



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2016/2017		
MASTER'S DEGREE (MSC)	MEDICINE AND SURGERY		
INTEGRATED COURSE	LABORATORY MEDICINE - INTEGRATED COURSE		
CODE	04988		
MODULES	Yes		
NUMBER OF MODULES	3		
SCIENTIFIC SECTOR(S)	MED/07, BIO/12, MED/05		
HEAD PROFESSOR(S)	CIACCIO MARCELLO GIAMMANCO ANNA	Professore Ordinario Professore a contratto in quiescenza	Univ. di PALERMO Univ. di PALERMO
OTHER PROFESSOR(S)	BALISTRERI CARMELA RITA CIACCIO MARCELLO SCOLA LETIZIA GIAMMANCO ANNA BIVONA GIULIA	Professore Associato Professore Ordinario Professore Associato Professore a contratto in quiescenza Professore Associato	Univ. di PALERMO Univ. di PALERMO Univ. di PALERMO Univ. di PALERMO Univ. di PALERMO
CREDITS	9		
PROPAEDEUTICAL SUBJECTS	13246 - SYSTEMATIC PATHOLOGY I - INTEGRATED COURSE 13248 - SYSTEMATIC PATHOLOGY II - INTEGRATED COURSE 13257 - SYSTEMATIC PATHOLOGY IV - INTEGRATED COURSE 13253 - SYSTEMATIC PATHOLOGY III - INTEGRATED COURSE		
MUTUALIZATION			
YEAR	4		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	BALISTRERI CARMELA RITA Wednesday 10:00 - 12:00 Istituto di Patologia generale, Corso Tukory 211 BIVONA GIULIA Wednesday 15:30 - 16:30 Dipartimento di Biopatologia e Biotecnologie Mediche, Sezione di Biochimica Clinica. CIACCIO MARCELLO Monday 10:00 - 12:00 Sezione di Biochimica Clinica Wednesday 10:00 - 12:00 Sezione di Biochimica Clinica GIAMMANCO ANNA Tuesday 12:00 - 14:00 Dip. Pro.Mi.Se SCOLA LETIZIA Tuesday 10:00 - 13:00 Sezione di Patologia Generale del Dipartimento di Biopatologia e Biotecnologie Mediche		

PREREQUISITES	The student will know the biochemistry and physiology of major organ systems that make up the human body and know the pathophysiology of major diseases.
LEARNING OUTCOMES	<p>Targets of the Laboratory Medicine Integrated course are to acquire the basic knowledge (theoretical and practical) to critically evaluate the biochemical data at the in relation to human disease.</p> <p>In particular:</p> <ul style="list-style-type: none">• knowledge of the main laboratory tests and the cellular, molecular and pathophysiological basis which are prerequisites and foundation.• critical interpretation of laboratory tests results with regard to analytical and biological variation; reliability of diagnostic laboratory tests, examples of correct forms of laboratory reports.• basic concepts on the most relevant methodologies used in Clinical Biochemistry and their limitations.• appropriate use of laboratory tests in screening, staging and treatment of the disease.• correct interpretation of laboratory tests results and their critical correlation with molecular and cellular events induced by the disease.• acquisition of a proper programming prescription of tests in relation to the diagnosis or monitoring. <p>Knowledge of the main diagnostic tests used in the laboratory of Clinical Biochemistry and diagnostic significance of reference change values of the main laboratory parameters.</p> <p>Proper ordering for laboratory tests and using of guidelines and flowchart based on "Evidence Based Medicine".</p> <p>Be able to relate to colleagues and health operating in laboratory to understand and synthesize relevant information about all the problems, understanding their content and devising and agreeing on how to study.</p> <p>Perform adequately the request of the most common laboratory tests.</p> <p>Implement self-protection measures in the collection and handling of biological samples.</p>
ASSESSMENT METHODS	<p>The learning assessment consists in itinere evaluations and an oral examination. There is a oral test (pre-test) of the Clinical Biochemistry module in preparation for the final oral examination of the Integrated Course. Oral examination consists in a conversation, order to check competences and subject knowledge required from the course; the evaluation is expressed in thirtieths.</p> <p>The questions will tend to test the learning achieved by assessing a) the knowledge captured; b) the processing capacity, c) possession of adequate exhibition capacityThe pass mark will be reached when the student shows knowledge and understanding of the issues at least in general terms, and has minimal application knowledge in order to solve concrete cases; the student will also have presentation skills and of argument as to allow the transmission of his knowledge to the examiner. Below this threshold, the examination will be insufficient. Link: http://www.unipa.it/scuole/dimedicinaechirurgia</p>
TEACHING METHODS	The didactic activity takes place through lectures.

