Roelofs J.J, Vogt L. Diabetic Nephropathy. Pathophysiology and Clinical Aspects. 2019
8. Bonora E, DeFronzo R.A. Diabetes complications, comorbidities and related disorders. 2nd ed., 2020
9. Lederman S.A, Akabas S.R, Moore B.J. Textbook of Obesity: Biological, Psychological and Cultural Influences. 1st ed., 2012
10. Lemieux I, Despres J,P. Metabolic syndrome from Etiology to Prevention and Clinical Management. 2021

CONSULTING LECTURERS

1. Coordinating lecturer: Agnė Abraitienė (Assist. prof. Dr.).

2. Žydrūnė Visockienė (Assoc. 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