SUBJECT TEACHING GUIDE

G159 - The Laboratory in Clinical Diagnosis

Degree in Medicine

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Degree in Medicine			Type and Year	Compulsory. Year 5
Faculty	Faculty of Medicine				
Discipline	Subject Area: Diagnostic Laboratory Tests Diagnostic and Therapeutic Procedures				
Course unit title and code	G159 - The Laboratory in Clinical Diagnosis				
Number of ECTS credits allocated	6	Term		Semester based (1)	
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

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3.1 LEARNING OUTCOMES

- Upon completion of learning, students should recognize the importance of the clinical laboratory in generating useful information for clinical care in areas such as:
  - Health and disease
  - Diagnosis and prognosis of the diseases
  - Effectiveness of the applied treatment
  - Clinical follow-up
  - Disease prevention

  Also, they should acquire a more responsible and critical attitude when using the laboratory for this purpose

4. OBJECTIVES

Lectures and practical teaching of the subject are aimed at the medical student at training, so that they can be able to fulfill their role in relation to the clinical laboratory, and to integrate it into their daily work. To accomplish this the following objectives are pursued:

- To recognize the importance and complexity of the clinical laboratory as healthcare support in different areas : preanalytical, analytical and postanalytical
- To perform an adecuate collection of samples for the clinical laboratory
- To know how to interpret the laboratory results for diagnosis , treatment or clinical follow-up
- To provide an update in new technologies applied to diagnosis
- To take contact with a hospital clinical laboratory to know "in situ" its potential in relation with the activity, the technological development and the services portfolio
- To encourage critical thinking in the laboratory requests from a professional and responsible side , avoiding unnecessary and expensive clinical practice
- To provide the student a broader approach to the degree in Medicine that goes beyond the clinical specialties of high popularity, so that the clinical laboratory be more attractive to new medical specialist in training

6. COURSE ORGANIZATION

	CONTENTS
1	THE MICROBIOLOGY LABORATORY 1. Phenotypic techniques of microbiological diagnosis (I): Direct diagnosis 2. Phenotypic techniques of microbiological diagnosis (II): Indirect or serologic diagnosis 3. Molecular techniques of microbial diagnosis (I): Identification of microorganisms 4. Molecular techniques of microbial diagnosis (II): Typing of microorganisms 5. The microbiological diagnosis of tuberculosis and micobacteriosis 6. The microbiological diagnosis of HIV infection 7. Microbiological diagnosis of respiratory tract infections 8. Microbiological diagnosis of urinary tract infections 9. Microbiological diagnosis of gastrointestinal infections 10. Microbiological diagnosis of the genital tract infections. STD (Sexually transmitted diseases) 11. The microbiological diagnosis of biomaterial-associated infections. Hemocultures 12. The antibiogram: Techniques and interpretation
1.1	- Presentation and discussion of clinical cases in Microbiology
1.2	- Facilities and activity of the Microbiology Laboratory of the University Hospital Marques de Valdecilla (HUMV)
2	THE IMMUNOLOGY LABORATORY 13. Plasticity of the immune response. Involvement in the development of immunologic biomarkers. 14. Study strategy for an immunodeficiency in the immunology laboratory. Classification of primary immunodeficiencies. 15. Humoral immunodeficiencies. Most remarkable features. 16. Cellular immunodeficiencies. Most remarkable features. 17. Other immunodeficiencies: phagocyte deficiency, complement deficiency, autoinflamatory diseases. 18. Cellular and molecular bases of autoimmunity. Systemic autoimmune diseases I. 19. Systemic autoimmune diseases II. 20. Laboratory tests for organ-specific autoimmune diseases. Diagnostic strategy from the immunology laboratory. 21. Hypersensitivity and allergies. Study of allergies in the laboratory. 22. Tumoral immunity: Immunotherapy. 23. Tumoral immunity: Immunomonitoring. 24. The immunology laboratory in alarm transplant.
2.1	- Presentation and discussion of clinical cases in Immunology
2.2	- Facilities and activity of the Immunology Laboratory of the University Hospital Marques de Valdecilla (HUMV)
3	THE LABORATORY OF GENETICS 25. Genetics in Public Health. Genetics section in the HUMV 26. Techniques used in genetic diagnosis (I): PCR and sequencing 27. Techniques used in genetic diagnosis (II): Using gene chips 28. The laboratory in prenatal diagnosis of genetic abnormalities 29. Genetic counseling: A roadmap in the request of genetic testing 30. Population genetic screening. Carriers studies 31. Association studies. Personalized medicine 32. Haematological genetics 33. Genetic study in hereditary blood diseases 34. Genetic study in oncological pathology 35. New approaches in diagnosis and treatment of genetic diseases
3.1	- Genetic diagnosis
3.2	- Analysis of clinical cases: display of karyotypes with different techniques and use of clinical diagnosis database