DOCENTE: Prof.ssa ANNA GIAMMANCO- Sede HYPATIA

PREREQUISITES	Students should have the basic knowledge of biology, biochemistry. They must have acquired a background of knowledge of anatomy, physiology, immunology and general pathophysiology of human diseases
LEARNING OUTCOMES	<p>The students will be acquire the basic knowledge (theoretical and practical) to critically evaluate the biochemical and microbiological data in relation to human disease.</p> <p>In particular:</p> <ul style="list-style-type: none">• knowledge of the main laboratory tests and the cellular, molecular and pathophysiological basis which are prerequisites and foundation of them.• critical interpretation of laboratory test results with regard to analytical and biological variation; reliability of diagnostic laboratory tests, examples of correct forms of laboratory reports.• basic concepts on the most relevant methodologies used in Clinical Biochemistry, Clinical Pathology and Clinical Microbiology and their limitations.• appropriate use of laboratory tests in screening, staging and treatment of the disease.• correct interpretation of laboratory tests results and their critical correlation with molecular and cellular events induced by the disease.• acquisition of a proper programming prescription of tests in relation to the diagnosis or monitoring. <p>Knowledge of the main diagnostic tests used in the laboratory of Clinical Biochemistry Clinical Pathology and Clinical Microbiology and diagnostic significance of reference change values of the main laboratory parameters.</p> <p>Proper ordering for laboratory tests and using of guidelines and flowchart based on "Evidence Based Medicine".</p> <p>Be able to relate to colleagues and health operating in laboratory to understand and synthesize relevant information about all the problems, understanding their content and devising and agreeing on how to study.</p> <p>Perform adequately the request of the most common laboratory tests.</p> <p>Implement self-protection measures in the collection and handling of biological samples.</p>
ASSESSMENT METHODS	oral exams
TEACHING METHODS	Frontal lessons

MODULE CLINICAL BIOCHEMISTRY

Prof. MARCELLO CIACCIO - Sede CHIRONE, - Sede CHIRONE, - Sede IPPOCRATE, - Sede IPPOCRATE

SUGGESTED BIBLIOGRAPHY

L. Sacchetti, P. Cavalcanti, G. Fortunato, L. Pastore, F. Rossano, D. Salvatore e F. Scopacasa: Medicina di Laboratorio e Diagnostica Genetica. Idelson-Gnocchi Editori, 2007.

G. Federici, P. Cipriani, C. Cortese, A. Fusco, P. Ialongo e C. Milani: Medicina di Laboratorio. 3a Edizione, McGraw-Hill, 2009.

I. Antonozzi, E. Gulletta. Medicina di Laboratorio Logica & Patologia Clinica. Piccin, 2012

L. Spandrio: Biochimica Clinica Speciale. Piccin Editore, 2006.

W.J. Marshall e S.K. Bangert: Biochimica in Medicina Clinica. Mc Graw-Hill, 1997.

B. Barbiroli, F. Filadoro, C. Franzini, L. Sacchetti, e F. Salvatore: Medicina di Laboratorio. UTET, 1996.

AMBIT	50402-Medicina di laboratorio e diagnostica integrata
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INDIVIDUAL STUDY (Hrs)	45
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COURSE ACTIVITY (Hrs)	30
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EDUCATIONAL OBJECTIVES OF THE MODULE

Acquisition of basic and applied concepts of clinical biochemistry in order to evaluate methods and clinical applications of laboratory tests critically. Specific aim of the course is to be able to identify the correct tests in relation to clinical conditions of the patients and to be able to understand them in relation to the diagnosis.

