UNIVERSITÀ
DEGLI STUDI DI MILANO-BICOCCA

COURSE SYLLABUS

Clinical Biochemistry and Molecular Biology (Sondrio)

2021-1-I0101D005-I0101D018M-SO

Aims

Know the basic mechanisms of the onset of disease and the means of defense. Understand the meaning of the laboratory tests and their clinical relevance. Acquire the basics of pharmacology. Acquire the basics of microbiology.

Contents

Learn the meaning of the examination laboratory, his scientific and clinical relevance; the contribution of the laboratory in disease prevention, diagnosis, especially in assessments of organ function and patients monitoring; the foundation for interpreting laboratory tests; the influence of the way to collect, transport and storage biological samples on results of the laboratory tests.

Detailed program

Role, purpose and limits of Laboratory Medicine. How to ask for a laboratory test. Characteristics of a laboratory examination: biological materials on which are performed laboratory tests; quantities and units; reference values; critical values. Features of laboratory methods. Pre-analytical, analytical and post-analytical mistakes. Precision. Accuracy. Sensitivity. Specificity. Predictive value. Patient preparation, identification collection and preservation of samples for the transportation to the laboratory. Sources of variability in sample collection: patient position, location and type of sampling, disinfectants, tourniquet application, blood amount taken, anticoagulants and preservatives, sample types, time of harvesting. Physiological factors that alter the composition of body fluids. Biological variables controllable: posture, hospitalization and immobilization, exercise, circadian rithym, influence of food, tobacco smoking, alcohol consumption, drug therapies, patient's medical condition. Uncontrollable biological variables: age, sex, race, environmental factors. Interferences: hemolysis, lipemia, jaundice. The laboratory diagnostic in organ and metabolic functions, in monitoring drug therapies and some process of the desease. Liver: the main laboratory

tests used to assess liver function; definition, classification and clinical significance of the aspartate aminotransferase, alanine aminotransferase, alkaline phosphatase, gamma-glutamyl transferase, bilirubin, albumin, ammonium, lactic dehydrogenase, alpha-fetoprotein. Kidney: the main laboratory tests used for the evaluation of renal function; definition classification and clinical significance of plasma creatinine, creatinine clearance, estimation of glomerular filtrate by MDRD, Urea plasma, serum uric acid, chemical-physical examination of urine. Carbohydrate metabolism: the main laboratory tests used for the evaluation of glucose metabolism; definition, classification and clinical significance of fasting plasma glucose, postprandial plasma glucose, plasma glucose after oral load (OGTT), glycated hemoglobin, Fructosamine, plasma insulin, Peptide C. Examples of indices of acute phase assayed in the laboratory: speed ??of erythrocyte sedimentation rate (ESR); C-Reactive Protein. Monitoring of drug therapies and dosing an overuse of substance: INR and prothrombin activity; measurement of ethanol. The markers of organ failure: tumor markers; markers of myocardial necrosis. Principles of Immunology: the blood groups; finding Antibodies Irregulars; blood components; outline of transfusion reactions.

Prerequisites

Positive evaluation in Biomedical Sciences 1.

Teaching form

Lectures through presentations in electronic form of drawings and diagrams explaining concepts and functions of the organism. The lessons of some disciplines will be provided by teledidattica.

In the period of COVID-19 emergency the lessons will be online asynchronous and some events with synchronous videoconference

Textbook and teaching resource

Rossi A., Biagiotti S., De Francesco D. (1993) Elementi di immunologia, immunoematologia e pratiche trasfusionali, Milano, Sorbona; Melzi D'Eril G. V., Chelazzi G. (1999) Biochimica clinica e immunologia, Milano, Sorbona;

Semester

1st Year, 2nd Semester

Assessment method

Written examination: 60 closed quiz with multiple choice answer and one open ended question. The 60 quiz are subdivided for different subjects: 20 for general pathology, 20 for pharmacology, 10 for clinical biochemistry, 10 for microbiology. The examination will be passed with 36 exact answers.

In the COVID-19 emergency the examination will be online with 6 open question that cover the 4 discipline of the course.

Office hours