

LECTURES AND SEMINARS

Subject:	Clinical Biochemistry	<i>ULCHBKB-CB-GM/18</i>	
Study	<i>General Medicine</i>	Study Period:	<i>9th semester</i>
Evaluation:	<i>graduated</i>	Subject Type:	<i>compulsory</i>
Content:	<i>2 h. lectures and 2 h. practical exercises / week</i>		<i>Total 56 hours</i>

Department: **Department of Medical and Clinical Biochemistry UPJŠ** in Košice,
Faculty of Medicine

Week	Lectures Educational Portal: Clinical biochemistry - Lectures	Seminars Educational Portal: Clinical Biochemistry - Selected chapters, e-book
1.	Introduction to clinical biochemistry - Clinical biochemistry as a part of laboratory medicine - Ordering and interpretation of results - reference intervals, cut-off values, biological variation, sensitivity, specificity	Introduction to clinical biochemistry - Clinical biochemistry as a part of laboratory medicine
2.	Water balance and its disorders - Water homeostasis, regulation of ECF volume - Hyperhydration, dehydration - Osmolality, osmolarity, tonicity	Water balance and its disorders - Laboratory markers of dehydration/hyperhydration - Osmolarity, tonicity, osmotic gap
3.	Electrolytes and ions - Disturbances of plasma sodium - Disturbances of plasma potassium	Clinical case studies - Hyponatraemia, hypernatremia - Hyper/hypokalaemia - Hyper/hypochloraemia
4.	Acid-base balance - Acid-base homeostasis - Acute and chronic disorders - compensation and correction - Metabolic and respiratory AB disorders - Oxygen transport and its disorders	Interpretation of acid-base results in patients - Systematic approach to interpretation of results - Clinical case studies with metabolic and respiratory acid-base disorders
5.	Kidney function tests - Glomerular filtration rate – creatinine clearance, estimated GFR, cystatin C - Proteinuria and albuminuria - Haematuria - Test of tubular functions – fractional excretion, concentrating test	Interpretation of laboratory results in patients - Urinalysis, urinary sediment - Proteinuria testing, types of proteinuria - Laboratory findings in acute kidney injury - Laboratory findings in chronic kidney disease
6.	Liver function tests - Tests for assessing of integrity of hepatocytes - Tests for cholestasis - Tests for assessing of synthetic liver function - Metabolic liver disease (Wilson´s diseases, alfa1AT deficiency)	Interpretation of laboratory results in patients - Jaundice - differential diagnosis - Acute and chronic liver failure - Metabolic-associated fatty liver disease - Markers of alcohol abuse

7.	Plasma proteins, inflammatory markers - Inflammation, sepsis, multiorgan failure syndrome - Biochemical markers of inflammation and sepsis	Interpretation of laboratory results in patients - Inflammatory biomarkers - Septic patient
8.	Diabetes mellitus - Regulation of glycemia, hormones - Impaired glucose and lipid handling: beta-cell dysfunction, insulin resistance, metabolic syndrome - DM - diagnostic criteria and monitoring of DM - Acute and chronic complications of DM - Gestational diabetes mellitus Hypoglycaemia - in diabetic and non-diabetic patients	Interpretation of laboratory results in patients: - Definition and laboratory screening of DM - Controlled and uncontrolled DM - Diabetic ketoacidosis, hyperosmolar hyperglycaemic state
9.	Lipids, hyperlipidaemias - Basic metabolism of lipoproteins - Classification of dyslipidaemias - Laboratory investigation of plasma lipids - international guidelines - Atherogenic dyslipidaemia - Biochemical background of lipid-lowering therapy: statins, fibrates, anti PCSK9	Clinical case studies: - Primary and secondary dyslipidaemias - Secondary hypercholesterolaemia - Mixed hyperlipidaemia - Assessing cardiovascular risk in patient
10.	Cardiac markers - Biochemical markers of myocardial necrosis - Cardiac troponins - recommendation of international guidelines - Diagnosis of heart failure - natriuretic peptides - Biochemical risk factors of cardiovascular diseases	Interpretation of laboratory results in patients - Dynamic changes of cardiac markers - AMI- examples of findings in patients - Specificity of cardiac markers - Rhabdomyolysis and SIRS, muscle compartment syndrome
11.	Calcium balance and its disorders - Hormonal regulation - Hyper-, hypocalcaemia	Interpretation of laboratory results in patients - Differential diagnosis of hypercalcemia - Primary, secondary hyperparathyroidism - Malignant hypercalcemia - Differential diagnosis of hypocalcaemia
12.	Phosphate and magnesium balance and their disorders - Hormonal regulation - Hyper, hypophosphatemia - Hypo, hypermagnesemia	Interpretation of laboratory results in patients - Hyper, hypophosphatemia - Refeeding syndrome - Findings in kidney mineral and bone disease - bone markers
13	Biochemical tests in endocrinology - Thyroid function tests	Interpretation of laboratory results in patients - Hypo/hyperthyroidism
14.	Biochemical tests in endocrinology - Assessing function of adrenal gland - Endocrine causes of hypertension	Interpretation of laboratory results in patients - Cushing syndrome, Cushing disease, - Addison's disease - Primary and secondary hyperaldosteronism