Particularly, the students must:

- know the main laboratory tests and the biological, molecular and pathological basis for their use in medicine;
- use laboratory tests in screening, diagnosis, prognosis and therapy of diseases correctly;
- understand laboratory tests results and connect them to the molecular and cellular aspect of the pathologic state
- order laboratory tests appropriately in relation to diagnostic hypothesis or monitoring.

Knowledge of the molecular mechanisms underlying the main clinical syndromes arising from genetic alteration.

SYLLABUS

Hrs	Frontal teaching
3	Pre-analytical phase: preparation of the patient, collection of biological samples, processing and identification of biological samples. General laboratory techniques with descriptions of the principles - colorimetry, turbidimetry, nephelometry, fluorimetry, atomic absorption and emission, potentiometric electrochemical techniques, kinetic reactions, electrophoresis, immunoelectrophoresis, immunofixation, immunochemical analysis with monoclonal antibodies, isoelectric focusing, chromatography, radioimmunoassay, count cell, flow cytometry, clinical microscopy, mass spectrometry, HPLC, molecular biology and recombinant DNA technologies, multiple analyzers, magnetic resonance spectroscopy, PET.
2	Post-analytical phase: data collection, calculation, automatic processing. Analytical variation, analytical error, quality control systems. Intra-individual and inter-individual biological variation, reference values, nomenclature and reporting of laboratory tests. Clinical sensitivity and specificity, predictive laboratory tests. Methodological approaches in clinical biochemistry. The main analytical techniques, automation in clinical biochemistry.
2	Enzymes: tissue and organ profiles. Acid and alcalin phosphatase, aldolase, aminotrasferase, LDH, gammaGT, cholinesterase, amylase, lipase, protease, G-6-PD, piruvate kinase, lysozyme.
3	Metabolism of glucose: Diabetes: biochemistry of DMT1 and DMT2; biochemistry of diabetes complications; clinical biochemistry diagnostics (serum glucose, urine glucose, insulin, C-peptide, glucagon, cortisol, GH, glicated proteins and their significance, OGTT, ketone bodies in serum and urine, lactic acid, piruvic acid, dyslipidemia in diabetic patients, urine test in diabetic patients. Hypoglicemia: clinical biochemistry
2	Metabolism of lipids: Fatty acids, cholesterol, HDL-cholesterol, LDL-cholesterol, tryglicerides, phospholipids. Lipoprotein. Dyslipidemia. Hypercholesterolemia. Atherosclerosis and cardiovascular diseases.
2	Metabolism of proteins: Plasma proteins. Electrophoresis of plasma proteins: interpretation of results. Clinical biochemistry of kidney disease. Hyperammonemia. Clinical biochemistry of liver failure. Urea metabolism: clinical biochemistry of enzymatic deficiency
2	Endocrine system: Clinical biochemistry of hypothalamus-pituitary axis: GH and growth, prolactin and amenorrhea, GnRH, LH, FSH and reproduction, ACTH, TSH e functional tests. Clinical biochemistry of endocrine pancreas: insulin and glucagon, somatostatin.
2	Clinical biochemistry of gastrointestinal hormones. Clinical biochemistry of adrenal cortex hyperplasia and hypofunction. Clinical biochemistry of hyperthyroidism, thyreotoxicosis, hypothyroidism. Clinical biochemistry of testis, ovary and sex differentiation.
2	Clinical biochemistry of rickets. Clinical biochemistry of osteoporosis and osteomalacia. Calcium homeostasis. Hormone receptors and their importance in clinical biochemistry. Clinical biochemistry of arterial pressure regulation: ANF, catecholamines, glucocorticoids. Essential hypertension and in the secondary forms.