4	THE LABORATORY OF BIOCHEMISTRY 36. The clinical laboratory care unit. General considerations. Information systems. 37. The analytical process phases: Preanalytical phase. 38. The emergency laboratory. 39. Protein analysis. Nutritional profile. 40. Interpretation of serum biochemistry I. 41. Interpretation of serum biochemistry II. 42. Hormonal analysis. 43. Electrolytic balance. Gasometries. 44. Systemic analysis of urine. 45. Biological fluids. 46. Lipid analysis. Indications and interpretation. 47. Analitic process. Quality control. Reference values. POCT systems.
4.1	- Presentation and discussion of clinical cases in Biochemistry
4.2	- Facilities and activity of the Clinical Analysis Laboratory of the University Hospital Marques de Valdecilla (HUMV)

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Midterm exam 1	Written exam	No	Yes	40,00
Midterm exam 2	Written exam	No	Yes	40,00
Oral presentations or written works	Work	Yes	No	20,00
TOTAL				100,00

Observations

- It is mandatory to pass both midterm exams in order to pass the subject. The exams include both multiple-choice and short-answer questions.
- A maximal score of 50% of the maximun grade is required to pass the exams. These ones can be compensated as long as a minimun of 40% of the maximun grade be attained in one of them.
- The retake of the exams that have not been passed during the course will take place in September.
- Failure to pass in September any of the midterm exams will mean failing the complete subject
- Only the scores achieved in the theorical exams will be taken into account to pass the subject. The mark obtained in the practical classes will be applied just to improve the final score.
- Oral presentations of the students related with clinical cases will be graded by instructor.
- Attendance to practical classes is mandatory.

Observations for part-time students

- Students enrolled part-time will undergo only one evaluation from the theoretical part, if requested. The evaluation will include an exam of similar characteristics to those made in the course.
- Furthermore, in case of being unable to attend the practical classes regularly, these may be offset by the completion of a written work about any of the subjects which are exposed in them.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

J.M. Prieto, J.R. Yuste: "La clinica y el laboratorio", 22 ed, Elsevier, 2015
J.B. Henry: "El Laboratorio en el Diagnóstico Clínico", 20 ed., Marbán, 2005
Martin A Crook: "Clinical Biochemistry and Metabolic Medicine", 8 ed, CRC Press, London, 2012
K.J. Ryan, C.G. Ray: “Sherris Medical Microbiology" 5th ed. McGraw Hill, 2010
G. Prats: “Microbiología Clínica” 1ª ed, Panamericana, Madrid 2006
Nussbaum, McInnes, Willard: “Thompson &Thompson. Genética en Medicina”, Masson, S. A Barcelona, 8ªed, 2015
Strachan: “Genetics and Genomics in Medicine” . Ed. Garland Science, 2015
Fainboim L. and Geffner J: "Introducción a la Inmunopatología Humana", 6 ed, Panamericana, 2011
Regueiro J.R., López-Larrea C., Gonzalez S., Martínez-Naves E: "Inmunología. Biología y Patología del Sistema Inmunitario" 5 ed, Panamericana, 2013