

LECTURES AND SEMINARS

Subject:	Clinical Biochemistry		
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

<i>Week</i>	<i>Lectures</i> https://portal.lf.upjs.sk/articles.php?aid=145	<i>Seminars</i> https://portal.lf.upjs.sk/index-en.php?f=search&q=
1.	<p>Introduction to clinical biochemistry</p> <ul style="list-style-type: none"> - Clinical biochemistry as a part of laboratory medicine - Ordering and interpretation of results - reference intervals, cut-off values, biological variation, sensitivity, specificity <p>Water balance and its disorders</p> <ul style="list-style-type: none"> - Water homeostasis, regulation of ECF volume - Hyperhydration, dehydration - Osmolality, osmolarity, tonicity 	<p>Sampling and interpretation of laboratory tests</p> <ul style="list-style-type: none"> - Biological material, sampling and manipulation in the preanalytical phase - Urine and blood sampling - Preanalytical factors - Organizing of clinical laboratory - visit of medical laboratory
2.	<p>Electrolytes and ions</p> <ul style="list-style-type: none"> - Disturbances of plasma sodium - Disturbances of plasma potassium 	<p>Clinical case studies</p> <ul style="list-style-type: none"> - Hyponatraemia, hypernatremia - Hyper/hypokalaemia - Hyper/hypochloraemia
3	<p>Acid-base balance</p> <ul style="list-style-type: none"> - Acid-base homeostasis - Acute and chronic disorders - compensation and correction - Metabolic and respiratory AB disorders - Oxygen transport and its disorders 	<p>Interpretation of acid-base results in patients</p> <ul style="list-style-type: none"> - Systematic approach to interpretation of results - Clinical case studies with metabolic and respiratory acid-base disorders
4.	<p>Kidney function tests</p> <ul style="list-style-type: none"> - Glomerular filtration rate - creatinine clearance, estimated GFR, cystatin C - Proteinuria and albuminuria - Haematuria - Test of tubular functions - fractional excretion, concentrating test 	<p>Interpretation of laboratory results in patients</p> <ul style="list-style-type: none"> - Urinalysis, urinary sediment - Proteinuria testing, types of proteinuria - Laboratory findings in acute kidney injury - Laboratory findings in chronic kidney disease
5.	<p>Liver function tests</p> <ul style="list-style-type: none"> - 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) 	<p>Interpretation of laboratory results in patients</p> <ul style="list-style-type: none"> - Jaundice - differential diagnosis - Acute and chronic liver failure - Non-alcoholic fatty liver disease - Markers of alcohol abuse
6.	<p>Biochemical tests in gastrointestinal disease</p> <p>Plasma proteins, inflammatory markers</p> <ul style="list-style-type: none"> - Immunoglobulins: polyclonal and monoclonal gammopathies - Inflammation, sepsis, multiorgan failure syndrome - Biochemical markers of inflammation and sepsis 	<p>Interpretation of laboratory results in patients</p> <ul style="list-style-type: none"> - Exocrine pancreas dysfunction - Markers of inflammatory bowel disease - Case studies - autoimmune diseases, MGUS, multiple myeloma - Septic patient

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7.	<p>Diabetes mellitus</p> <ul style="list-style-type: none"> - 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 <p>Hypoglycaemia</p> <ul style="list-style-type: none"> - in diabetic and non-diabetic patients 	<p>Interpretation of laboratory results in patients:</p> <ul style="list-style-type: none"> - Clinical and laboratory findings - Definition and laboratory screening - Controlled and uncontrolled DM - Diabetic ketoacidosis, hyperosmolar hyperglycaemic state
8.	<p>Lipids, hyperlipidaemias</p> <ul style="list-style-type: none"> - 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 	<p>Clinical case studies:</p> <ul style="list-style-type: none"> - Primary and secondary dyslipidaemias - Secondary hypercholesterolaemia - Mixed hyperlipidaemia - Assessing cardiovascular risk in patient
9.	<p>Cardiac markers</p> <ul style="list-style-type: none"> - Biochemical markers of myocardial necrosis - Cardiac troponins - recommendation of international guidelines - Diagnosis of heart failure - natriuretic peptides - Biochemical risk factors of cardiovascular diseases 	<p>Interpretation of laboratory results in patients</p> <ul style="list-style-type: none"> - Dynamic changes of cardiac markers - AMI- examples of findings in patients - Specificity of cardiac markers - Rhabdomyolysis and SIRS, muscle compartment syndrome
10.	<p>Calcium-phosphate and magnesium balance and their disorders</p> <ul style="list-style-type: none"> - Hormonal regulation - Hyper-, hypocalcemia - Hyper, hypophosphatemia - Hypo, hypermagnesemia 	<p>Interpretation of laboratory results in patients</p> <ul style="list-style-type: none"> - Primary, secondary hyperparathyroidism - Malignant hypercalcemia - Refeeding syndrome - Findings in kidney mineral and bone disease
11..	<p>Biochemical tests in endocrinology</p> <ul style="list-style-type: none"> - Thyroid function tests - Assessing function of adrenal gland - Endocrine causes of hypertension 	<p>Interpretation of laboratory results in patients</p> <ul style="list-style-type: none"> - Hypo/hyperthyroidism - Primary and sec. hyperparathyroidism - Primary and secondary hyperaldosteronism
12	<p>Laboratory markers of malignant disease</p> <ul style="list-style-type: none"> - Tumour markers - Endocrine manifestation of cancer - Metabolic changes in cancer 	<p>Interpretation of laboratory results in patients</p> <ul style="list-style-type: none"> - Malignant hypercalcaemia - Tumour lysis syndrome TM in monitoring of the therapy
13	<p>Disorders of iron metabolism</p> <ul style="list-style-type: none"> - Iron, metabolism and its investigation - Biochemical aspects of anemia - Laboratory signs of haemolysis - Iron overload disorders 	<p>Interpretation of laboratory results in patients</p> <ul style="list-style-type: none"> - ICA, ACD - Haemolytic anaemia - Laboratory signs of haemolysis - Basic coagulation tests
14.	<p>Hyperurikemia</p> <p>Biochemistry of extreme age</p> <ul style="list-style-type: none"> - Laboratory findings in new-borns and small children - Laboratory findings in elderly people 	<p>Repetition: Overview of typical cases</p> <p style="color: red; text-align: center;">Final test</p>