2	Clinical biochemistry of acid base balance. Blood gas analysis: interpretation and reporting. Myocardial infarction: risk factors, biochemical modification in the necrotic area; clinical enzymes, new markers of myocardial infarction.
2	Clinical Biochemistry of liver diseases. Clinical Biochemistry of jaundice. Clinical biochemistry of exocrine pancreas. Clinical biochemistry of healthy and pathologic renal function. Clinical Biochemistry of heme metabolism Clinical Biochemistry of rheumatic, connective and autoimmune diseases.
2	Cancer diseases: biochemistry of cancer; metastasis, biomarkers. Biochemistry of nutrition and its surveillance.
2	Laboratory tests in genetic diseases. Laboratory tests in myopathies. Clinical biochemistry of neuro-psychiatric diseases. Biochemistry of pain. Clinical biochemistry of cerebro-spinal fluid. Clinical biochemistry in shock, trauma and surgery.
2	Clinical molecular biology: diagnostic techniques used for the diagnosis of the main genetic diseases. Main chromosomal abnormalities revealed by karyotyping. Monogenic diseases and DNA typing. DNA mutations analysis by direct and indirect analyzes (restriction polymorphism). PCR reaction (polymerase chain reaction) for the amplification of abnormal DNA sequences.

MODULE CLINICAL MICROBIOLOGY

Prof.ssa ANNA GIAMMANCO - Sede CHIRONE, - Sede CHIRONE, - Sede HYPATIA, - Sede HYPATIA, - Sede IPPOCRATE, - Sede IPPOCRATE

SUGGESTED BIBLIOGRAPHY

Microbiologia Medica, Quinta Edizione, EMSI

AMBIT	50401-Patologia generale e molecolare, immunopatologia, fisiopatologia generale, microbiologia e parassitologia
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

To perform reasoned requests for microbiological investigation to diagnosis of infectious diseases.
To know the procedures on patient preparation and execution of the levy for the microbiological investigation .
To indicate the biological and diagnostic significance of data obtained in the microbiological diagnostic methods , with the clinical pathology and clinical biochemistry integrated approach .

SYLLABUS

Hrs	Frontal teaching
4	Execution mode , storage and forwarding to the laboratory of samples for culture and molecular tests (blood culture , urine culture , coproculture , sputum and other biological materials).
3	Execution mode of: tonsillar, vaginal and cervical swab, prostate massage and collection of prostatic secretions or urine to diagnosis of prostatitis.
3	Diagnostic procedure by direct and indirect evaluation including: ELISA, PCR, REAL TIME PCR.
2	Methods for: microbial identification, evaluation of antimicrobial resistance
2	Interpretation of pathogenesis role of microorganism and of antibiograms
2	Markers of bacterial and viral resistance
3	Central nervous system infections, respiratory tract infections and Enteric infections and food poisoning
4	Urinary and genital tract infection, intravascular infections bacteriemia.
2	Skin and wound infections, bone and joint infections, eye infections, infections in pregnancy.
4	HIV, HBV, M.tuberculosis, T.pallidum, Brucella spp, Rickettsia spp. Infections
2	Nosocomial infections

MODULE CLINICAL PATHOLOGY

Prof.ssa CARMELA RITA BALISTRERI - Sede CHIRONE, - Sede CHIRONE

SUGGESTED BIBLIOGRAPHY

Autore: La posata M.
 Titolo: Medicina di laboratorio - diagnosi di malattia nel laboratorio clinico
 Casa Editrice: Piccin Nuova Libreria SpA
 Autore: Antonozzi I. - Gulletta E.
 Titolo: Trattato di Patologia Clinica
 Casa Editrice: Piccin Nuova Libreria SpA

Per la Patologia Clinica sono disponibili le presentazioni delle lezioni, scaricabili attraverso il portale studenti (<http://immaweb.unipa.it/immaweb/home.seam>) a cui ciascun iscritto può accedere tramite le credenziali in suo possesso. A richiesta possono essere forniti anche articoli scientifici di approfondimento

AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

Knowledge of the main types of diagnostic tests in the Clinical Pathology Laboratory and diagnostic significance of change in laboratory parameters.

Proper use of the request for laboratory tests and use of guidelines and flowchart based on "Evidence Based Medicine" for the achievement of laboratory data useful in the diagnosis evaluation and treatment of patients. Be able to relate to laboratory medicine colleagues and laboratory staff to understand and synthesize relevant information about clinical problems, understanding their content and devising and agreeing on how to proceed for further insights.

SYLLABUS

Hrs	Frontal teaching
2	The logic of diagnostic laboratory tests: Factors influencing the pre-analytical and analytical variability. Sampling, collection and validity of the specimens for laboratory diagnosis. The laboratory data as a clinical sign of the disease. Organ profiles and diagnostic protocols Mode and reporting times Concepts: reference interval, decision-making values, laboratory clinical history of the patients. Use of laboratory data in the therapeutic evaluation and prognosis
6	The patient with hematologic diseases: - Examination blood count Nomenclature and clinical interpretation examination blood count Meaning of pathological changes of the blood count values The examination of anemia indicators and the logical / interpretive trail of the lab report. Diagnostic significance of Numerical changes in leukocyte populations
4	Correlations of changes in coagulation parameters - Monitoring of blood coagulation parameters The counts and platelet parameters Basic blood coagulation profile; laboratory path in thrombophilia and hemorrhagic diathesis; monitoring of anticoagulant therapy
4	The patient with urinary tract pathologies: - Examination of Urine The laboratory and the kidney functionality tests. special examinations of urine samples and correlation with the serum-hemathological parameters
6	The patient with diseases of the immune system: - basic serological pictures in organ specific and systemic immune diseases- diagnosis of the state of primary immune deficiency and acquired - The laboratory in allergies and intollerances
4	Approach to immuno-hematology Principles of immuno-hematology. guidelines in the proper use of blood. Blood components: types and main applications. stem cells . HLA typing: diagnostic applications and in transplant medicine
4	The patient with internal medical and surgical disorders: - Laboratory diagnosis of cavitory spills - Laboratory Guidelines in emergencies and use of POCT - Laboratory Diagnostics in CNS lesions - Laboratory approach to the diagnosis of vascular disease - Laboratory approach to the hypertensive patient

MODULE CLINICAL PATHOLOGY

Prof.ssa CARMELA RITA BALISTRERI - Sede HYPATIA, - Sede HYPATIA

SUGGESTED BIBLIOGRAPHY

Antonozzi – Gulletta : Medicina di Laboratorio –Logica & Patologia Clinica. Ed. Piccin. Manuale tecnico della banca del sangue. Sono inoltre a disposizione degli studenti le presentazioni (.ppt) utilizzate durante le lezioni ed, a richiesta, articoli scientifici di approfondimento su specifici argomenti .

AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

Teaching of Clinical Pathology are to allow the students acquire the basic knowledge (theoretical and practical) that allow them to critically evaluate the significance of laboratory data obtained in connection with a pathological condition. The student will acquire the methodological and cultural bases, as well as the experience to know how to decide on the desirability of special tests or analyzes and have the ability to access the analytical data as a particular diagnostic instrument .In 'expected to know the main examinations laboratory and the biological basis, molecular and pathophysiological which are prerequisites and foundation; he who approaches the study of laboratory Medicine should be able to provide a critical interpretation of the analytical results with regard to the uncertainty, measurement and biological variability; must evaluate the diagnostic accuracy of laboratory investigations, then applying the formulas correct reporting. Finally, information is provided on the characteristics and limitations of the most important methods used in Clinical Pathology, the correct use of tests in screening procedures, diagnosis, staging and therapeutic response of the disease..

Verify of knowleges: the oral examination is characterized by three questions abouts the most important of ClinicalPathology.The 'threshold will be reached if the student shows knowledge and understanding of the topics, at least in general lines and have minimum application expertise on the use of laboratory tests in the attivita' diagnostic and operative of the dental practice; must 'also possess skills' exhibition such as to allow the examiner evaluation.Al below this threshold the examination result 'insufficiente.As much is able to interact with the examiner and as much' her knowledge and capacity 'applications goes into detail of the discipline, the more' evaluation will be 'positive.The valuation is thirty and is obviously compared and integrated ponderalmente to that on the assessment of the preparation on the second module of the course. (Pathological anatomy).

SYLLABUS

Hrs	Frontal teaching
5	Logic of diagnostic laboratory and the laboratory examinations: - The organization of the clinically Pathology laboratory diagnostics strumentale- The evaluation of the data Instrumental Laboratory - Pre-analysis and Analytical Variability - The validation of the samples - Quality Controls Sensitivity 'and Analytical specificity and diagnostics
4	The patient with hematologic diseases: - The examination Hemocromocitometrico-
4	Pathological changes of Hemocromocitometric examination parameters and their interpretation
1	Cytometry and flow cytometry applications
4	Applications of Flow Cytometry and flow cytometry to patients with diseases coagulative- Emostasi- examinations of first and second level
2	Diagnostics of the causes of bleeding diathesis and thrombophilia
3	The patient with urinary tract infections: - Examination of Urine
2	The Myocardial Infarction: - The Laboratory Indexes in 'AMI and susceptibility to Coronaropatia- Diagnostic Applications IMA in the POCT
2	Special tests on body fluids: - generalized edema, and edema localizzati- Examination of ascites fluid and the liquid pleurico- of liquor Examination
3	Blood Groups ABO,RH systems,Irregular antibodies,Cross-match,Hemocomponents and clinical application

**MODULE
CLINICAL BIOCHEMISTRY**

Prof.ssa GIULIA BIVONA - Sede HYPATIA, - Sede HYPATIA

SUGGESTED BIBLIOGRAPHY

Panteghini -interpretazione dei dati di laboratorio- Piccin

AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

knowledge and comprehension of the most used lab tests used in clinical practice
 knowledge and comprehension of the mostly used guide lines and flow charts in clinical practice-EBM
 problem solving, from lab test to clinical diagnosis.
 excellent communication and analytical-synthetical ability.

SYLLABUS

Hrs	Frontal teaching
8	lab test parameters energetic substrates-metabolism and dysfunctions
5	liver, kidney, digestive and bone functionality lab tests.
3	plasma and CSS proteins.
3	cardiacdysfunction biomarkers.
3	neoplastic biomarkers
5	Psyconeuroimmunology
3	hormones as immunomodulators

MODULE CLINICAL PATHOLOGY

Prof.ssa LETIZIA SCOLA - Sede IPPOCRATE, - Sede IPPOCRATE

SUGGESTED BIBLIOGRAPHY

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AMBIT	50402-Medicina di laboratorio e diagnostica integrata
INDIVIDUAL STUDY (Hrs)	45
COURSE ACTIVITY (Hrs)	30

EDUCATIONAL OBJECTIVES OF THE MODULE

Knowledge of the main types of diagnostic tests in the Clinical Pathology Laboratory and diagnostic significance of change in laboratory parameters.

Proper use of the request for laboratory tests and use of guidelines and flowchart based on "Evidence Based Medicine" for the achievement of laboratory data useful in the diagnosis evaluation and treatment of patients. Be able to relate to laboratory medicine colleagues and laboratory staff to understand and synthesize relevant information about clinical problems, understanding their content and devising and agreeing on how to proceed for further insights.

SYLLABUS

Hrs	Frontal teaching
2	The logic of diagnostic laboratory tests: Factors influencing the pre-analytical and analytical variability. Sampling, collection and validity of the specimens for laboratory diagnosis. The laboratory data as a clinical sign of the disease. Organ profiles and diagnostic protocols Mode and reporting times Concepts: reference interval, decision-making values, laboratory clinical history of the patients. Use of laboratory data in the therapeutic evaluation and prognosis
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4	Approach to immuno-hematology Principles of immuno-hematology. guidelines in the proper use of blood. Blood components: types and main applications. stem cells . HLA typing: diagnostic applications and in transplant medicine
4	The patient with internal medical and surgical disorders: - Laboratory diagnosis of cavitory spills - Laboratory Guidelines in emergencies and use of POCT - Laboratory Diagnostics in CNS lesions - Laboratory approach to the diagnosis of vascular disease - Laboratory approach to the hypertensive patient